Community Interconnectedness and Anti-Gay Behavior:

A Test of the Lay Disease-Spread Model of Homosexuality

by

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ABSTRACT

Negative behaviors targeting gay men and lesbians range from violent physical assault to avoiding social or physical contact, with very different implications for those targeted. However, existing theoretical accounts of sexual prejudices are unable to differentially predict these various behaviors, leaving a large theoretical hole in the literature and hindering the design of effective interventions. I propose (a) that homosexuality and pro-gay ideology are conceptualized by many lay persons as contaminants analogous to infectious diseases and (b) that anti-gay behaviors can thus be viewed as strategic attempts to prevent, contain, treat, or eradicate the "pathogens" of homosexuality and pro-gay ideology. In three preliminary studies I demonstrate that sexually prejudiced individuals do view homosexuality and pro-gay ideology as contagious, and that sexually prejudiced people report being more likely to engage in aggressive (versus avoidant) anti-gay behavior in conditions that predict an aggressive pathogen-combating response – highly interconnected social networks. The current study explores the effect of a social network manipulation on actual behavioral responses to a gay (versus straight) interaction partner. In this study I show that sexually prejudiced participants engage in more aggression towards a gay partner compared to a straight partner under a highly interconnected network manipulation.

For being an inspiring role model and for teaching me to be curious, speak up, and ask the hard questions, this is for my mom, Beverly Filip.

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CHAPTER 1

INTRODUCTION

Just after midnight on October 7, 1998, Matthew Shepard, a young gay man, was brutally beaten, tied to a fence, and left for dead in Laramie, Wyoming. His murderers would later (unsuccessfully) invoke the "gay panic" defense – claiming they had been thrown into a state of violent temporary insanity on finding out that Matthew Shepard was gay. In 2008, 52% of Californians voted for Proposition 8, eliminating the right of same-sex couples to marry (a move later ruled unconstitutional). Under the Federal mandate of "Don't Ask, Don't Tell," from 1994 to 2011, gay and lesbian members of the United States armed forces could only serve if they kept their sexual orientation secret. In 2012, Burke Wallace, English teacher and football coach at a California charter school, was fired when the school administration found out he was married – to another man. These actions range from brutal murder to checking a box on a ballot slip, but what each has in common is an attempt to limit the freedoms and rights of gay men and lesbians.

For decades researchers have sought to understand and predict acts of violence and discrimination such as those described above, often characterizing the acts as behavioral manifestations of negative attitudes towards gay men and lesbians (e.g., Alden & Parker, 2005). Such attitudes do indeed predict negative behaviors towards gay men and lesbians (e.g., Parrott, 2009). However, anti-gay behaviors, as demonstrated in the examples above, take a wide variety of forms.[1] To effectively prevent such behaviors, we

[1] For ease of exposition, and following common research and colloquial conventions, I use the term *anti-gay* to refer to actions, attitudes, and ideologies directed against both

must be able to predict not only when an individual will engage in anti-gay behavior, but also when he or she will engage in a *particular type* of anti-gay behavior. When will an individual violently assault a gay man or lesbian versus avoid contact with him or her? When will a parent move his or her child to a different classroom to avoid a gay or lesbian teacher versus seek to have the teacher fired? I suggest that exploring the affective content of anti-gay attitudes provides a useful starting point.

Anti-gay attitudes are largely characterized (Cottrell & Neuberg, 2005; Haddock, Zanna, & Esses, 1993; Herek, 2000) and predicted (Inbar, Pizarro, Knobe, & Bloom, 2009; Olatunji, 2008; Terrizzi, Shook, & Ventis, 2010) by disgust. Disgust, in its earliest form (both phylogenetically and developmentally), functions to regulate responses to pathogen cues and related contamination or contagion (Curtis, 2007; Tybur, Lieberman, Kurzban, & Descioli, 2013). I argue that focusing conceptual attention on the psychology of combating pathogens illuminates a different, and valuable, perspective on anti-gay behaviors.

Consider how individuals and communities engage in a wide variety of behaviors to combat threats of contagion from viruses and other communicable pathogens. Each year millions of Americans are vaccinated to prevent contracting the flu. Those who do get sick often stay home from school or work, in an attempt to keep the infection contained. At early signs of infection a person may choose to take anti-viral medication to eradicate the virus. Medical professionals, from family doctors to federal-level organizations, are engaged to facilitate and legislate for prevention and treatment

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gay men and lesbians.

processes. And so on. Moreover, such actions vary depending on the virulence of the virus, how widespread the contagion is, which people are especially susceptible to it, etc. Combating a pathogen requires a variety of coordinated, strategic actions.

In three preliminary studies I demonstrate that (1) homosexuality (i.e., identifying as gay or lesbian, experiencing same-sex attractions, and/or engaging in same-sexual sexual behavior) and pro-gay ideology (i.e., positive attitudes toward gay men and lesbians) are conceptualized by many sexually prejudiced lay persons as contagious and (2) that sexually prejudiced people report being more likely to engage in aggressive (versus avoidant) anti-gay behavior in conditions that predict an aggressive pathogen-combating response – highly interconnected social networks. Building on this foundational work, the present study explores whether and how social network structure affects actual behavioral responses to a gay interaction partner.

Defining Anti-Gay Behaviors

Anti-gay behaviors are characterized both by avoidance of and aggression towards gay men and lesbians. Although anti-gay behaviors also include indirect actions that target the rights and freedoms of gay men and lesbians as a group (e.g., institutional discrimination) the present work focuses on the behaviors of individuals. Aggressive anti-gay behaviors include anti-gay hate crimes, at the extreme, as well as other forms of interpersonal discrimination. Anti-gay hate crimes are traditional offenses – including threats of violence, acts of intimidation, property crimes, violent assaults, murder, and rape – in which the perpetrator is motivated by anti-gay bias (Federal Bureau of Investigation). Each year in the United States, over 1,100 sexual orientation-motivated hate crimes are reported to law enforcement agencies (Federal Bureau of Investigation,

2012). Many others are thought to go unreported, often due to gay and lesbian individuals' concern over potential secondary victimization from law enforcement agencies (Herek & Berrill, 1992). In addition, gay and lesbian youth are bullied and harassed at much greater rates than heterosexual youth (Kosciw, Greytak, Bartkiewicz, Boesen, & Palmer, 2012) and are, perhaps because of this, at higher risk for self-injury and suicide (Herek, Cogan, & Gillis, 2003; Whitlock, Eckenrode, & Silverman, 2006).

Anti-gay behaviors are also characterized by avoidance. Social distancing is a commonly measured behavioral indicator of sexual prejudice (e.g., Hinrichs & Rosenberg, 2002; Oswald, 2007; Wright, Adams, & Bernat, 1999). Participants who report negative attitudes toward gay men and lesbians also tend to report that they would not accept a gay man or lesbian as a close relative, would not want gay men or lesbians to live on their street, etc. (Hinrichs & Rosenberg, 2002). In interactions with gay men and lesbians, sexually prejudiced participants report greater desire for social distance, and indeed actually place themselves at a greater distance from their interaction partner (Shaffer & Augustine, 2003). Gay men and lesbians also often encounter jokes and expressions of stereotypes that communicate stigmatizing attitudes about homosexuality, as well as exclusion from conversations or social events (Swim, Johnston, & Pearson, 2009).

Extant Approaches to Anti-Gay Behaviors

Predicting such contrasting behaviors – aggression and avoidance – poses a challenge to researchers. Most existing research has focused on sexual prejudice as the primary predictor of anti-gay behavior, and different models of sexual prejudice have different behavioral implications. Researchers working from a gender threat perspective

explore anti-gay behavior as a way of reinstating a threatened masculine identity (Bosson, Vandello, Burnaford, Weaver, & Wasti, 2009; Bosson & Vandello, 2011), finding that men whose masculine identity is threatened tend to show increased levels of physical aggression, often towards gay men (Bosson, Weaver, Caswell, & Burnaford, 2012; Talley & Bettencourt, 2008). Similarly, research from a gender-role enforcement perspective highlights anti-gay behavior as punishment for deviation by gay men and lesbians from traditional masculine and feminine identities (Parrott, 2009). Heterosexual men and women who more strongly endorse traditional gender roles are thus more likely to be sexually prejudiced (Parrott & Gallagher, 2008; Wilkinson, 2006) and to engage in anti-gay behaviors (Parrott, 2009; Parrott & Zeichner, 2005; Parrott & Zeichner, 2008; Whitley, 2001). Finally, gay men and lesbians are also often viewed as members of a social group distinct from that of heterosexual men and women. Some researchers thus treat anti-gay behavior as simply another instantiation of ingroup favoritism and outgroup derogation (Wright et al., 1999). From this perspective, outgroup members – gay men and lesbians – are viewed and treated negatively simply based on group membership.

None of these models, however, are designed to differentiate between specific forms of anti-gay behavior – threats to masculine identity, for example, ostensibly cause both aggression and avoidance – or to predict the circumstances under which different forms of anti-gay behavior may be enacted.

Another body of research has explored the factors that serve to "release" anti-gay behavior that might otherwise be suppressed. In an extensive survey of attitudes and behaviors toward lesbians and gay men, Franklin (2000) identified a set of self-reported motivations for anti-gay behaviors. These motivations included peer dynamics (e.g.,

wanting to live up to friends' expectations, proving toughness or heterosexuality), anti-gay ideology (e.g., disgust, religious and moral values), thrill seeking (e.g., desire for excitement, acts committed out of boredom), and self-defense (e.g., defense against physical attack or unwanted sexual interest). In addition, Franklin (2000) found a significant relationship between anti-gay behaviors and alcohol use.

Parrott and colleagues (2009, 2010) have further explored the link between alcohol use and anti-gay behaviors. Alcohol facilitates aggressive behavior, particularly for those individuals who possess aggression-related traits or are exposed to aggression-promoting situational cues (Anderson & Bushman, 2002). Parrott and Miller (2009) propose, therefore, that alcohol facilitates anti-gay aggression by enhancing the likelihood that an individual will act on motivations such as peer dynamics and anti-gay ideology. Indeed, in one study men were twice as likely to aggress against gay men and lesbians on days they were drinking, compared to days they were not (Parrott, Gallagher, Vincent, & Bakeman, 2010). These findings, however, focus exclusively on physical and verbal aggression. There has been no exploration of whether or how these particular releasers might predict other forms of anti-gay behavior.

What's Missing from Traditional Approaches?

The research detailed above has identified situational characteristics (Franklin, 2000; Parrott et al., 2010), motivations (Bosson et al., 2012), and attitudes (Parrott, 2009; Parrott & Zeichner, 2005) that predict anti-gay behavior, in general. However, the anti-gay behaviors of sexually prejudiced individuals are varied: Sometimes sexually prejudiced individuals vote against gay marriage, sometimes they avoid restaurants with gay servers, sometimes they send their children to private religious schools, and

sometimes they violently attack gay strangers on the street. The models discussed above are not designed to distinguish between alternative types of anti-gay behavior. How, then, might we reach a more nuanced understanding of anti-gay behavior?

Recent research on prejudice from an affordance management perspective opens up new possibilities. An affordance management approach posits that intergroup prejudices are psychological phenomena rooted in the human need to manage exposure to potential interpersonal or intergroup threats (e.g., Cottrell & Neuberg, 2005; Schaller & Neuberg, 2012; Schaller, Park, & Faulker, 2003). From this perspective, prejudice is understood not as general feelings of negativity towards target groups but as specific emotional responses elicited by the perception of specific threats, thereby contrasting with most conceptualizations of anti-gay attitudes as simple general negativity (but see Parrott & Peterson, 2007). Cottrell and Neuberg (2005) examined the emotional responses and perceived threats elicited by a number of different groups, uncovering group-specific patterns of prejudice. Of note here are their results for gay men. Participants reported an emotional response of disgust to gay men, with a corresponding perceived threat of physical and moral contamination and a behavioral response of avoidance.

These results accord with other research demonstrating disgust in response to gay men (e.g., Haddock et al., 1993; Herek, 2000). This is not to say that other emotions are not relevant as well. For example, some work has suggested that anger plays a role in anti-gay behavior (Bernat, Calhoun, Adams, & Zeichner, 2001; Parrott, Peterson, Vincent, & Bakeman, 2008; Parrott & Zeichner, 2008; Parrott, Zeichner, & Hoover, 2006). However, to the best of my knowledge, anger has only been explored as a

predictor of anti-gay aggression, not as a predictor of avoidance. Moreover, there is a potentially important caveat to the finding that anger plays a distinctive role in anti-gay aggression: in each study, anger has been measured with the 6-item Anger-Hostility Scale from the Positive and Negative Affect Schedule – Expanded Form (Watson & Clark, 1994), which includes "disgusted" among its items. This makes it unclear whether the resultant scale score is driven by anger, per se. It also raises the possibility that the observed relationship between "anger" and anti-gay aggression may require a response of disgust as well.

Given the strong evidence that disgust plays a role in anti-gay prejudices, I suggest that it provides a solid foundation on which to build a nuanced understanding of anti-gay behaviors. Disgust, as discussed below, has its evolutionary origins in pathogen avoidance systems (Curtis, 2007; Tybur et al., 2013), and a fundamental property of disgust-eliciting objects is the ability to contaminate (Oaten, Stevenson, & Case, 2009; Rozin, Haidt, & McCauley, 2008). Indeed, Cottrell and Neuberg (2005) found that gay men were perceived to pose threats of physical and moral contamination. The perceived threat of physical contamination may relate to concerns with HIV/AIDS (Herek & Capitanio, 1998), but moral contamination concerns stem from the perception that gay men promote values and ideals that oppose those of straight men and women (Cottrell & Neuberg, 2005).

In addition, legislation such as Russia's federal ban on "propaganda of nontraditional sexual relations," which prohibits the distribution of pro-gay information to minors, demonstrates that individuals can hold negative attitudes not only towards gay men and lesbians, but also towards ideology that supports or advocates for homosexuality

or gay rights (Schwirtz, 2012). Pro-gay ideology may be held not only by gay men and lesbians, but also by straight individuals (e.g., straight "allies"), and I suggest that pro-gay ideology itself may be seen as a unique source of potential contamination. Indeed, contact with alternative ideologies can elicit disgust (Ritter & Preston, 2011) and those holding alternative ideologies are often perceived to pose a threat to group values and avoided (Cook, Cottrell, & Webster, 2014).

As discussed earlier, addressing a perceived threat of pathogen contamination requires a variety of coordinated, strategic actions that vary depending on features of the perceived threat and of the community facing the threat. I thus propose that a contagion framework provides a coherent structure for understanding both aggressive and avoidant anti-gay behaviors.

The Behavioral Immune System, Extended

Pathogens are organisms, such as bacteria, viruses, fungi, and parasites, which can cause disease in their hosts. Throughout evolutionary history, all species, including humans, have faced continuous selection pressure from rapidly evolving and changing pathogens (Oaten et al., 2009). This has led to the co-evolution of flexible systems and strategies to effectively fight the constantly changing threat. The "classical" immune system is an integral part of this process, but is extremely costly in terms of both metabolic costs and the damage an inflammatory response can inflict on bodily systems. Avoiding contact with pathogens is a far more effective form of disease-prevention. To facilitate this, humans have evolved a repertoire of behaviors designed to minimize risk of contact with infectious agents – what Schaller and Park (2011) term the *behavioral immune system*.

The emotion of disgust – specifically pathogen disgust (Tybur et al., 2013) – is central to the functioning of the behavioral immune system. Pathogen cues elicit disgust, which motivates behavioral avoidance (Rozin, Haidt, & Fincher, 2009). Many elicitors of disgust seem to be universal, such as feces and dead bodies, and there is a strong correspondence between cues that indicate pathogen-presence and cues that elicit disgust (Oaten et al., 2009). However, avoidance of everything that could possibly carry a pathogen (e.g., food, other people) is impossible and costly to survival. Tybur and colleagues (2013) argue that humans calculate a tradeoff between the potential costs of pathogen contact and the potential costs of avoiding the disgust elicitor. For example, meat that has been sitting out for a day is likely to have pathogen contaminates. For an individual who has many other food options, the potential cost of eating this meat would outweigh its benefit as a source of calories. In contrast, for an individual who has nothing else to eat, the benefit of the meat as food outweighs its potential cost as a source of pathogens.

Pathogen cues are not the only elicitors of disgust. People are disgusted by, for example, unfair treatment or certain sexual acts (Rozin et al., 2009; Tybur et al., 2013). These additional forms of disgust seem to have developed from pathogen disgust, which is phylogenetically more ancient (Curtis, 2007). Developmentally in humans, there is also evidence that sexual and moral disgust arise at a later age than pathogen disgust (Stevenson, Oaten, Case, Repacholi, & Wagland, 2010). Disgust functions, therefore, to regulate not only pathogen avoidance but also mate choice and moral decisions (Tybur et al., 2013). These latter two forms of disgust – sexual and moral – are particularly relevant for understanding sexual prejudice and anti-gay behaviors. Similar emotional and

behavioral responses to a perceived pathogen threat are present in anti-gay attitudes and behaviors and in attitudes towards those who violate or promote the violation of ingroup values. Gay men, in particular, elicit disgust (Cottrell & Neuberg, 2005; Haddock et al., 1993; Herek, 2000) and avoidance of gay men and lesbians is a commonly observed and measured behavioral response to potential contact (e.g., Wright et al., 1999). More generally, people respond with disgust to violations of moral values (e.g., Haidt & Hersh, 2001).

Objects that trigger disgust have the ability to *contaminate* previously neutral objects or people that come in contact with them, thus rendering the new object disgusting (Oaten et al., 2009; Rozin et al., 2008). For example, rotten food triggers disgust and an avoidance response. A clean spoon triggers no disgust, until it comes in contact with the rotten food. At that point, the spoon itself will elicit disgust and avoidance. Contamination is also an asymmetrical process – the rotten food can spoil the clean spoon through contact, but the clean spoon cannot cleanse the rotten food (Rachman, 2004). Active cleaning is necessary to restore a contaminated object to neutrality.

Research on the "magical law of contagion" has demonstrated that people believe that interpersonal characteristics can also be spread through contact (Nemeroff & Rozin, 1994). People are reluctant to wear an article of clothing previously worn by an immoral person, believing that the clothing would be imbued with some of that person's immorality. Perceivers not only see interpersonal characteristics as capable of contaminating physical objects, but also of contaminating other individuals. Stigma-by-association is the process of a non-stigmatized individual becoming stigmatized by others

because of his or her association with members of a stigmatized group (Neuberg, Smith, Hoffman, & Russell, 1994). In the context of sexual prejudice, experiments by Neuberg and colleagues (1994) found that a man presented as straight was evaluated negatively when viewed with a male friend presented as gay. That is, the stigmatization of the gay man contaminated perceptions of the straight man. Just as with pathogen contamination, their findings revealed stigma-by-association to be an asymmetrical process – whereas the gay man contaminated impressions of the straight man, the gay man was not de-stigmatized through contact with the straight man.

Research is thus compatible with the idea that sexually prejudiced heterosexuals view gay men and lesbians, as well as pro-gay ideology, in terms of pathogens – as potential infectious contaminants. Given that many people possess highly developed lay models of disease, disease transmission, and behaviors useful for mitigating against the acquisition and spread of disease (Lau, Bernard, & Hartman, 1989; Moss-Morris, Weinman, Petrie, Horne, Cameron, & Buick, 2002; Hagger & Orbell, 2003), I suggest that (1) people holding sexual prejudices may possess analogous pathogen-based models of homosexuality and pro-gay ideology, and (2) these models may provide leverage for better understanding both the specific diversity of anti-gay behaviors and the personal and situational factors that elicit and moderate their occurrence.

A Disease-Spread Lay Model of Homosexuality and its Implications for Anti-Gay Behavior

To the extent that people high in sexual prejudice conceptualize the spread of homosexuality and/or pro-gay ideology as analogous to the spread of infectious pathogens – believing that same-sex sexual orientation itself and/or positive attitudes

toward homosexuality can spread – avoidant and aggressive anti-gay behaviors might best be understood as strategic attempts to prevent or eradicate, respectively, the "diseases" of homosexuality and pro-gay ideology. Whereas existing models of anti-gay behavior are not designed to differentially predict different forms of anti-gay behavior, research on contagious pathogens has identified features of disease and of community networks that predict different forms of pathogen-combating behaviors (Brug, Aro, & Richardus, 2009; Christley et al., 2005; Funk, Gilad, & Jansen, 2010; Funk, Salathé, & Jansen, 2010).

An understanding of the features and mechanisms underlying the spread of infectious pathogens (as well as lay understanding of this process) enables, by analogy, predictions about lay models of the spread of homosexuality and pro-gay ideology. Just as pathogens are the causal agents of infectious diseases, the "pathogens" in my analogous model are homosexuality and pro-gay ideology. That is, I suggest that sexually prejudiced individuals may regard homosexuality itself (i.e., identifying as gay or lesbian, experiencing same-sex attractions, and/or engaging in same-sexual sexual behavior), as well as positive attitudes toward gay men and lesbians, as potentially contagious. Although the studies presented in this paper focus on two particular forms of anti-gay behavior – aggression/eradication and avoidance/prevention – and one particular moderating variable – network interconnectedness – my lay disease-spread model of homosexuality is more comprehensive.

My model contains four broad components of infectious pathogen spread: (1) the behaviors engaged in to address a pathogen threat (e.g., prevention, eradication), (2) the variety of individuals and organizations (i.e., actors) that respond to pathogen threats via

the behaviors described above (e.g., laypersons, professional responders, policy makers), (3) characteristics of the population relevant for disease spread (e.g., network interconnectedness within a community), and (4) the features of the infectious disease process itself (e.g., mode of transmission, consequences of infection). Based on the relevant elements of each component, I have developed analogues for sexually prejudiced people's lay theories about the spread of homosexuality and pro-gay ideology, and the ways they may behave to combat this spread. Here I will discuss two particular categories of behavior – prevention/avoidance and eradication/aggression – as well as a key population characteristic – network interconnectedness.

Pathogen-Combating Behaviors: Analogues to Homosexuality and Pro-Gay Ideology

Individuals engage in a variety of behaviors to combat the spread of infectious disease. I classify such behaviors into five broad categories: identification, prevention, containment, treatment, and eradication. These behaviors can be employed by a variety of actors, ranging from laypersons to public policy professionals to advocacy organizations.

By analogy, I posit that these same features of the behavioral immune process also shape the behaviors employed by sexually prejudiced actors to fight against the perceived spread of homosexuality and pro-gay ideologies. Although all five of these categories are relevant to understanding various types of anti-gay behavior, I will focus on prevention (avoidance) and eradication (aggression).

Prevention. Prevention behaviors are designed to protect an individual from becoming infected or to move an individual directly from a state of susceptibility to the preferred state of immunity (i.e., invulnerability to infection). Attempts to avoid infection

involve behaviors designed to reduce the likelihood that one will be infected by those believed to be carrying the contagious pathogen. This is the work of the behavioral immune system, which is triggered by physical or behavioral cues to pathogen presence or knowledge of an individual's state of contamination (Schaller & Park, 2011). When effective avoidance is possible, other behavioral strategies are much less likely to be implemented (e.g., a person living in the United States can effectively avoid malaria, and thus has no need to seek prophylactic treatment). Prevention behaviors also include those intended to improve the functioning of the physiological immune system, such as eating a healthy diet and reducing stress (Chandra, 1997; Segerstrom & Miller, 2004). Behavioral avoidance is prevention that nonetheless maintains an individual in a state of susceptibility to the pathogen. In contrast, preventative behaviors aiming to confer immunity against a particular pathogen involve controlled exposure to a pathogen (e.g., via vaccination by a weakened or dead version of the pathogen) to trigger the physiological immune system to build a specific defense against that pathogen.

In the case of defending against a perceived threat from homosexuality and pro-gay ideology, prevention by the sexually prejudiced can likewise occur via behavioral avoidance or attempts to build "immunity." As discussed previously, avoidance, or social distancing, is a commonly measured behavioral indicator of sexual prejudice (e.g., Hinrichs & Rosenberg, 2002; Oswald, 2007; Wright et al., 1999) and gay men and lesbians are often excluded from social interactions (Swim et al., 2009). In the present paper I will focus on this aspect of prevention behavior. Aggressive behavior carries a relatively high cost, for several reasons. Physical aggression brings the aggressor into contact with the perceived threat, thus exposing him or her to potential contamination. In

addition, aggression can result in injury to the aggressor or can have legal, social, or reputational ramifications. Thus, as with pathogen avoidance, I predict that sexually prejudiced people who believe that they can effectively avoid gay men and lesbians will do so, and will be less likely to engage in other, more aggressive, anti-gay behaviors.

Aside from behavioral avoidance, socialization with anti-gay attitudes is analogous to boosting the physiological immune system. In communities with a social norm of anti-gay attitudes, such socialization may occur through a variety of channels as a simple matter of course. For example, family, neighbors, and peers might espouse negative attitudes toward gay and lesbian public figures, religious leaders might preach against homosexual behavior, etc. More intentional socialization is likely to occur when susceptibility to homosexuality and/or pro-gay ideology is perceived to be high, when exposure is seen as likely, and when the consequences of exposure are seen as particularly severe.

Eradication. Eradication behaviors shape infectious disease dynamics by either removing the pathogen from the environment (altering the infection rate) or by removing the pathogen from an individual's body (altering the recovery rate). Eradication involves the use of, particularly, prevention and treatment strategies with the goal of eliminating the threat posed by a particular pathogen. These behaviors occur both on the individual level (lay people and professional responders) and on the community or population level (policy makers and advising organizations). For example, through programs of vaccination, screening, and treatment, diseases such as smallpox and polio have been eradicated from the United States. On a smaller scale, antibiotics eradicate bacterial infections from an individual's body. Eradication behaviors are most likely to be

employed when a pathogen is highly contagious and present in a highly interconnected community, where it has the potential to spread rapidly (e.g., recent aggressive efforts to halt the spread of the Ebola virus in West Africa). Disease eradication may involve quarantine (voluntary or not) of disease carriers, but violence is rarely, if ever, enacted against the carrier of a disease as a method of disease eradication.

Eradication behaviors vary in the context of homosexuality and pro-gay ideology. For those who believe treatment can fully "cure" homosexuality, eradication may take the form of treatment – eliminating the pathogen of homosexuality from an individual. However, if an individual cannot be cured (or refuses to be cured) and particularly if he or she is in a highly interconnected network, eradication may take the extreme form of elimination of that individual. That is, under these conditions we might be more likely to see violent action taken against gay individuals, as in the case of the murder of Matthew Shepard.

Why do efforts to eradicate homosexuality/pro-gay ideology sometimes involve extreme violence, whereas pathogen eradication typically involves treatment and containment? One possibility is the perception of gay and pro-gay individuals as intending to spread homosexuality and/or pro-gay ideology. Although homosexuality and pro-gay ideology elicit disgust from sexually prejudiced perceivers, such perceivers also believe that gay men and lesbians *want* to spread homosexuality and pro-gay ideology. The presence of perceived intentionality to spread these "immoral" traits may elicit anger as well as disgust (Russell & Giner-Sorolla, 2011). Anger is characterized as an approach emotion (Carver & Harmon-Jones, 2009) and is linked to aggressive behavior. Of course, anger does not always trigger violence and aggression. I suggest that anti-gay violence

will most likely occur when containment is perceived as impossible or ineffective, cues of infection and perceived contagiousness are seen as high, contact with susceptible populations is seen as highly probable, and community networks are highly interconnected.

Eradication behaviors can also target non-human sources of homosexuality or pro-gay ideology. Passing laws to prevent the teaching of homosexuality-related information in schools, or banning books or TV shows with gay themes in a community, are instances of this. Legislation in a number of U.S. states provides an example of such attempts to ban or restrict children's access to plays or books by gay authors or featuring gay characters (Emert, 2006).

Community Network Characteristics: Analogues to Homosexuality and Pro-Gay Ideologies

Building on epidemiological research and research on pathogen spread and the behavioral immune system, I have described here several behavioral strategies used to prevent and eradicate diseases. For each behavioral strategy, I developed analogues for preventing or eradicating the perceived spread of homosexuality and pro-gay ideology. These behaviors do not occur in a vacuum, but rather operate within a broader context. Understanding the characteristics of the social network in which pathogens are embedded is critical for fully understanding responses to the spread of infectious disease. Understanding the characteristics of the social network in which gay men and lesbians, and those holding pro-gay ideologies, are embedded should be similarly critical for fully understanding responses to the perceived spread of homosexuality or pro-gay ideology. Moreover, from the perspective of existing models of sexual prejudice, the structure of a

social network would not be expected to affect anti-gay behaviors – it does not affect violations of gender role norms, nor does it alter the boundaries between the ingroup and outgroup. Exploring the effects of network structure on anti-gay behaviors thus offers an excellent first test of my broader model.

Life as a social species confers many benefits to humans that enhance survival and reproduction opportunities, but it also exacts costs, including an increased likelihood of infection from group members. Research on the structure of social networks has been instrumental in understanding both how infectious disease spreads and how best to implement programs of prevention, containment, treatment, and eradication (Christley et al., 2005; Eubank, 2005; Funk, Gilad, & Jansen, 2010; Funk, Salathé, & Jansen, 2010; Danon, House, Read, & Keeling, 2012; Keeling & Eames, 2005; Miller, Slim, & Volz, 2012; Valente, 2012). In the present research I will explore one critical characteristic of community networks that affects the spread of infectious disease and, I propose, perceptions of the spread of homosexuality and pro-gay ideology – the interconnectedness of the social network.

Network Interconnectedness. Different populations have different network structures. The more interconnected a network (i.e., the greater the numbers of links among network members), the more rapidly pathogens can spread in that network (Christley et al., 2005). Interconnectedness is largely orthogonal to the size of a network (Lewis, Kaufman, Gonzalez, Wimmer, Christakis, 2008); both small and large networks can be highly interconnected. In a highly interconnected network, individuals are likely to have many shared friends and acquaintances and there are few degrees of separation between any two individuals in the network (Lewis et al., 2008). More aggressive

pathogen-combating strategies must be employed to effectively combat a contagious disease in a highly interconnected network, whereas in a loosely interconnected network it may be easier to contain or avoid those who carry a disease (Eubank, Kumar, Marathe, Srinivasan, & Wang, 2004).

As with disease, homosexuality and pro-gay ideology may be perceived by those holding negative sexual prejudices to have the potential for more rapid spread in highly interconnected social networks. A gay or lesbian individual joining a highly interconnected social network would have the potential to interact with a greater number of network members than in a loosely interconnected network, and would thus, I argue, be perceived as a greater threat. Moreover, if the gay or lesbian individual "infects" even a single person in a highly interconnected network, the effects may be perceived to be greater than if they "infect" that same person in a more loosely interconnected network. I suggest that avoidance is less likely to be a successful strategy for sexually prejudiced people in a more highly interconnected network, and thus they may be more likely to engage in aggressive behaviors to eradicate the perceived gay threat.

Overview

Although a wide variety of negative behaviors are directed at gay men and lesbians, existing models of anti-gay behavior are not designed to generate predictions that differentiate between, for example, aggression and avoidance. However, research on the affective content of anti-gay attitudes suggests that such attitudes are largely characterized by disgust. Based on the role of disgust in the regulation of pathogen-response behaviors, I have developed a lay disease-spread model of beliefs about the spread of homosexuality and pro-gay ideology. I propose that sexually prejudiced persons

conceptualize homosexuality and pro-gay ideology as analogous to infectious diseases. Moreover, I suggest that nuanced predictions of anti-gay behaviors can be made based on features known to moderate pathogen-response behaviors. As a factor that plays an important role in such pathogen-response behaviors yet lies outside the theoretical architectures of existing models of anti-gay behaviors, network interconnectedness is a good candidate for a first test of the lay disease-spread model of homosexuality.

CHAPTER 2

OVERVIEW OF PRELIMINARY RESEARCH

In a series of three studies, I first test the foundational assumption of the lay disease-spread model of homosexuality – that sexually prejudiced persons believe homosexuality and pro-gay ideology to be contagious – and then explore whether network-interconnectedness interacts with sexual prejudice to differentially predict anti-gay avoidance and aggression behavioral intentions. I present here an overview of these studies to provide background and context for Study 4.

Study 1: Perceived Contagion Threats

In this study, I addressed the basic foundational argument of my lay disease-spread model – that sexually prejudiced individuals perceive both homosexuality and pro-gay ideology as potentially contagious. I hypothesized that sexually prejudiced individuals would perceive spending time with a gay or lesbian person as likely to cause an individual to identify as gay/lesbian and to endorse pro-gay ideology. Likewise, I predicted that sexually prejudiced individuals would perceive spending time with pro-gay persons (whether gay or straight) as likely to cause individuals to endorse pro-gay ideology.

Method

Participants (N = 1,327; 533 male) were recruited via Amazon's Mechanical Turk and received a small monetary compensation. They were randomly assigned to one of four conditions in a 2 (source sexual orientation: gay vs. straight) x 2 (source message: publicly supports vs. does not support gay rights) experimental design, and participant

sexual prejudice was assessed as a continuous variable.[2] Each participant read a brief statement describing the target and source. For example: "Susan is 16 years old. Her teacher, James, is gay and supports gay rights publicly." Afterwards, participants responded to questions such as: "If Susan spends time with James, how likely is it that this will cause Susan to identify as lesbian?" and "If Susan spends time with James, how likely is it that this will cause Susan to support gay rights?" Responses to each question were measured on a 7-point scale from "Very Unlikely" to "Very Likely." In addition, participants reported the degree to which they felt negatively toward gay men and lesbians, as well as their levels of disgust and anger. These attitudes were measured on 9-point scales from "Not at all" to "Extremely."

Results and Discussion

Using the Process macro developed by Hayes (2013), I conducted linear regression analyses exploring the effects of perceiver sexual prejudice (disgust felt towards gay men and lesbians; $\alpha = .96$), source sexual orientation, and source support for gay rights on perceptions of changes to target sexual orientation and target support for gay rights.

Target Sexual Orientation. There were significant main effects of sexual prejudice and source support for gay rights on perceptions of the sources effect on the

[2] This experiment was part of a larger study in which I also manipulated target gender and age, as well as source gender and source relationship to target (e.g., aunt/uncle, teacher). These variables did not moderate the effects reported here and are thus omitted from this dissertation.

targets sexual orientation and a marginal main effect of source sexual orientation. Sexually prejudiced participants were more likely to believe that the target would come to identify as gay or lesbian after contact with a source (b = .08, t(1318) = 4.57, p < .001, r^2 = .01).[3] In addition, a source who supported gay rights was viewed as more likely to alter target sexual orientation to become gay or lesbian than a source who did not support gay rights (b = -.23, t(1318) = -2.97, p = .003, r^2 = .01), as was a gay or lesbian source (b = -.14, t(1318) = -1.82, p = .069, r^2 = .003). However, these main effects were modified by a significant interaction between source sexual orientation and perceiver sexual prejudice on perceived likelihood of change to target sexual orientation (b = -.11, t(1318) = -3.44, p = .001, r^2 = .01). Sexually prejudiced participants believed that contact with a gay (but not a straight) source was significantly more likely to cause the target to identify as gay or lesbian (Figure 1). The three-way interaction between perceiver sexual prejudice, source sexual orientation, and source support for gay rights was not significant (p = .981).

[3] For each significant effect I report the effect size in terms of the partial squared correlation (r^2). This reflects the proportion of variance in the outcome explained by the predictor(s) and/or interaction term(s) in the analysis. With this measure, a small effect size is approximately r^2 = .01, medium is r^2 = .09, and large is r^2 = .25.

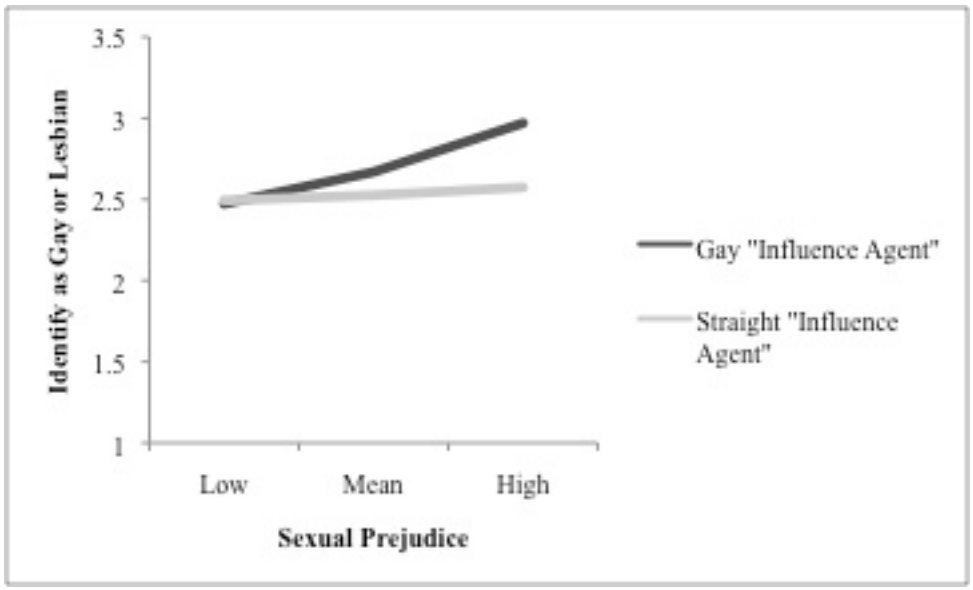


Figure 1. Perceived likelihood of target becoming gay/lesbian as a function of source sexual orientation and perceiver sexual prejudice.

Target Support for Gay Rights. There were significant main effects of source sexual orientation and source support for gay rights on perceptions of the sources effect on the targets support for gay rights. A source who supported gay rights was viewed as more likely to increase target support for gay rights than a source who did not support gay rights (b = -1.52, $t(1318)$ = -18.84, $p < .001$, r^2 = .21), as was a gay or lesbian source (b = -.80, $t(1318)$ = -9.92, $p < .001$, r^2 = .07). Neither effect was moderated by perceiver sexual prejudice (ps > .18); individuals high and low on sexual prejudice were equally likely to believe that support for gay rights could be caused by contact with a gay/lesbian or pro-gay individual (Figure 2).

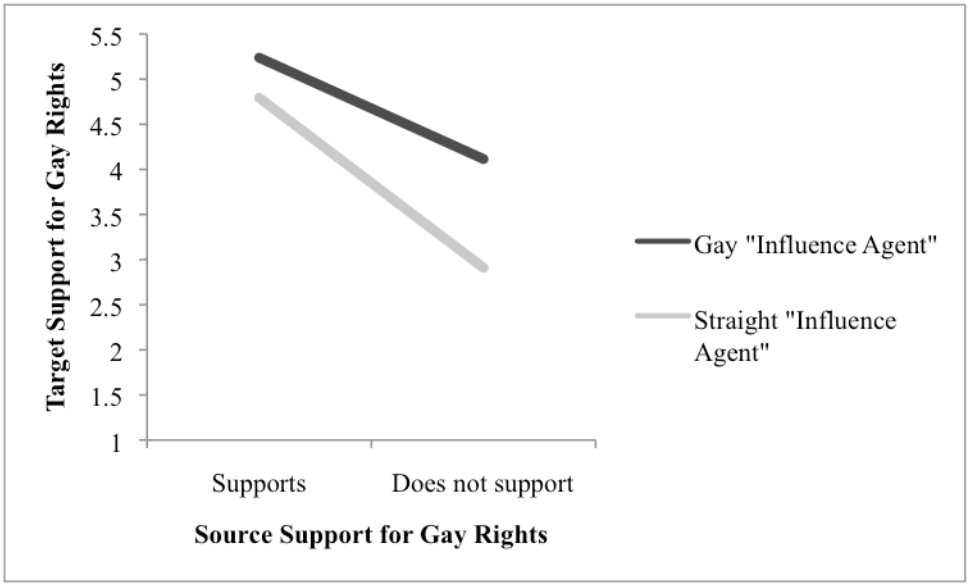


Figure 2. Perceived likelihood of target supporting gay rights as a function of source sexual orientation and support for gay rights.

These findings suggest that sexually prejudiced individuals do indeed perceive sexual orientation to be contagious. However, it is also clear that pro-gay ideology is more likely to be perceived as contagious by all individuals, regardless of attitudes toward gay men and lesbians. This may be because there is a strong element of truth to beliefs about the spread of pro-gay ideology. Contact with gay men and lesbians, as well as with straight men and women who support gay rights, does indeed increase support for gay rights and positive attitudes toward gay men and lesbians (Herek & Capitanio, 1996; LaCour & Green, 2014; Smith, Axelton, & Saucier, 2009).

Study 2: Network Interconnectedness and Anti-Gay Behavioral Intentions

Study 1 established that those who are high in sexual prejudice are more likely to perceive interpersonal contact with a gay man or lesbian as causing a target to identify as gay or lesbian. That is, sexually prejudiced individuals viewed homosexuality as

potentially contagious. In the second study, I sought to explore a factor that has a strong effect on pathogen-response behaviors, but that existing models of anti-gay behavior have ignored – the interconnectedness of a community. Contagious disease can spread more rapidly in highly interconnected communities with many links between individuals. In such communities it can be difficult to avoid carriers of a disease, thus making avoidance an ineffective response to a contamination threat and increasing the likelihood of active, approach-oriented pathogen-response behaviors. I hypothesized that sexually prejudiced people would thus report a greater desire to engage in anti-gay aggression in highly interconnected communities as compared to loosely interconnected communities. However, as discussed earlier, avoidance is typically the preferred behavioral response, as it prevents "infection" while avoiding the possible risks of aggression. As the focus here is on behavioral intentions, I thus predicted that sexually prejudiced people would report an equal *desire* to avoid gay men and lesbians regardless of community network structure.

Method

I recruited 200 participants (103 male) from Amazon's Mechanical Turk, and participants received a small monetary compensation. Participants responded to a series of questions regarding the structure of their community and of social relationships within that community. These questions included three items measuring community interconnectedness, such as, "In my community, it seems like everyone knows everyone else" ($\alpha = .79$). Following this, participants responded to a series of questions assessing their behavioral intentions and attitudes toward lesbians and gay men. The items assessing behavioral intentions included avoidance behaviors (e.g., I want to avoid gay

men; α = .94) and aggressive behaviors (e.g., I would hit a gay man for coming on to me; α = .89). All items – both attitudes and behaviors – were measured separately for lesbian and gay male targets.

Results and Discussion

Using the Process macro developed by Hayes (2013), I conducted linear regression analyses exploring the effects of perceiver sexual prejudice (disgust felt towards gay men and lesbians) and community interconnectedness on behavioral intentions (avoidance and aggression) toward gay men and lesbians.

Avoidance. There was a significant main effect of sexual prejudice toward gay male targets on desire to avoid gay men, such that more highly prejudiced individuals were more avoidant (b = .79, $t(196)$ = 27.84, $p < .001$, r^2 = .79). As predicted, community interconnectedness did not moderate the effect of sexual prejudice on avoidance (p = .512; Figure 3a). There was also a significant main effect of sexual prejudice toward lesbian targets on desire to avoid lesbians, such that more highly prejudiced individuals were more avoidant (b = .80, $t(196)$ = 22.03, $p < .001$, r^2 = .71). Here the interaction between community interconnectedness and sexual prejudice was marginally significant (b = -.03, $t(196)$ = -1.85, p = .066, r^2 = .02). There appears to be a trend for sexually prejudiced participants to report a higher desire to avoid lesbian targets in loosely interconnected networks compared to highly interconnected ones (Figure 3b).

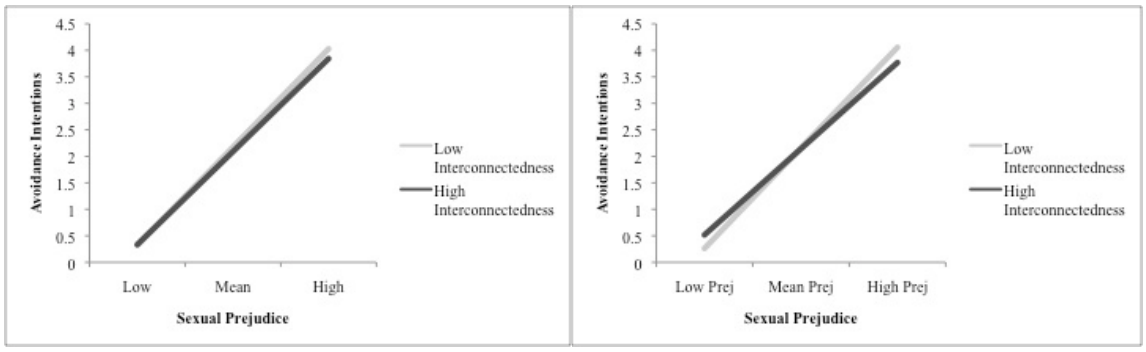


Figure 3a and 3b. Perceiver intention to avoid a gay male (left) or lesbian target (right) as a function of perceiver sexual prejudice and community interconnectedness.

Aggression. There was a significant main effect of perceiver sexual prejudice towards gay male targets on desire to aggress towards gay men, such that more prejudiced perceivers were more aggressive (b = .36, $t(196) = 11.81$, $p < .001$, r^2 = .42). This effect was modified by a significant interaction between perceiver sexual prejudice and community interconnectedness, such that highly prejudiced participants reported a greater desire to engage in aggression toward gay men in highly interconnected communities (b = .04, $t(196) = 2.79$, p = .006, r^2 = .04; Figure 4a). There was also a significant main effect of perceiver sexual prejudice towards lesbian targets on desire to aggress towards lesbians, such that more prejudiced perceivers were more aggressive (b = .34, $t(196) = 10.34$, $p < .001$, r^2 = .35). Just as for behavioral intentions toward gay men, this effect was modified by a marginally significant interaction between perceiver sexual prejudice and community interconnectedness (b = .03, $t(196) = 1.75$, p = .082, r^2 = .01). Participants reported a greater desired to engage in aggression towards lesbians in highly interconnected communities compared to loosely interconnected ones (Figure 4b).

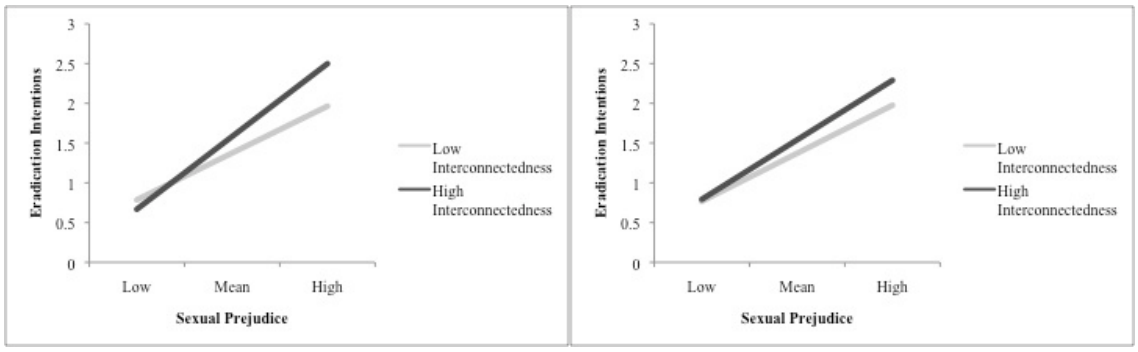


Figure 4a and 4b. Perceiver intention to aggress towards a gay male (left) or lesbian target (right) as a function of perceiver sexual prejudice and community interconnectedness.

These results suggest that behavioral intentions toward gay men and lesbians may indeed be responsive to the same factors that affect pathogen-response behavior. Consistent with prior research on anti-gay behaviors, sexual prejudice strongly predicted both aggression and avoidance. However, community network structure interacted with sexual prejudice, indicating that in a situation where contagion might spread more rapidly (i.e., a highly interconnected social network), sexually prejudiced people were more likely to advocate an aggressive response.

Study 3: Network Structure Causally Shapes Anti-Gay Behavioral Intentions

Although Study 2 established a relationship between community interconnectedness and the desire to engage in eradication/aggression vs. avoidance-oriented anti-gay behaviors, the correlational design makes it impossible to rule out third-variable explanations. To replicate and expand on these findings, I manipulated participant perception of network interconnectedness and explored the effect of this manipulation on behavioral intentions toward lesbians and gay men. In line with Study 2,

I predicted that the network manipulation would have no effect on intentions to avoid gay men and lesbians, but would shape aggressive behavioral intentions, such that participants would report greater desire for aggression under the highly interconnected network manipulation.

Method

I recruited 103 participants (60 male) from introductory psychology courses at Arizona State University. Participants were randomly assigned to a loosely interconnected network manipulation, a highly interconnected network manipulation, or a control condition. In both of the network structure manipulations, participants read a passage describing and defining highly interconnected and loosely interconnected college communities (see Appendix C for full text of these manipulations, which are also employed in Study 4). Following this general introduction, students were informed either that our research demonstrated that social networks at ASU were highly interconnected, or that social networks at ASU were loosely interconnected. Each participant was then asked to describe in writing a time when they personally felt that the ASU community was highly or loosely interconnected (depending on assigned condition).

Following this network structure manipulation, participants responded to a series of questions assessing their behavioral intentions and attitudes toward lesbians and gay men. The items assessing behavioral intentions included avoidance behaviors (e.g., I want to avoid gay men; $\alpha = .90$) and aggressive behaviors (e.g., I would hit a gay man for coming on to me; $\alpha = .87$). Participants in the control condition did not read about social networks, but instead immediately responded to these items. All items – both attitudes and behaviors – were measured separately for lesbian and gay male targets.

Results

As for Study 2, I conducted linear regression analyses using the Process macro developed by Hayes (2013). In these I explored the effects of perceiver sexual prejudice (disgust felt towards gay men and lesbians) and the community interconnectedness manipulation on behavioral intentions toward gay men and lesbians.

Avoidance. There was a significant main effect of sexual prejudice toward gay male targets on desire to avoid gay men, such that more prejudiced participants were more avoidant (b = .70, $t(65)$ = 11.19, p < .001, r^2 = .66). As predicted, this effect was not moderated by the network interconnectedness manipulation (p = .158; Figure 5a). Similarly, the main effect of sexual prejudice toward lesbian targets on desire to avoid lesbians was significant, such that more prejudiced participants were more avoidant (b = .76, $t(65)$ = 9.61, p < .001, r^2 = .59). Again, this effect was not moderated by network interconnectedness (p = .478; Figure 5b).

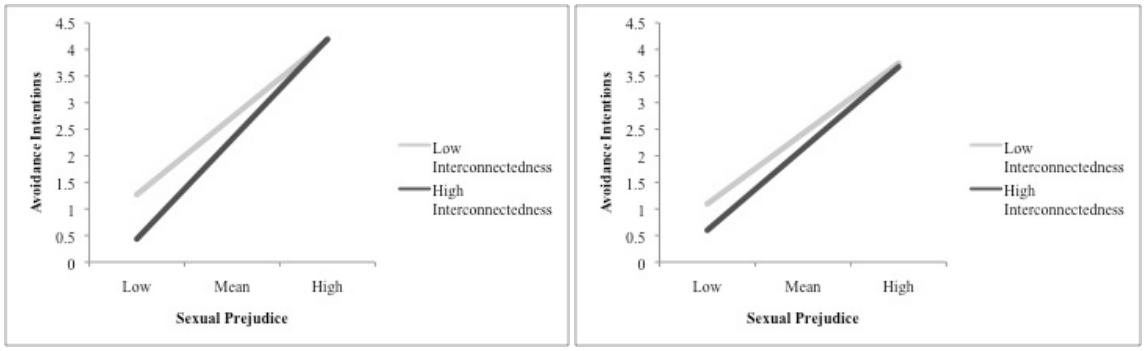


Figure 5a and 5b. Perceiver intention to avoid a gay male (left) or lesbian target (right) as a function of perceiver sexual prejudice and community interconnectedness.

Aggression. The main effect of sexual prejudice toward gay male targets on desire to aggress against gay men was significant, such that more prejudiced participants reported a desire to be more aggressive (b = .42, $t(65)$ = 7.53, p < .001, r^2 = .46). This effect was significantly moderated by the network interconnectedness manipulation, such that sexually prejudiced participants reported a greater desire to aggress against gay men in the highly interconnected condition (b = .37, $t(65)$ = 3.28, p = .002, r^2 = .14; Figure 6a). There was also a significant effect of sexual prejudice toward lesbian targets on desire to aggress against lesbians, such that more prejudiced participants were more aggressive (b = .48, $t(65)$ = 5.75, p < .001, r^2 = .34). This effect was modified by a marginally significant interaction with the network interconnectedness manipulation (b = .32, $t(65)$ = 1.91, p = .061, r^2 = .05). Sexually prejudiced participants reported a greater desire to aggress against lesbians in the highly interconnected condition (Figure 6b).

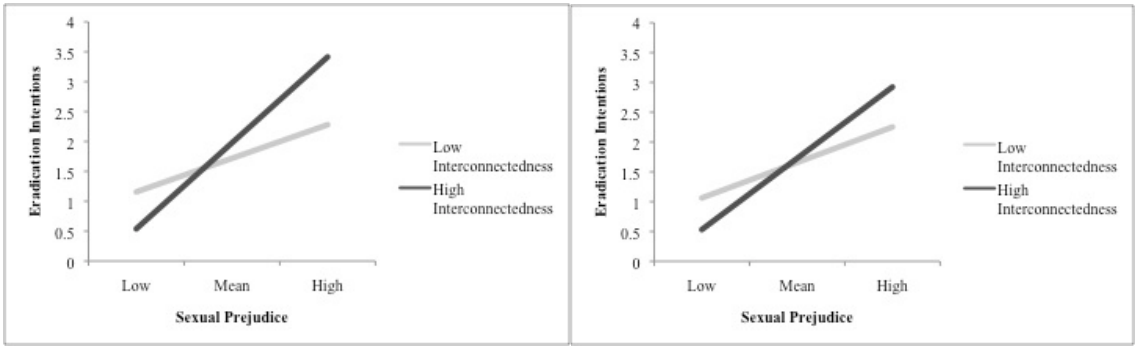


Figure 6a and 6b. Perceiver intention to aggress towards a gay male (left) or lesbian target (right) as a function of perceiver sexual prejudice and community interconnectedness.

The results of this study replicated those of Study 2. Sexually prejudiced participants in the high interconnectedness condition reported a greater desire to engage in aggressive, eradication-oriented anti-gay behaviors compared to participants in the low interconnectedness condition. Network structure did not influence intentions to avoid gay men and lesbians.

CHAPTER 3

METHODS

In Studies 2 and 3, sexually prejudiced participants in more highly interconnected communities (either self-defined or experimentally manipulated) reported a higher desire to engage in aggressive, eradication-oriented anti-gay behaviors. As predicted, however, community interconnectedness did not affect their desire to engage in avoidance-oriented anti-gay behaviors.

In each of these studies, participants expressed behavioral intentions but did not exhibit actual behaviors and were not faced with a forced choice between avoidance and aggressive behaviors. However, in a given interpersonal interaction, an individual can either approach or avoid, but cannot do both. Moreover, the behavioral intentions measures used, though adapted from past research on anti-gay behaviors (e.g., Cottrell & Neuberg, 2005; Wright et al., 1999), also confound situation with behavioral intention. For example, participants are asked whether they would hit a gay man for coming on to them, but not whether they would avoid or walk away from a gay man who came on to them. Likewise, they are asked whether they would remove their child from a class taught by a gay man, but not whether they would aggress against the gay man in this scenario. Study 4 addresses these issues by exploring the effect of a community network manipulation on straight men's actual behavior (both aggression and avoidance) toward gay (versus straight) men.

Consistent with past research, the patterns of behavioral intentions in Studies 2 and 3 toward lesbians and gay men were similar, but more robust for gay men. Although existing theoretical accounts differ somewhat in their explanations, they agree that the

most negative anti-gay attitudes and behaviors are typically experienced and expressed by straight men towards gay men (Bosson et al., 2012; Federal Bureau of Investigation, 2012; Parrott, 2009). In addition, lesbians are much less likely than gay men to be the victims of physically aggressive anti-gay behaviors (Federal Bureau of Investigation, 2012). Consistent with this, in Studies 2 and 3 participants reported significantly lower levels of aggressive behavioral intentions toward lesbians than toward gay men. I thus limited Study 4 to male participants and targets in order to focus on the interpersonal interactions in which aggression is most likely to emerge.

The present experiment sought to examine the behavior of sexually prejudiced straight men towards gay and straight men in highly or loosely interconnected social networks. Participants were thus randomly assigned to either a gay or straight male interaction partner (not a real participant) and to either a highly or loosely interconnected network condition. I will describe these manipulations in detail below. In this study I explored both aggressive and avoidant behaviors. To elicit aggressive behavior in a laboratory setting, I utilized an aggression paradigm created by Carver and Harmon-Jones (2009) that has previously been used to assess aggression towards gay men (Bosson et al., 2012). This paradigm is framed as a reaction time game in which participants send (when they win) and receive (when they lose) blasts of white noise in each of 20 trials. To assess avoidance as well as aggression, I split the game in half, giving participants the option to switch partners (for a cost) after the first 10 trials. Rather than playing against another participant, each person actually played against a decision algorithm implemented by the computer.

Study 1 established that sexually prejudiced participants perceive gay men and lesbians as posing threats of contamination, and I wanted to make this perceived threat particularly salient to participants in Study 4. For this reason, I made two additional modifications to the aggression game paradigm. First, participants were informed that the points they earned in the game would go to support a non-profit organization of their choosing (from a provided list). In the gay target condition, the "other player" was depicted as playing for an organization – Gay and Lesbian Community Educators – that sought to promote positive attitudes toward homosexuality among students in middle and high schools. Second, participants had the option to send comments to and receive comments from the "other player" between game trials. In the gay target condition, the "other player" sent comments that were pro-gay and supported the mission of Gay and Lesbian Community Educators. I thus hoped to make concerns with "gay contamination" salient to participants.

Consistent with Studies 2 and 3, I hypothesized that participants would engage in more aggressive behavior toward a gay target compared to a straight target, and that this aggression would be highest in the high interconnectedness condition. Although avoidance is the preferred behavioral response to a perceived threat of contagion, it is only an effective response in loosely interconnected networks. I thus hypothesized that participants would be more likely to avoid a gay target compared to a straight target, but that this avoidance would be the most likely in the low interconnectedness condition.

Participants and Design

This experiment used a 2 (network manipulation: highly vs. loosely interconnected) x 2 (target sexual orientation: gay vs. straight) design, yielding four

between-subject conditions. Based on their sexual prejudice scores on a pre-screening survey administered to all PSY 101 students, 81 male participants were recruited via email or phone from introductory psychology courses at Arizona State University for a study on social games. The recruitment script informed participants that they would play a game with another participant and have the chance to earn money for an organization of their choice. To focus this study on the behavior of sexually prejudiced individuals, the pre-screening assessed moral and physical disgust as well as general negativity towards gay men, and only those with an average score greater than one (on a 9-point scale) were recruited ($M = 4.17$, SD = 2.35).[4] Mean participant age was 20.23, and 51.3% identified as White/Caucasian.

Procedure and Materials

Participants arrived at the lab in groups of up to six. They were assigned to separate cubicles in two laboratory rooms and participated as individuals. Upon arrival at the lab, each participant was randomly assigned to one of the four experimental conditions by a research assistant unaware of the associated manipulations. Participants first read the consent letter and indicated if they wished to participate in the study. The

[4] Initially I had planned to recruit between 200 and 300 participants scoring toward the upper end (between 4 and 9) of the sexual prejudice scale. Three hundred and thirty-nine of the 839 men in the pre-screened pool qualified, based on this criterion. Despite extensive phone and email recruitment efforts, it proved extremely difficult to recruit these individuals. I decided to open recruitment to those scoring above a 1 on the sexual prejudice scale (an additional 168 individuals) to maximize participation.

consent letter described the study as an investigation of how social relationships within a community relate to community engagement, and briefly explained that participants would play a reaction time game that involved sending and receiving blasts of white noise. Only one participant opted out at this point. Once all participants in a session had read the consent letter and indicated that they wished to continue, the research assistant reiterated that the researchers were interested in social relationships and community engagement, and informed participants that they would play a reaction time game with another participant who was currently in our lab on the third floor. The research assistant explained that game winnings would be donated to a non-profit organization that would be determined by raffle. Each point a participant won would become a raffle ticket to support a non-profit organization of their choice. Participants were told that they would next complete a profile about themselves to share with the other player, and then would read about and write a response to research we had conducted on the social networks at ASU (see Appendix A for the full study script). Participants put headphones on at this point.

Participants were then asked to select a non-profit organization to play for from a list of eight organizations we provided (see Appendix B for the list and descriptions displayed to participants). Six of the organizations were selected to be relatively politically neutral (e.g., American Red Cross, Make-A-Wish Foundation), and two were intentionally highly political: Gay and Lesbian Community Educators (a non-existent politically liberal pro-gay organization) and the National Pro-Life Alliance (a politically conservative organization). Participants were told that each point they earned would become a raffle ticket for this organization, to be placed in a drawing for a donation at the

end of the study. Once they had selected their organization, they completed their profile information, which would ostensibly be shared with the "other player" before the game began. The profile questions asked for participant gender, age, major, relationship status, hobbies, ideal career, and involvement in campus organizations.

Following this, participants completed the network interconnectedness manipulation that was also used in Study 3 (see Appendix C for the full text of this manipulation). In both of the network interconnectedness conditions, participants read a passage describing and defining highly interconnected and loosely interconnected college communities. Highly interconnected communities were described as ones in which a student might feel that most of his or her friends know each other, whereas loosely interconnected communities were described as ones in which a student might feel that few of his or her friends know each other. In addition, the passage stated that information, behaviors, and illnesses spread more rapidly in highly interconnected communities compared to loosely interconnected communities.

Following this general introduction, students were informed that researchers at ASU had been measuring and tracking first-year student social networks and the spread of behaviors, attitudes, and illnesses within these networks over the last seven years. Participants in the high interconnectedness condition read that this research had demonstrated that social networks at ASU were highly interconnected, whereas participants in the low interconnectedness condition read that social networks at ASU were loosely interconnected. Each participant was then asked to describe in writing a time when they personally felt that the ASU community was highly or loosely interconnected (depending on assigned condition).

The computer program next presented the rules of the reaction time game (see Appendix D for full game rules). Participants were told that at the start of each trial, they would select the intensity (from 60 Db to 100 Db) of noise blast they would like to send to the other player if they won. This served as one of my measures of aggression. Three hash marks (# # #) would then appear in the center of the screen to orient participants, followed by a plus sign (+) on either the right or left side of the screen. Participants were instructed to hit the "1" key when it appeared on the left and the "9" key when it appeared on the right. Each key was marked with a red sticker. The goal was to hit the appropriate key before the other player hit his key. The first player to hit the key would win that trial, receiving two points and sending a noise blast to the other player. The order of participant wins and losses was predetermined and identical across participants and conditions. On trials the participant won, he would select the length of noise blast to send to the other player, from 1 to 10 seconds. The duration of noise blast served as a second measure of aggression. Each win was worth two points. On trials the participant lost, he would receive a noise blast from the other player (this was automated, and was always either 80 or 102 decibels, varying in length between 1 and 10 seconds). See Appendix E for screenshots of the various screens of the game.

After reading these instructions, each participant heard a sample blast of white noise (5 second blast at 102 decibels). At this point, participants were again given the chance to leave the game if they were uncomfortable with the noise blasts. No participants chose to leave at this point. Participants then played three practice trials to orient them to the game. The program was set such that the participant won the first two of these practice trials and lost the third. The duration and intensity of noise blasts

selected by participants from the two winning trials were collected to serve as a measure of individual differences in aggression within this task.

As the final part of this pre-game portion of the study, participants viewed the profile of the "other player." This other player was ostensibly another participant who was seated in our third floor lab. The profile delivered the sexual orientation manipulation (see Appendix F). In the gay target condition, the other player was presented as a member of a (non-existent) campus organization for LGBT students, the Gay and Lesbian Student Alliance, and he wrote that he had joined this organization because he identified as gay. In the straight target condition, the other player was presented as a member of a (non-existent) campus organization for first-generation college students. The straight target did not explicitly state his sexual orientation. In addition, these profiles included information on the non-profit organization the other player had selected. The gay "other player" played for Gay and Lesbian Community Educators, whereas the straight "other player" played for United Food Bank. The profile also reinforced the previous network interconnectedness manipulation. Participants assigned to the low interconnectedness condition were told that we estimated they and the other player had one friend or acquaintance in common; participants assigned to the high interconnectedness condition were told that we estimated they and the other player had four friends or acquaintances in common.

Once all participants had read the profile, the research assistant returned and reiterated the rules of the game. At this point the research assistant informed participants that although they would be playing with a player in another room, they would meet the other player at the end of the study to discuss the game and get to know each other

personally. I included this information so that participants would anticipate actual contact with the other player, thus potentially heightening the perceived threat of contamination and providing a rationale for the avoidance measure (described below).

Although participants were led to believe that they were playing with another participant, in actuality the game consisted of a pre-determined and standardized order of wins and losses. Once the actual game began (after the practice trials) the participant and the other player had the option to send each other a comment after each trial. The comments sent by the other player were pre-arranged and expressed support for his chosen organization (either Gay and Lesbian Community Educators or United Food Bank) and its mission. These comments were intended to enhance the perceived threat of contamination by making salient the gay target's desire to spread pro-gay attitudes and to support an organization that targeted middle and high school student attitudes toward homosexuality. For example, the first comment the gay target sent was, "I'm not really sure what to write here, but it's pretty cool that we got to choose organizations to play for. Gay and Lesbian Community Educators did a presentation at my high school last year and I think it really changed people's attitudes." The straight target sent nearly identical comments about United Food Bank (see Appendix G for all comments sent by both the gay and straight targets).

It was predetermined that the participant and the other player would be tied (10 points each) after the first two blocks of trials. To assess avoidance behavior, at this point the computer offered participants an option: they could continue for another ten trials of the game with the same partner or they could give up half of their points (leaving them with 5) to switch partners. This acted as my measure of behavioral avoidance.

Participants were also informed that if they chose to switch partners, they would meet their new partner, rather than the former partner, at the end of the lab session. Thus the decision to switch partners would enable a participant to avoid direct interpersonal contact with the other player. If a participant chose to switch partners, the screen briefly flashed the message "searching for a new player," then informed participants that no other players were currently available and requested that they complete some questionnaires (see Appendix H). These questionnaires included the manipulation checks, demographic questions, and individual difference measures described in detail below, as well as three additional individual difference measures to ensure that the study lasted one hour for all participants, even those who chose to switch partners. These three additional measures assessed thought-action fusion (Shafran, Thordarson, & Rachman, 1996), need for cognition (Cacioppo & Petty, 1982), and need for structure (Neuberg & Newsom, 1993; Thompson, Naccarato, Parker, & Moskowitz, 2001).

Participants who chose not to switch partners played two more blocks of five trials each, winning 6 of these 10 trials. Participants thus ended the game with 22 points and the other player with 18. At this point, each participant was presented with a second decision: they could leave the points as they stood or they could give up one-third (7 points) of their own points to take away all of the other player's points, thus depriving the other player's charitable organization of those 18 raffle tickets.[5] This measure assessed

[5] Unfortunately, I made a programming error on this question that was caught by a research assistant towards the end of data collection. In all conditions, including the two straight conditions in which the other player was supporting United Food Bank, the text

whether a participant was willing to pay a cost in order to reduce the contamination threat posed by the other players' charitable organization, and thus acted as an additional measure of aggressive behavior.

After the participant made this decision, he completed a series of questionnaires, including manipulation checks, demographic questions, and individual difference measures (see Appendix H). There were three manipulation check questions, asking participants to report the sexual orientation of the other player, the content of the information they had read about ASU social networks (i.e., whether they were loosely or highly interconnected), and the desired career of the other player. The demographic measures included race/ethnicity, social class, political attitudes and affiliation, religiosity and religious affiliation, and sexual orientation. Participants also completed individual difference measures of trait-level sensitivity to contamination concerns (Three-Domain Disgust Scale – Tybur et al., 2009 – and Perceived Vulnerability to Disease – Duncan, Schaller, & Park, 2009) and trait-level aggression (Buss & Perry, 1992). Finally, participants completed the same measures of "gay contagion" concerns, sexual prejudice, and anti-gay behavioral intentions from Studies 2 and 3 and from the pre-screening for this study. Sexual prejudice was assessed as a composite of two items measuring physical and moral disgust toward gay men. When all participants had completed the study, the research assistant delivered a verbal debriefing (see study script in Appendix A).

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of the question indicated that the other player supported Gay and Lesbian Community Educators. This error makes any analyses of the data from this particular measure impossible to interpret.

CHAPTER 4

RESULTS

Manipulation Checks

Participants completed manipulation checks to ensure that the interconnectedness manipulation and the sexual orientation manipulation were processed and remembered. For interconnectedness, participants overwhelming correctly remembered their condition, with only six of 40 individuals in the loosely interconnected condition and two of 41 individuals in the highly interconnected condition erring in their response to the manipulation check. The sexual orientation manipulation was also largely reported correctly. Five of 41 participants in the gay condition erred in their report of the "other player's" sexual orientation, whereas 11 of 40 participants in the straight condition erred. This difference is likely due to the fact that the straight "other player" did not explicitly state his sexual orientation.

In addition, some participants doubted whether they were truly playing the game with a real person, and tested the existence of the "other player" in the comments they sent. For example, some participants explicitly asked, "Are you a computer?" or "On our next encounter type 'cherry' just so I know you're a real person." Ten of the 81 participants tested the "other player" in this way, and thus had good reason to doubt his existence.

In each analysis below I focus on the results with all participants included. The patterns of findings did not differ when those who failed each manipulation check or doubted the existence of the other player were excluded.

Replications of Past Findings

Tables 1 and 2 present the means, standard deviations, and intercorrelations for my focal variables.

Table 1

Means and Standard Deviations for all Predictors and Outcomes

	Mean	Std. Deviation
Combined Aggression	-.01	1.43
Intensity	2.33	1.17
Duration	3.40	2.31
Avoidance Intentions	3.03	2.15
Aggression Intentions	2.04	1.47
Sexual Orientation Contagion	4.11	2.55
Ideology Contagion	6.13	2.50
Sexual Prejudice	4.17	2.35

Table 2

*Intercorrelations Among all Predictors and Outcomes (** p < .001)*

Measure	1	2	3	4	5	6	7	8
1. Combined Aggression	–							
2. Intensity	.910**	–						
3. Duration	.919**	.673**	–					
4. Avoidance Intentions	.180	.152	.174	–				
5. Aggression Intentions	.155	.115	.166	.684**	–			
6. Sexual Orientation Contagion	.128	.139	.097	.479**	.404**	–		
7. Ideology Contagion	.009	.010	.009	-.067	-.027	.345**	–	
8. Sexual Prejudice	.110	.041	.156	.543**	.507**	.297**	.093	–

The present study attempts to replicate and extend the findings of Studies 2 and 3 with behavioral measures of aggression and avoidance. In addition to these behavioral measures, however, I also assessed "gay contagion" beliefs with questions similar to those used in Study 1 and behavioral intentions toward gay men and lesbians with the questions used in Studies 2 and 3. These measures allow me to directly replicate the findings of Studies 1-3, thereby further testing the validity of those findings. Moreover, given that this paradigm is very different than those employed in Studies 1-3, a replication of those findings in this context would enhance confidence in the credibility of this paradigm for testing my behavioral hypotheses.

Perceived contagion threats

In this study I used similar items to measure perceived contagion threats as in Study 1. Replicating Study 1 findings, participants high in sexual prejudice, as measured during the pre-screening, were more likely to believe that contact with a gay man or lesbian would cause a child to identify as gay or lesbian ($r = .30$, $p = .009$).[6] Belief that such contact would cause a child to support gay rights was unrelated to sexual prejudice ($r = .09$, $p = .423$). In fact, all participants, regardless of level of sexual prejudice, were likely to agree that contact with a gay man or lesbian would cause a child to support gay rights ($M = 6.13$, $SD = 2.50$). As in Study 1, sexually prejudiced participants were more

[6] I used the pre-screening measure of sexual prejudice for all analyses. The measure of sexual prejudice taken during the in-lab study significantly differed across experimental conditions and thus its use as an independent predictor variable is compromised.

likely to believe that contact with gay men and lesbians could cause homosexuality, but all participants saw contact as potentially spreading pro-gay ideology.

Network interconnectedness and anti-gay behavioral intentions

Studies 2 and 3 found that sexually prejudiced participants expressed a greater desire to aggress against gay men and lesbians in highly interconnected networks compared to loosely interconnected networks. Here, as in the preliminary studies, aggression intentions were measured as a composite of four items assessing participant desire to hit a gay man for coming on to him, damage the property of a gay man, and verbally abuse a gay man in public or private ($\alpha = .82$).

The main effect of sexual prejudice toward gay male targets on desire to aggress against gay men was significant, such that more prejudiced participants wanted to be more aggressive ($b = .31$, $t(72) = 4.88$, $p < .001$, $r^2 = .25$). There was no main effect of the interconnectedness manipulation on aggression intentions ($p = .166$). Most importantly, replicating Study 3, there was a significant two-way interaction ($b = .26$, $t(72) = 2.07$, $p = .042$, $r^2 = .06$); whereas increased sexual prejudice marginally predicted desire to aggress against gay men in the loosely interconnected condition ($b = .18$, $t(72) = 1.89$, $p = .062$, $r^2 = .05$), it strongly predicted desire to aggress against gay men in the highly interconnected condition ($b = .44$, $t(72) = 5.16$, $p < .001$, $r^2 = .27$; Figure 7).

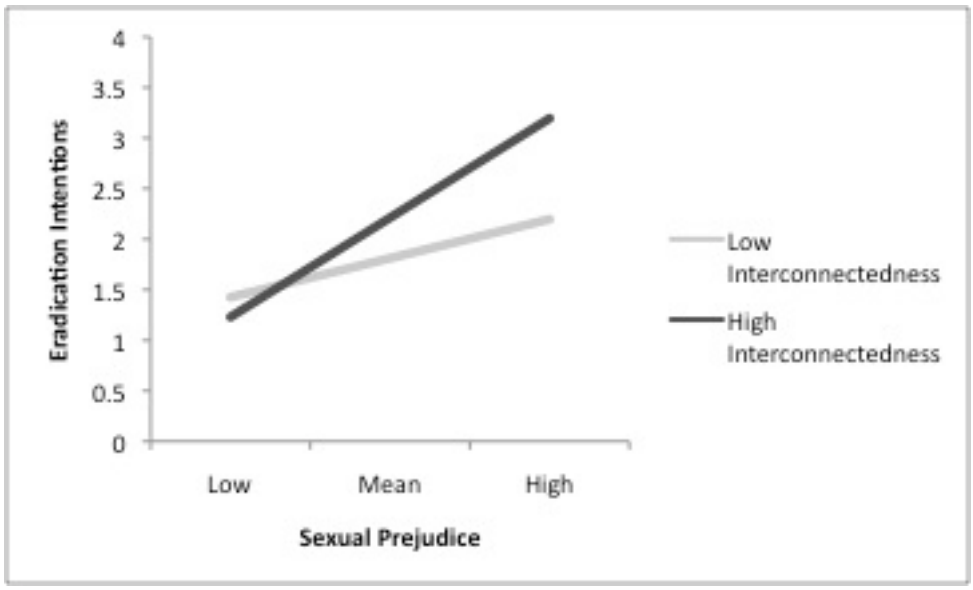


Figure 7. Perceiver intention to aggress towards a gay male target as a function of perceiver sexual prejudice and community interconnectedness.

Study 3 also found that sexually prejudiced participants were more likely to want to avoid contact with gay men, but this effect was not moderated by network interconnectedness; in both highly and loosely interconnected networks, sexually prejudiced people wanted to avoid gay men. As in Study 3, avoidance intentions were measured here as a composite of four items assessing participant desire to end a friendship with a gay man, avoid gay men, remove his child from a class taught by a gay man, and prevent his child from watching TV shows favorable to gay men ($\alpha = .85$).

Replicating Study 3, the main effect of sexual prejudice toward gay male targets on desire to avoid gay men was significant, such that more prejudiced participants wanted to be more avoidant ($b = .49$, $t(72) = 5.45$, $p < .001$, $r^2 = .29$). Interestingly, there was also a main effect of the interconnectedness manipulation on avoidance intentions; participants reported a greater desire to avoid gay men in the highly interconnected

condition compared to the loosely interconnected condition (b = .99, $t(72)$ = 2.43, p = .017, r^2 = .08; Figure 8). The two-way interaction was not significant (p = .302).

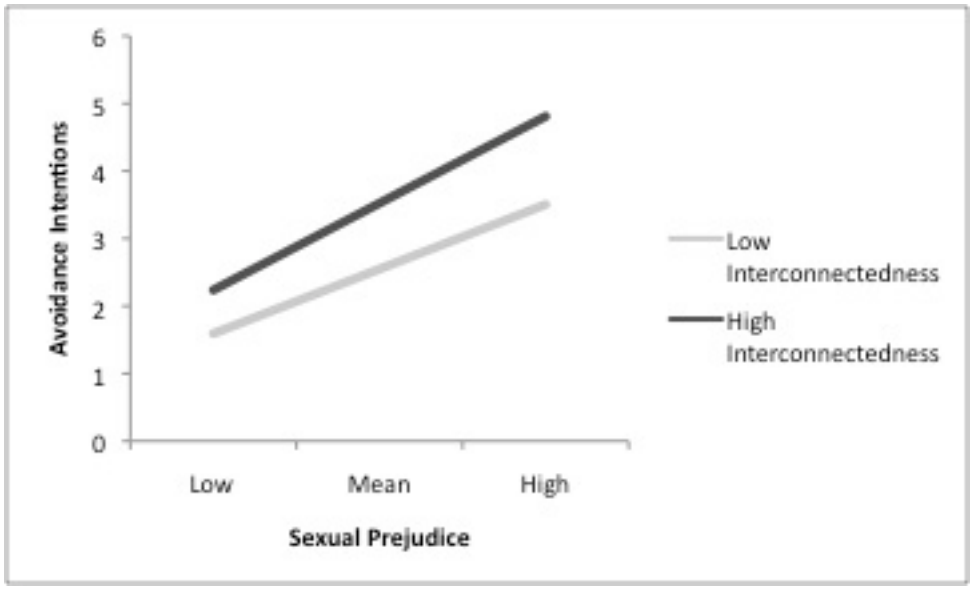


Figure 8. Perceiver intention to avoid a gay male target as a function of perceiver sexual prejudice and community interconnectedness.

The present findings thus provide additional support for the findings of Studies 2 and 3, demonstrating that sexually prejudiced participants in highly interconnected communities report a greater desire to engage in aggression toward gay men compared to those in loosely interconnected communities. In the present study it is unclear, however, why participants in the high interconnectedness condition reported a greater desire to avoid gay men, compared to those in the low interconnectedness condition.

Tests of the Focal Hypotheses: Noise Blasts

With the pre-set order of wins and losses throughout the game, participants won 11 trials (5 if they chose to switch partners after the first two blocks of trials). Intensity

scores averaged 2.33 (*SD* = 1.17) on a 5-point scale (1 = 60 db to 5 = 100 db) and duration scores averaged 3.40 (*SD* = 2.31) on a 10-point scale (1 = 1 second to 10 = 10 seconds). I standardized decibel levels and durations of noise blasts for each winning trial, then summed these standardized scores for each trial and created an overall mean aggression score. For participants who completed all four blocks of trials (*N* = 76), this was the mean of summed scores for 11 winning trials. For participants who chose to switch partners (*N* = 5), this was the mean of summed scores for five winning trials.[7]

I hypothesized that there would be a main effect of target sexual orientation on aggression, such that participants would show a higher level of aggression towards gay targets compared to straight targets. I also predicted that this would be modified by a two-way interconnectedness by target sexual orientation interaction, such that participants in the highly interconnected network condition would be the most likely to aggress against a gay target. Because participant scores on sexual prejudice were more varied than initially expected, I included pre-screening sexual prejudice scores as an additional independent

[7] I initially ran the analyses using each participant's average scores during the practice trials as a covariate. Practice trials were completed after participants completed the interconnectedness manipulation, but before they received the sexual orientation manipulation, and thus acted as an assessment of individual differences in aggression on this task. I also ran all relevant analyses using each subscale of a trait-level aggression measure (physical, verbal, anger, and hostility; Buss & Perry, 1992) as covariates. The inclusion of covariates did not alter the pattern or significance of the results, and I report the analyses without inclusion of any covariates here.

variable. With this additional predictor, I thus hypothesized a three-way interaction between interconnectedness, target sexual orientation, and participant sexual prejudice, such that sexually prejudiced individuals would engage in the highest levels of aggression against a gay target (relative to a straight target) in the highly interconnected network condition.

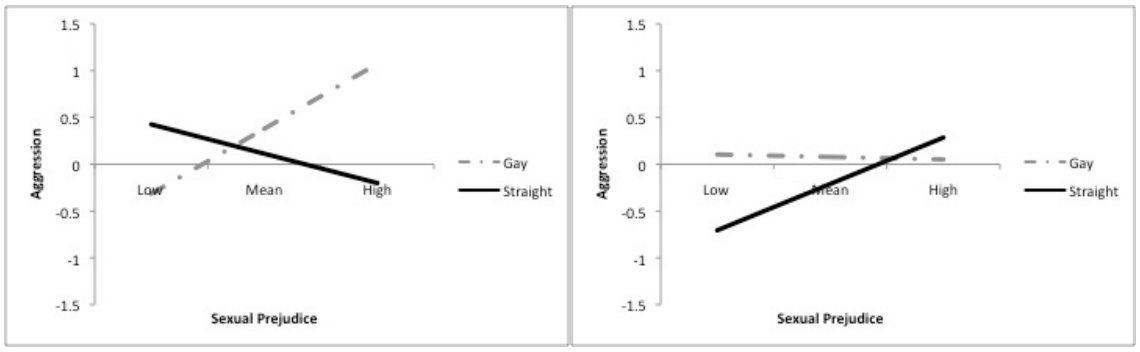
Using model 3 within the Process macro developed by Hayes (2013), I conducted a linear regression analysis to explore the effect of target sexual orientation, interconnectedness, and participant sexual prejudice on aggression. Although there were no significant main effects or two-way interactions (all *p*s > .212), the overall analysis yielded a significant three-way interaction between target sexual orientation, interconnectedness, and participant sexual prejudice (b = -.65, $t(69)$ = -2.21, p = .03, r^2 = .07).[8]

To parse this three-way interaction, I will explore the two-way sexual prejudice by target sexual orientation interaction separately for the high and low interconnectedness conditions. This enables a comparison of the amount of aggression directed at gay targets

[8] This result holds when participants who failed the sexual orientation manipulation check are excluded (b = -.85, $t(54)$ = -2.39, p = .020, r^2 = .10) and when those who failed the interconnectedness manipulation check are excluded (b = -.53, $t(62)$ = -1.83, p = .072, r^2 = .05). When those who used the comments to check the existence of the other player are excluded, the three-way interaction again remains significant (b = -.97, $t(59)$ = -3.24, p = .002, r^2 = .15) and the main effect of sexual prejudice becomes marginally significant (b = .13, $t(59)$ = 1.74, p = .087, r^2 = .05).

versus straight targets in both interconnectedness conditions. This direct comparison would seem especially useful given that moderate degrees of aggression are a required behavioral response in the reaction time game, yet there is no clear indicator of what a normal, baseline level of aggression would be. Participants' aggressive responses to straight targets provide a useful approximation of this and thus an important comparison. For this analysis, I would predict a significant two-way interaction in the highly interconnected condition, such that sexually prejudiced participants engage in more aggression towards the gay target in the highly interconnected condition.

As predicted, the two-way interaction was significant for the high interconnectedness condition (b = -.43, $t(69)$ = -2.26, p = .027, r^2 = .07; Figure 9a, and Figure K1a for scatterplot). The effect of target sexual orientation in the high interconnectedness condition was significant at high levels of sexual prejudice (b = -1.27, $t(69)$ = -2.04, p = .045, r^2 = .05) but not at low levels (b = .74, $t(69)$ = 1.12, p = .267). Consistent with my prediction, participants high in sexual prejudice in the highly interconnected condition engaged in greater aggression towards gay, compared to straight, targets.



Figures 9a and 9b. Perceiver aggression in the high (left) and low (right) interconnectedness conditions as a function of target sexual orientation and perceiver sexual prejudice.

The two-way target sexual orientation by perceiver sexual prejudice interaction was not, however, significant for the low interconnectedness condition (b = .17, $t(68)$ = 1.14, p = .261; Figure 9b and Figure K1b for scatterplot). Moreover, the effect of target sexual orientation in the low interconnectedness condition was not significant at high (b = .18, $t(68)$ = .34, p = .734) or low (b = -.62, $t(68)$ = -1.44, p = .156) levels of sexual prejudice.

Although I have used the standard method for calculating the dependent variable for this aggression measure, I also ran these analyses separately, decomposing the aggression measure into its constituent parts. That is, I ran the analyses with average intensity of noise blast as the dependent variable and again with average duration of noise blast as the dependent variable. The three-way interaction of interconnectedness, target sexual orientation, and participant sexual prejudice on intensity was significant (b = -.63, $t(69)$ = -2.68, p = .009, r^2 = .10), with the same pattern of results seen for the summed standardized scores reported above (see Appendix I, Figures I1a and I1b). However, this

interaction was not significant for duration (b = -.68, $t(69)$ = -1.37, p = .174), nor were there other significant results in this analysis (see Appendix I, Figures I2a and I2b).

Tests of Focal Hypotheses: Avoidance

After completing the first ten trials of the reaction time game, participants were given the opportunity to switch partners (giving up five of their ten points to do so) or to play another ten trials with their current partner. This choice served as my measure of avoidant behavior. I hypothesized that there would be a main effect of target sexual orientation on the likelihood of choosing to switch partners, such that participants would be more likely to avoid a gay, compared to a straight partner. However, I also predicted that this would be moderated by participant sexual prejudice and interconnectedness condition, such that highly sexually prejudiced participants would be the most likely to avoid a gay target in the loosely interconnected condition. However, as only five of the 81 participants chose to switch partners, any analyses of these results would not yield interpretable solutions (Table 3).

Table 3

Participants Opting to Switch Partners by Condition.

	Gay Target	Straight Target
Low Interconnectedness	0	3
High Interconnectedness	2	0

Tests of Focal Hypotheses: Post-game Aggression

Participants who played all 20 trials of the game (i.e., those who did not switch partners) faced a second choice: To allow the points to stay as they were (participant with 22 points, other player with 18) or to give up 7 of their points to eliminate all of the other

player's points. This choice served as an additional measure of aggressive behavior. I hypothesized that there would be a sexual prejudice by target sexual orientation interaction, such that sexually prejudiced participants would be more likely to eliminate the points of gay, but not straight, targets. In addition, I predicted that network interconnectedness would moderate this effect, such that sexually prejudiced participants would show the highest likelihood of eliminating the gay target's points in the highly interconnected condition. However, as with the decision to switch partners, analysis of this dependent measure was not feasible. As noted earlier, a programming error on this item caused it indicate that all targets (including the straight target, who was playing for United Food Bank) were playing for Gay and Lesbian Community Educators. This error was only displayed in this one question; all preceding portions of the study (before and during game play) provided correct information for each condition. In addition, only eight of the 81 targets chose to eliminate the other players' points, thus eliminating the value of any analysis of this measure (Table 4).

Table 4

Participants Giving up Points to Delete Other Players Points by Condition.

	Gay Target	Straight Target
Low Interconnectedness	3	2
High Interconnectedness	1	2

CHAPTER 5

DISCUSSION

The purpose of this study was to explore the effect of network interconnectedness on straight men's aggressive and avoidant behavior toward gay men. In my lay disease-spread model of homosexuality, I argue that sexually prejudiced individuals view homosexuality and pro-gay ideology as analogous to contagious pathogens, and that anti-gay behaviors can thus be seen as analogous to pathogen-response behaviors. Based on this model, I explored whether a feature of the environment – community interconnectedness – that strongly influences pathogen-response behaviors would similarly affect anti-gay behaviors. Highly interconnected networks require more aggressive pathogen-response behaviors, as these are environments where pathogens are able to spread rapidly. In contrast, avoidance can be an effective response to a disease threat in loosely interconnected networks. I predicted, therefore, that sexually prejudiced participants would engage in more aggressive behavior toward gay men in the high interconnectedness condition, and would engage in more avoidant behavior toward gay men in the low interconnectedness condition.

In three preliminary studies I demonstrated (a) that sexually prejudiced individuals are more likely to believe that contact with gay men and lesbians can cause a child to become gay or lesbian and (b) that sexually prejudiced individuals in highly interconnected communities report a greater desire to engage in aggressive anti-gay behavior compared to those in loosely interconnected communities. The present study also included measures of beliefs about the contagiousness of homosexuality and pro-gay ideology as well as behavioral intentions toward gay men and lesbians, allowing me to

replicate the findings of Studies 1-3. As in Study 1, I found that sexually prejudiced participants were more likely to believe that contact with gay men and lesbians could alter a child's sexual orientation to become gay or lesbian. All participants, however, were equally likely to believe that such contact could spread pro-gay ideology. I also replicated the findings from Studies 2 and 3 with regard to the effect of network interconnectedness on aggressive and avoidant anti-gay behavioral intentions. Sexually prejudiced participants were more likely to express a desire to aggress against gay men in the high interconnectedness condition, compared to the low interconnectedness condition. In terms of intentions to avoid gay men, I replicated the main effect of sexual prejudice from Studies 2 and 3; sexually prejudiced individuals were more likely to want to avoid gay men. There was also an unexpected main effect of interconnectedness, however, such that participants were more likely to want to avoid gay men in highly interconnected networks. The reason for this finding is unclear.

Moving to my focal hypothesis regarding aggressive behavior, I found a significant three-way interaction between network interconnectedness, target sexual orientation, and participant sexual prejudice. In parsing this interaction, I discovered that the two-way sexual prejudice by target sexual orientation interaction was significant for the high interconnectedness condition, but not the low interconnectedness condition. Under the highly interconnected network manipulation, sexually prejudiced participants engaged in more aggression towards gay, compared to straight, targets. This is consistent with my predictions. It is also noteworthy that the patterns of results for gay targets versus straight targets clearly differ. The findings of Studies 2 and 3 – in which sexually prejudiced individuals report an increased desire to aggress against gay and lesbians

when believing themselves to be in highly interconnected communities – thus do not likely reflect a general pattern of aggression, but rather a pattern specific to anti-gay behaviors. As I will discuss in detail below, I was unable to test my hypothesis regarding avoidant behavior.

Methodological Considerations

One of the aims of this study was to be able to disentangle avoidant and aggressive behaviors. Recall that in Studies 2 and 3 the measures of intentions to avoid or aggress were somewhat confounded with situations. Indeed, in Study 4, avoidance intentions and aggression intentions were positively correlated, and at all levels of sexual prejudice (see Appendix J).

Unfortunately, there were methodological issues with my measure of avoidant behavior, and although I was able to explore the effect of network interconnectedness on aggressive behavior, I was not able to disentangle avoidant and aggressive behaviors. One clear issue with this study was thus the lack of participants choosing to switch partners (measure of avoidant behavior) or eliminate the other player's points (measure of post-game aggressive behavior). To switch partners after the first ten trials of the game, a participant had to give up half of his points, and the decision to eliminate the other player's points at the end of the game cost 1/3 of the participant's points. My initial decision to make these choices costly was based on a concern that, without a related cost, too many participants would choose to switch partners and/or to eliminate the other player's points, resulting in a ceiling effect and rendering interpretation of any analyses unreliable. However, so few participants chose to switch partners or eliminate points that I was unable to test either my post-game aggression hypothesis or my avoidance

hypothesis. The most straightforward explanation for this is simply that the costs for these choices were too high. In future studies using this paradigm, I would like to eliminate the cost for both of these choices, enabling participants to avoid or aggress (in the context of the reaction-time game) without cost.

Alternatively, participants may have been particularly invested in the non-profit organizations they had selected, and therefore unwilling to give up any "raffle tickets" for their organization. For exploratory reasons, future studies might include an open-ended question at the end of the study asking participants to explain their choices. That is, participants would be asked to explain why they did or did not choose to switch partners and why they did or did not choose to eliminate the other player's points at the end of the game. Participants may also have perceived these choices as potentially altering (either shortening or lengthening) the time needed to complete the study. To remove this as a potential source of variability, I would emphasize in the script that all participants would be in the lab for one hour, regardless of the choices made within the study.

Additionally, participants in the gay player condition may have correctly perceived the decision to switch partners as an assessment of anti-gay behavior or attitudes. This perception could have made the decision to switch partners costly not only in terms of giving up points but also in terms of self-presentation. That is, participants may have been motivated to respond without prejudice, and could thus have shown this bias on items that were perceived to be directly measuring sexual prejudice. There is some evidence that motivation to respond without prejudice may have occurred during the present study. Participants reported lower levels of disgust and negativity toward gay men when playing with a gay other player compared to a straight other player.

Another issue in the study was some participants doubted that the other player was real. Participant awareness of deception is a potential issue in many studies. However, the fact that participants were able to send comments to the other player and receive pre-determined comments from him created a unique opportunity for suspicions. Those who doubted the other players' existence were able to send a comment explicitly asking the other player to indicate whether he was a real person. Although the majority of participants did not do so, ten out of the 81 participants tested the other player in this way, and thus had evidence that he did not exist. Note, however, that when their results were removed from the dataset, the outcomes of all analyses remained the same.

I made the decision to include the ability to send and receive comments to make concerns with the perceived contagiousness of homosexuality and pro-gay ideology more salient. However, it is not clear that this goal was achieved, and the inclusion of the comment process potentially enhanced participant awareness of deception. In future iterations of this study I would eliminate participant perception of a conversation-like exchange of comments by removing the comment option from after every trial, and instead limiting it to once per game, at the mid-way point. Thus, after playing ten trials each participant would have the option to send a comment to the other player and would receive a comment from him. The comment from the other player could thus enhance the perceived threat of "gay contagion" immediately before the choice of whether or not to switch partners.

Finally, the present study has a limited sample size. I recruited males from the ASU psychology subject pool who scored higher than one on a pre-screening sexual prejudice measure. Although approximately 500 men qualified based on this criterion, I

was only able to recruit 81 for this study, despite extensive email and phone recruiting efforts. Students in the subject pool can choose between many studies to complete their required participation credits, and they often prefer online over in-lab studies. In addition, the penalty for failing to show up for a study is minimal, and approximately 30% of those who initially signed up to participate in my study did not show up. Due to the fact that I need to recruit pre-screened participants who report some level of sexual prejudice, I may need to offer a monetary incentive for future studies, in addition to offering course credit.

Theoretical Extensions

I have so far conceptualized "community" very broadly. One might think, however, about each individual belonging to various types of communities – family, friends, work, school, neighborhood, etc. Some communities are geographically bound, as in the case of neighborhoods, whereas others may be more dispersed, as in the case of a group of college friends who now live in multiple states. Each of these communities has its own structure and level of interconnectedness, and communities likely differ in their norms for behavior. An individual may play very different roles across communities; a person who is low ranking in his or her workplace might be a neighborhood leader. In addition, each of us varies in the degree to which we identify with and feel close to each community we interact with.

A contagion threat may thus pose varying levels of threat and elicit different behavioral responses across types of communities. In the full lay disease-spread model I discuss various features of pathogens themselves (e.g., how they are transmitted, the consequences of infection) that influence how people respond to a pathogen contamination threat, and develop analogues for perceptions of the "spread" of

homosexuality and/or pro-gay ideology. Exploring some of these features may help us to understand and predict how perceptions of threat will vary across communities. For example, in the full model I suggest that sexually prejudiced people may perceive direct interpersonal interaction with gay men or lesbians as posing the highest risk for "transmission" of homosexuality. In communities that are not bound to a particular location, such contact might pose a threat to an individual community member, but might not be perceived as having the potential to spread throughout the network. In contrast, people living in geographically bound communities, in which direct contact between members is frequent, might perceive direct contact with gay men and lesbians as posing a much larger risk to the community.

Strongly identifying with a particular community and/or having a sense of shared fate will also likely increase the degree to which a sexually prejudiced person perceives homosexuality or pro-gay ideology as a threat to the community. Self-defense (or defense of close others) is a strong motivator for aggressive behavior (Kenrick, Griskevicius, Neuberg, & Schaller, 2010), and thus sexually prejudiced individuals who perceive a threat to a group they identify with may be more likely to engage in aggressive anti-gay behavior. Conversely, if a sexually prejudiced person does not identify with a particular community, he or she may be more likely to simply avoid gay men and lesbians.

In addition, I have focused here on the attitudes and behaviors of straight men toward gay men. The perceived threats posed by homosexuality and pro-gay ideology differ, however, depending on perceiver and target gender as well as characteristics such as age, relationship status, etc. For example, the threat of sexual orientation contagion may be perceived to be highest with same-sex contact (e.g., contact between a gay man

and straight man, rather than between a gay man and straight woman). Children are also perceived to be more vulnerable to such "contagion," as their sexual orientations and gender identities are thought to still be developing. The threat of contact between gay men or lesbians and children is accordingly likely to elicit more anti-gay behaviors than is the threat of contact with the elderly.

More broadly, I argue in the lay disease-spread model of homosexuality that anti-gay behaviors are responsive to perceived features of homosexuality and pro-gay ideology as well as the structure of the surrounding community. These behaviors include prevention and eradication, as discussed in detail in this dissertation, but also identification, treatment, and containment. I have also focused here on the behavior of laypeople, but those in professional socialization roles (e.g., teachers, clergy), political officials, and anti-gay organizations such as Focus on the Family or National Organization for Marriage, among others, also enact anti-gay behaviors.

Ethical Considerations

One might argue that studies that explore negative behavior – discrimination, aggression, social exclusion, etc. – run the risk of priming such behavior in the study participants. In the present study, I have recruited participants who report at least a low level of prejudice towards gay men and created an environment in which, for those in the gay player condition, they can aggress against a gay man with no repercussions. It is thus reasonable to consider whether this experiment may in fact increase these men's likelihood of engaging in anti-gay aggression in their everyday lives.

In everyday life, aggressive behavior is actually quite rare. Engaging in physical aggression carries a high risk of both physical and reputational damage to an individual

and there are strong societal norms against physically aggressive behavior (Griskevicius, Tybur, Gangestad, Perea, Shapiro, & Kenrick, 2009). Increasingly, there are also specific societal norms against anti-gay behavior (Saad, 2005). Aggression (and anti-gay aggression in particular) thus requires the presence of psychological and/or situational releasers, such as alcohol, the presence of individuals who endorse anti-gay aggression, etc. To elicit aggressive behavior in a lab setting, researchers must therefore create a context in which aggressive behavior is appropriate and acceptable, as in the reaction-time game I adapted for the present study. This game and similar aggression research paradigms create a perfect storm of aggression releasers. Not only does the game *require* a level of aggressive behavior, but the participant is also playing against an unseen individual, and that level of physical removal increases the willingness to aggress (Ahmed, 1979). In everyday life, this sort of perfect storm rarely occurs.

Behaviors elicited in laboratory psychology experiments are more likely to transfer to real life behaviors to the degree that the in-lab behavior resembles the real-life behavior (e.g., Levitt & List). In the present study, aggression was measured as the duration and intensity of blasts of white noise sent by the participant to the "other player." As well as being a means of aggression that is extremely unlikely to cause actual harm, sending noise blasts is not a typical means by which people aggress outside a lab setting.

I believe the risk of the present study causing the low levels of in-lab aggression to transfer to real-life aggression is minimal. However, even if there is a non-zero risk of such a transfer occurring, that risk must be weighed against the potential benefits of the study. As the first model in social psychology to identify factors that predict specific

types of anti-gay behaviors, the lay disease-spread model has great potential for shaping efforts to reduce anti-gay behaviors. The present research identifies a community network factor – interconnectedness – that influences aggressive anti-gay behavior. This knowledge allows for the creation of intervention programs that not only attempt to reduce sexual prejudice but that also emphasize aggression reduction. Such interventions could also be selectively deployed to more highly interconnected communities, based on knowledge of the relevant social and community networks.

In addition, public health research consistently demonstrates the importance of acknowledging and addressing lay beliefs about illness in order to effectively influence pathogen response behaviors, even when those beliefs are incorrect (Allmark & Tod, 2006). Because homosexuality clearly does not spread (Brakefield, Mednick, Wilson, De Neve, Christakis, & Fowler, 2014), interventions aimed at reducing sexual prejudice have largely ignored this lay contagion belief. Acknowledging and directly addressing lay beliefs about the contagiousness of homosexuality may be a useful component to include in such prejudice-reduction interventions.

Although in the present study I do feel that the risk of causing or increasing participant's real-world aggression was very low, it is important to continually evaluate the costs and benefits of research such as this.

Conclusion

The hypotheses I have derived from an analysis of epidemiological research and tested here lie well outside the theoretical architectures of existing models of anti-gay behaviors. From the perspective of these existing models, the structure of a sexually prejudiced person's community network should not affect the type of anti-gay behavior

he or she engages in. Interconnectedness does not pose a threat to masculine identities, it does not affect violations of traditional gender role norms, and it does not alter the boundary between the heterosexual ingroup and the gay and lesbian outgroup. Interconnectedness does, however, have a very clear effect on infectious disease dynamics and pathogen response behavior and, as I demonstrate in the present research, it also influences anti-gay behaviors. In sum, this study provides a useful and interesting initial test of the lay disease-spread model of homosexuality on actual behavioral outcomes. Network interconnectedness is clearly relevant to anti-gay behaviors and further exploring this variable and other hypotheses generated by the lay disease-spread model of homosexuality will be a fruitful area for future inquiry.

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APPENDIX A

STUDY SCRIPT

Check-In:

- Put on lab coat.
- If you are the first researcher of the day, print the timesheet.

- **IMPORTANT: Each person signed up will have a unique code associated with his name. You can find this code on the desktop in an excel file titled "Social Games ID Codes." Next to each name, please carefully find the person's unique code *AND WRITE THIS CODE ON THE PRINTOUT AND ON THE LOG SHEET.***
    - NOTE: If a participant does NOT have a unique code, create a 5-digit code for them in the following format: 00001, 00002, etc. Look at previous entries on the log sheet to make sure you aren't duplicating a previous code.
- Study Materials:
    - Timesheet (printed, **write unique code on here**)
    - Participant Log (**write unique code on here**, comments)

GREET PARTICIPANTS A COUPLE MINUTES BEFORE THE TIME (waiting room).

- ***"Hi. I'm here to take attendance for the Social Games Study. Before I do, if you received an email from the research team instructing you to meet on the third floor, please head upstairs now."*** **[If they're unsure about where to be, ask for their name, look at your attendance sheet, and tell them they're in the right place].** Take attendance.
- Call participants first and last names from timesheet.
- ***"I'll go set up the computers for the experiment and come back in a moment"***

Lab Set-Up:

- Open and start MediaLab on computers (icon with the rat & computer)
- Go to the "Run" menu, and select "Run last selection again"
    - NOTE: If for any reason this does not pull up the appropriate study or you get an error message, go to "Run" menu, select "Select and run an experiment" go to desktop > Social Games (Gabrielle) and open "social games.exp"
- Type in the appropriate **unique ID code**. This ID number should be on the SONA sheet, and will be unique for each person. When taking notes on the log sheet, please write in this **unique ID CODE** (a 5-digit code starting with an 8 or 9).
- **Type in the appropriate condition from the log sheet.**
- Click to the next page (consent form)

GREET PARTICIPANTS ON THE HOUR.

- ***"I'm here for participants in the Social Games Study. Will the following students please come with me:"***
    - You may have up to 6 participants per hour. Invite them back 3 at a time. Set the first 3 up to read the consent letter, then go get the other 3 and set them up.
- Call participants first and last names from timesheet.
- ***"Please follow me."*** Walk participants to the computer room.
- ***"Thank you for coming into the study today. My name is _____."***

- ***"Please make sure your cell phones are either turned off or silent. Please take a moment to read the consent letter on your screen and indicate whether or not you agree to participate by clicking the appropriate box. I'll be back in a few minutes."***
- Check the wait room for any late participants, until 5 minutes past the hour.

Starting the study/first set of instructions:

- Once all participants in a room have finished the consent letter and indicated that they would like to participate (NOTE: if anyone does NOT want to participate, thank them, escort them out, and let them know that they will be assigned credit – make sure you don't say this where the other participants can hear you!), close the door and **read the following**:
    - "This study is computerized; most of the instructions will be given to you on the computer screen, and all of your responses will be electronically recorded. Although some of the items ask sensitive or personal questions, all of your answers in this study are completely anonymous - that is no one will know how you individually answered the items. There are also dividers between computer stations to ensure no one can read your answers. Your responses are very valuable and we appreciate you answering each question fully and completely. Since there will be more than one research participant completing the study at one time, please be absolutely silent at all times. It is important that you do not distract other participants or yourself in any way, such as by moving, talking, making noises, or using your cell phone. Please also make sure you are directly facing the computer. At no point should you look around the room at the other participants or their computers."
    - "As you read in the consent letter, we're interested in social relationships within the ASU community and the ways in which these affect community engagement. We'll ask you first to read about some research we have conducted on social interactions among freshman in the ASU community, and to briefly reflect in writing on your own personal experiences at ASU. After this you will play a reaction-time game with another player. We're interested in whether people will play this game differently when they are playing in person versus online. For the session today, [pause and flip through papers on the clipboard as though you're checking] you will all be playing with other participants who are currently in our lab on the third floor – you will not play the game with anyone in this room."
    - "At the end of this study, we'll be donating game winnings to a non-profit organization – which organization we donate to will be determined by how successfully you each play the game. Each point a player earns in the game becomes, essentially, a raffle ticket entered into a drawing to select the organization. In a minute, I'll advance the computer screen so that you can choose an organization to play for. Any points you earn will become tickets entered in the drawing for the organization of your choice."
    - "After you choose an organization, the computer will prompt you to enter some basic information about yourself in order to create a profile to share with your game partner. You will see the same information about the other player

before you start the game. You will then read about some previous research conducted in this lab and write about your own experiences at ASU. At that point, the computer will walk you through the game rules and three practice trials. The computer will stop you at that point and ask you to wait. When both you and your game partner are ready to start the game, I'll be back to set it up."

- "Please put on your headphones now."

- **Enter password (game) for all participants.**
- NOTE: During this first portion players will hear a sample noise blast, and have a chance to withdraw from the study at that point. If this happens, you will thank them, escort them out, and let them know that they will be assigned credit – again, out of the hearing of the other participants.

Second set of instructions:

- The first part should take 5 – 10 minutes. Check on them periodically until everyone in a room is finished. Then **read the following**:
  - "Alright, everyone is ready to go, so we'll start the game. Remember, you are each playing against participants who are in our third floor lab rooms, not against anyone in this room. However, at the end of the study, you'll each meet your game partner and discuss the game. [Pause here for emphasis and make eye-contact if you can] We do this so you get to know each other personally a bit." [Pause a bit; pretend to look over info on clipboard.]
  - "Ok, before starting, let's briefly review the rules. First, remember that you'll be playing for the organization you chose. Each point you earn will become a raffle ticket for that organization. This is a reaction time game. For each trial you will indicate the level of noise blast you want to deliver to the other player if you win the trial. Then three hash marks will appear in the center of the screen, telling you that a plus sign is about to appear. If the plus sign appears on the left, hit the " number 1" key. If it appears on the right, hit the "number 9" key. Both are marked with red stickers. If you hit the correct key faster than the other player, you win two points for your organization and send a 1 to 10 second noise blast to the other player. If the other player is faster, you lose, and they win two points for their organization and send a noise blast to you over your headphones. After each round you and the other player can send comments to one another. You do not have to do so – you will first be asked whether or not you want to send a comment. If you respond yes, you can write a brief comment to send to the other player. If you respond no, you will not write a comment. You will then see any comment the other player chooses to send. Do you have any questions? I'll come check on you every few minutes."
  - **Enter password (game) for all participants.**
  - **As quietly as possible, check on participants every 10 minutes to make sure things are going smoothly.**

Debriefing:

- You will deliver this debriefing verbally, and should be prepared to answer basic questions. If they have any questions you can't answer or concerns, give them my name and email address.
- **Read the following**:

"Thank you for participating in our research. We very much appreciate your time and efforts!

As humans, we face many threats from our environments as well as many opportunities. Often our best course of action in the face of a threat is avoidance. This could mean running away from a threat of physical attack or it could mean avoiding contact with a sick person or a person who holds beliefs or values that are contrary to our own. Sometimes, however, we might feel that we have to approach a threat to deal with it effectively (e.g., fight back, offer treatment to a sick person, or confront a person with conflicting values). So when will an individual choose to deal with a potential threat by avoiding it versus by approaching it?

The social environment we live in has a strong effect on our behavior. In close-knit or highly interconnected communities we might be less likely to be aggressive or confrontational in general, but we might also feel that others in the community are like family, and that we should thus act to protect them in case of a threat. A threat could be to the physical safety of the group, it could be to the physical health of the group, or it could be to the knowledge and ideologies held by the group.

We are investigating how the level of community interconnectedness—the extent to which people within the community have connections and relationships with one another—affects whether community members will react with more aggression or more avoidance towards those they see as threatening. This study focuses on the threats potentially posed by a person seen as trying to spread his or her beliefs throughout the community. Because information, rumors, and ideas can spread quickly in highly interconnected social networks, one hypothesis is that individuals in highly interconnected communities will be more likely to show aggression (versus avoidance) to the threatening person.

In this study, you were asked to play an online reaction time game against a player in another lab room. Prior to playing the game, you read information about research conducted on the structure of social networks at ASU. Because we are interested in the effect of different levels of network interconnectedness on behavior, some of you read that the social networks at ASU are highly interconnected, whereas others read that they are only loosely interconnected. That information was not actually based on real research.

In the context of the reaction time game, we wanted to explore how the information you received about the ASU social networks would affect your behavior toward another player who tried to persuade you to adopt his or her views. To study this scientifically,

we needed to control the other player's behavior and responses. For this reason, there actually was no other player. Instead, you were playing against a computerized, pre-set strategy. Therefore, you will not meet another player at this point. This minor deception strengthens the usefulness of the data you provided us, and enables us to test more rigorously the different hypotheses.

In addition, in order to place the other player's persuasive comments in a particular context, you were informed that each of you would be playing for a particular charitable organization. We manipulated the organization your 'partner' was playing for. For some of you, the organization we chose would be compatible with your own goals and beliefs; for others, the organization we chose would be less compatible with your own goals and beliefs. This allowed us to test whether the specific organization your partner "selected" affected how you chose to play the game. Thus our lab will not actually make a contribution to any of the organizations listed.

Finally, the game you played was designed to elicit aggressive responses from you and each of our participants within the lab setting. Sending noise blasts to the other player is in no way an indication of any general tendency you might have to be aggressive against real people in the real world; in fact, this game is designed to elicit aggression—everyone does it—so we can look at the factors that increase or decrease it... factors such as thinking that one is interconnected with others in one's community.

Some people *are* targeted for aggression merely because of what they believe or who they are. Although we created an environment within the lab in which aggression (the noise blasts) was appropriate, we are not sanctioning aggressive behavior in the real world. We hope this study will contribute to a better understanding of why aggression happens, so that we can ultimately reduce such aggression. All people deserve to live in a climate of respect, inclusiveness, diversity, and equality, and ASU policy actively promotes and supports such a community.

Thank you again for your time. Analyzing why and how community interconnectedness influences behavior is critical for understanding interpersonal aggression and avoidance. Although this study did include some minor deceptions, we hope you understand that this allows us to capture more natural behavior, thus enabling stronger tests of our hypotheses.

Because this research is ongoing, it is important that you not discuss the study or give away the minor deceptions to any of your classmates in PSY 101. We'll continue collecting data throughout the semester, so any discussion of this work among students would jeopardize our research.

If you are interested in this topic or have any other questions or concerns, please feel free to contact the researchers, Gabrielle Filip-Crawford or Dr. Steven Neuberg."

CLEANING UP.

- Use one of the alcohol wipes in the control room (labeled "Social Games Study") to wipe down the headphones that were used after each session.
- When you leave your shift, make sure everything is put back the way it was when you came in. In the rooms, close out of MediaLab on all the computers. Leave the clipboard in the control room for the next RA.

Note:

If a participant doesn't make it through the whole survey, please click **ctrl + alt + right arrow** to exit out of the experiment and save their data.

APPENDIX B

NON-PROFIT ORGANIZATION LIST

Please select one of the following organizations to play for. During the game, each point you win will become, essentially, a raffle ticket entered in a drawing to determine which organization we will donate to.

- American Red Cross
  - This organization works with communities to prepare for disasters and provides medical support, shelter, etc. during disasters and emergencies.
- American Cancer Society
  - In their efforts to eliminate cancer as a major health issue, this organization supports health education, works with those fighting cancer, and conducts research to find cancer cures.
- United Food Bank
  - By working with community partners and volunteers, this Phoenix-based organization provides over 51,000 meals to hungry people in Arizona daily.
- Make a Wish Foundation
  - This organization grants the wishes of children with life-threatening medical conditions.
- Americans for the Arts
  - This organization works to promote, sustain, and support the arts in America by advocating to policy-makers and conducting research on the ways in which art can influence communities.
- Keep America Beautiful
  - Through their programs and community partnerships, this organization seeks to reduce waste, increase recycling, and protect natural areas.
- National Pro-Life Alliance
  - This organization works to pass pro-life legislation through lobbying legislators at the local, state, and federal levels.
- Gay and Lesbian Community Educators
  - This Phoenix-based organization seeks to promote acceptance of gay and lesbian students in middle schools and high schools through speaker series, workshops, and educational campaigns.

APPENDIX C
INTERCONNECTEDNESS MANIPULATION

Throughout college, students meet many new people with whom they study, work, attend class, live, and form friendships. As students interact with the people around them, they discuss their opinions or experiences they've had, and often come to share some of the same opinions or engage in some of the same behaviors. These interactions between students also spread less positive things, such as gossip, rumors, or even contagious illnesses like the flu. Researchers look at in the ways in which these social networks form and develop and the ways in which behaviors, attitudes, and illnesses spread throughout networks.

In some college communities, social networks are *highly interconnected*. A student in such a community might feel that most of his or her friends know each other. In an interconnected social network like this, two students (strangers) chosen at random from the student body would be very likely to have at least one friend in common. The more highly interconnected a social network is, the more rapidly information, behaviors, and even illnesses spread.

In other college communities, social networks are *loosely interconnected*. A student in such a community might feel that few of his or her friends know each other. In such a community, two students (strangers) chosen at random from the student body would be very unlikely to have any friends in common. In loosely interconnected social networks, information, behaviors, and illnesses spread much more slowly (if at all).

Over the past seven years (2007 – 2013), researchers at ASU have measured and tracked the social networks of incoming freshmen. At the beginning and end of each school year, first-year students responded to a number of measures of behavior, attitudes, and physical and mental health. In addition, students viewed a list of the other first-year students, and indicated whether or not they knew each individual. This allowed researchers to track who knows whom and the ways in which behaviors, attitudes, and illnesses spread among social networks at ASU.

High Interconnectedness

This research has found that social networks at ASU are *highly interconnected*. On average, two first-year students (strangers) selected at random from the ASU student body have four friends or acquaintances in common. Students also report that they often have the impression that, within the ASU community, "everyone knows everyone else." As a result of this very high level of interconnectedness, we find that the differences in student attitudes and behaviors we observe at the beginning of the year tend to greatly diminish by the end of the year. That is, students are much more similar to each other at the end of the year than at the beginning.

We're interested in your experience of social networks at ASU. Please briefly write about a time when you felt that the ASU community was highly interconnected. That is, describe a time when you had the impression that, within the ASU community, "everyone knows everyone else."

Low Interconnectedness

This research has found that social networks at ASU are *loosely interconnected*. On average, two first-year students (strangers) selected at random from the ASU student body have only one friend or acquaintance in common. Students also report that they often have the impression that, within the ASU community, "students tend to be isolated from one another." As a result of this very low level of interconnectedness, we find that the differences in student attitudes and behaviors we observe at the beginning of the year tend to be mostly unchanged by the end of the year. That is, students are just as different from one another at the end of the year as at the beginning.

We're interested in your experience of social networks at ASU. Please briefly write about a time when you felt that the ASU community was loosely interconnected. That is, describe a time when you had the impression that, within the ASU community, "students tend to be isolated from one another."

APPENDIX D
REACTION-TIME GAME RULES

Remember that you'll be playing for the organization you chose. Each point you earn will become a raffle ticket for that organization.

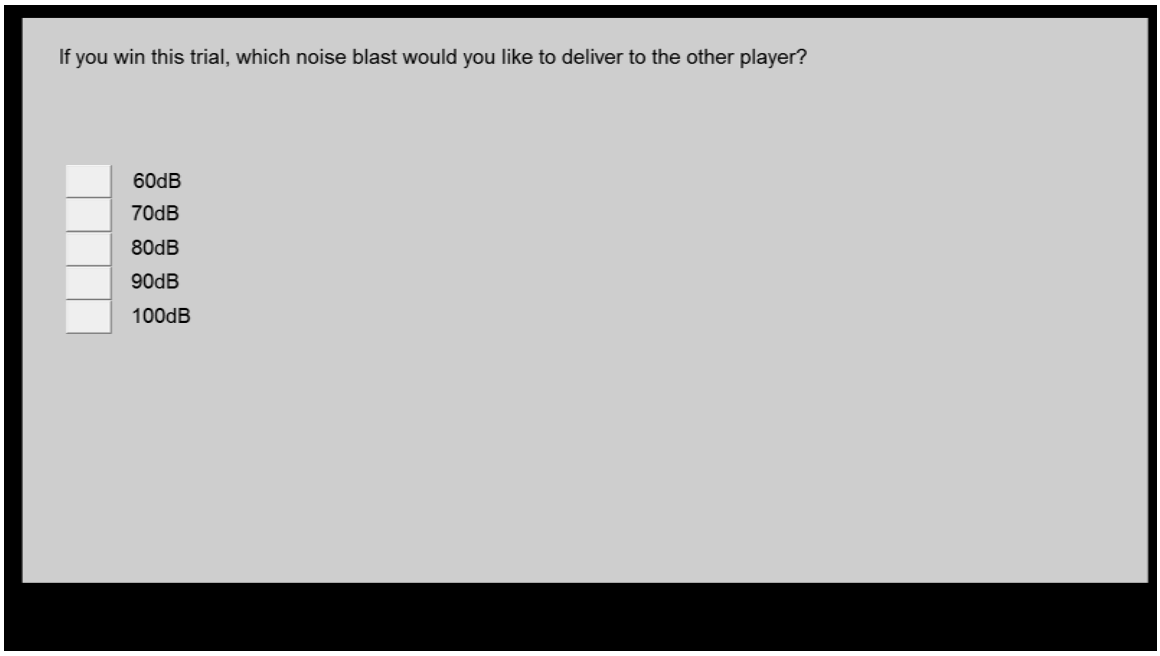
This is a reaction time game. At the beginning of each trial you will be asked which noise blast you would like to deliver to the other player if you were to win. Then # # # will appear in the center of the screen, indicating that a plus sign is about to appear.

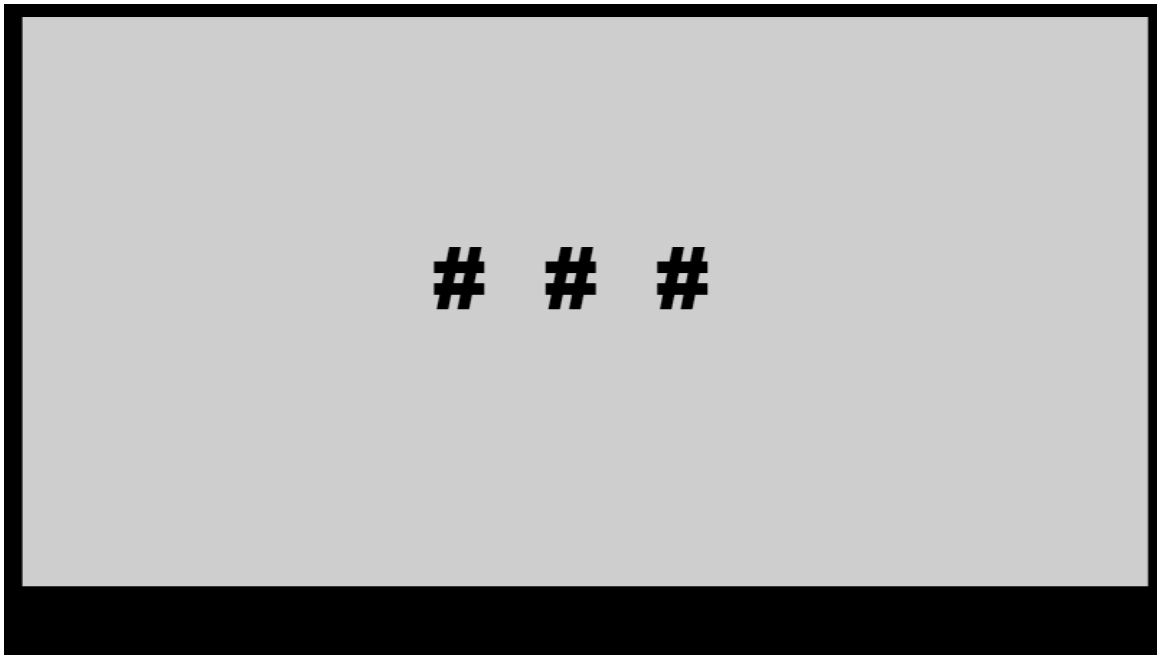
Press the "1" key if it appears on the left side of the screen. Press the "9" key if it appears on the right side of the screen. Both keys are marked with red stickers. If you react faster than the other player, you will earn two points for <*insert selected organization*> and deliver a noise blast to the other player. If you react slower than the other player he or she will receive two points for their organization and you will receive a noise blast from him or her.

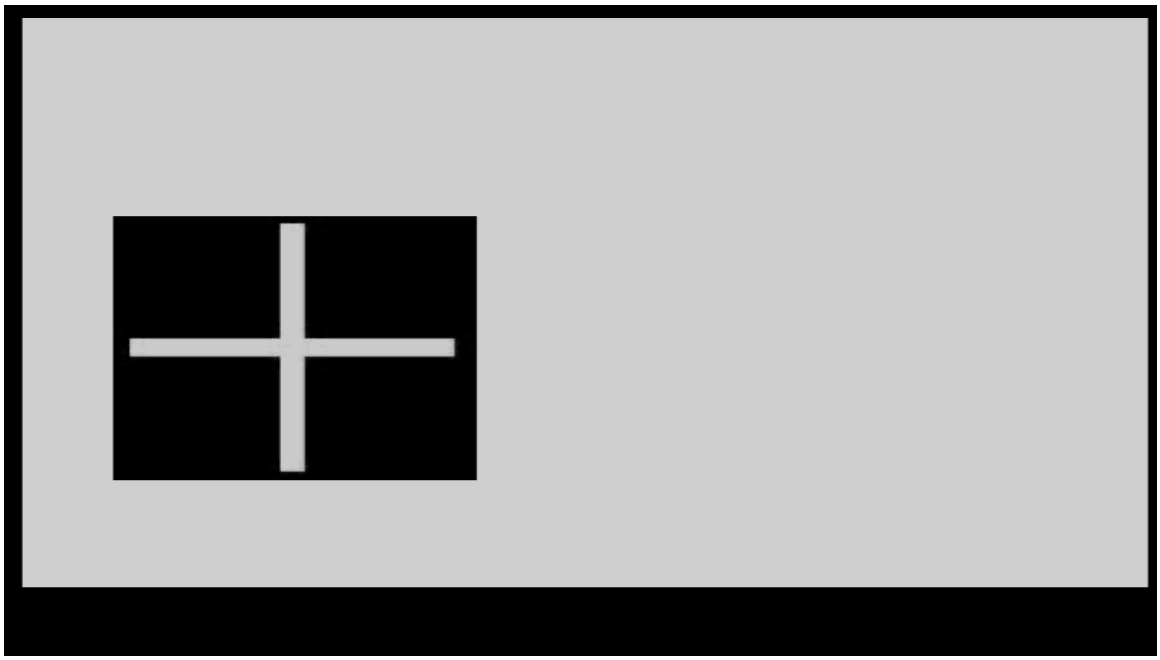
There will be two blocks of five trials, for a total of 10 trials. After each trial you and the other player have the chance to send comments to one another. You do not have to send comments – you will first be asked whether or not you want to do so. If you respond yes, you can write a brief comment to send to the other player. If you respond no, you will not write a comment. You will then see and read any comment the other player chooses to send.

You will now hear a sample noise blast and then play three practice rounds, before we start keeping score. Please put on your headphones and click the "Sample Noise Blast" button. Click continue when you are ready to play the practice rounds.

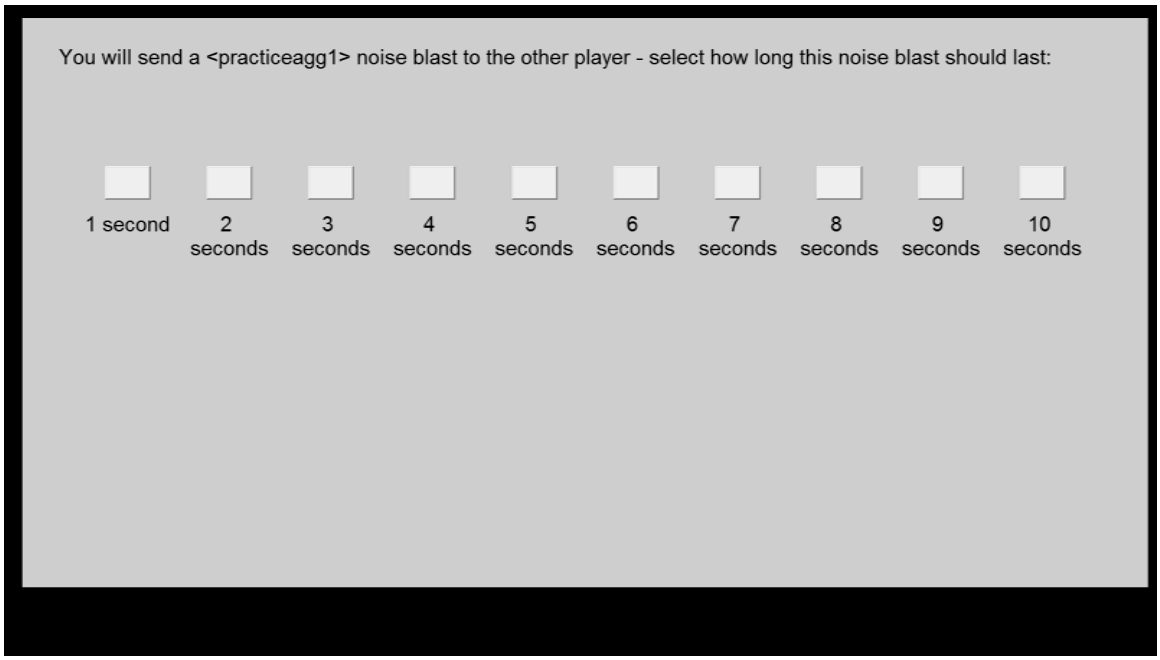
APPENDIX E
SAMPLE GAME SCREENSHOTS

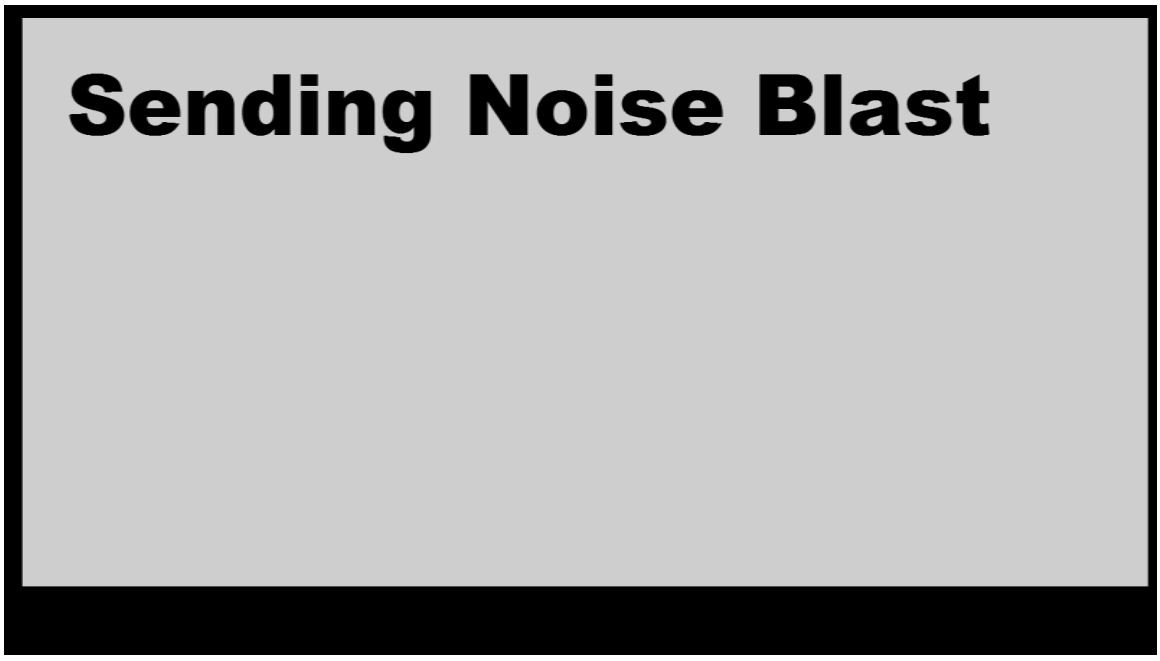

If you win this trial, which noise blast would you like to deliver to the other player?
60dB
70dB
80dB
90dB
100dB


# # #



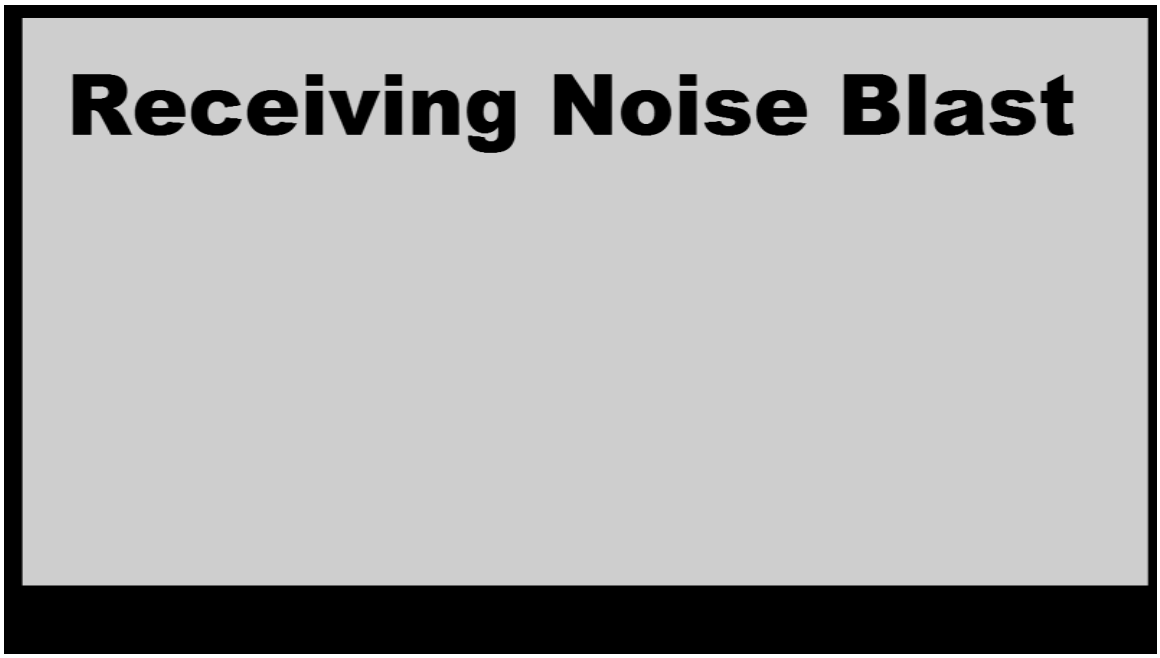
You Win!


You will send a <practiceagg1> noise blast to the other player - select how long this noise blast should last:
1 second
2 seconds
3 seconds
4 seconds
5 seconds
6 seconds
7 seconds
8 seconds
9 seconds
10 seconds


Sending Noise Blast

OR





APPENDIX F
SEXUAL ORIENTATION MANIPULATION

Straight Other Player

Gender: Male

Age: 19

Major: Psychology

Relationship Status: Single, dating casually

Favorite Hobbies: Biking, listening to music

Ideal Career: Youth Counselor

Involved with Campus Organizations: Yes

- First Generation Student Alliance – I joined this group because I am a first-generation college student and I was excited about their work to improve the experience of first generation college students at ASU.
- ASU Student Government – Since I'm a freshman, I'm not an elected member yet, but I've been attending the senate meetings and I hope to run next year.

Playing for: United Food Bank

Based on our research on the social networks at ASU, we estimate that you and this player have 1 friend or acquaintance in common (low interconnectedness condition).

Based on our research on the social networks at ASU, we estimate that you and this player have 4 friends or acquaintances in common (high interconnectedness condition).

Gay Other Player

Gender: Male

Age: 19

Major: Psychology

Relationship Status: Single, dating casually

Favorite Hobbies: Biking, listening to music

Ideal Career: Youth Counselor

Involved with Campus Organizations: Yes

- Gay and Lesbian Student Alliance – I joined this group because ***I identify as gay*** and I was excited about their work to increase the acceptance of gays and lesbians at ASU.
- ASU Student Government – Since I'm a freshman, I'm not an elected member yet, but I've been attending the senate meetings and I hope to run next year.

Playing for: Gay and Lesbian Community Educators

Based on our research on the social networks at ASU, we estimate that you and this player have 1 friend or acquaintance in common (low interconnectedness condition).

Based on our research on the social networks at ASU, we estimate that you and this player have 4 friends or acquaintances in common (high interconnectedness condition).

APPENDIX G

COMMENTS SENT BY OTHER PLAYER

Gay Other Player

- *Blocks 1 and 2*
    - I'm not really sure what to write here, but it's pretty cool that we got to choose organizations to play for. Gay and Lesbian Community Educators did a presentation at my high school last year and I think it really changed people's attitudes.
    - Finally won one! Two points for Gay and Lesbian Community Educators!
    - I'm winning!
    - We're tied so far! I know gay and lesbian community educators is raising donations to start programs in elementary schools, so I really want to win enough points to help them do that.
- *Blocks 3 and 4*
    - Tied again! I can see why you'd want to support <insert name of participant's organization>, but I really think teaching that homosexuality is normal and should be accepted is such an important public service.
    - :(
    - I lost count… but it's a raffle so I guess any points I won will help gay and lesbian community educators!

Straight Other Player

- *Blocks 1 and 2*
    - I'm not really sure what to write here, but it's pretty cool that we got to choose organizations to play for. United Food Bank did a presentation at my high school last year and I think it really changed people's attitudes.
    - Finally won one! Two points for United Food Bank!
    - I'm winning!
    - We're tied so far! I know united food bank is raising donations to start programs outside Arizona, so I really want to win enough points to help them do that.
- *Blocks 3 and 4*
    - Tied again! I can see why you'd want to support <insert name of participant's organization>, but I really think providing food for the hungry is such an important public service.
    - :(
    - I lost count… but it's a raffle so I guess any points I won will help united food bank!

APPENDIX H
DEMOGRAPHIC AND INDIVIDUAL DIFFERENCE QUESTIONNAIRES

Manipulation Checks

What was the other player's ideal career, according to his profile?

1. Engineer
2. Youth Counselor
3. Nurse
4. I don't remember

Did the other player communicate his sexual orientation?

1. Yes
2. No
3. I don't remember

What was the other player's sexual orientation?

1. Straight
2. Gay

According to the research on social networks at ASU that you read about, social networks at ASU are:

1. Highly interconnected
2. Loosely interconnected
3. I don't remember

Demographic Questions

What is your race or ethnicity?

1. African-American
2. Asian/Asian-American
3. Latino/Latina/Hispanic
4. Native American
5. Middle-Eastern
6. Caucasian/White
7. Biracial/Multiracial
8. Other

How would you describe your social class?

1. Working class
2. Lower middle class
3. Middle class
4. Upper middle class
5. Upper class

What was your family's yearly household income when you were growing up?

1. Less than $15,000
2. $15,001 - $25,000
3. $25,001 - $35,000
4. $35,001 - $50,000
5. $50,001 - $75,000
6. $75,001 - $100,000
7. $100,001 - $150,000
8. $150,000 +

How would you describe your overall political views?
How would you describe your views on social issues?
How would you describe your views on economic issues?

I am… 1 = Very liberal – 7 = Very Conservative

With which political party do you most closely identify?

1. Democrat
2. Republican
3. Independent
4. Libertarian
5. Tea Party
6. Green
7. Other

How religious are you?

I am… 1 = Not religious at all – 7 = Very religious

What is your current religious affiliation?

1. Catholic
2. Christian (Non-Catholic)
3. Jewish
4. Latter-day Saints (Mormon)
5. Muslim
6. Buddhist
7. Hindu
8. Agnostic
9. Atheist
10. Other

How do you choose to label your sexual orientation?

1. Straight/heterosexual
2. Gay/lesbian
3. Bisexual
4. Other

I have felt sexually attracted to:

1. Only females, never to males
2. More often to females, and at least once a male
3. About equally often to males and females
4. More often to males, and at least once a female
5. Only males, never to females

Disgust Sensitivity (Tybur et al., 2009)

0 = not at all disgusting – 6 = extremely disgusting

1. Shoplifting a candy bar from a convenience store.
2. Hearing two strangers having sex
3. Stepping on dog poop
4. Stealing from a neighbor
5. Performing oral sex
6. Sitting next to someone who has red sores on their arm
7. A student cheating to get good grades
8. Watching a pornographic video
9. Shaking hands with a stranger who has sweaty palms
10. Deceiving a friend.
11. Finding out that someone you don't like has sexual fantasies about you
12. Seeing some mold on old leftovers in your refrigerator
13. Forging someone's signature on a legal document
14. Bringing someone you just met back to your room to have sex.
15. Standing close to a person who has body odor
16. Cutting to the front of a line to purchase the last few tickets to a show
17. A stranger of the opposite sex intentionally rubbing your thigh in an elevator
18. Seeing a cockroach run across the floor.
19. Intentionally lying during a business transaction
20. Having anal sex with someone of the opposite sex.
21. Accidentally touching a person's bloody cut.

Perceived Vulnerability to Disease (Duncan, Schaller, & Park, 2009)

1 = Strongly disagree – 7 = Strongly agree

1. It really bothers me when people sneeze without covering their mouths.
2. If an illness is 'going around', I will get it.
3. I am comfortable sharing a water bottle with a friend. (R)
4. I do not like to write with a pencil someone else has obviously chewed on.
5. My past experiences make me believe I am not likely to get sick even when my friends are sick. (R)
6. I have a history of susceptibility to infectious disease.
7. I prefer to wash my hands pretty soon after shaking someone's hand.
8. In general, I am very susceptible to colds, flu and other infectious diseases.
9. I dislike wearing used clothes because you do not know what the last person who wore it was like.
10. I am more likely than the people around me to catch an infectious disease.
11. My hands do not feel dirty after touching money. (R)
12. I am unlikely to catch a cold, flu or other illness, even if it is 'going around'. (R)
13. It does not make me anxious to be around sick people. (R)
14. My immune system protects me from most illnesses that other people get. (R)
15. I avoid using public telephones because of the risk that I may catch something from the previous user.

Sexual Prejudice – Emotions (Cottrell & Neuberg, 2005)

1 = Not at all – 9 = Extremely

1. How morally disgusted are you by gay men, as a group?
2. How morally disgusted are you by lesbians, as a group?
3. How negative do you feel towards gay men, as a group?
4. How negative do you feel towards lesbians, as a group?
5. How angry are you at gay men, as a group?
6. How angry are you at lesbians, as a group?
7. How grossed out are you by gay men, as a group?
8. How grossed out are you by lesbians, as a group?
9. How afraid are you of gay men, as a group?
10. How afraid are you of lesbians, as a group?

Sexual Prejudice – Attitudes (Cottrell & Neuberg, 2009)

1 = Strongly Disagree – 9 = Strongly Agree

1. Gay men, as a group, possess values that directly oppose the values of people like me.
2. Lesbians, as a group, possess values that directly oppose the values of people like me.
3. Gay men, as a group, take away or damage the innocence of children.
4. Lesbians, as a group, take away or damage the innocence of children.
5. Gay men, as a group, seek to limit the personal rights and freedoms of people like me.
6. Lesbians, as a group, seek to limit the personal rights and freedoms of people like me.

7. Gay men, as a group, hold values that are morally inferior to the values of people like me.
8. Lesbians, as a group, hold values that are morally inferior to the values of people like me.

9. Gay men, as a group, endanger the physical safety of people like me.

10. Lesbians, as a group, endanger the physical safety of people like me.

11. Gay men, as a group, take and/or damage the personal property or resources of people like me.

12. Lesbians, as a group, take and/or damage the personal property or resources of people like me.

Sexual Prejudice – Behavioral Intentions (modified from Cottrell & Neuberg, 2005)

1 = I would NOT want to do this at all – 9 = I would want to do this VERY MUCH

1. End the friendship if a male friend came out as gay.

2. End the friendship if a female friend came out as lesbian.

3. Make anti-gay comments in private to a gay man.

4. Make anti-gay comments in public to a gay man.

5. Make anti-lesbian comments in private to a lesbian.

6. Make anti-lesbian comments in public to a lesbian.

7. Avoid gay men.

8. Avoid lesbians.

9. Remove my child from a class taught by a lesbian.

10. Remove my child from a class taught by a gay man.

11. Prevent my child from watching TV shows that portray the lifestyles of gay men in favorable ways.

12. Prevent my child from watching TV shows that portray the lifestyles of lesbians in favorable ways.

13. Damage the property (e.g., by writing “fag” on a house or car) of a gay man.

14. Damage the property (e.g., by writing “dyke” on a house or car) of a lesbian.
15. Fire a male elementary school teacher if he came out as gay.

16. Fire a female elementary school teacher if she came out as lesbian.

17. Vote against a gay male political candidate from my preferred political party.

18. Vote against a lesbian political candidate from my preferred political party.

19. Hit a gay man for coming on to me.

20. Hit a lesbian for coming on to me.

21. Ask two men kissing in public to refrain from doing so.

22. Ask two women kissing in public to refrain from doing so.

Contagion Perceptions

1 = Strongly disagree – 9 = Strongly agree

1. Gay men and lesbians want to socialize young people to have pro-gay attitudes.

2. Gay men and lesbians want to change the attitudes of the people around them to become more pro-gay.

3. Spending a lot of time with a gay man or lesbian is likely to cause a child to support gay rights.

4. Gay men and lesbians want to change children who are heterosexual to become gay or lesbian instead.

5. Spending a lot of time with a gay man or lesbian is likely to cause a child to become gay or lesbian.

Aggression Scale (Buss & Perry, 1992)

1. Once in a while I can't control the urge to strike another person.
2. Given enough provocation, I may hit another person.
3. If somebody hits me, I hit back.
4. I get into fist fights a little more than the average person.
5. If I have to resort to violence to protect my rights, I will.
6. There are people who pushed me so far that we came to blows.
7. I can think of no good reason for ever hitting a person.
8. I have threatened people I know.
9. I have become so mad that I have broken things.
10. I tell my friends openly when I disagree with them.
11. I often find myself disagreeing with people.
12. When people annoy me, I may tell them what I think of them.
13. I can't help getting into arguments when people disagree with me.
14. My friends say that I'm somewhat argumentative.
15. I flare up quickly but get over it quickly.
16. When frustrated, I let my irritation show.
17. I sometimes feel like a power keg ready to explode.
18. I am an even tempered person.
19. Some of my friends think I'm a hothead.
20. Sometimes I fly off the handle for no good reason.
21. I have trouble controlling my temper.
22. I am sometimes eaten up with jealousy.

23. At times I feel I have gotten a raw deal out of life.

24. Other people always seem to get the breaks.

25. I wonder why sometimes I feel so bitter about things.

26. I know that "friends" talk about me behind my back.

27. I am suspicious of overly friendly strangers.

28. I sometimes feel that people are laughing at me behind my back.

29. When people are especially nice, I wonder what they want.

Scales for Participants Who Chose to Switch Partners Only

Need for Cognition (Cacioppo & Petty, 1982)

1 = Extremely uncharacteristic – 5 = Extremely characteristic

1. I would prefer complex to simple problems.
2. I like to have the responsibility of handling a situation that requires a lot of thinking.
3. Thinking is not my idea of fun.
4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.
5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.
6. I find satisfaction in deliberating hard for long hours.
7. I only think as hard as I have to.
8. I prefer to think about small, daily projects to long-tern ones.
9. I like tasks that require little thought once I've learned them.
10. The idea of relying on thought to make my way to the top appeals to me.
11. I really enjoy a task that involves coming up with new solutions to problems.
12. Learning new ways to think doesn't excite me very much.
13. I prefer my life to be filled with puzzles that I must solve.
14. The notion of thinking abstractly is appealing to me.
15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.
16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort.
17. It's enough for me that something gets the job done. I don't care how or why it works.

18. I usually end up deliberating about issues even when they do not affect me personally.

Need for Structure (Neuberg & Newsom, 1993; Thompson et al., 2001)

1 = Strongly Disagree – 6 = Strongly Agree

1. It upsets me to go into a situation without knowing what I can expect from it.
2. I'm not bothered by things that interrupt my daily routine.
3. I enjoy having a clear and structured mode of life.
4. I like to have a place for everything and everything in its place.
5. I enjoy being spontaneous.
6. I find that well-ordered life with regular hours makes my life tedious.
7. I don't like situations that are uncertain.
8. I hate to change my plans at the last minute.
9. I hate to be with people who are unpredictable.
10. I find that consistent routine enables me to enjoy life more.
11. I enjoy the exhilaration of being in unpredictable situations.
12. I become uncomfortable when the rules in a situation are not clear.

Thought-Action Fusion (Shafran et al., 1996)

0 = Strongly disagree – 4 = Strongly agree

1. Thinking of making an extremely critical remark to a friend is almost as unacceptable to me as actually saying it.
2. Having a blasphemous thought is almost as sinful to me as a blasphemous action.
3. Thinking about swearing at someone else is almost as unacceptable to me as actually swearing.
4. When I have a nasty thought about someone else, it is almost as bad as carrying out a nasty action.

5. Having violent thoughts is almost as unacceptable to me as violent acts.

6. When I think about making an obscene remark or gesture in church, it is almost as sinful as actually doing it.

7. If I wish harm on someone, it is almost as bad as doing harm.

8. If I think about making an obscene gesture to someone else, it is almost as bad as doing it.

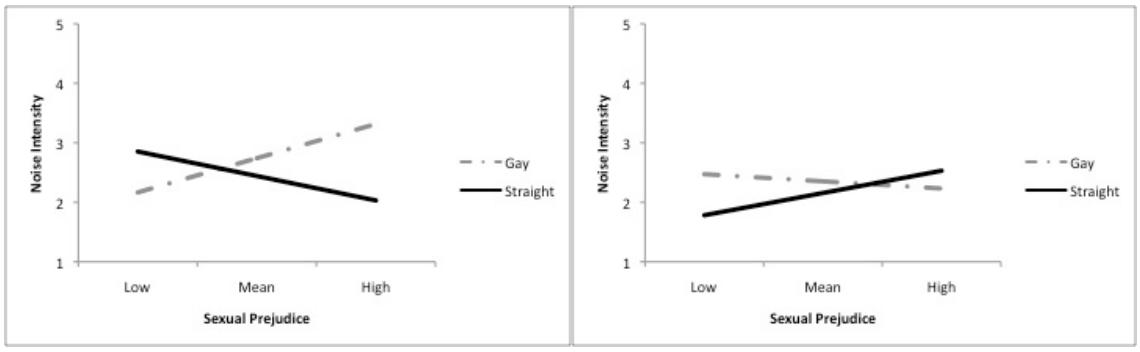
9. When I think unkindly about a friend, it is almost as disloyal as doing an unkind act.

10. If I have a jealous thought, it is almost the same as making a jealous remark.

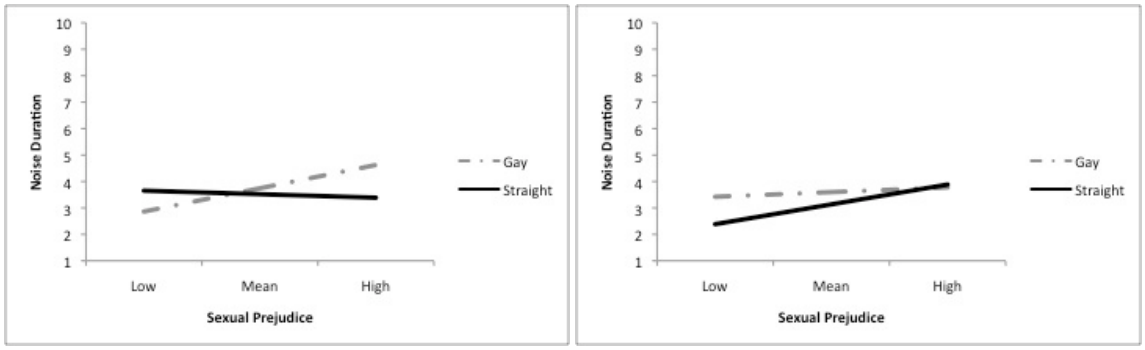
11. Thinking of cheating in a personal relationship is almost as immoral to me as actually cheating.

12. Having obscene thoughts in church is unacceptable to me.

APPENDIX I
FIGURES FOR INTENSITY AND DURATION OUTCOMES

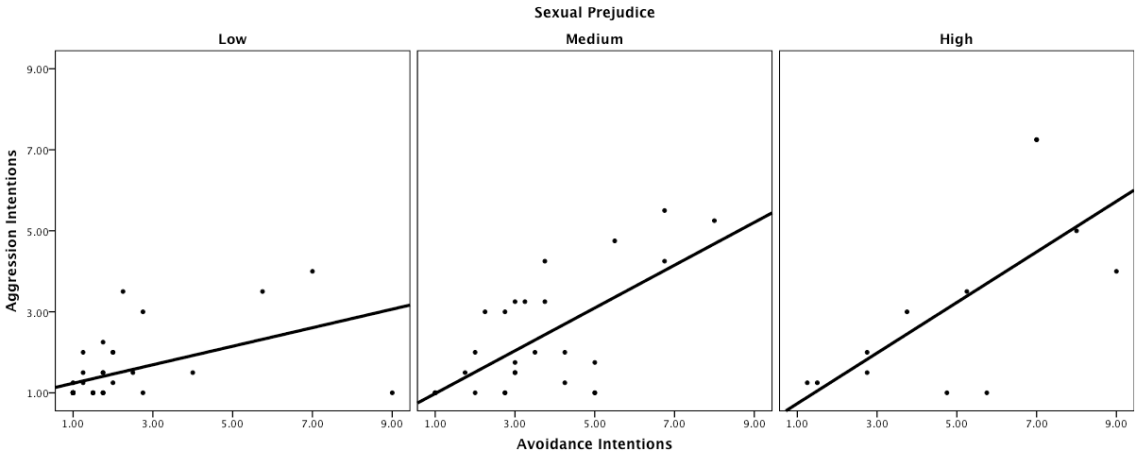


Appendix I, Figure 1a and 1b. Perceiver aggression (noise blast intensity) in the highly (left) and loosely (right) interconnected conditions as a function of target sexual orientation and perceiver sexual prejudice.



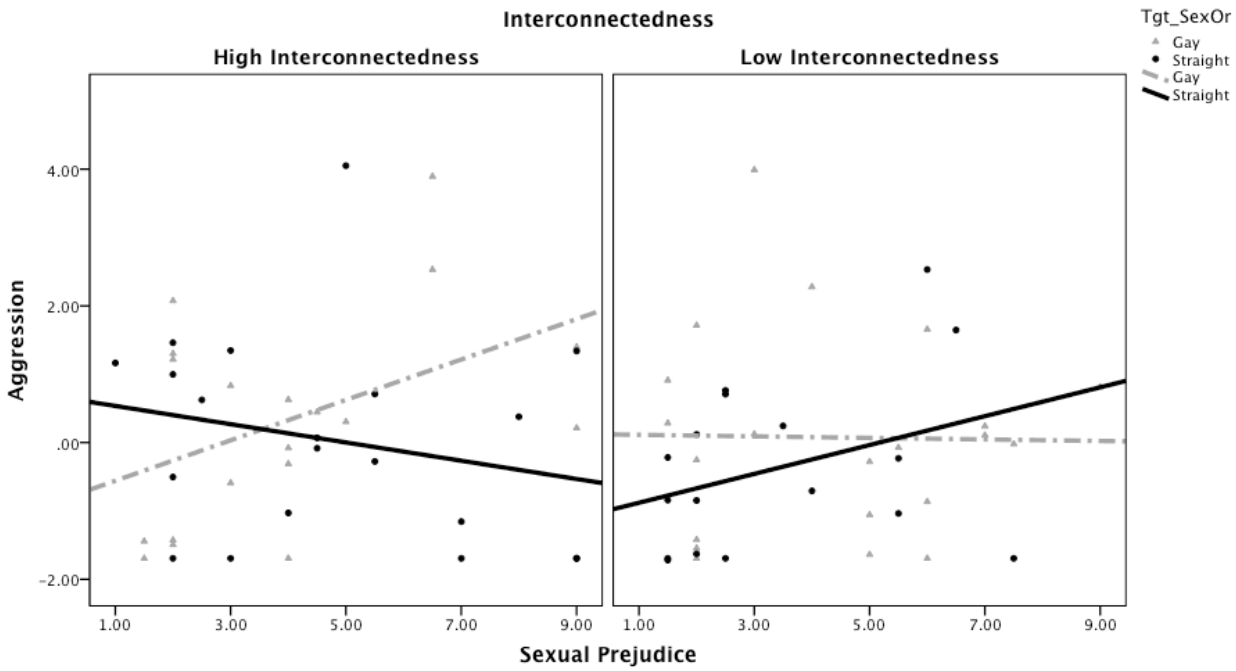
Appendix I, Figure 2a and 2b. Perceiver aggression (noise blast duration) in the highly (left) and loosely (right) interconnected conditions as a function of target sexual orientation and perceiver sexual prejudice.

APPENDIX J
SCATTERPLOTS FOR CORRELATIONS BETWEEN AGGRESSION AND AVOIDANCE INTENTIONS



Appendix J, Figures 1a, 1b, and 1c. Correlation between intentions to avoid gay men and intentions to aggress against gay men and low (left), medium (middle), and high (right) levels of sexual prejudice.

APPENDIX K
SCATTERPLOTS OF STUDY 4 THREE-WAY INTERACTION



Appendix K. Figures 1a and 1b. Perceiver aggression in the high (left) and low (right) interconnectedness conditions as a function of target sexual orientation and perceiver sexual prejudice.