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Masculine Threat and Anti-Gay Attitude

Chad Corbley '02
Illinois Wesleyan University

Running head: MASCULINITY AND ANTI-GAY ATTITUDE

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Abstract

In a pretest, male and female participants completed the PAQ, a measure of self-perceived masculinity and femininity. Only male participants (though they were not aware of this fact) were contacted to return for the second part of the study. Participants were hooked up to psychophysiological recording equipment and took part in one of three conditions. In the *masculine threat* condition, they took a test ostensibly measuring masculine knowledge and received false negative feedback. In the *general threat* condition, participants took a test ostensibly measuring general knowledge and received the same feedback. The *no threat* or control condition was exactly like the general threat condition, except that participants receive no feedback. Participants then filled out a number of questionnaires relating to attitudes towards gays, women, minorities, and multiculturalism. It was predicted that physiological threat and challenge patterns would be found in the threat a in no threat conditions, respectively, that participants in the threat conditions would be more negative in their evaluation of all groups than participants in the threat condition, and that participants in the masculine threat condition would be most negative in their assessment of gays. An interaction between masculinity and threat condition was predicted such that more masculine men would express the most anti-gay attitude in the masculine threat condition, followed by the general threat condition. Non-masculine men were predicted to react equally to the two threat conditions. Other than the threat/challenge hypothesis, these hypotheses were not supported by significant results. There were some significant findings using the other subscales of the PAQ (femininity and masculinity/femininity, as opposed to the simple masculine subscale). Possible interpretations of these findings are discussed.

Masculine Threat and Anti-Gay Attitude

The brutal murder of Matthew Shepard in October of 1998 in Laramie, Wyoming shocked the nation. What most Americans did not know was that in the same year Shepard was killed, there were 28 other anti-gay, lesbian, bisexual and transgendered (GLBT) murders, representing a twelve-percent increase over the previous year (National Organization of Antiviolence Programs, 2000). According to the FBI's Uniform Crime Reports for 1991-1999, despite an overall decline in serious crime for eight consecutive years, GLBT-based hate crimes rose each year during that period, increasing 4.5 percent from 1998 to 1999. Reported hate crime incidents based on sexual orientation have more than tripled since the FBI began collecting statistics in 1991. At the same time, American opinion towards gays and gay rights became more favorable. For example, 52% of those surveyed in May of 2001 consider homosexuality to be an "acceptable alternative lifestyle," as compared to 34% in 1982, and 85% percent of respondents think homosexuals should have equal job opportunity, up from 56% in 1977 (Gallup, 2001). It appears that even as public opinion becomes more open to gay men and lesbians, there remains an increasingly violent anti-gay element.

Over the past twenty years, many researchers have explored the nature of anti-gay attitudes (e.g., Krulewitz & Nash, 1980; Herek, 1984; Haddock & Zanna, 1993; Herek, 1994) as well as the extent and impact of anti-gay violence (e.g., Comstock, 1991; Herek, 1990; Herek 1999). Many researchers have hypothesized possible correlates and precursors of such attitudes as well as the relation of these attitudes to violent acts. Some theorists have suggested that, for males, anti-gay attitudes and actions may serve to affirm one's masculinity, especially in adolescence and early adulthood (Comstock,

1991; Herek, 1995). One way to test this proposition would be manipulate the masculine security of participants in the laboratory, followed by an opportunity to express anti-gay attitude. Using three experimental manipulations, I attempted to threaten the masculinity of male participants, threaten participants in a general way, or not threaten them at all, thus creating distinct groups whose propensity to show anti-gay attitude could be assessed. Presumably, the more his masculinity was threatened, the more a participant would display more anti-gay attitude. At least three current social psychological models suggest that this would be the case: the functional approach to attitudes (Katz 1960; Herek, 1986b), self-affirmation (Steele & Liu, 1983; Liu & Steele, 1986; Steele, Spencer, & Lynch, 1993), and symbolic self-completion (Gollwitzer, Wicklund, & Hilton, 1982; Gollwitzer and Wicklund, 1985).

The Functional Approach to Attitudes

First postulated by Katz (1960), the functional approach to attitudes states that attitudes serve a purpose, and that we will only hold them so long as they are effective in serving that purpose. Katz postulated four basic attitude functions: adjustment, knowledge, value-expression, and ego defense. He describes the adjustment, or instrumental, function as being based on reward and punishment; we learn to have negative attitudes toward aversive stimuli and positive attitudes towards good, beneficial stimuli (Katz, 1960). Similarly, Katz outlines a knowledge function based on individuals' need for structured interpretation of experience (e.g., negative attitudes towards Nazis fit into our conception of Nazis as evil, and our dislike for all things evil) (Katz, 1960). He also describes a value-expressive function, in which people derive satisfaction from expressing attitudes reflective of their values and self-image (Katz,

1960). Finally, Katz describes an ego-defense function, whereby people hold attitudes to protect themselves from acknowledging objectionable truths about themselves and the world. Katz argues that unlike attitudes serving other functions such as adjustment, ego-defensive attitudes "proceed from within the person, and the object and situation to which they are attached are merely convenient outlets for their expression." (Katz, 1960, p. 172-173)

Herek (1986, 1995) later revised Katz's set of ideas. He combined Katz's adjustment and knowledge functions into a single, *experiential* function. Attitudes serving this function are based on actual experiences or beliefs (true or false) pertaining to an attitude object (Herek, 1986). In this sense, such attitudes are a means to an end (i.e., advising the individual of possible benefits or detriments.) Herek defines a second class of functions where the attitude *object* (as opposed to the attitude itself) is a means to an end, and the benefits of the attitude come from its expression. In this case, the attitude is said to serve a *symbolic* function (Herek, 1986). This class includes social and value expressive functions as well as the ego-defense function. Herek splits Katz's value expressive function into separate *social* and *value expressive* functions. An attitude serves a value expressive function if its expression affirms a value central to the self, and it serves a social expressive function if it reinforces membership in a certain group. Finally, Herek keeps Katz's conception of the ego-defensive function, which he also classifies as a symbolic function.

Herek (1995) describes the way in which each of these functions may work in the context of anti-gay/lesbian attitudes and violence. For some people, actual contact with

gay men and lesbians determines attitudes (the experiential function). On the other hand, for the majority of people:

> homosexuality and gay people are primarily symbols. Whereas attitudes towards people with whom one has direct experience function primarily to organize and make sense of these experiences, attitudes towards symbols serve a different kind of function. Such attitudes help people to increase their self-esteem by expressing important aspects of themselves - by declaring (to themselves and others) what sort of people they are. Affirming who one *is* often is accomplished by distancing oneself from, or even attacking, people who represent the sort of person one is not. (Herek, 1995, p. 328)

In a study done in 1987, Herek analyzed essays about homosexuality written by heterosexual college students in which he was able to identify each of his attitude functions. One respondent wrote that being gay is a private matter, that people should "live and let live." Another respondent perceived herself as firmly grounded in her Christian faith, and her opposition of homosexuality symbolized that grounding. In both cases, the attitude seemed to serve a value expressive function. In the first, the woman's attitude towards homosexuality served to express her "live and let live" value. In the second case, the woman's attitude also seemed to serve a social expressive function, as anti-gay attitude reinforces her membership in the Christian faith. Furthermore, in a survey of victims of anti-gay/lesbian violence designed to determine demographics of perpetrators, Comstock (1991) found that most victims reported hearing their assailants disparaging homosexuality during the attack. This would seem to indicate that, for these

attackers, the primary reason for perpetrating the violence was an expression of anti-gay/lesbian values (examples of other language used during incidents includes anti-feminist language and language referring to god, religion, and the bible).

For some males, researchers have suggested that anti-gay attitudes and violence function on many levels to affirm masculinity. Nationally, 82.6% of persons arrested for violent crimes in 2000 were male (FBI Uniform Crime Reports, 2000). In Comstock's (1991) survey regarding the perpetrators of anti-gay/lesbian violence, however, he found that 94% of such perpetrators were male, almost half were under 21, and that 80% were under 29. The fact that almost all perpetrators are male, to a greater degree than the percentage of males in all violent crimes, suggests that such violence has something to do with masculinity. Moreover, the perpetrators are relatively young, and given that young men are still establishing an adult identity, of which masculinity and "manhood" is an integral part, it seems likely that anti-gay violence may be related to this developing identity (Erikson, 1963, cited in Herek, 1995). Comstock (1991) speculates that, for young men "attacking lesbians and gay men allows them to do what men 'should' and 'have the right to' do and what is lacking in their own lives. It allows them to be 'masculine,' to be physically aggressive, to be dominant over someone else" (p. 118). Herek (1999, 2000) has found that heterosexual men, but not heterosexual women, tend to view gay men more negatively than they view lesbians. Since gay men likely represent the opposite of traditional masculinity (given the feminine connotations of words like "sissy" and "queen" used to denigrate gay men), it furthermore seems likely that negative attitudes toward them serve a symbolic function of affirming one's own

masculinity. Lesbians do not represent such a direct opposite and probably cannot be used as symbols so easily.

Studies have also found that men holding anti-gay/lesbian attitudes tend to adhere strongly to traditional sex roles and place a high value on traditionally masculine traits. In a pretest, Krulewitz and Nash (1980) administered the "attitudes towards feminism" scale (FEM) and the "attitudes towards homosexuals" scale (ATHS) to 188 male undergraduates. Low scores on the FEM indicate strong agreement with traditional sex roles, and low scores on the ATHS indicate endorsement of anti-homosexual attitudes. They found that the measures correlated highly ($r = .65$, $p < .001$). One-hundred twenty participants, falling into the low, middle, and high range on the FEM (labeled as traditional, moderate, and liberal, respectively) were retained for the study itself, which involved evaluation of a gay or straight male fellow participant (as identified by a demographics sheet.

The researchers found that homosexuals were liked less, perceived as more immoral, and rated as less well adjusted than heterosexuals, and that these attitudes were significantly more pronounced for traditional participants relative to liberal participants. The authors suggest that such rejection occurs because of perceived dissimilarity. They argue that highly traditional participants reject gay men because they believe gay men to be very different from themselves in terms of traditional masculine/feminine roles (to which they adhere strongly), and because they have a low tolerance for difference and "ambiguity." This argument seems circular in that it states that highly traditional men dislike gay men because they perceive gay men as different, but, at the same time, the authors argue that traditional men perceive gay men as different primarily because of

already-held negative attitudes towards gay men. "That homosexuals were...described as less intelligent, more immoral, and less well adjusted than heterosexuals suggests negative affective reactions to homosexuals are accompanied or mediated by negative cognitions regarding them (Krulewitz & Nash, 1980, p.72)."

A less circular explanation of their findings involves the functional approach to understanding attitudes. Herek (1986a) argues that anti-gay/lesbian attitudes are often an integral part of "heterosexual masculinity." These attitudes serve an expressive function, expressing what one is (a heterosexual male) by devaluing what one is not (homosexual). Consistent with Herek's view, Horwitz and White (1987) found that many anti-gay/lesbian assailants embrace cultural definitions of masculinity while rejecting feminine traits. Similarly, the traditional men in the Krulewitz and Nash study highly valued traditional sex roles. In the context of the functional approach, it could be argued that they advocated more anti-gay attitudes than moderate and liberal participants because such attitudes serve to express their traditional values.

In support of the above assertion, other studies have found a link between authoritarianism and homophobia. In two studies by Haddock, Zanna, and Esses (1993), the researchers measured participants' attitudes, stereotypes, symbolic beliefs, affect, and past experiences dealing with lesbians and gay men and administered a measure of right-wing authoritarianism (RWA). The authors define "symbolic beliefs," as "beliefs that social groups violate or promote the attainment of cherished values, customs, and traditions (Haddock et al., 1993, p. 1106)." The concept of RWA comes from Altemeyer (1988), who described high authoritarians as self-righteous individuals who, among other things, adhere strongly to traditional values and norms and are threatened by individuals

who defy conventional mores. Haddock and Zanna (1993, cited in Haddock et al., 1993) found that high RWA individuals describe values as being extremely important in their lives. Earlier research has suggested that authoritarianism tends to correlate with anti-gay/lesbian attitudes, and it did in this study. In performing hierarchical regression analyses, however, the authors found that for high RWA participants, symbolic beliefs accounted for a significant proportion of the variance in attitude while accounting for almost none of the variance in low RWA participants. It seems that by devaluing gays and lesbians, therefore, a highly traditional person can affirm "cherished values," a process that seems similar to Herek's value expressive function.

In the authors' view, anti-gay/lesbian prejudice was highest for high RWA participants for two reasons. First, high authoritarians hold fast to their values (usually traditional) and give them elevated importance, as shown by Altemeier (1988) and Haddock and Zanna (1993). Second, gay men and lesbians seemingly defy those values. In other words, anti-gay prejudice could exist for anyone holding traditional values, but it should be especially pronounced for high RSA individuals because their values are so important to them. Haddock and colleagues agree with Krulewitz and Nash that gay men and lesbians are disliked because they are perceived as different. Though the authors do not use the language of the functional approach, these findings can be more easily conceptualized in such terms. It seems possible that such negative attitudes, at least in part, serve an expressive function. This includes the expression of one's masculinity as well as the expression of traditional values, (i.e.- the traditional family, traditional male/female roles, etc.), both of which are highly rigid and central to the self in high RWA individuals.

Other studies can be analyzed in terms of the value-expressive and ego-defensive functions. In recent study by Adams, Wright, and Lohr (1996) participants, all self-proclaimed heterosexual men, were separated into homophobic and non-homophobic groups based on their scores on the Index of Homophobia. They were then exposed to explicit heterosexual, lesbian, and gay male pornography while their sexual arousal was monitored using penile plethysmography. As expected, the researchers found that all participants were aroused by the heterosexual pornography. All participants were also aroused by lesbian pornography. Interestingly, however, only the homophobic participants were aroused by the gay male pornography. This seems an unlikely contradiction. Why would anyone be sexually aroused by something he or she finds objectionable? In the discussion of their results, the researchers offer two possible explanations for their data.

On the one hand, for example, a primary cause for anti-gay/lesbian attitude might be ego defense exactly as described by Katz (1960) and Herek (1986b). Perhaps the homophobic men in the study are sexually attracted to men (which explains the arousal during the gay male pornography), but they would rather not acknowledge this attraction. They therefore hold anti-gay/lesbian attitudes in an ego-defensive measure to protect themselves from having to acknowledge their attraction. The authors seem to lean more strongly towards another explanation, however, supported by data from a study by Barlow, Sakheim, and Beck (1983). Adams and colleagues speculate that viewing homoerotic imagery produces negative emotions, such as anxiety, in homophobic men, but not in non-homophobic men. Since anxiety has been shown to increase arousal and

erection (Barlow et al., 1983), this explanation could account for the increased sexual arousal found in homophobic men.

This argument is contradictory to the particular ego defense hypothesis offered by Adams, Wright, and Lohr, but it does not exclude all ego-defensive explanations. An ego-defensive mechanism could still be at work in the anxiety/arousal model. For instance, if a homophobic man is anxious and thus aroused under the conditions in the study, it seems likely that similar situations must occur outside the laboratory. He could simply have a passing homosexual thought or perhaps encounter a gay man and in both cases feel anxiety followed by sexual arousal. In order to protect himself from acknowledging the arousal, he adopts an anti-gay/lesbian attitude, which is strengthened by every such instance of anxiety/arousal. It is easy to imagine such a sequence beginning with a small amount of anxiety (brought on by a heterosexist culture represented in parents, teachers, friends, the media, etc.) and building over many such instances into a robust anti-gay/lesbian attitude. When homophobic men are aroused around gay men, for whatever reason, one could imagine that their sense of masculinity and manhood would be threatened. Anti-gay/lesbian attitude and action could then serve an expressive function in a way that reaffirms their injured sense of masculinity. This can conceptualized in simpler terms using self-affirmation (Steele & Liu, 1983) and symbolic self-completion (Gollwitzer, Wicklund, &Hilton, 1982).

Symbolic Self-completion and Self-affirmation

In a sense, self-affirmation and symbolic self-completion go a step beyond the functional approach in terms of explaining symbolic attitudes (though they are completely separate models that have not been used in such a manner). For example, in

using the functional approach, an attitude may be labeled as "value expressive." In terms of self-affirmation and symbolic self-completion, one might also ask why a *particular* value is being expressed and why it is being expressed at a certain time.

As conceptualized by Gollwitzer and Wicklund (1982), the basic tenet of symbolic self-completion is that insofar as an individual feels lacking or "incomplete" in a self-defining area, that individual will attempt to substitute "symbols of completeness" to compensate. The authors give the example of two university professors. Both have prestigious degrees, but one has won a number of awards for research and excellence in his field. The other has won no awards, and therefore feels deficient in a self-defining goal (that of being a productive academic and researcher). To make up for this fact, he displays his diplomas prominently in his office; they are Gollwitzer and Wicklund's symbols of completeness. The other professor feels confident and complete, and therefore has no need to display his diplomas.

In the first of pair of studies, Gollwitzer and Wicklund (1985) used female participants committed to the self-definition of female professional. Participants were separated into four groups. One group was told that they fit the ideal personality for a female professional, while a second was told that they did not fit this ideal. A third group was told that they fit the ideal personality for a mother, while a fourth was told that they did not fit the mother ideal. They were then paired with another participant (a pair always included an "ideal" participant and a "non-ideal" participant in the same category). Participants were told to generate, together with their partner, seven self-relevant, positive attributes pertaining either to motherhood or female professional. The researchers found that in the relevant condition (female professional) the participant

labeled as non-ideal tended to generate more attributes than the participant labeled as ideal. This was not the case in the non-relevant condition. They also found that the ideal-labeled participant tended to describe the non-ideal-labeled participant in negative terms. This was not the case for the non-ideal-labeled participant's description of the ideal-labeled participant, and no such difference was observed in the non-relevant condition. In other words, participants given negative feedback dominated the attribute generating session, but only when the negative feedback was in a self-defining area. Gollwitzer and Wicklund carried out a similar study involving male participants highly committed to certain areas (e.g., journalism, photography, swimming, tennis, mathematics). They found that when given the chance, participants in the non-ideal condition rated their abilities in that area significantly higher than participants in the ideal condition. This was true even when clear interpersonal cues (a nonexistent fellow participant named Debbie who either did or did not like self-aggrandizing men) went against doing so. In each study, the researchers argued that participants were using symbols of completeness (the essay, the attribute list, and the self description) to compensate if a feeling of incompleteness is brought on by the experimental manipulation (being told they do not fit the ideal personality profile).

Similar to symbolic self-completion is Claude Steele's model of self-affirmation. Steele argues that "people will do anything to enhance their self-image after it has been threatened, even if the action cannot redress the specific threat (Liu & Steele, 1986, p. 539)." For example, Steele (1975) found that after being called bad drivers, participants were more willing than people not called bad drivers to help with a community food co-op. Here self-affirmation diverges slightly from symbolic self-completion. Helping in a

community food co-op clearly has nothing to do with being a bad driver, and symbolic self-completion would say that helping in the co-op should do little to restore someone's image of himself or herself as a good driver. Steele's model, on the other hand, does not require that the affirming behavior be in the same area that was threatened, just that it be in an area central to the self. In terms of self-affirmation, a threat in a self-defining area threatens the whole self-image, and affirming other parts of the self-image can make up for the threat.

In a study representative of the self-affirmation model, Steele and Liu (1983) had participants write counter-attitudinal essays as in a classic dissonance paradigm. Next, participants completed a self-affirming value scale and then an attitude measure (relevant to the subject of their essay), or the attitude measure followed by the value scale. The researchers found less dissonance-reducing attitude change when the participant was allowed to fill out the value scale before the attitude measure *and* the scale affirmed values central to the self. Presumably, dissonance-reducing attitude change occurs not simply to avoid inconsistency, but to protect the overall self-image. When the self-affirming value scale came before the attitude measure, there was no need to protect the self-image (threatened by the dissonance created when writing the essay) because the value scale had already reaffirmed it.

Applying self-affirmation to the Adams, Wright, and Lohr study, if a homophobic man's masculinity is threatened when he is aroused by homoerotic stimuli, he may use anti-gay/lesbian attitudes to counter this threat. Such attitudes may serve a value or social expressive function (as predicted by the functional approach to attitudes), which subsequently may serve to reaffirm a threatened self-image. Herek (1986a) goes as far as

to say that homophobia is an integral part of heterosexual masculinity. Though this is certainly not true of every man, for many men adherence to masculine ideals is of central importance. For such men, devaluing gay men, who are perceived as the antithesis of those ideals, seems likely, in light of the functional approach. If their masculinity is threatened in some way, this seems even more likely in terms of symbolic self-completion and self-affirmation. In the Haddock, Zanna, and Esses (1993) and Krulewitz and Nash (1980) studies cited above, participants who subscribed to traditional values and ideals of masculinity were found to hold more anti-gay/lesbian attitudes, and the Horwitz and White (1987) study showed that actual perpetrators of anti-gay/lesbian violence placed a high value on traditionally masculine traits. It is unlikely that any man with such expectations can realistically live up to all of his own perceptions of what a "real man" should be. For such a person, affirming his masculinity would be a constant task. If his masculinity was ever directly threatened, it seems likely that he would search for a way to self-affirm or seek out "symbols of completeness."

Recently, Bernat, Calhoun, Adams, and Zeichner (2001) performed a study similar to that of Adams and colleagues. In this study, participants were divided into homophobic and non-homophobic groups and exposed to homosexual pornography, after which they competed in a reaction time task against a fictitious homosexual fellow participant. During this task, they were given the opportunity to shock the fellow participant. The researchers found that homophobic participants reported significantly more negative affect, anxiety, and anger hostility after watching the pornography than the non-homophobic participant. In addition, the homophobic participants were significantly

more aggressive (as measured by the intensity and duration of shocks) towards the fellow participant than were the non-homophobic participants.

My study goes beyond the Bernat and colleagues (2001) study as well as the Adams and colleagues (1996) study in two ways. First, my study is an experimental design, while both the studies cited above are correlational. While useful, these studies say nothing about the origins of anti-gay attitude in individuals, whereas my study could directly link masculine threat to homophobia. The only conclusion one can draw from the Bernat, Calhoun, Adams, and Zeichner study is that homophobic men tend to have more negative attitudes about and tend to be more aggressive towards homosexual men. The only conclusion one can draw from the Adams, Wright, and Lohr study is that the homophobic men in their sample tended to be more aroused by homosexual pornography than non-homophobic men. Secondly, neither study, nor any other study I am aware of, has ever directly assessed the relationship between masculinity and anti-gay attitude. By manipulating masculine threat in the laboratory, we can begin to explore this relationship and gain a better understanding of anti-gay attitude in general.

Many modern gender theorists divide the male/female dichotomy into two distinct layers of meaning, the first of which is objectively defined while the second is socially constructed. (Nielsen, J.L., 1990; Marshall, B.L., 2000) Biological sex is determined by looking at a person's chromosomes. Gender, on the other hand, could be broadly defined as what it means to be male or female in a given society, from childhood through adulthood. The two are linked, though not inextricably. Besides having its own specific gender norms, each society differs on how stringently those norms are applied. Similarly, each individual has his or her own beliefs about how strictly he or she will follow those

norms and how strictly those norms *should* be followed by others. Homosexuality by its very nature stands in opposition to many male/female norms in American society (e.g., man marries woman). If a man sees himself as very masculine (essentially the set of male norms in western or American society) and necessarily so, it seems he would likely be critical of those he considers flouting those norms. These are, in essence, the findings cited above (Horwitz & white, 1987; Krulewitz & Nash, 1980) where men who subscribe to traditional masculine ideals are found to hold more anti-gay attitude.

We attempted to directly threaten participants' masculinity to see if they would reaffirm their threatened self-image through expression of anti-gay attitude, as predicted by the functional approach to attitudes, self-affirmation theory, and symbolic self-completion. Male participants completed the Personal Attributes Questionnaire (PAQ), a measure designed to evaluate how stereotypically masculine or feminine a person sees him or herself (Spence, Helmreich & Stapp, 1974). Participants were separated into three conditions: masculine threat, general threat, and no threat. Threat was manipulated using fictitious "masculine knowledge" and "general knowledge" tests and negative false feedback. There was no feedback in the no-threat condition. Participants were hooked up to psychophysiological recording equipment, and the readings were examined for evidence of the threat and challenge patterns as validated by Tomaka, Blascovich, Kelsey, and Leitten. (1993). After the threat manipulation, participants were given an opportunity to express anti-gay attitudes on the ATLG (Attitudes Towards Lesbians and Gays Scale), and they completed other measures assessing attitudes towards a number of other groups, including women, blacks, Arabs, and fraternity and sorority members.

These measures were included to see of participants would express negative attitudes towards other groups, in addition to gays.

We predicted that participants should express the least anti-gay attitude in the no threat condition, the most anti-gay attitude in the masculine threat condition, and that participants in the intermediate threat condition would fall somewhere in between. Both the self-affirmation model and symbolic self-completion model require that the threat be in an area central to the self. Therefore, participants who see themselves as highly masculine - as measured by the PAQ - were predicted to express the most anti-gay attitude. We expected to see an interaction such that highly masculine men would express more anti-gay attitude in the general and masculine threat conditions than low-masculinity men. This is because masculine participants should be especially eager to affirm their threatened masculinity, and because self-affirmation does predict that some need to affirm should occur in the general threat condition, given findings that the method of affirmation need not necessarily have anything to do with the threat to the self (e.g.- Steele, 1975). The manipulation was expected to have similar effects for the high and low masculinity groups on the measures of attitudes regarding other groups, as these have little to do with masculinity. Negative attitudes were expected to increase across all participants in the general and masculine threat condition as compared to the no threat condition. For all participants, we expected to see a clear physiological threat pattern in the masculine and general threat conditions, and clear challenge patterns in the no threat condition.

Methods

Design

Data from the three conditions (masculine threat, general threat, and no threat/control) was analyzed using separate one-way ANOVAs to determine the effects of the manipulation on two sets of dependent variables – physiological measures and anti-gay attitude. Scores on a pretest assessing masculine identity were analyzed separately to determine how level of masculine identity correlates with the dependant variables.

Participants

Participants were 10 male undergraduates (ages 17-20 years) at Illinois Wesleyan University enrolled at the time of the study in an introductory psychology course and 26 male undergraduates (ages18-29) enrolled in introductory psychology, social psychology, and human sexuality at Illinois State University. Thirty-four participants received class credit for participating in the study. Two of the Illinois Wesleyan students who had already received enough research credits received $10 compensation in lieu of credit.

Setting and Apparatus

For the first part of the study, IWU participants signed up to attend one of six mass testing sessions, held in a lecture hall in the Center for Natural Science. ISU participants completed the measures during regular class time. In addition to the measure of interest for the present study, participants filled out a number of filler measures to disguise the nature of the experiment and measures related to the research of other faculty. For the second part of the study, participants were run in one of the psychology research labs on the second floor of the Center for Natural Science at Illinois Wesleyan University, and in one of the research labs in the basement of the psychology building at Illinois State University. In both locations, participants were seated upright in a comfortable, upholstered chair. Recording, monitoring, and laboratory computer

equipment were located in a neighboring room. The physiological signals were recorded using 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 digital signal converter (Biopac corporation), and an IBM computer. The masculine and general knowledge tests and the false negative feedback were administered via a Macintosh 6100/600 computer at IWU, and a Macintosh 8100 computer at ISU.

Measures

Physiological Measures. Cardiac and hemodynamic measures were recorded noninvasively using equipment meeting commercial and hospital safety standards and following guidelines established by the Society for psychophysiological research (e.g., Sherwood et al., 1990). Impedance cartiographic (ZCG) and electrocardiographic (ECG) recordings provided continuous measures of cardiac performance. Impedance cardiography uses four mylar/aluminum bands serving as electrodes to provide basal thoracic impedance (Zo) and the first derivative of the Zo signal (dZ/dt). This signal is used to compute several measures such as inter-beat interval (IBI), respiratory sinus arrhythmia (RSA), and pre-ejection period (PEP). Pre-ejection period is a measure of ventricular contractility (VC) and sympathetic control of the heart. Cardiac output (CO) is a measure of the amount of blood pumped by the heart per unit time. One pair of electrode leads was placed around the base of the neck and a second pair at the bottom of the sternum. These measured the impedance to an electric current of 4mA AC 100kHz maintained by a second par of electrode bands placed around the neck and the abdomen. A standard Lead II configuration (right clavicle, left base of rib cage, right iliac crest

ground) was used to provide ECG signals. The Colin AT machine, consisting of an automatic inflation cuff and a wristband sensor placed over the participant's radial artery, provided a continuous, noninvasive monitor of blood pressure. An interactive software program was used to record and later score the cardiac and hemodynamic data.

Cardiovascular reactivity (i.e. - change from baseline) measures were used to differentiate threat from challenge. Specifically, we looked at PEP, CO, and total peripheral resistance (TPR) for established threat and challenge patterns (Tomaka et al., 1993). TPR is derived from blood pressure and cardiac output using the formula (mean arterial pressure / cardiac output) x 80 (Sherwood et. al., 1990). TPR is expressed in resistance units, and a formal description of these units can be found in Sherwood and colleagues (1990). TPR measures the total resistance to blood flow in the body. It is a measure of autonomic control of arterial contractility.

Trait measures. Participants completed the Personal Attributes Questionnaire (PAQ) as a pretest measure. The form of the PAQ we used is a twenty-four-item measure that gauges participants' endorsement of stereotypical male and female and traits (Spence, Helmreich & Stapp, 1974). Each item consists of a pair of personality traits such as "not at all aggressive" and "very aggressive" or "very submissive" and "very dominant." Participants are asked to indicate where they fall on a five-point continuum between the two. The PAQ was developed to tap certain aspects of sex roles ("sel-assertive-instrumental traits" for men and "interpersonal-expressive traits" for women), but not necessarily to be a measure of global masculinity and femininity (Spence, Helmreich & Stapp, 1974). Three subscales make up the PAQ. The masculine and feminine subscales contain traits considered desirable in both sexes, but which are

stereotypically found in men or women, respectively. The third subscale, the M-F scale, contains traits that are thought to be desirable in when found in one sex but not desirable when found in the other. Spence and colleagues (1974) created the PAQ by having participants decide if certain traits would be found in the *ideal* man or woman, the *stereotypical* man or woman, and also whether they rate themselves as having these traits. Participants also completed Herek's (1999) Functions of Attitudes towards Homosexuals Scale (FATHS). The FATHS contains items such as "My opinions about gay men mainly are based on my personal experiences with specific gay persons." and "My opinions about gay men mainly are based on my perceptions of how people I care about have responded to gay people as a group." The FATHS is included to see what functions anti-gay attitudes serve for those who express them. Also included is a feeling thermometer about attitudes towards gays, which allows participants to choose a number between zero and 100 that expresses their overall evaluation of gays (Haddock & Zanna, 1998).

The PAQ, the FATHS, and the feeling thermometer were embedded in a series of other measures including 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).

After the manipulation, participants filled out several attitudinal measures, including the Attitudes Towards Gays scale (ATG), the Quick Discrimination Index (QDI), another feeling thermometer about attitudes towards gay men and feeling thermometers regarding attitudes toward women, blacks, Arabs, and fraternity and

sorority members. The ATG (Herek, 1988) is a ten-item measure of participants' feelings about gay men. It is half of a larger, twenty-item scale dealing with attitudes towards lesbians and gay men. Using a 9-point scale ranging from "strongly disagree" to "strongly agree," participants respond to items such as "I would *not* be too upset if I learned that my son were homosexual" and "I think that male homosexuals are disgusting." An overall value for the ATG was obtained by adding together the responses to each item, with six of the 10 items being reverse scored. The QDI (Ponterotto, Burkard, Rieger, Grieger, D'Onofrio, Dubuisson, Heenehan, Millstein, Parisi, Rath, & Sax, 1995) is a reliable and valid measure of sensitivity to multiculturalism and women's equality issues. It contains 30 items, asking for agreement or disagreement with statements like "All Americans should learn to speak two languages" and "Generally speaking, men work harder than women." The participant may choose from a 5-point scale anchored with "strongly agree" and "strongly disagree. The QDI was scored by adding up the responses to each item, with 15 of the 30 items being reverse scored.

Procedures

After IWU participants arrived for the first part of the experiment, the mass test, they were greeted by the experimenter and told that the study had to do with the social and emotional lives of students. They were asked to sign an informed consent form stating that they may be contacted to participate in further research for additional credit, though it was clear that their future participation is in no way mandatory. ISU participants were treated similarly, except that the surveys were administered during regular class time. At this time, the participants completed the PAQ, the FATHS, the

RSE, the COPE, the MCSDS, the LDS, the REI, and a short demographics sheet including their name, sex, race, and contact information (phone number and email address). Participants were then instructed to put the surveys back into the folder and hand the data to the experimenter.

All male participants from the first part of the experiment who provided contact information were contacted at least two weeks after the first experiment by the experimenter via telephone and email and asked to return for the second part. They were asked to commit to a time slot arranged by the experimenter. Upon arrival for the second part of the experiment, participants were greeted by the experimenter, informed as to the general nature of the study (i.e., that it pertains to social and emotional lives of students) and asked to sign an informed consent form. After obtaining informed consent, the experimenter applied the psychophysiological sensors. Data was collected in five-minute blocks. The first block served as a test block to make sure the equipment was working correctly and that the signal was clean. As soon as the person operating the computer informed the other experimenter that everything was in working order, the participant was told to relax, and the experimenter left the room, turning the light off as he or she left. As soon as the test block ran out, the rest period was started and minute to minute systolic and diastolic blood pressure values were recorded.

Manipulations. Participants were randomly assigned to one of three conditions, all of which consisted of two sequences of questions. In the first condition, the masculine threat condition, participants were told that they were going to be given a test measuring "masculine knowledge" (MK), a series of questions "designed to assess the masculine knowledge normally acquired during the life of the average American college student."

This was done at the conclusion of the five-minute rest period. The participant was then asked to read the directions for the test, which appeared on screen and stipulated that participants would have up to 10 seconds to answer each question (if participants did not respond to a question in 10 seconds, it disappeared and the next question automatically appeared). The participant then initiated the test by pressing the space bar (at which point a 10 minute recording block was begun). Participants answered a series of 25 questions ostensibly measuring ability and knowledge in stereotypically masculine areas (e.g. – car repair, sports rules and history, etc.) After they finished answering the first 25 questions, the computer screen reported that the first part of the test was over, and that they should press the space bar to continue. For ten seconds, the computer screen reported that the participant's score was being computed, after which a bar graph appeared on screen showing that the participant scored "one standard deviation" below average for the average male college student. This information remained on the screen for 30 seconds, at which point a message appeared at the top of the screen indicating that the participant should press the space bar to continue with the second part of the test. After the participant answered the 25 remaining questions, the screen reported that the test was over. The experimenter generally reentered the room during the second part of the test (being careful not to watch the subject answering questions), prepared the post-manipulation questionnaires and waited for the participant to be done, at which point he was given the questionnaires. The time the participant finished the test was recorded.

The second condition, the general threat condition, was identical to the masculine threat condition, except that instead of being told that they were taking an MK test, they were told they were taking a test "designed to assess the general knowledge normally

acquired during the life of the average American college student." Participants then answered 50 questions appearing to measure general knowledge. The third condition, the no threat or control condition, was identical to the general threat condition in every way, except that the participant received no feedback after completion of the first 25 questions of the GK test. Instead, the computer screen remained blank for 40 seconds until the instructions to begin the second GK test appeared.

After the manipulation, the participants were asked to fill out a packet containing the feeling thermometer for gay men, the ATG, the feeling thermometers for women and African Americans, the QDI, and the feeling thermometers for Arabs and fraternities and sororities, in that order. When the participant had finished, he was unhooked from the physiological equipment, thoroughly debriefed, thanked for his participation, and dismissed. He was asked not to discuss the purpose or the nature of the study with any other students.

Results

Measures of Anti-Gay Attitude – a Priori Hypotheses

The results obtained from the dependent measures of ATG and the feeling thermometer were analyzed using a series of one-way analyses of variance with three levels (masculine threat, general threat, control) and a priori contrasts. The first contrast was masculine threat vs. general threat and the second contrast was the combination of both threat groups compared with the control condition. The values from the feeling thermometer were analyzed in two ways – using the simple post-manipulation value in one analysis and change scores (post-manipulation minus pretest scores) in another analysis. The means and standard deviations for the three threat groups on the post-test

thermometer and the thermometer change scores and the t and p values from the a priori contrasts can be found in table 1. Inspection of table 1(b) reveals that the a priori contrasts were not significant ($p > .1$ for both contrasts). In looking at the ATG score, the two groups were not significantly different in either of the contrast sets ($p > .1$ for both contrasts). The mean values and standard deviations and the ATG scores for each of the three groups are shown in table 1(a). The t and p values from the a priori contrasts are shown in table 1(b). A correlational analysis was run comparing scores on the ATG to the post-manipulation feeling thermometer for gay men. The measures were significantly correlated ($r = .712, p < .01$).

Measures of Attitude Towards Other Groups

The results obtained from the feeling thermometers towards women, African Americans, Arabs, fraternities and sororities, and the QDI were analyzed in the same way as the anti-gay measures. No significant differences on the feeling thermometers or the QDI were found between the a priori groups ($p > .1$), with the exception of the feeling thermometer for fraternities and sororities (the combination threat group reported more favorable attitudes towards fraternity and sorority members than the control group). The means and standard deviations for the three groups on the feeling thermometers and the QDI are shown in table 2, along with the t and p values for the a priori contrasts.

Pretest Scores of the PAQ – a Priori Hypotheses

The PAQ consists of three subscales: unipolar masculine and feminine scales and a bipolar scale with masculinity and femininity at opposite ends. Each of these scales was scored individually and used in analysis. Only analyses using the masculine subscale are reported in this section, however, as a priori hypotheses only pertained to the

high/low masculinity. Differences between the three threat groups were also analyzed using masculinity scores on the PAQ as a covariate in additional one-way ANOVAs to control for the effects of masculinity score using the ATG, the feeling thermometers, the gay feeling thermometer change, and the QDI as dependant variables. No significant results were found, however ($p > .10$ for every dependant variable tested). A median split was then performed on the data from the masculine scale. All participants with scores equal to or less than the median were placed into the "low" category for the masculine scale, and all scores above the median resulted in the participant being placed in the "high" group. Thus, all participants were categorized into high or low masculinity groups. The post-manipulation measures were then analyzed using a 2x3 ANOVA: 2(masculinity: high vs. low) x 3 (condition: masculine threat vs. general threat vs. no threat).

For each high/low or masculine split, we compared scores in the post-manipulation feeling thermometer for gay men, the pre- to post-manipulation feeling thermometer change, the ATG, and the QDI. On each of these measures, higher scores indicate more positive attitudes (a positive feeling thermometer change score indicates a favorable change in attitude, pre-to post-manipulation). There were no significant findings on the dependant measures for the ANOVA comparing the high and low masculinity groups. However, there were two general trends in the data. In the masculine threat condition, more masculine participants were more negative in their evaluation of gay men than more feminine participants. In the general threat condition, more masculine and less feminine participant tended to be more *positive* in their evaluation of gay men than feminine participants.

Pretest Scores on the PAQ – Exploratory analyses

A median split was also performed on the data from the other two PAQ scales. Thus, all participants were categorized into high or low femininity groups and masculine or feminine groups (based on the bipolar subscale). The post-manipulation measures were then analyzed using two 2x3 ANOVAs: 2(femininity: high vs. low) x 3 (condition: masculine threat vs. general threat vs. no threat), and 2(masculine/feminine bipolar scale: high vs. low) x 3 (condition: masculine threat vs. general threat vs. no threat).

Just as in the analysis for the masculine subscale, for each high/low or masculine/feminine split, we compared scores in the post-manipulation feeling thermometer for gay men, the pre- to post-manipulation feeling thermometer change, the ATG, and the QDI, for a total of 8 additional analyses (two high/low splits times four dependant variables). Again, there were two general trends in the data. In the masculine threat condition, more masculine (and less feminine) participants were more negative in their evaluation of gay men than more feminine participants. In the general threat condition, more masculine and less feminine participant tended to be more *positive* in their evaluation of gay men than feminine participants.

There were two significant and two marginally significant interactions found (the results for these ANOVAs are depicted in figures 2, 3, 4, and 5). There were two interactions between high/low femininity group and threat condition. Score on the QDI was the dependant measure for the first significant interaction. Inspection of means for each cell (see table 4 for the means for each cell and figure 2 for a depiction of the results) suggest that, in the masculine threat and no threat conditions, low femininity participants reported more positive attitudes (higher scores) towards women and

minorities than high femininity participants. High femininity participants reported more positive attitude in the general threat condition ($F(2,35) = 6.135, p < .01$). The second interaction, with pre- to post-manipulation change score on the feeling thermometer as the dependant measure, was marginally significant (see table 5 and figure 3). Inspection of the means suggests that high femininity participants had a negative pre- to post-manipulation change in attitude in the threat conditions, while low femininity men appeared to have a positive change in attitude in the two threat conditions($F(2, 30) = 2.546, p < .10$). There were two interactions between score on the bipolar masculinity/femininity scale and threat condition. Feeling thermometer score was the dependent variable for one of the significant interactions. Inspection of table 6 and figure 4 suggests that more feminine participants rated gays higher (reported higher values on the feeling thermometer) than more masculine participants in the masculine threat condition. However, more masculine participants rated gays as higher in the general threat condition ($F(2,34) = 6.723, p < .01$). A second interaction between masculine/feminine group and threat condition with change in the gay male feeling thermometer as the dependant measure was marginally significant. Inspection of table 7 and figure 5 suggest that more feminine participants had a slightly positive pre- to post-manipulation change in attitude toward gays, as compared to a negative change for more masculine participants. This was only true in the masculine threat condition. In the general threat condition, feminine men had a negative change and masculine men had a positive change in their evaluation of gay men($F(2,30) = 2.551\ p < .10$).

Though none of the ANOVAs with score on the ATG as the dependant measure found significant group differences, inspection of two of the graphed results (see table 8

and figures 6a and 6b) reveals that the trends for these data are the same as for most of the findings cited above. Specifically, the patterns found in the data using change in gay thermometer and post-manipulation gay thermometer score as dependant measures (bipolar masculinity/femininity x threat condition) were similar to those found using ATG as the dependant measure in the same analysis. In all of these analyses, feminine participants were more positive towards gay men in the masculine threat condition, whereas masculine participants were more positive towards gay men in the general threat condition. The analysis of ATG as a function of high/low femininity and threat condition (see figure 8a) also resemble these overall findings. Interestingly, the significant pattern of results found using the QDI as the dependant measure (as a function of high/low femininity and threat condition) is opposite to the pattern found using the ATG; feminine men were more negative in their evaluation of women and minorities (scored lower on the QDI) in the masculine threat condition, but higher in their evaluation of these groups in the general threat condition.

Physiological Measures

Minute to minute heart rate (HR) and respiratory sinus arrhythmia (RSA) were measured using an ECG signal, which was also used in combination with the impedance cardiography signal to measure stroke volume (SV) and pre-ejection period (PEP). Cardiac output (CO) in liters per minute was calculated using HR and SV. Minute to minute systolic and diastolic blood pressure were monitored and used to calculate mean arterial pressure (MAP). Total peripheral resistance (TPR), a measure of the constriction of the body's blood vessels at a given time, was calculated using CO and MAP. Physiological data was analyzed by comparing the data from the last minute of the rest

period to a minute after the participant had seen or would have seen the threat feedback (or would have seen 30s of blank screen corresponding to the feedback, in the case of the control group). Since the experimenter was not in the same room as the participant, and because the participant had *up* to 10 seconds to answer each question, it was difficult to determine exactly when the participant received feedback. The time when the participant finished the test *was* recorded, however, and it was decided that the physiological data from the minute three minutes before the time the participant finished the test would be analyzed. At this point, all participants would have seen the feedback or at least would have been in the middle of receiving it. Change scores for HR, CO, PEP, MAP, TPR, and RSA were calculated by subtracting the rest minute values from the post-manipulation minute values. If data was unavailable for the rest minute (because of poor signals), data from the preceding minute was substituted (i.e., from the second to last minute of the rest block). If unavailable for the post-manipulation minute, data from the following minute was used. The data for one participant (in the general threat condition) could not be used due to signal interference. Means and standard deviations for physiological change scores for the three threat groups are presented in table 3(a).

The same a priori contrasts used in analyzing the post-manipulation attitude measures (masculine vs. general threat and threat vs. no threat) were used in analyzing the physiological change scores. HR and MAP are two traditionally used markers of cardiovascular reactivity, but when considered alone they reveal little about underlying hemodynamic functions or autonomic activation of the heart. More useful are CO, PEP, RSA and TPR, as they reveal information about the actual amount of blood the heart is pumping, how hard it is working, autonomic activation, etc.. No significant differences

between the contrast groups were found with change scores for CO, RSA, and PEP, though the PEP and RSA analyses were marginally significant ($p = .091$ and $p = .089$, respectively, not assuming equal variance) when comparing the masculine threat and general threat conditions (PEP went down more in the threat than in the no-threat group, and reduction in RSA was more pronounced for the threat groups than the no threat group). The findings for TPR were significant ($p < .04$) when comparing the combined threat group to the control/no threat group. Comparing the rest minute to the post-manipulation minute, TPR went down slightly for the control group and up for the combination of threat groups.[1] *P* and *t* values resulting from using ANOVAs with the a priori contrasts to analyze the physiological data are presented in table 3(b).

Discussion

It was predicted that participants in the masculine threat condition would show the most anti-gay attitude, followed by the general threat group, with the control group showing the most positive attitudes. It was also predicted that the two threat groups would evaluate other groups about equally, with the control group showing the most positive attitude. Neither of these predictions was confirmed, and in inspecting the means for the three groups on the three measures listed in table 1(a), it is difficult to find any recognizable trends. The probability of finding statistically significant differences was hindered by very the large standard deviations also found in table 1(a). One of the major limitations of this study was its small sample size, which only allowed for 12 participants per group.

Even with the small sample size, however, two significant interactions were found between the unipolar femininity and bipolar masculinity/femininity scales from the PAQ

[1] Findings for MAP were also significant, but MAP is part of the calculation for TPR.

and threat condition. It is important to note that these findings neither support nor refute any a priori hypotheses, as predictions were made based on the masculine subscale of the PAQ and not in reference to the feminine or the M-F subscales. One might expect patterns of data using score on these scales as variables to look similar to patterns found with the masculine subscale, but this was never explicitly predicted. The following findings, therefore, should be treated as exploratory, as they do not necessarily fit within the original theoretical framework of the study. In looking at the graphs for the two significant results (high/low femininity x threat condition with the QDI as the dependant measure and feminine/masculine x threat condition with post-manipulation feeling thermometer for gay men as the dependant measure, see figures 2 and 4) one can see a nearly opposite pattern. More masculine men, as compared to more feminine men, are more negative towards gay men in the masculine threat condition, but significantly more positive towards gay men in the general threat condition (a similar result is found when using the ATG as the dependant variable, though this was not significant). This data partially supports the hypothesis that the masculine threat would more effectively threaten the self-images of more masculine men, leading to lower evaluations of gay men in the masculine threat condition. On the other hand, low femininity men (as compared to high femininity men) are more positive in their assessment of other groups (as measured by the QDI) in the masculine threat condition, but more negative in the general threat condition (see figure 2). This finding does not necessarily refute the hypothesis, as it said nothing about the relation of femininity to masculine threat, but it is an interesting contrast.

Given the number of analyses we ran, it is possible that we capitalized on chance and inadvertently inflated our alpha error, and that the effects we found were not real. This seems unlikely, given that fact that so many of our findings are repeated for different measures (whether significant or not). Nonetheless, this remains a concern.

One possible explanation for the results on the QDI is that feminine identity in men (or some equivalent) is completely separate from masculine identity. Indeed, the design of the PAQ allows for the separate analysis of masculinity and femininity when using the unipolar scales. Perhaps, regardless of masculine level, men scoring high in femininity recognize on some level that they have some stereotypically feminine traits. This in itself may make them more susceptible to the masculine threat manipulation if it is already a point of insecurity. On the other hand, this does not account for the marginally significant results with the change in the thermometer for gay men as the dependant variable, where more feminine men tended to have a positive change whereas less feminine men tended to have a negative change. Nor does it account for the non-significant pattern found with the ATG as the dependant measure, where more feminine men evaluated gay men lower than less feminine men in the masculine threat condition.

Turning back to the graphs in figures 2 through 6, another pattern is apparent. In all of the graphs except for that in figure 3 (change in gay thermometer as a function of threat group and femininity level), the lines cross between the masculine and general threat conditions. That is, the group that rated gays higher in the masculine threat condition (i.e., high femininity, feminine on the bipolar scale) rated gays as lower in the general threat condition. Because of the limited sample size any speculation should be regarded as tentative; nonetheless, perhaps the masculine threat activated some sort of

pro-gay feeling (or pro-"that which is like me and not very masculine") for the more feminine participants, and an anti-gay feeling for the less feminine or more masculine participants. These feelings would likely not be generated in the general threat condition, and they would not be reflected on the QDI.

The post-test measures were not counterbalanced, with the gay male feeling thermometer and the ATG coming before the QDI and other feeling thermometers. This leads to another possible explanation for the apparently contradictory results. Instead of reaffirming an injured self-image by expressing negative attitudes towards these various groups, participants may have been reaffirming the self by expressing *positive* attitudes to express values of justice or egalitarianism. For some participants (perhaps for the more masculine or less feminine groups), the feeling thermometer for gay men and the ATG might not be an attractive opportunity for affirmation, so they might "wait" to affirm until they get to the QDI. For the more feminine groups, the feeling thermometer and the ATG may have been provided an attractive affirmation opportunity. By the time they reached the QDI, their need to affirm would be gone. In this way, in the masculine threat condition, the less feminine participants could have ended up with higher scores on the QDI than the more feminine participants, while the more feminine participants would have had higher scores on the feeling thermometer for gay men. This seems a reasonable explanation, but it still does not account for the opposite results found in the general threat condition with many of the dependant measures. Future studies with more participants should pay close attention to femininity scores and their relation to masculine threat. In addition, counterbalancing post-manipulation measures could make interpretation of results more clear.

Physiological Measures

It is interesting to note that even with the lack of statistical power in this study, some of the physiological results were either significant or approached significance when using the a priori contrast tests. It was predicted that the two threat groups should show the physiological patterns of threat while the control group should show the patterns of challenge. Tomaka and colleagues (1993) defined a *threat* situation as one where a person's primary appraisal of the situation (i.e., an evaluation of the difficulties of dealing with the situation) is higher than the person's secondary appraisal (i.e., an evaluation of the one's ability or resources available to deal with the situation). A *challenge* situation is one where the secondary appraisal is higher. In other words, a person is threatened when he feels unable to deal with a situation, whereas a person is challenged when she feels adequately prepared to deal with a situation. In terms of our study, we predicted that by telling participants they were doing poorly on difficult question sets we would be putting them in a threat situation. After they had seen the feedback, we believed they would lack confidence in their ability to answer the last 25 questions. With the control group, we attempted to create a challenge situation, or at least a less threatening situation, given that the questions were difficult but that the participants had no idea how they were performing.

Tomaka and colleagues (1993) found that participants' self-reported primary and secondary appraisals of a given situation and the resulting determination of "threat" or "challenge" correlated highly with certain physiological markers. Specifically, the researchers found that when participants were challenged, PEP and TPR went down compared to baseline (the lower the PEP, the harder the heart is pumping). When

participants were threatened, PEP went down and TPR went up. TPR was the one significant physiological measure we found, and the directions of the findings correspond to those predicted by the threat/challenge hypothesis. That is, TPR rose overall for participants in the threat groups and went down slightly for participants in the control condition (see figure 1). On the other hand, there was no recognizable pattern in the PEP data when comparing the threat groups to the control groups, and there was only a slight, trend, approaching significance ($p = .089$) for the change in RSA to be slightly more negative for the threat groups than control (reduction in RSA is a marker of parasympathetic withdrawal). This suggests that the one significant finding, change in TPR, may itself have been due to chance, though it does conform to a priori predictions.

If the TPR result were to hold up across more participants, it would support the idea that our threat conditions were in fact threatening. However, one additional problem with the current study is that the masculine and general threat tests were not rigorously pretested to determine if they were of equal difficulty. This could introduce several confounds. If one was more difficult than the other, then participants taking the more difficult test could be more threatened than those taking the other test, leading to differences in both physiological and attitude measures. It is also possible that either or both of the tests were so difficult that participants simply "gave up." If a participant thought the questions were far beyond his ability to answer, he may have simply stopped trying and stopped caring about his performance. Theoretically, the test would then have little impact on the physiological and attitude measures. In future studies, extensive pretesting of the threat tests might prove extremely valuable.

Another limitation with the current study is that the exact time the participant received feedback is unknown. By estimating this time across participants, we introduced noise into the data that could have hidden more clear results. In the future, it would be useful to devise a way to know exactly when the participant has finished receiving the feedback and record that time. In this way, the physiological data that is most strongly affected by the manipulation (i.e., that recorded right after feedback was given) could be analyzed.

The high level of between measures reliability indicated by the strong correlation between the ATG and the post-manipulation feeling thermometer of gay men is encouraging, and the ATG has been used as part of the ATLG in several studies (Herek, 1994) suggesting that it is a valid measure of overall anti-gay attitude.

It could be that our interpretation of the theories cited in the introduction (the functional approach to attitudes, the self-affirmation, and symbolic self completion) is appropriate, that our hypotheses were correct, and that with more participant data and therefore more power, our hypotheses would be supported. Other limitations cited above (e.g., ambiguity in the difficulty of the threat test, not knowing exactly when the participant received feedback) could be dealt with, and perhaps the hypothesized patterns would emerge more clearly. On the other hand, we could simply be wrong, and our failure to reject the null hypothesis based on this data could be correct.

In any case, any new study should include a new set of hypotheses relating to feminine identity. Our results, tentative as they may be, seem to indicate that self-perceived femininity may be as important to the study of anti-gay attitudes as masculinity, perhaps even more important. It could be that masculine identity matters

little, but that, for many men, self-perceived femininity has a large impact on whether or not they express anti-gay attitude and when.

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Table 1(a)

Means and Standard deviations for each threat group for the ATG scale, the feeling thermometer for gay men, and the pre-manipulation to post manipulation change in thermometer score.

Attitude Measure		Experimental Group		
		Masculine Threat	General Threat	No Threat (Control)
ATG	*M*	50.83	59.17	59.92
	SD	17.151	16.492	19.787
Feeling thermometer for gay men – post manipulation	*M*	48.17	59.09	43.75
	SD	25.106	22.115	21.011
Pre-manipulation minus post-manipulation change	*M*	-3.20	-6.50	-3.75
	SD	23.878	27.085	9.799

Table 1(b).

t and P values resulting from using two a priori contrasts – masculine threat vs. general threat groups and the combination of the two threat groups vs. the control group - for the ATG scale, the feeling thermometer for gay men, and the pre-manipulation to post manipulation change in thermometer score (does not assume equal variance).

Attitude measure		Contrast Pair: Masculine threat vs. general threat	Contrast Pair: Threat combination vs. control (no threat)
ATG	*t*	-1.213	.288
	p	.238	.777
Feeling thermometer for gay men - post-manipulation	*t*	-1.109	-1.264
	p	.280	.218
Pre-manipulation minus post-manipulation change	*t*	.289	.173
	p	.776	.864

Table 2(a)

Means and Standard deviations for each threat group for the QDI and for the feeling thermometers for women, African Americans, Arabs, and fraternities and sororities.

Attitude Measure		Experimental Group		
		Masculine Threat	General Threat	No Threat (Control)
QDI	*M*	77.67	86.00	81.92
	SD	16.155	12.270	9.793
Feeling thermometer for women	*M*	80.42	89.55	84.17
	SD	17.117	9.070	16.214
Feeling thermometer for African-Americans	*M*	74.58	74.17	71.67
	SD	26.238	22.344	16.422
Feeling thermometer For Arabs	*M*	66.25	52.50	54.17
	SD	28.534	20.944	21.933
Feeling thermometer for fraternities and sororities	*M*	55.83	55.42	36.67
	SD	26.443	26.238	21.462

Table 2(b).

t and P values resulting from using two a priori contrasts – masculine threat vs. general threat groups and the combination of the two threat groups vs. the control group - for the QDI and for the feeling thermometers for women, African Americans, Arabs, and fraternities and sororities (does not assume equal variance).

Attitude measure		Contrast Pair: Masculine threat vs. general threat	Contrast Pair: Threat combination vs. control (no threat)
QDI	*t*	-1.423	.020
	p	.170	.984
Feeling thermometer for women	*t*	-1.616	-.149
	p	.124	.883
Feeling thermometer for African-Americans	*t*	.042	-.394
	p	.967	.696
Feeling thermometer For Arabs	*t*	1.346	-.640
	p	.193	.528
Feeling thermometer for fraternities and sororities	*t*	.039	-2.311
	p	.969	.029

Table 3(a)

Means and standard deviations for physiological change scores.

Physiological measure		Threat condition		
		Masculine threat	General threat	No threat (control)
HR (beats per minute)	*M*	4.804	2.223	4.250
	SD	4.519	3.618	4.517
CO (liters per minute)	*M*	.0286	-.2391	.2189
	SD	.4935	1.0798	1.8928
PEP (seconds)	*M*	.1667	-4.9091	.0000
	SD	5.5569	7.76472	5.0452
MAP (mmHg)	*M*	8.167	11.444	-.5758
	SD	5.780	17.928	12.587
TPR	*M*	100.694	98.683	-37.2535
	SD	123.997	187.088	163.105
RSA	*M*	-.3630	-1.2860	-.1836
	SD	.5899	1.7920	.6549

Table 3(b)

t and P values resulting from using two a priori contrasts – masculine threat vs. general threat groups and the combination of the two threat groups vs. the control group – for the physiological change scores (does not assume equal variance).

Physiological measure		Contrast Pair: Masculine threat vs. general threat	Contrast Pair: Threat combination vs. control (no threat)
HR (beats per minute)	*t*	1.488	.470
	p	.152	.643
CO (liters per minute)	*t*	.723	.562
	p	.483	.583
PEP (seconds)	*t*	1.789	1.166
	p	.091	.254
MAP (mmHg)	*t*	-.603	-2.224
	p	.557	.038
TPR	*t*	.029	-2.278
	p	.977	.034
RSA	*t*	1.547	1.791
	p	.150	.089

Table 4

Mean score on the QDI as a function of femininity and threat condition. F and p values are for the significance of the interaction between the two variables.

Median Split Group	Threat Condition			*F*	*P*
	Masculine	General	No threat		
Low femininity	92.75	82.25	84.25	6.135**	.006
High femininity	70.13	93.50	77.25		

** $p < .01$.

Table 5

Mean pre- to post-manipulation change score on the feeling thermometer for gay men as a function of femininity and threat condition. F and p values are for the significance of the interaction between the two variables.

Median Split Group	Threat Condition			*F*	*p*
	Masculine	General	No threat		
Low femininity	11.67	8.33	-5.63	2.546	.099
High femininity	-9.57	-15.00	0.00		

Table 6

Mean score on the post-manipulation feeling thermometer as a function of threat group and masculinity and femininity as measured by the bipolar masc./fem. scale. F and p values are for the significance of the interaction between the two variables.

Median Split Group	Threat Condition			*F*	*p*
	Masculine	General	No threat		
masculine	33.00	78.00	50.00	6.135**	.006
feminine	59.00	43.33	41.67		

** $p < .05$.

Table 7

Mean pre- to post-manipulation change score on the feeling thermometer for gay men as a function of threat group and masculinity and femininity as measured by the bipolar masc./fem. scale. F and p values are for the significance of the interaction between the two variables.

Median Split Group	Threat Condition			*F*	*p*
	Masculine	General	No threat		
masculine	-11.25	10.00	0.00	2.551	.098
feminine	2.17	-11.25	-5.00		

Table 8

Mean score on the ATG as a function of threat group and (a) femininity or (b) masculinity and femininity as measured by the bipolar masc./fem. scale. F and p values are for the significance of the interaction between the two variables.

(a)

Median Split Group	Threat Condition			*F*	*p*
	Masculine	General	No threat		
Low femininity	92.75	82.25	84.25	6.135**	.006
High femininity	70.13	93.50	77.25		

(b)

Median Split Group	Threat Condition			*F*	*p*
	Masculine	General	No threat		
masculine	42.00	64.00	48.33	2.551	.098
feminine	57.14	54.33	59.78		

Figure Caption

Figure 1. Change in TPR as a function of threat group.

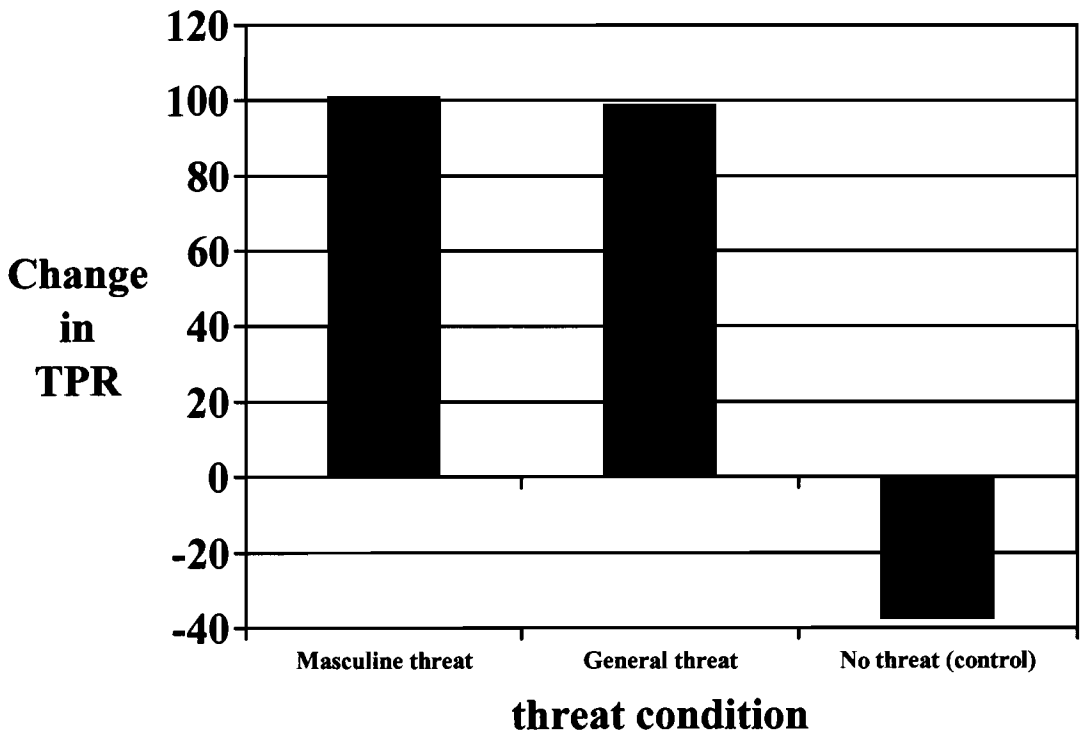

120
100
80
60
40
20
0
-20
-40
Change in TPR
Masculine threat
General threat
No threat (control)
threat condition

Figure Caption

Figure 2. Score on the QDI as a function of femininity and threat condition.

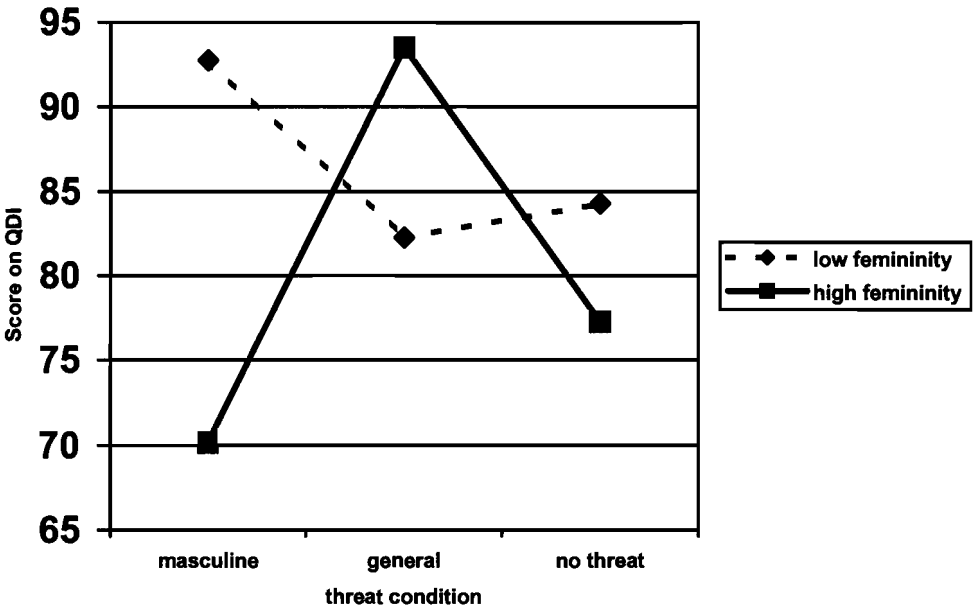

95
90
85
80
75
70
65
Score on QDI
masculine
general
no threat
threat condition
low femininity
high femininity

Figure Caption

Figure 3. Pre- to post-manipulation change score on the feeling thermometer for gay men as a function of femininity and threat condition.

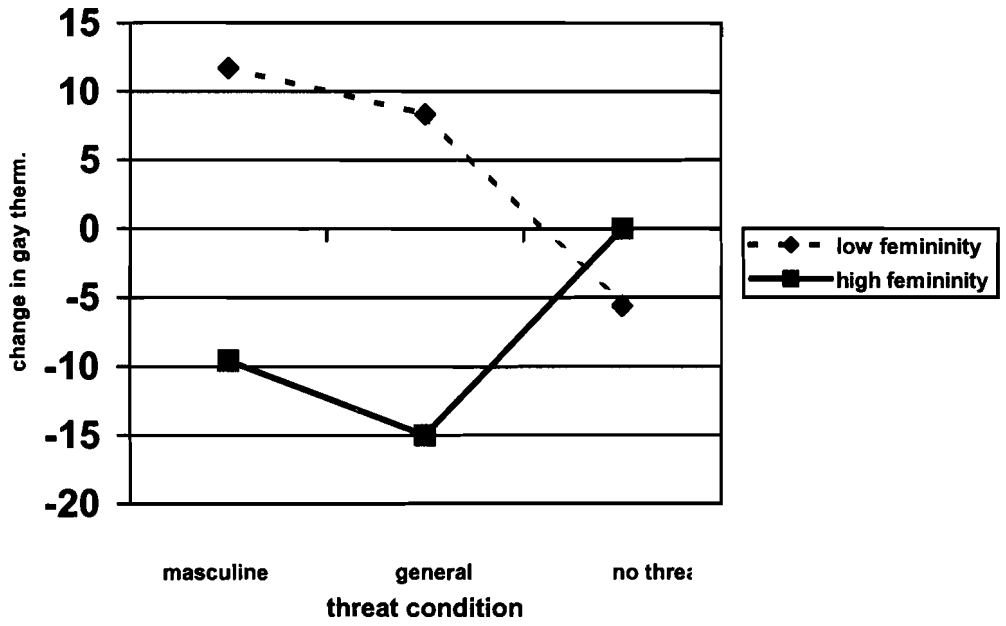

15
10
5
0
-5
-10
-15
-20
change in gay therm.
masculine
general
no threa
threat condition
low femininity
high femininity

Figure Caption

Figure 4. Score on the post-manipulation feeling thermometer as a function of threat group and masculinity and femininity as measured by the bipolar masc./fem. scale.

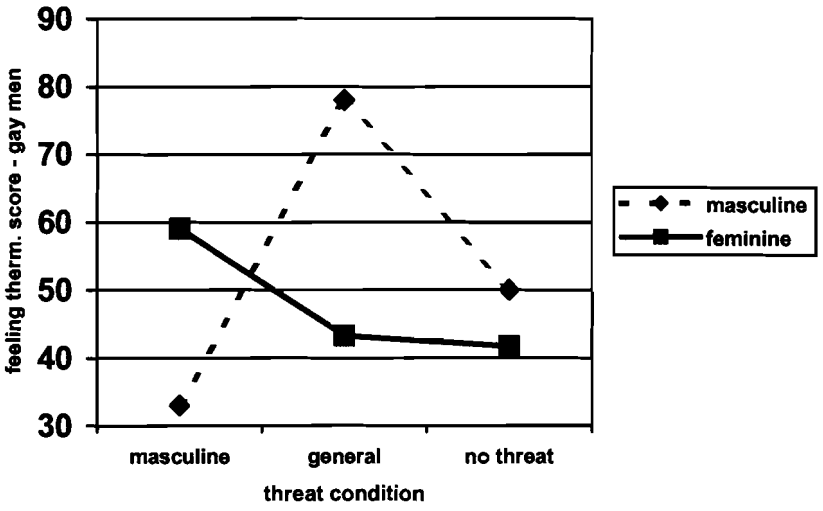

90
80
70
60
50
40
30
feeling therm. score - gay men
masculine
general
no threat
threat condition
masculine
feminine

Figure Caption

Figure 5. Pre- to post-manipulation change score on the feeling thermometer for gay men as a function of threat group and masculinity and femininity as measured by the bipolar masc./fem. scale.

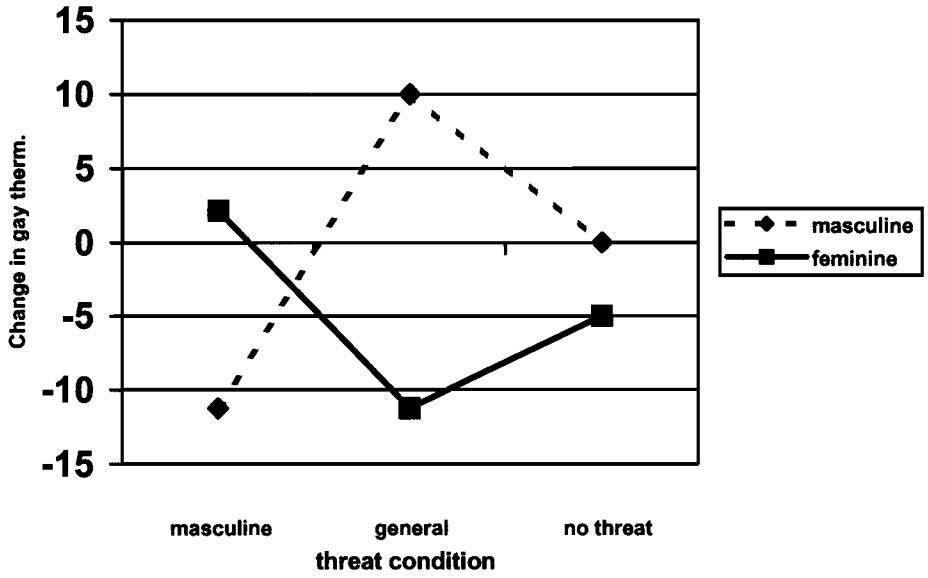
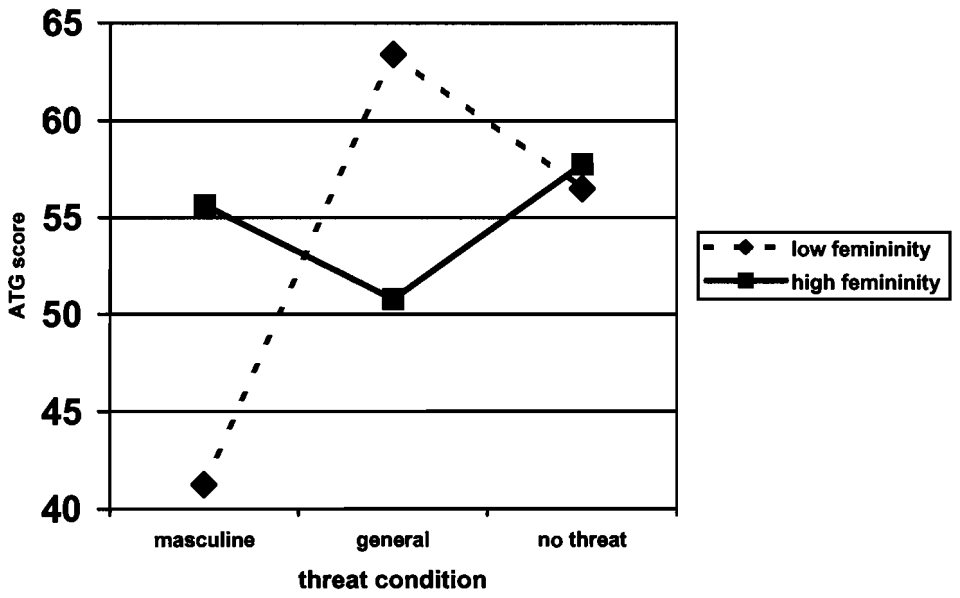

15
10
5
0
-5
-10
-15
Change in gay therm.
masculine
feminine
masculine
general
no threat
threat condition

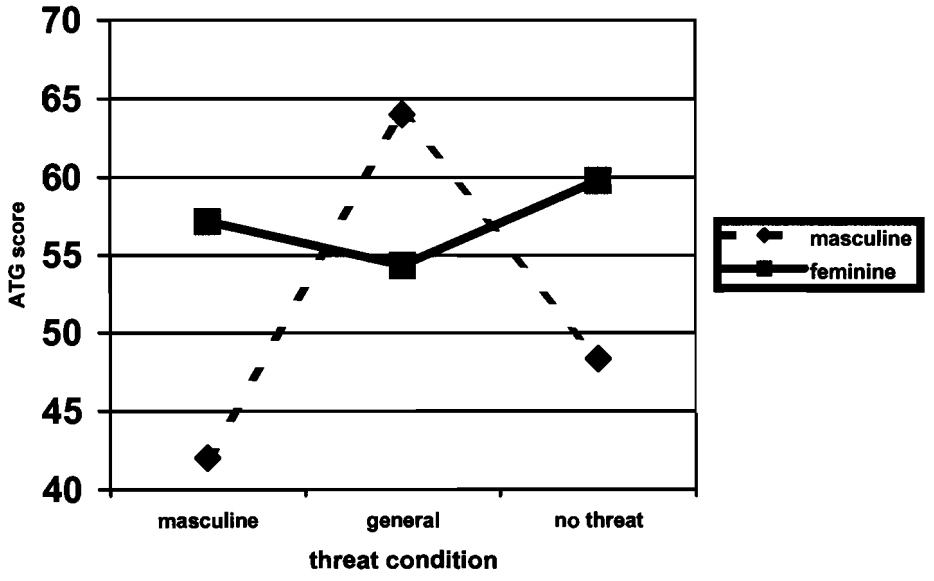
Figure Caption

Figure 6. Score on the ATG as a function of threat group and (a) femininity or (b) masculinity and femininity as measured by the bipolar masc./fem. scale.

(a)


65
60
55
50
45
40
ATG score
masculine
general
no threat
threat condition
low femininity
high femininity

(b)


70
65
60
55
50
45
40
ATG score
masculine
general
no threat
threat condition
masculine
feminine