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Running head: MASCULINE THREAT AND ANTIGAY ATTITUDES

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Abstract

This study examined the relationship between threatening masculinity identity in men and subsequent antigay attitudes and behaviors. In a group testing session, masculinity levels were assessed in college men using the Male Role Norm Scale. Male participants were called back for the experimental manipulation, in which they were assigned to one of two conditions. In the masculine threat condition, participants took a test supposedly measuring masculine knowledge and received false feedback of poor performance. In the no threat condition, participants took a test supposedly measuring general knowledge without receiving any feedback. Following the experimental manipulation, a male confederate that participants were led to believe was gay administered a professionalism evaluation, which was used as a behavioral measure. Participants then completed measures on attitudes toward gays. It was predicted that participants with high masculinity in the masculine threat condition would express the most antigay attitude and behavior. This hypothesis was not supported by significant results. Possible interpretations of these findings are discussed.

Threatening Masculinity and Its Effects on Antigay Attitudes and Behaviors

In 1984, the National Gay and Lesbian Task Force reported that 94% of surveyed lesbians and gay men have experienced some form of victimization during their lifetime because of their sexual orientation (as cited by Parrott, Adams, & Zeichner, 2002). Nearly half of these respondents have also been threatened by physical violence. Antigay victimization, however, is seldom reported (as few as 10%), due to lesbians' and gay men's fear of additional harassment from public revelation of their sexual orientation (Herek, 1995). Franklin (2000) reported an even more startling finding that anti-gay behaviors are common among the young, non-criminal population. In an anonymous survey of 484 college students from a politically and reputedly tolerant geographical area, 1 in 10 admitted to having engaged in physical violence or threats against presumed homosexuals in the past, with another 24% admitting to having engaged in name-calling. These findings suggest that many young adults believe anti-gay harassment and violence are socially acceptable, especially in response to inferred sexual innuendoes or gender norm violations. Since the frequency of self-acknowledged antigay behaviors among a general population sample is correlated with victim studies where large proportions of lesbian and gay men report sexuality-related victimization, there exists a concern for the extent and impact that antigay behaviors may have on the gay and lesbian population (Herek, 1999).

Faced with the need to reduce or eliminate anti-gay victimization, recent studies have attempted to discover the causes of anti-gay attitudes and behaviors. Two models that attempt to explain the reasons behind attitudes are the functional approach to attitudes (Katz, 1960) and the self-affirmation model (Steele & Liu, 1986). Based upon

these two models, antigay attitudes and behaviors may be caused by feelings of threat toward one's masculinity (Herek, 1995; Kimmel, 2001; Parrott, Adams, & Zeichner, 2002). Studies have also shown that men who hold onto more traditional male ideologies display more antigay attitudes. However, these studies have been correlational in nature and have not experimentally examined the causal relationship between traditional masculine ideology and antigay attitudes and behaviors.

Functional Approach to Attitudes

Katz's (1960) functional approach is an attempt to understand the reasons individuals hold specific attitudes. Katz defines an attitude as "the predisposition of the individual to evaluate some symbol of object or aspect of his world in a favorable or unfavorable manner. Attitudes include both the affective, or feeling core of liking or disliking, and the cognitive, or belief, elements which describe the object of the attitude, its characteristics, and its relations to other objects" (Katz, 1960, p. 168). He claims that attitudes meet personal needs and are held to perform a specific psychological function for the individual. Four major functions that attitudes serve for the individual are the adjustment function, the ego-defensive function, the value-expressive function, and the knowledge function.

Attitudes serving adjustment function help people to maximize their rewards or to reach for a desired goal, or to minimize the penalties or to avoid undesirable goals. These attitudes are formed and maintained by the person's past or present perceptions on the utility of the attitudinal object. In other words, these attitudes are formed as they satisfy specific needs. The more these attitudinal objects actually satisfy an individual's need, the greater the probability they are formed (Katz, 1960).

The ego-defense function is the mechanism with which people develop attitudes to protect the ego from unacceptable impulses and outside threats and reduce anxiety. These attitudes function to defend one's self-image. For example, when individuals cannot admit to themselves that they feel inferior, they may project this anxiety onto other minority groups to bolster the ego with attitudes of superiority (Katz, 1960).

The value-expressive function describes attitudes as providing positive expressions to people's central values and to the type of person that they perceive themselves to be. Gratification from the expression of these attitudes is obtained through the establishment of their self-identity and confirmation that they are who they view themselves to be (Katz, 1960).

Finally, many of these attitudes are provided by the norms of our culture. Those who seek knowledge in order to provide meaning, standards, or a frame of reference for understanding their world are using the knowledge function. Therefore, existing stereotypes provide an orderly and consistent view of a world that our habits, tastes, and comforts have already become accustomed to (Katz, 1960).

According to Herek (1986), Katz's functional approach to attitudes was never transformed into a systematic theory because of his inadequate method for assessing functions. Katz's empirical methodological strategies assumed that attitudes were closely tied to personality. Therefore, his model on the functions of attitudes were assessed through global personality characteristic measures, and neglected the impact of situational factors.

Herek (1987) attempted to address these methodological issues by investigating whether a reliable and valid procedure could be developed to assess the functions of

attitudes. He (Herek, 1986) developed the neofunctional theory, in which attitude functions were assessed not only through personality traits, but were also allowed to vary across situations and attitude domains. Through this model, Herek (1986) found evidence for two classes of attitude functions: evaluative and expressive.

In the evaluative function, the individual associates the attitude object with rewards and punishments. When the individual perceives the object as beneficial or rewarding, a positive attitude will form. If the individual perceives the object as harmful or unpleasant, then a negative attitude will form. These attitudes therefore function to organize the world's objects according to the individual's self-interest.

For the expressive function, benefit is derived from the attitude through its expression (Herek, 1986). These attitudes function to secure social support, to increase self-esteem, and to reduce anxiety through the declaration to themselves and others about the sort of people they are (Herek, 1995). This may be done through affirming the self by attacking those who represent the sort of person one is not or does not want to be (Herek, 1995).

Herek (1986) further divides these two classes into three specific functions of attitudes: experiential function, defensive function, and self-expressive function. The evaluative function classification includes the experiential function, while the expressive function includes the defensive and self-expressive functions.

The experiential function occurs when individuals base their attitudes upon their past experiences (Herek, 1986). The positive or negative affect that results from these past experiences is then generalized to an entire group. This function is a combination of Katz's knowledge and adjustment function.

The defensive function results from the formation of attitudes based upon insecurities and intrapsychic conflicts concerning an individual's gender or sexuality (Herek, 1986). These attitudes serve to alleviate the anxiety produced by these conflicts. This is similar to Katz's ego-defensive function.

Comparable to Katz's value-expressive function, the self-expressive function creates attitudes that reflect values central to the individual's self-concept (Herek, 1986). Herek (1986) separates this self-expressive function into two components: the value-expressive function and the social-expressive function. Attitudes of the value-expressive function are motivated by the need to affirm one's sense of self by articulating these values central to the self. The social-expressive function results in attitudes that are motivated by the need for acceptance from others.

Self-Affirmation Model

Similar to the Katz's expressive function of attitudes (1960), Steele and Liu (1986) developed a model that suggests attitudes serve to self-affirm or enhance the self-image after an individual experiences threat. In a representative study of self-affirmation, Steele (1975) investigated whether name-calling would enhance an individual's willingness to comply with a later request for help. They found that negative name-calling resulted in more compliant behaviors than positive names. These results suggest that when an individual feels their general character is threatened, they will behave in a fashion that enhances their self-image.

Several studies have also demonstrated that individuals will engage in any actions to affirm the self after feeling threatened, even if it is unrelated to the specific threat (Steele & Liu, 1986). In one of these studies, Steele and Liu (1983) examined whether an

experience that affirms a valued self-aspect would eliminate dissonance. Specifically, they wanted to determine whether dissonance processes are mediated by ego or consistency motives. They reasoned that if dissonance resulted from a threat to the self, then thoughts or actions that affirm an important aspect of the self would reduce dissonance, regardless of whether they pertain to the particular inconsistency. However, if the dissonance resulted from a need to be consistent, then self-affirmative thoughts or actions that did not resolve or dismiss the inconsistency would not result in a reduction of dissonance for the individual. The results of the study demonstrate that dissonance processes are mediated by the ego. Dissonance was reduced after self-affirmation, regardless of whether it pertained to the particular inconsistency.

Anti-gay Attitudes

Researchers have used the theory of self-affirmation and the defense function of attitudes to explain the production of anti-gay attitudes after the experience of threat (Herek, 1995; Herek, 2000). Adams, Wright, and Lohr (1996), for example, investigated whether homophobic men would show more sexual arousal to homosexual cues than non-homophobic men. Homophobic men and non-homophobic men were exposed to sexually explicit erotic stimuli of heterosexual, male homosexual, and lesbian videotapes, and then measured for sexual arousal through changes in penile circumferences. The two groups did not significantly differ in self-reports of low erection and arousal to homosexual stimuli. Homophobic individuals, however, exhibited a significant sexual arousal to gay erotic stimuli whereas non-homophobic individuals did not demonstrate any significant increases in penile response. Although this study was derived based on psychoanalytic theory, the authors provided an alternative explanation to these results that corresponds

with the self-affirmation theory. Barlow, Sakheim, and Beck's (as cited by Adams, Wright, & Lohr, 1996) theory on the role of anxiety and attention in sexual response states that anxiety plays a role in attention in sexual responding. It is therefore possible that the viewing homosexual stimuli may have caused anxiety in homophobic men and not in non-homophobic men (Adams, Write, & Lohr, 1996). If this were the case, then increases in erection would be found in homophobic men as a function of threat rather than that of sexual arousal.

Although these studies suggest that heterosexual men may hold antigay attitudes are a result of feeling threatened, they do not identify the self-value that homosexual men threaten in homophobic men. Since Berrill reports that current data suggests that the bulk of antigay attacks are perpetrated by males (as cited by Herek, 1995), some studies have shed light on an answer to this issue by investigating anti-gay attitudes and behaviors in terms of gender differences. With such evidence, studies have examined gender differences in heterosexual attitudes towards lesbians and gay men.

Herek (2000) investigated differences in how heterosexual men and women think about lesbians and gay men. The purpose of the study was to determine how and why heterosexuals' attitudes toward lesbians and gay men differ both quantitatively and qualitatively. He found no differences in heterosexual women's attitudes toward lesbians and gay men. However, heterosexual men's attitudes were more hostile toward gay men than toward lesbians, and also more negative toward both groups of homosexuals in comparison to heterosexual women's attitudes. Heterosexual men's attitudes were also found to be easily influenced by the order of presentation. When heterosexual men were

asked first about gay men and then lesbians, their attitudes toward both groups were more negative in comparison to the presentation of lesbians before gay men.

Herek (2000) offers an interpretation for this difference in the pattern of attitudes that heterosexual men and women have toward lesbians and gay men. He defines sexual prejudice as attitudes related to one's own sexual and gender identity. Therefore, it is most likely that depending on the gender of the heterosexual individual, the sexual prejudice will be expressed differently toward lesbians and gay men. If the purpose of the sexual prejudice serves the function of demonstrating one's membership as heterosexual while disproving one's membership as a homosexual, then attitudes of sexual prejudice would be directed at homosexuals that are of the heterosexual's same sex. This would be the group most relevant to the heterosexual individual's identity. In American society, heterosexual men are more likely to feel pressured in affirming their heterosexual masculinity by rejecting gay men. In contrast, heterosexual women's rejection of lesbians is less relevant to affirming their self-image because women are not pressured by American society to affirm their femininity. This would explain the insignificant difference found between heterosexual women's attitudes toward lesbians and gay men in contrast to the significant difference found between heterosexual men's attitudes toward these two groups.

Threat to Masculinity

Herek's study (1995) seems to suggest that the self-value that homosexual men threaten in heterosexual men may be their masculinity. He found that heterosexual men reported higher levels of prejudice against gay men than did heterosexual women. He explained this finding to be the result of a link between masculinity and heterosexuality

in American culture. Kimmel (2001) claims that males define what it means to be man in our culture by opposing a set of "others", such as racial minorities, sexual minorities, and women. Similar to this, Herek (1995) argues that males are under considerable pressure to affirm their masculinity through the rejection of those that are not culturally defined as masculine, (i.e., gay men). Since heterosexual females do not perceive the need to reject homosexuality as a means for affirming their gender identity, opportunities for personal contact with openly gay people are greater for heterosexual females. This is an explanation for the higher acceptance of lesbians and gay men from heterosexual females.

Herek (1995) has also found evidence that people who hold negative attitudes toward gay people are more likely to support traditional gender roles. Kimmel (2001) states that homophobia and sexism go hand in hand, with the fear of being perceived as gay and not a real man producing an exaggeration in the traditional rules of masculinity. Indeed, other studies have also shown that adherence to a traditional male gender role is correlated to higher levels of homophobia (Parrott et al., 2002).

Parrott et al. (2002) examined the relationship between homophobia and both hypermasculinity attitudes and negative attitudes against women. Their study found a positive correlation between homophobia and an exaggerated sense of masculinity, defined as the endorsement of violence as manly attributes, callous sexual beliefs, and perceiving danger as exciting. A positive correlation was also found between homophobia and feeling threatened by femininity, defined as attitudes of hostility against women, perceiving women as manipulative and exploiting men, and endorsement of violence in interpersonal relationships with women. Thus, not only may extreme

masculinity correlate with feelings of threat induced by homosexual stimuli, but that an encounter with femininity, whether with women or gay men, are correlated with negative responses in homophobic men (Parrott et al., 2002). In other words, men whose masculinity is threatened are more likely to exhibit negativism towards gay men, and that these feelings of threat stem from the femininity perceived in gay men (Parrott et al., 2002).

Antigay Behaviors

Studies have shown that masculinity and antigay attitudes are correlated with antigay behaviors as well. Franklin (2000) conducted a study to explore the motivations of individuals who had committed antigay behaviors. The results of the study found that the primary heterosexual males who exhibited antigay behaviors also endorsed a masculine ideology. A correlation between antigay behaviors and the defensive function was found, suggesting that those most anxious about their own sexuality may be more likely to exhibit antigay behaviors.

Additional evidence of a possible link between antigay attitudes and behaviors comes from researchers reporting a positive correlation between negative affect toward homosexuals and reports of negative behavior toward homosexuals (Bernat, Calhoun, Adams, & Zeichner, 2001). Roderick, McCammon, Long, and Allred also found that homophobic affect was correlated with self-reported antigay behaviors (as cited by Bernat et al., 2001).

Rayburn and Davison (2002) examined whether antigay attitudes predicted perceptions about hate crimes. Antigay attitudes were positively correlated with anger against the hate crime victim, disapproval of victim, and support of the hate crime

perpetrators. However, antigay attitudes were not correlated with any crimes that were not hate-crimes. This suggests that antigay attitudes lead to the endorsement of antigay behaviors.

Bernat et al. (2001) designed a study to examine the link between antigay attitudes and antigay behaviors by assessing the relationship between homophobia and laboratory aggression toward homosexuals. Participants were asked to administer shocks to a fictitous heterosexual or homosexual opponent in a competitive reaction time task after being exposed to male homosexual erotic videotape. The homophobic men and non-homophobic men were also compared in their affective responses towards watching the erotic male homosexual videotape. The results of this study showed that homophobic men reported more anxiety and anger-hostility after watching the homosexual erotic videotape in comparison to the non-homophobic men. In addition, a significant increase in anger-hostility was found in homophobic men in comparison to the baseline. The homophobic men also displayed more aggression towards the homosexual opponent in comparison to the non-homophobic group, but no differences were found in their aggression toward the heterosexual opponent. Finally, a strong correlation was found between an increase in anger-hostility and anxiety after exposure to the homosexual erotic videotape and aggression toward the homosexual opponent. This correlation was not found for the heterosexual opponent.

Manipulating Masculine Threat

A study performed by Chad Corbley (2002) was the first empirical attempt to examine the relationship between masculinity and anti-gay attitudes by manipulating masculine threat. Participants were first assessed for their masculinity level with the

Personal Attributes Questionnaire (PAQ). Participants were then called back to participate in one of three conditions: masculine threat, general threat, and no threat. In the masculine threat condition, the participant took a masculine knowledge test, in which the researchers told the participant that it was used to assess masculinity. Participants were then given false feedback that they did poorly on the test. The general threat condition was the same except that participants took a general knowledge test and given the false feedback. In the no threat condition, participants took the general knowledge test but were not provided with any feedback on their performance. Participants then filled out measures assessing attitudes toward gay men.

Corbley's study found evidence that the masculinity test produced physiological patterns of threat in participants' of the threat condition and challenge for participants in the no-threat condition. Tomaka, Blascovich, Kelsey, and Leitten (1993) found that there are certain physiological markers that are correlated with "threat" and "challenge". When participants are challenged, physiological measures of PEP and TPR both decreases, but when participants are threatened, physiological measures of PEP decreases and TPR increases. Corbley's study did find a significant overall increase in TPR for participants in the threat condition and a slight decrease for participants in the control condition. However, there were no significant patterns in the physiological measures of PEP in the comparison between the threat and control conditions. Corbley suggested that a possible explanation for this incomplete physiological evidence is the result of an unequal difficulty level between the masculine and general threat tests. This would cause participants taking the more difficult test to evidence greater physiological measures of

threat than those taking the other test. Extensive pre-testing of the threat tests before actual experimentation may eliminate this issue.

Another major limitation in Corbley's study was the small sample size. Due to time restraints, only 12 participants were used in each condition. An increase in the sample size may result in significant findings for this study.

Overview and Predictions

This study was a modification of Corbley's study. I attempted to threaten participants' masculinity in order to observe whether they would try to reaffirm their masculinity through reporting antigay attitudes and behaviors. Participants were divided into high and low masculinity based upon their scores on the Male Role Norm Scale (Fischer, Tokar, Good, & Snell, 1998), and then randomly placed into one of two conditions: masculine threat or no threat.

Based upon the functional approach to attitudes (Katz, 1960) and the self-affirmation model (Steele & Liu, 1986), we predict that participants with high masculinity will express the most anti-gay attitude and behavior in the masculine threat condition than all other groups. We expect to find high masculine participants to express the more anti-gay attitudes and behaviors than low masculine participants because highly masculine participants should be particularly eager to affirm their threatened masculinity. It is also predicted that measures of attitudes towards other groups will be similar between high and low masculinity in both conditions because these attitudes have little to do with males' masculine identities. For all the participants, we expected to see a clear physiological threat pattern in the masculine threat condition, and a no threat pattern in

the no threat condition. In addition, we hypothesize that participants will not differ in their attitudes toward women or racial minorities, regardless threat condition.

Methods

Participants

Participants for this study consisted of 49 male undergraduates recruited from Illinois Wesleyan University and Illinois State University. Students from the research experience program at Illinois Wesleyan University received course credit for participating, while students from the psychology subject pool at Illinois State University received extra credit. 25 subjects were randomly assigned to the no threat condition, and 24 subjects were randomly assigned to the masculine threat condition. However, psychophysiological recordings were only available for 20 subjects out of the 24 subjects in the no threat condition and 19 subjects out of the 25 subjects in the masculine threat condition.

Setting and Apparatus

The preliminary testing session was held in either a classroom in the Center for Natural Sciences at Illinois Wesleyan University or in a classroom in the psychology department at Illinois State University. The experimental manipulation was held in either a psychology research lab on the second floor of the Center for Natural Science at Illinois Wesleyan University or in a research lab on the lower level of the education building at Illinois State University. Subjects were seated in a comfortable upholstered chair. The masculine knowledge test of the masculine threat condition and the general knowledge test of the no threat condition were administered on a Macintosh computer. The recording, monitoring, and lab equipment were located in a control room adjacent to the

recording room. The physiological recording equipment included a Minnesota Impedance Cardiograph (model 304B, instrumentation for medicine, Greenwich, CT), a Colin Arterial Tonometry Machine (model 7000, Colin Instruments Corporation), a Biopac analog to a digital signal converter (Biopac Corporation), and a personal computer.

Measures

Masculinity Ideology. The Male Role Norm Scale was used to measure masculine ideology by assessing the participants' opinions of what constitutes the male role. Fischer, Tokar, Good, and Snell (1998) found that the three subscales of the MRNS had moderate to good reliability, with coefficient alpha for the Status scale as .83, Toughness scale as .79, and Antifeminity scale as .75. Participants were asked to rate items such as "Success in his work has to be man's central goal in this life" on a 7-point Likert scale from "strongly disagree" to "strongly agree". A median split was performed on the participants' MRNS score to determine their level of masculinity, with those who scored less than or equal to the median score considered as low in masculinity, while those who scored higher than the median score considered as high in masculinity.

The MRNS was embedded within the Personal Attributes Questionnaire (PAQ), the Bem Sex-Role Inventory (BSRI), the Rosenberg Self-esteem scale (RSE), the Loneliness Dimensions Scale (LDS), the Rational Emotive Inventory (REI), the COPE (a measure of active and passive coping styles), and the Marlowe-Crowne Social Desirability Scale (MCSDS) to disguise the nature of the experiment. A demographics questionnaire included questions about the participants' gender, age, year in school, and

ethnicity. Participants were also asked to provide their name, phone number, and email address so that they may be contacted for the second part of the study.

Antigay Attitudes. The Attitude Towards Lesbians and Gays scale (ATLG) and the Functions of Attitudes Towards Homosexuals Scale (FATHS) were used to measure antigay attitudes after the experimental manipulation. The ATLG (Herek, 1988) is a twenty-item measure of participants' feelings towards gay men and lesbians. On a 9-point Likert-type scale that ranges between "strongly disagree" to "strongly agree", participants were asked to respond to items such as "lesbians just can't fit into our society" and "I think that male homosexuals are disgusting". The alpha coefficients for the scale and subscales indicate satisfactory levels of internal consistency (alpha = .95 for the ATLG, .91 for the ATG, and .90 for the ATL) (Herek, 1994). Herek (1994) found that higher ATL and ATG scores were significantly correlated with attitudes about gender and family roles, religiosity, political ideology, and the extent and quality of interpersonal contact with lesbians and gay men. The ATLG overall value was calculated by totaling the responses of each item. The FATHS (Herek, 1999) was used to tap into the functions that antigay attitudes serve. The FATHS contains such items as "My opinions about gay men mainly are based on my personal experience with people whose family members or friends are gay". In addition, at the end of the study several questionnaires regarding attitudes toward women, minorities, international students, and sororities and fraternities were included for exploratory purposes.

Antigay Behavior. An evaluation of the male confederate's professionalism was used as a means for assessing antigay behaviors after the experimental manipulation. On a seven-point Likert-type scale, participants were asked to respond to items such as "In

your opinion, how competent was the principal experimenter?" and "Would you be willing to participate in another project with this experimenter in the future?"

Physiological Responses. Systolic and diastolic blood pressures were measured continuously and non-invasively with the Colin AT blood pressure machine. Colin AT consists of an automatic inflation cuff and a wristband sensor that is placed over the participant's radial artery of the participant's nonpreferred arm. Measures were taken at 0, 100, and 200 seconds during the baseline and 0, 80, and 160 seconds during the manipulation tasks.

The impedance cardiograph (ZCG) and the electrocardiograph (ECG) were used to continuously record cardiac performance. ECG signals were measured using three spot electrodes placed in the standard Lead II configuration (right clavicle, left base of the rib cage, right iliac crest ground), and was used to obtain minute to minute heart rate (HR) and respiratory sinus arrhythmia (RSA). Impedance cardiography measured stroke volume (SV) and pre-ejection period (PEP), and were then used to compute the cardiac output (CO). PEP is a measure of the ventricular contractility and the sympathetic control of the heart, while CO is a measure of the amount of blood pumped by the heart per unit time. The ZCG uses four mylar/aluminum electrode bands placed around the body for measuring impedance. One measuring electrode band was placed at the base of the neck, and one beneath the sternum. Two current electrodes were then placed by at least 3cm from their respective measuring electrodes. To record the impedance, a 4mA AC 100kHz current was passed through the two outer electrode bands. These electrodes obtained the basal thoracic impedance (Zo) and the first derivative of basal impedance

(dZ/dt). An interactive software program was used to record and score the physiological data.

Procedures

Upon arrival for the preliminary group testing session, participants were greeted by the experimenter and informed that the study was related to the social and emotional lives of students. They were asked to sign an informed consent form that states that they may be contacted to participate in further research for additional class or extra credit. It was made clear that their future participation is not mandatory. During this initial testing session, participants completed the PAQ, the BSRI, the Male Role Norm Scales, the feeling thermometer, the RSE, the LDS, the REI, the COPE, the MCSDS, the demographics questionnaire, and a call-back form. Participants were instructed to place the surveys back into a folder once they have completed the measures, and to hand the data back to the experimenter.

Male participants were then contacted by the experimenter and asked to return for the second part of the study. Upon arrival for the second part of the experiment, the participants were greeted by the male confederate and the research assistant, informed of the general nature of the study (i.e., that it relates to the social and emotional lives of students), and asked to sign the informed consent form.

Once the informed consent was obtained, the research assistant applied the electrodes to the participant. When the participant was fully attached to the physiological equipment, the male confederate checked to make sure the electrodes were well placed, and lightly touched the participant in the process. Data was then collected in blocks. The first block was a test block to ensure that the equipment was working correctly and that

the signal was clean. Once the experimenter that was operating the computer informed the male confederate that the signal was fine, the participant was told to relax as the male confederate left the room and turned off the light on his way out. Once the test block ran out, the minute to minute systolic and diastolic blood pressure values was recorded for the rest period (baseline).

Manipulations. The participants were randomly assigned to two conditions: the masculine threat condition and the no threat condition. Both conditions consisted of two sequences of questions. In the masculine threat condition, participants were told that they were going to take a test that measures "masculine knowledge" (MK) through a series of questions "designed to assess the masculine knowledge normally acquired during the life of the average American college student." The participant was then asked to read the directions for the test on the computer screen, and informed that they would have up to ten seconds to answer each of the questions. Participants were informed that if they did not respond to a question within the ten seconds, the question would disappear and the next question would automatically appear. The participant began the test by pressing the space bar, at which time the second physiological recording block began. Participants answered a series of twenty-five questions that appeared to be measuring their ability and knowledge in stereotypically masculine areas (i.e., car repair, sports, history). Once the participant finished answering the twenty-five questions of this first test, the computer reported to the participant that the first portion of the test was over and that they should press the space bar to continue. The computer screen then reported that the participant's score was being computed. After ten seconds, a bar graph appeared on the screen, displaying that the participant scored "one standard deviation" below the average college

student. The participant's score remained on the screen for thirty second before a message appeared at the top of the computer screen to indicate that the participant should again press the space bar to continue on to the second portion of the test. Once the participant began the second portion of the test, the third physiological recording block began. After the participant answered the twenty-five questions, the computer screen reported that this test was over.

The no threat, or control condition, was identical to the masculine threat condition except that instead of being told that they will be taking a masculine knowledge test, they will be taking a test that is "designed to assess the general knowledge normally acquired during the life of the average American college student." The participants answered fifty questions that appear to be measuring general knowledge. In addition, the participant did not receive any feedback after the completion of the first twenty-five questions of the general knowledge test. The computer screen remained blank for forty seconds until the instructions to move onto the second portion of the GK test appeared.

Once the experimental manipulation was finished, the male confederate reentered the room, wearing a gay pride T-shirt and carrying a backpack with homosexual paraphernalia on it. The male confederate asked the participant to fill out an evaluation that his supervisor wanted him to administer. The male confederate placed the bag on the table directly in front of the participant to ensure that they noticed the homosexual paraphernalia. The male confederate looked through the backpack, informed the participant that he must have misplaced the questionnaire, and left the room to retrieve the questionnaires. Once the male confederate came back with the professionalism evaluation, he informed the participant that since he is not allowed to see the evaluation,

the participant should seal it in an envelope and that the female research assistant will be in collect it later. The participant was left alone in the room to fill out the professionalism evaluation. A few minutes later, the female research assistant entered to collect the sealed evaluation and administer the packet of questionnaires that included the ATLG, QDI, ATG, and a series of feeling thermometers about Muslims, women, and Blacks. When the participant finished the questionnaires, the participant was unhooked from the physiological equipment. The participants was thoroughly debriefed, thanked for his participation, and dismissed. He was asked not to discuss the purpose or nature of the study with any other students.

Results

Masculinity Level

Masculinity levels for the participants were measured by the MRNS administered during the preliminary mass testing. MRNS scores were totaled after reverse scoring, and then a median split was used to divide the participants into high and low masculinity groups. Participants that scored above the median were placed in the high masculinity group (N=24), while those that scored at the median or below were placed in the low masculinity group (N=25).

Check of Masculine Threat Manipulation on Physiological Response

A manipulation check of the masculine threat manipulation was first conducted by examining the effects of the threat manipulation on physiological markers of psychological threat. Tomaka et al. (1993) found that when an individual felt challenged, they displayed an increase of cardiac responses and a reduction of vascular resistance, while those who felt threatened displayed an increase of cardiac responses and vascular

resistance. In other words, challenged participants displayed a decrease in PEP and TPR compared to baseline, while threatened participants displayed a decrease in PEP and an increase in TPR.

The electrocardiograph (ECG) and impedance cardiograph (ZCG) signals were used to measure minute to minute heart rate (HR), respiratory sinus arrhythmia (RSA), stroke volume (SV), and pre-ejection period (PEP). HR and SV were used to calculate CO in liters per minute. The minute-to-minute systolic (SBP) and diastolic (DBP) blood pressures were used to calculate mean arterial pressure (MAP) (MAP = ((SBP-DBP)/3) + DBP). Total peripheral resistance (TPR) is a measure of the constriction of the body's blood vessels. TPR was calculated using CO and MAP (TPR = (MAP * 80) / CO).

Changes in TPR and PEP were used to determine whether participants were physiologically threatened. Changes in the physiological data were calculated by subtracting the last minute of the rest period from the first minute of the second portion of the test after the participant had seen (or would have seen) the feedback. If the data was not available for the last minute of the rest period due to poor quality of signals, the preceding minute was substituted. If the data was not available for the first minute of the second portion of the test, the following minute was substituted.

I hypothesized that participants in the masculine threat condition would display patterns of physiology consistent with psychological threat, while participants in the no threat condition would not display these physiological patterns of psychological threat. In order to test this hypothesis, a one-way MANOVA with threat condition as the sole between-subjects variable and the dependent variables of change in TPR and change in PEP was conducted. The analysis was not significant for change in PEP, $F(1,36) =$

1.672, $p < .204$, and was marginally significant for change in TPR, $F(1,36) = 2.902$, $p < .097$. Inspection of the means revealed that TPR increased in the masculine threat condition and decreased in the no threat condition, while the PEP decreased in both the masculine threat condition and the no threat condition. This pattern is consistent with the idea that participants in the masculine threat condition felt psychological threat as measured by physiological indices. The means, standard deviations, and F and p values for the effects of threat condition on physiological change scores can be found in table 1.

Test of Masculine Threat Manipulation on Anti-Gay Attitudes

My second hypothesis was that participants in the masculine threat condition would behavior more negatively towards a confederate wearing gay paraphernalia relative to participants in the no-threat condition. Furthermore, this effect was predicted to be modified by the masculinity of the participants and whether they displayed patterns of physiology consistent with psychological threat. To test this hypothesis, a 2 (threat condition: masculine vs. control) X 2 (masculinity: high vs. low) X 2 (physiological reactivity: threat vs. no threat) MANOVA with dependent variables of the gay men feeling thermometer, FATHS, and ATG was conducted. The ATG included only those items from the ATLG that pertained to gay men and not lesbians. This overall 3-way analysis for the three attitudinal measures was not significant, $mF(3,25) = .421$, $p < .739$.

I then examined the two-way interactions and main effects for the 2 (threat condition: masculine vs. control) X 2 (masculinity: high vs. low) X 2 (physiological reactivity: threat vs. no threat) MANOVA with dependent variables of the gay men feeling thermometer, FATHS, and ATG. The overall main effect for masculinity on all three measures was significant, $mF(3,25) = 4.325$, $p < .014$ (see table 5). Consistent

with prior literature, inspection of the means showed that participants with low masculinity displayed more positive attitudes on all three measures than those with high masculinity (see figure 2). The overall main effect for threat condition on the attitudinal measures was marginally significant, F (3,25) = 2.950, $p < .052$. Specifically for each attitudinal measure, the main effect for threat condition on the gay men feeling thermometer was significant, F (1,27) = 9.04, $p < .006$, and marginally significant on the ATG, F (1,27) = 3.602, $p < .068$ (see table 6). The main effect for threat condition on FATHS was not significant, F (1,27) = 2.617, $p<.117$. However, an inspection of the means showed that participants in the masculine threat condition rated gays less positively than participants in the no threat condition on all three measures (see figure 3). The means and standard deviations for the 2-way interactions and main effects on the gay feeling thermometer, FATHS, and ATG can be found on table 2, table 3, and table 4 respectively.

A 2 (true threat: masculine vs. no threat) X 2 (masculinity: high vs. low) MANOVA with dependent variables of the gay thermometer, FATHS, and ATG was conducted. "True" threat participants include only those participants that displayed physiological threat in the experimental manipulation of masculine threat condition and "true" no threat participants who did not display physiological threat in the no threat control condition. This 2-way interaction was not significant, mF (3,16) = .205, $p < .892$. I then examined the main effects. The main effect for true threat on the gay men feeling thermometer was significant, F (1,20)=5.312, $p < .032$. However, the main effect for true threat was not significant on the FATHS, F (1,20) = 1.49, $p < .236$, and the ATG, F (1,20) = 1.90, $p < .183$. Even though the main effect was only significant for the gay men

feeling thermometer, an inspection of the means (see table 7) showed that the means are in the direction of our hypothesis. Participants in the true masculine threat condition rated gays less positively than participants in the no threat condition (see figure 4).

Test of Masculine Threat Manipulation on Anti-Gay Behavior

Behavior towards gay men was assessed through administering a professionalism evaluation on the male confederate to the participant after the experimental manipulation. A 2 (threat condition: masculine vs. control) X 2 (masculinity: high vs. low) X 2 (physiological reactivity: threat vs. no threat) ANOVA with dependent variables on the professionalism evaluation was conducted. The analysis was not significant, F (1,30) = .08, $p < .780$.

I then examined the 2-way interactions and main effects. The effect was not significant for the 2 (threat condition: masculine vs. control) X 2 (masculinity: high vs. low) interaction, F (1,30) = .992, $p < .327$, and the 2 (physiological reactivity: threat vs. no threat) X 2 (masculinity: high vs. low) interaction, F (1,30) = .572, $p < .455$, on the professionalism evaluation (see table 8). The effect for the 2 (physiological reactivity: threat vs. no threat) X 2 (threat condition: masculine vs. control) was significant, F (1,30) = 11.251, $p < .002$ (see table 8). An inspection of the means (see table 7) showed that participants who displayed no physiological threat rated the male confederate as more professional in the no threat condition than in the threat condition, while those who displayed physiological threat rated the male confederate as less professional in the no threat condition than those in the masculine threat condition (see figure 5).

A one-way ANOVA with true threat condition as the sole between-subjects variable and the dependent variables of the professionalism was conducted. The analysis

was not significant, F (1,21) = .471, p < .500. An inspection of the means showed that participants in the true masculine threat condition rated the male confederate as lower in professionalism (M = 72.75, SD = 2.296) than those in the true no threat condition (M = 74.508, SD = 2.515).

Test of Masculine Threat Manipulation on Attitudes Toward Other Groups

A 2 (threat condition: masculine vs. control) X 2 (masculinity: high vs. low) X 2 (physiological reactivity: threat vs. no threat) MANOVA with dependent variables on the Islamic, women, and Blacks feeling thermometers, and the Greek and QDI measures was conducted. The QDI was also divided into QDI for women and QDI for racial minorities. This overall 3-way analysis was not significant, mF (7,17) = .803, p<.596. I then examined the 2-way interactions and main effects. A significant main effect was found for masculinity level on the QDI for women, the QDI for racial minorities, and the QDI combined (both women and racial minorities). An inspection of the means showed that participants in the high masculinity group held less positive attitudes on the QDI for women, QDI for racial minorities, and the QDI combined than those in the low masculinity group (see figure 6). A significant main effect was also found for threat condition on QDI for women, F (1,23) = 4.459, p<.046. A closer inspection of the means showed that participants in the masculine threat group (M = 28.396, SD = 1.862) held less positive attitudes on the QDI for women than those in the low masculinity group (M = 33.025, SD = 1.157). The 2 (masculinity level: high vs. low) X 2 (threat condition: masculine vs. control) interaction was not significance for the QDI for women, F (1,23) = .519, p<.479.

In addition, a 2 (threat condition: masculine vs. control) X 2 (physiological reactivity: threat vs. no threat) interaction was marginally significance for the QDI for women, F (1,23) = 4.128, p<.054. A closer inspection of the means showed that participants who felt physiologically threatened and were in the masculine threat condition (M = 3.625, SD=2.519) expressed the same positive attitudes toward women as those who felt physiologically threatened in the no threat condition (M = 32.800, SD = 1.593). Participants who did not feel physiologically threatened but were in the masculine threat condition (M = 24.167, SD = 2.742) expressed less positive attitudes toward women than those in the no threat condition (M = 33.250, SD = 1.679).

A one-way MANOVA with true threat as the sole between-subjects variable and the dependent variables of the Islamic, women, and Blacks feeling thermometers, and the Greek and QDI measures was conducted. The analysis was significant effect for the Islamic feeling thermometer, F (1,16), p<.012. An inspection of the means showed that participants in the masculine threat condition and displayed physiological patterns of threat (M = 48.889, SD = 7.027) rated less positively on the Islamic feeling thermometer than those in the no threat condition and did not display physiological patterns of threat (M = 76.944, SD = 7.027).

Discussion

My main hypothesis that high masculinity participants in the masculine threat condition who displayed physiological threat would have the most antigay attitudes and behaviors compared to all other conditions was not supported. Interactions between masculinity level, threat condition, and physiological reactivity was not significant in predicting antigay attitudes or behaviors.

Although my main hypothesis was not supported, masculinity level did show a significant main effect for antigay attitudes, suggesting that the high masculinity men in our sample held more negative attitudes toward gay men than low masculinity men. These results support the previously mentioned literature that suggests a relationship between homophobia and masculinity exists (Herek, 1995, Parrott et al., 2002; Kimmel, 2001). Specifically that higher levels of homophobia are correlated with adherence to traditional male gender roles (Parrott et al., 2002)

In addition, our results extended the prior research by showing that the threat condition had a significant main effect for antigay attitudes. Participants that were in the masculine threat condition expressed more antigay attitudes toward gays in the masculine threat condition than participants in the no threat condition. Even though this effect was significant for one of the antigay attitude measures, and either marginally significant or not significant for the other two, the direction of the results for all three measures suggests that our threat conditions may have been effective in their purpose to manipulate masculine threat.

When inspecting only those participants that were physiologically threatened in the masculine threat condition ("true" masculine threat) and those that showed no physiological threat in the no manipulated-threat condition ("true" no threat), it was interesting to find that although the means were consistent with participants who displayed physiological threat in the masculine threat condition rated the male confederate as less professional than those who displayed no physiological threat in the no threat condition, this effect was not significant for the professionalism evaluation.

Since the results for "true" masculine threat and lower professionalism ratings of the male confederate were not significant, this finding does not support the self-affirmation theory (Steele & Liu, 1986). Based upon this theory, it was predicted that participants would attempt to self-affirm by rating the male confederate as lower in professionalism after their masculinities were threatened. Since there seemed to be a significant effect for the "true" threat conditions on antigay attitudes but not for antigay behaviors, our results seem to support the functional approach to attitudes (Katz, 1960) and not the self-affirmation theory (Steele & Liu, 1986). An explanation may be that threat in masculinity does not result in a behavioral but an attitudinal affirmation.

My hypothesis that masculine threat would not have an effect on attitudes toward other groups was supported. Although masculinity level was found to have an effect on attitudes toward women and racial minorities, threat conditions did not. These results show that threatening a heterosexual male's masculinity does not have an effect on attitudes toward women and racial minorities, suggesting that the effect is specific to attitudes toward gays.

My hypothesis that participants in the masculine threat condition would display physiological responses consistent with psychological threat was supported. Even though no significance was found for change in PEP, a marginal significance was found for TPR.

The results of this study show that participants placed in the masculine threat condition express more antigay attitudes than those placed in the no threat condition. In addition, participants that are higher in masculine ideology express more antigay attitudes than those lower in masculine ideology. These findings support both the expressive function of attitudes and the self-affirmation model. Both models are consistent with the

idea that when participants' masculinity are threatened in the masculine threat condition, they will defend and affirm their masculinity by expressing antigay attitudes. Since these attitudes also would serve a greater function for participants higher in masculine ideology, participants who were higher in masculine ideology should have and did express more antigay attitudes than those lower in masculine ideology.

Although the findings of this research are promising in its purpose to understand the causes of antigay attitudes and behavior, the results of this study should be interpreted with caution due to various limitations in the study. These limitations include a small sample size, an insufficient number of high masculine men, the administration of the attitude measures after the presentation of the homosexual paraphernalia on the male confederate, and a behavioral measure that may or may not have really suggested to participants the opportunity to "gay-bash."

One of the limitations of the study was the number of subjects within each of our "true" threat conditions. Due to poor physiological data, as well as the finding that not all participants within the masculine threat condition were physiologically threatened and not all those within the no threat condition were physiologically challenged, the number of subjects within each of our "true" threat conditions suffered. Future studies should increase subject number within each "true" threat condition.

In addition, the cause for some of our marginally significant and non-significant data may be because masculinity levels were determined through a median split. This may have resulted in masculinity levels of the participants in the high masculinity group and those in the low masculinity group to be too similar for significant results. The MRNS scores of the low masculinity group ranged from 1.65 to 3.96, while those of high

masculinity ranged from 4.00 to 5.64. The MRNS scale is in a range of 1-7, suggesting that our high masculinity group may be only moderate in masculinity. Future studies should attempt to recruit more masculine participants to obtain more extreme MRNS scores.

The administration of the antigay attitude measures after exposing the participant to the homosexual paraphernalia on the male confederate may also be a limitation in the study. Although all participants went through the same procedure with the confederate regardless of the threat condition or their masculinity level, it is conceivable that the participants would become suspicious of the nature of the study. This may result in unreliable measures of antigay attitudes.

Finally, a limitation for measuring the behavior of participants toward homosexuals lies in our professionalism questionnaire. Our non-significant results may be a result of the professionalism evaluation's inability to measure behavior. Since this is a measure that we developed ourselves, its external validity is questionable. It is possible that participants did not view the evaluation as an opportunity for self-affirming their threatened masculinities. For future studies, it may be important to find an alternative measure for behavior.

Despite these limitations, this study may have important practical and theoretical implications. These data suggest that symbolic threat (failure on a masculinity test) may be best explained by attitudinally based theories, such as the functional approach to attitudes. Future research should attempt to replicate these findings and further explore whether more direct threats to masculinity would result in self-affirmation processes, such as investigating whether "gay-bashing" would result from a heterosexual male

finding himself the target of another male's sexual advances. In addition, these findings may also have practical applications. Interventions for reducing anti-gay attitudes and behaviors should link these concepts to masculinity and more specifically—to threats to masculinity. Men can be trained to self-affirm their masculinities through other means apart from anti-gay attitudes and behaviors.

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Table 1

Mean pre- to post-manipulation physiological threat change scores as a function of threat condition as measured by change in TPR, PEP, and HR. F and p values are for the significance of the main effect of condition.

Physiological Measure		Threat condition: Masculine threat	Threat condition: No threat	*F*	*P*
TPR	M	57.740	-3.478	2.902	.097
	SD	111.752	109.769		
PEP (seconds)	M	-7.684	-1.579	1.672	.204
	SD	19.768	5.719		
HR (beat per min.)	M	5.534	4.362	.352	.557
	SD	5.105	6.036		

Table 2

Mean score on the gay men feeling thermometer as a function of masculinity level, threat condition, and physiological threat.

Masculinity level		Threat condition: Masculine threat	Threat condition: No threat
		Physiological Threat	
High	M	48.000	46.667
	SD	16.865	50.332
Low	M	65.000	90.000
	SD	21.213	8.165
		Physiological No Threat	
High	M	16.667	60.000
	SD	16.865	10.000
Low	M	36.667	71.429
	SD	23.094	18.645

Table 3

Mean score on the FATHS as a function of masculinity level, threat condition, and physiological threat.

Masculinity level		Threat condition: Masculine threat	Threat condition: No threat
		Physiological Threat	
High	M	18.200	18.333
	SD	5.095	7.572
Low	M	23.500	26.500
	SD	6.364	1.732
		Physiological No Threat	
High	M	11.667	16.667
	SD	16.692	8.387
Low	M	19.667	24.286
	SD	5.860	2.563

Table 4

Mean score on the ATG as a function of masculinity level, threat condition, and physiological threat.

Masculinity level		Threat condition: Masculine threat	Threat condition: No threat
		Physiological Threat	
High	M	56.000	48.000
	SD	21.541	21.000
Low	M	74.500	83.000
	SD	6.364	10.231
		Physiological No Threat	
High	M	29.333	53.667
	SD	17.098	30.089
Low	M	47.000	78.714
	SD	31.480	9.250

Table 5

F and p values on the positive attitude toward gay men measures as a function of masculinity level.

Attitude Measure	df	*F*	*P*
Gay Men Feeling Thermometer	1	7.351	.012
FATHS	1	13.615	.001
ATG	1	10.429	.003
Total	27		

Table 6

F and p values on the positive attitude toward gay men measures as a function of threat condition.

Attitude Measure	df	*F*	*P*
Gay Men Feeling Thermometer	1	9.040	.006
FATHS	1	2.617	.117
ATG	1	3.602	.068
Total	27		

Table 7

Mean score on the professionalism evaluation as a function of masculinity level, threat condition, and physiological threat.

Masculinity Level		Threat condition: Masculine threat	Threat condition: No threat
		Physiological Threat	
High	M	73.091	62.500
	SD	2.647	4.390
Low	M	67.500	65.200
	SD	6.209	3.927
		Physiological No Threat	
High	M	64.333	77.333
	SD	5.069	5.069
Low	M	55.667	73.297
	SD	5.069	3.319

Table 8

F and p values on the professionalism evaluation as a function of masculinity level, threat condition, and physiological threat.

Interaction Variables	df	*F*	*P*
Threat Condition	1	1.869	.182
Masculinity Level	1	1.444	.239
Phys Threat	1	.033	.858
Condition X Masculinity Level	1	.992	.327
Condition X Phys Threat	1	11.251	.002
Masculinity X Phys Threat Level	1	.572	.455
Condition X Masculinity Level X Phys Threat	1	.080	.780
Error	30		

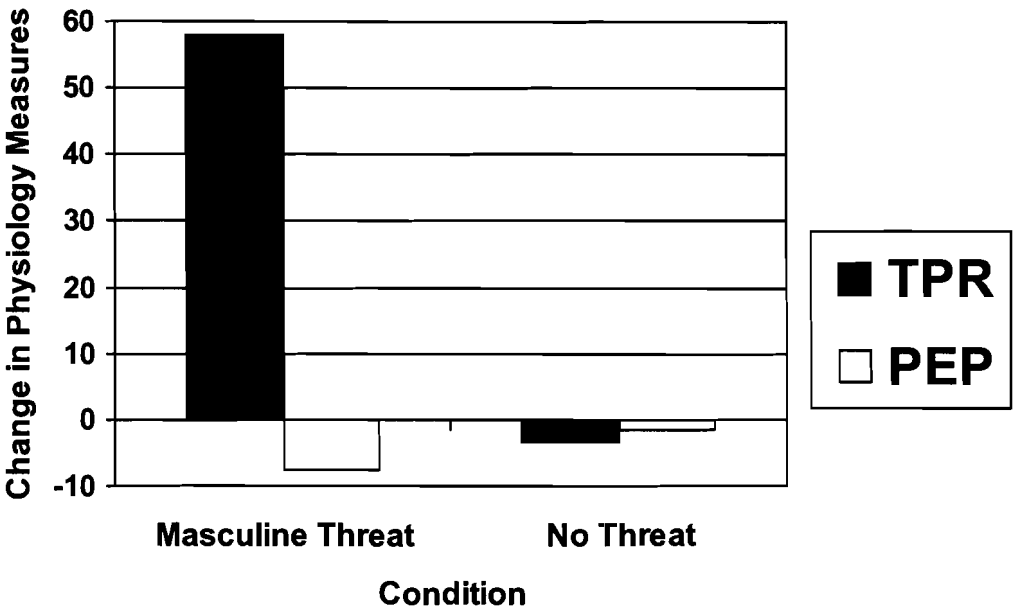

Figure 1. Change in physiological measures as a function of condition and change in TPR, and PEP.

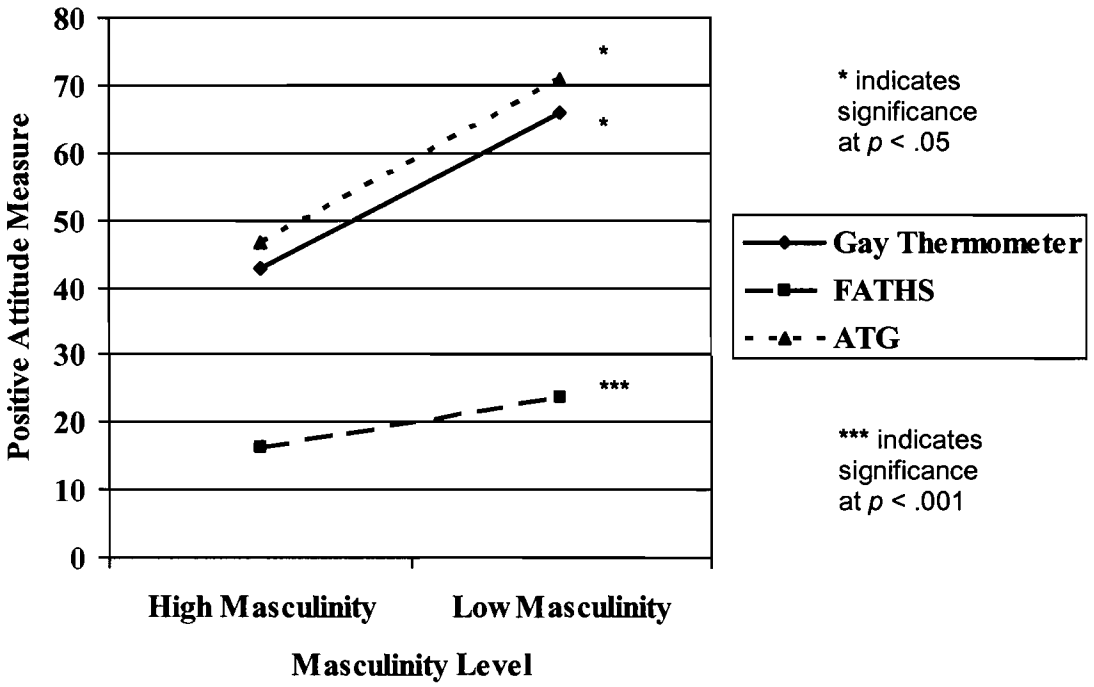

Figure 2. Positive attitudes toward gay men as a function of masculinity level as measured by the gay thermometer, FATHS, and ATG measures.

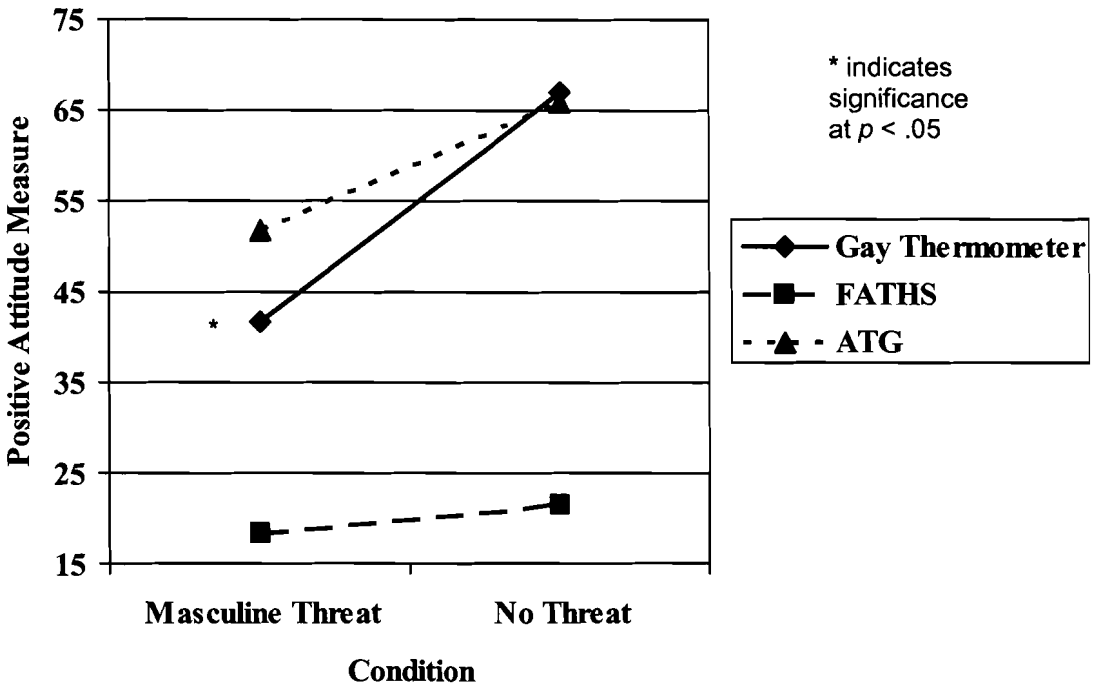

Figure 3. Positive attitude toward gay men as a function of threat condition as measured by the gay thermometer, FATHS, and ATG.

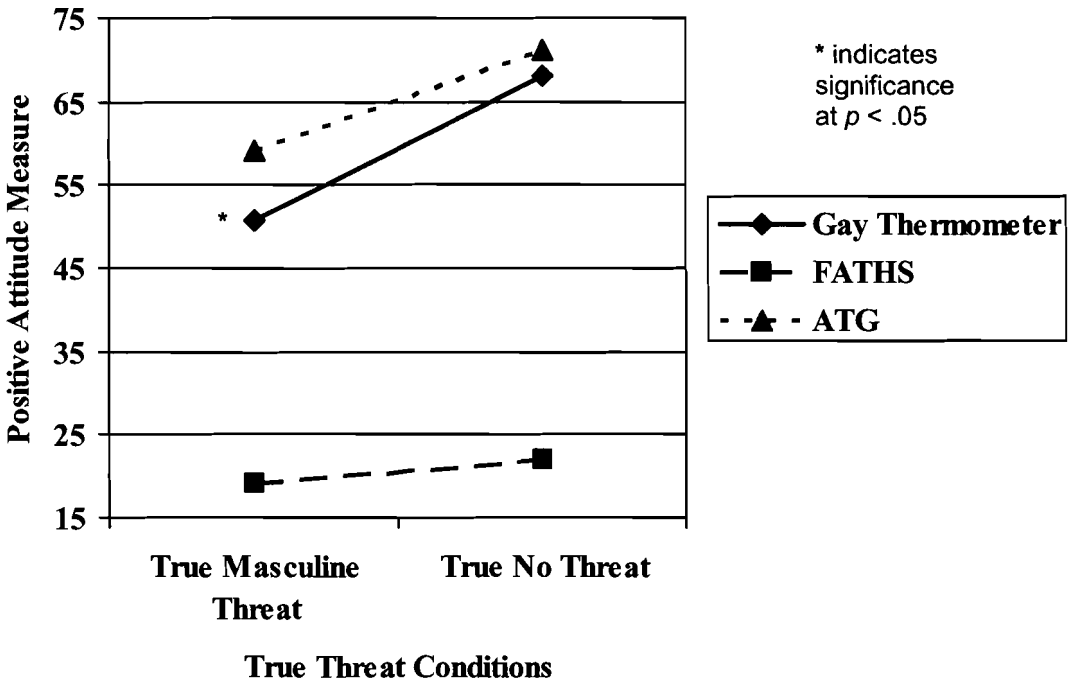

Figure 4. Positive attitude toward gay men as a function of true threat conditions as measured by the gay thermometer, FATHS, and ATG

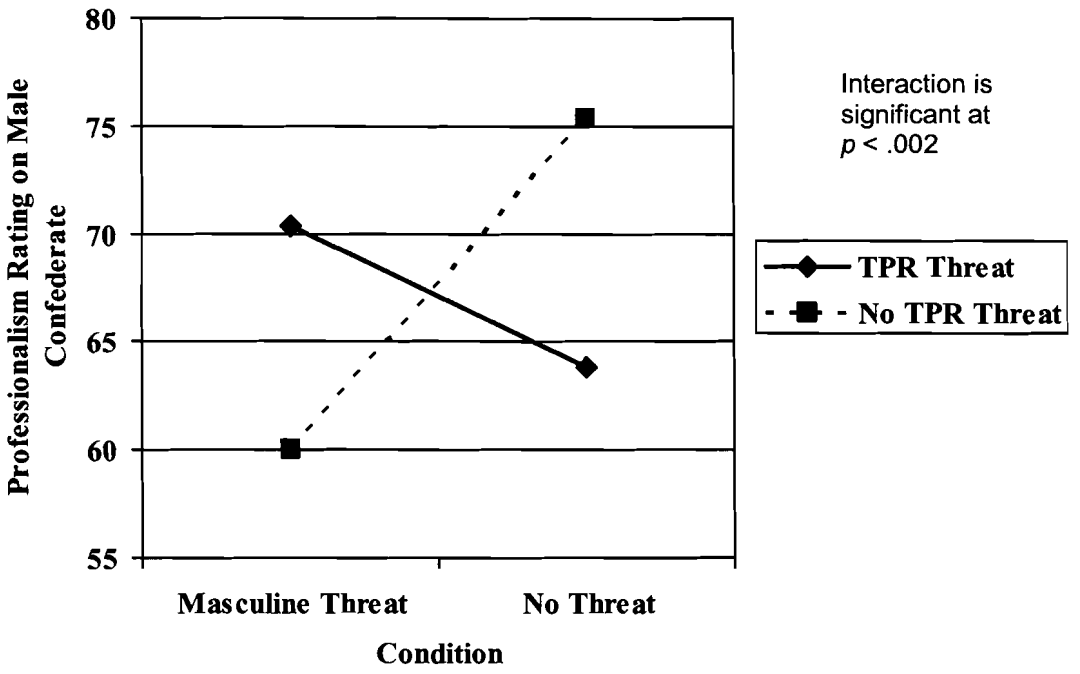

Figure 5. Professionalism rating of male confederate as a function of threat condition and physiological threat as measured by change in TPR.

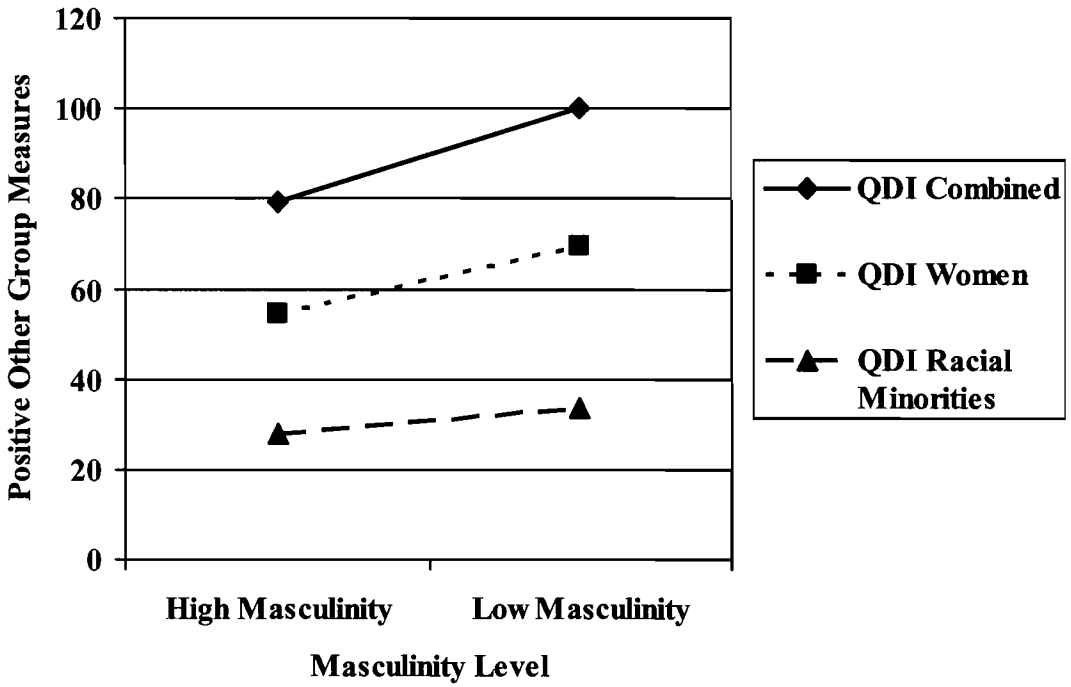

Figure 6. Positive attitudes toward other groups as a function of masculinity level as measured by QDI combined, QDI women, and QDI racial minorities.