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Filthy Movies and Filthy Germs: The Link Between Pathogens and Tolerance Towards

Pornography

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in Communication

by

Christopher Scott Seaman

Committee in charge:

Professor Daniel Linz, Chair

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September 2014

The dissertation of Christopher Scott Seaman is approved.

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July 2014

Filthy Movies and Filthy Germs: The Link Between Pathogens and Tolerance Towards

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ABSTRACT

Filthy Movies and Filthy Germs: The Link Between Pathogens and Tolerance Towards Pornography

by

Christopher Scott Seaman

Censorship has been a heavily investigated topic within the field of Communication, and explanations of why individuals support the censorship of media, particularly pornography, have traditionally relied upon either the third-person effect, or theories of personality, such as authoritarianism. However, recent research within the field of evolutionary psychology has suggested that the generation of particular cultural values have arisen because they indirectly influenced pathogen avoidance. Based upon the parasite model of democratization developed by Thornhill, Fincher and Aran (2009), it was tested whether the reduction of pathogens in decreases authoritarianism and restrictiveness of sexuality, which subsequently decreases support for the censorship of pornography. An analysis of country-level data was undertaken to test whether the historical prevalence of pathogens in a country is related to the legal status of pornography. In addition, an online experiment was administered, in which participants were exposed to either a pathogen prime, a threatening gun prime, or a control. While results did not show a clear link between pathogens and censorship, some interesting results were found.

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I. Introduction

Depictions of sexual acts have been present in many cultures for thousands of years. Paleolithic art is littered with erotic images of women that emphasize traits cross-culturally valued in female mates: large hips, small waists, large buttocks, and, to a lesser extent, large breasts (Guthrie, 2005). In addition, Paleolithic artists created many images of erect penises, as well as vulvae. While some scholars have tried to downplay the erotic nature of these images, newer research grounded in anthropological and evolutionary research on human sexuality suggests that these images were explicitly designed to act as triggers for sexual arousal (Guthrie, 2005). However, despite the similarities to what we commonly refer to today as pornography, there are also some very important distinctions.

First, actual depictions of copulation are rare in Paleolithic art (Guthrie, 2005). This is in contrast to contemporary pornography, in which explicit depictions of sexual acts are exceedingly common. Given that concealed copulation is universal across cultures (Brown 1991), it is likely that the rarity of these images is due to taboos regarding the open display of copulation. Second, unlike contemporary pornography, Paleolithic erotic images were not created for the widespread consumption of others. Guthrie (2005) points out those males in groups that rely upon subsistence economies (e.g., hunter-gatherer societies) often do not obtain their first wife until their late twenties to early thirties. However, male sexual appetite peaks between the ages of 17 and 19, meaning that, barring potentially risky short-term mating opportunities, many males would have encountered significant delays to the gratification of sexual desire. Therefore, it is likely that many of the artists of Paleolithic images were young men who created these images as some sort of personal sexual release or

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focus (Guthrie, 2005). Contrast this with modern day pornography (excluding homemade amateur videos), which is mass produced and distributed by production companies with the intent of generating profit. This has allowed for sexual depictions that appeal to niche desires to proliferate, creating an incredible diversity of sexual images, some of which violate deeply ingrained cross-cultural taboos. Thus while the function of Paleolithic and contemporary sexual images are the same (i.e., eliciting sexual arousal), the content and production of those images are quite distinct. These more contemporary sexual images began to emerge between the Renaissance and French Revolution due to the invention of the printing press and the subsequent emergence of a print culture. Before this point written, drawn, and printed sexually explicit materials were almost exclusively only available to a small proportion of society that consisted of social elites (Meese Commission, 1986). However, with the advent of the printing press, sexual depictions could become distributed at a mass level that was never possible before. Thus, pornography is essentially distinguished by other types of sexual depictions as being a form of mass media.

Furthermore, contemporary pornography, since its beginnings, has been inextricably linked with modernity and democratization, which has caused it to be perceived as a threat by established authority and traditionalist elements of society (Hunt, 1996). The result of this is that contemporary pornography has been created and defined out of the conflict between "liberal" producers of pornography who attempted to push the boundaries of decency and societal norms, and the "conservative" authority figures who attempted to censor these messages to prevent the perceived encroachment of modernism and its harmful effects (Hunt 1996). Indeed, Linz and Malamuth (1993) argue that liberal versus conservative clashes over

pornography are rooted within the broader normative theories of each perspective concerning both the role of the press in society and the extent to which government is involved in controlling public morality. While one could argue that this explained by religious belief, totalitarian Marxist states such as the People's Republic of China, which is officially atheist, censors pornography with the explicit intention of protecting public morality ("Latitude", 2013). Therefore the roots of censorship go deeper than any particular religious ideology.

This relationship between conservative and liberal normative perspectives has continued up into the present. Out of the sexual revolution and social upheaval of the 1960's came the popularity and normalization of hardcore pornography in the United States, which was met with strong attempts at censorship that ultimately failed as cultural mores shifted (Allyn, 2001). Today, only the most extreme types of pornography (bestiality, coprophilia, depictions of rape, etc.) have any chance of being found criminally obscene by a court in the United States. In contrast, in 1973, at the height of the sexual revolution, the Supreme Court found sexually explicit illustrations in violation of obscenity laws (*Miller v. California*, 1973).

To summarize, there seems to be a strong link between the democratization and liberalization of a society and the tolerance towards pornography within that society. However, why might such a link exist? Based upon the parasite model of democratization developed by Thornhill, Fincher and Aran (2009), I will argue that the reduction of pathogens in society plays a strong role in its democratization and liberalization, which subsequently causes greater tolerance towards pornography. Counter-intuitively, this

democratization effect of diminishing pathogens not only increases tolerance towards pornography, but concurrently increases gender-equality in economic and social spheres, as well. To develop this argument, I will begin by reviewing two areas of research that have commonly been used to explain support for the censorship of pornography: authoritarianism (and its influence by threat), and the third-person effect. Then, I will explicate why, based upon evolutionary theory and prior pathogen research, these two conventional explanations for the support of censorship of pornography might actually be confounded by the pathogen hypothesis. Specifically, I will propose that authoritarianism is potentially one of two proximal processes responsible for support of the censorship of pornography, along with sociosexuality, that can ultimately be explained by evolved adaptations for pathogen avoidance. Furthermore, while the third-person effect has often been used to explain support for the censorship of pornography, I will hypothesize that its ability to predict support for censorship could be confounded by both the equivalent impact of first perception perceptions, as well as the relative predictive power of the pathogen hypothesis. Finally, I will develop a set of hypotheses and outline a study that provide a critical test of whether authoritarianism and the third-person effect explanations of pornography censorship are exogenous causal factors or, as the pathogen hypothesis predicts, they are actually mediating and spurious factors, respectively.

II. Literature Review

Before discussing how pathogens may underlie the support for pornography censorship, it's important to first discuss those factors that have been already identified as influencing these attitudes. Thus, the literature on two such factors (authoritarianism and the third person

effect) will first be reviewed.

A. Authoritarianism, Threat, and Censorship

One of the most widely researched factors underlying the support of censorship is authoritarianism. According to Altemeyer (1988), authoritarianism is defined by strict attachment to conventional rules and norms, aggressive feelings towards people who violate those rules and norms, and an unquestioning acceptance of authority. Altemeyer (1988) proposed that the covariation between these three clusters of personality traits (conventionalism, authoritarian aggression, and authoritarian submission) defined the authoritarian personality. Based upon Altemeyer's definition, authoritarianism should be an important influence on support for censorship for two reasons. First, the aggressive feelings authoritarians feel towards those who transgress conventional rules and norms provides a strong underlying motivation for the suppression of deviant and unpopular forms of speech. Second, the uncritical acceptance of authority that is characteristic of authoritarianism should increase the perceived effectiveness of censorship as a means of dealing with deviant and unpopular speech. In addition, authoritarians have been described by Adorno, Frenkel-Brunswik, Levinson, & Sanford (1950) and others (Byrne, Cherry, Lamberth, & Mitchell, 1973; Kelley, 1985) as being particularly concerned about adherence to sexual rules and norms. Therefore, authoritarians should be particularly willing to censor pornography, compared to other types of unpopular speech.

Concordant with this reasoning, a variety of studies have demonstrated that endorsement of authoritarian attitudes is associated with support for censorship. Suedfeld,

Steel, & Schmidt (1994) and Busha (1970) demonstrated that authoritarianism was strongly associated with greater support of censorship generally, while Lambe (2008) found that endorsement of authoritarian attitudes strongly predicted support for various specific censorship policies (e.g., prior restraint, subsequent punishment). In addition, several studies supported found support for the hypothesis that authoritarians are particularly willing to censor pornography. For example, Fisher, Cook and Shirkey (1994) found that authoritarianism was a significant predictor of support for the censorship of both sexual and violent media, but that this relationship was significantly stronger for sexual media than for violent media (.32 versus .14) and Lambe (2004) found that authoritarianism predicted both support for the censorship of pornography and hate speech, but that this relationship was stronger for pornography.

While authoritarianism has traditionally been measured as unidimensional (Adorno et al., 1950, Altemeyer, 1988), more recent research has suggested that authoritarianism might actually be multidimensional in nature. Altemeyer's (1988) conceptual definition of authoritarianism consisted of three distinct, yet interrelated, clusters of traits (i.e., conventionalism, authoritarian aggression, and authoritarian submission), while his operational definition treated authoritarianism as a single latent construct. However, Funke (2005), Passini (2008), and Mavor, Louis, and Sibley (2010) have all found evidence that a three-factor solution where conventionalism, aggression, and submission are each treated as a distinct latent variable is a better fit to the data than Altemeyer's one-factor solution. In addition Rattazzi, Bobbio and Canova (2007) also found that, using a shortened version of the original right-wing authoritarianism scale (Altemeyer, 1988), a two-factor solution (in

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which authoritarian aggression and submission were combined as a single latent variable) was also supported.

Furthermore, while both Altemeyer (1988) and Adorno et al. (1950) conceived of authoritarianism as being a stable personality trait, this idea has since come under significant criticism. Duckitt (1989) first suggested that, rather than being an aspect of personality, authoritarianism would be better conceptualized as attitudes towards the normative relationship between the individual and the group. In other words, authoritarianism is the extent to which it is believed that the individual should be subordinated to the group. Using this definition, Duckitt (1989) reconceptualized Altemeyer's (1988) original three constructs of the authoritarian personality in terms of specific group attitudes. Conventionalism was re-conceptualized as attitudes concerning how much of an individual's behaviors should conform to group norms, and how strictly these norms should be followed. Authoritarian aggression was re-conceptualized as attitudes concerning how severe punishment for norm violation should be, and how strictly should these punishments be enforced. Finally authoritarian submission was conceptualized as attitudes concerning the extent to which in-group authorities should be deferred to unconditionally, as well as how much they should be deferred to due to their role or status in the group (Duckitt, 1989).

The conceptualization of authoritarianism as attitudinal rather than as a personality trait has important implications about its intra-individual stability. If authoritarianism is a personality construct as Altemeyer (1988) proposed, we would predict that it should be very resistant to change. However, if it is actually attitudinal, as Duckitt (1989) hypothesized, we would expect, like other types of attitudes, that it would be possible to influence. Indeed,

there has been some research to suggest that there are certain conditions under which it can actually be increased. One of the most important of these conditions is when individuals are under threat. For example, in a classic study, Sales (1973) analyzed archival data from two threatening and two nonthreatening historical periods and found that various cultural markers of authoritarianism (e.g., expenditure on police protection, severity of criminal punishment, legislation requiring oaths of loyalty, etc.) increased when there was significant environmental threat during that time period. Doty, Peterson & Winter (1991) obtained similar findings using many of Sale's (1973) same measures when examining archival data between 1978 and 1987.

Later studies explored the effect of threat on authoritarianism using individuals as the unit of analysis, particularly within the literature on terrorism. For example, Bonanno and Jost (2006) surveyed individuals who lived near the World Trade Center during the 9/11 attacks and found that perceived threat of future terrorist attacks significantly predicted authoritarianism a year later, while Huddy, Feldman, Taber, and Lahav (2005) also found that perceived threat of future terrorist attacks was significantly related to authoritarianism. In a related study, Echebarria-Echabe and Fernandez-Guede (2006) conducted a quasi-experiment in which Spaniards were asked questions about various political opinions and attitudes both before and after the terrorist attacks in Madrid on March 11th. The results of their study demonstrated that there were statistically significant increases in authoritarianism among participants after the terrorist attacks occurred. In addition, Dallago and Roccato (2010) found that, even when controlling for important personality traits (i.e., conscientiousness, openness), perceived societal threat was the strongest predictor of

authoritarianism.

Feldman (2003), expanding on the work of Duckitt (1989), theorized that threat may actually be an integral component of authoritarianism. While agreeing that authoritarianism is essentially the belief in the relative importance of group conformity over individual autonomy, Feldman (2003) proposed that this belief should always be contingent on the extent to which there is perceived to be a threat to social cohesion. Absent such a threat, there will be no tension between conformity to group norms and the individual autonomy of group members. In this sense, authoritarianism can be conceptualized as the interaction between individual attitudes regarding the relative importance of the group over the individual and the situational threat to the group's cohesion and stability. This hypothesis was partially supported by Stellmacher and Petzel (2005), who found that authoritarianism was activated only for those participants who were part of a group under threat. However, contrary to Feldman's (2003) theory that threats to social cohesion generally should activate authoritarianism, Stellmacher and Petzel (2005) only found an effect for those individuals who identified strongly with the group that was under threat. Therefore, threats may not instigate authoritarianism if the threat does not specifically target the person themselves, or a group that they closely associate with. However, in the absence of a threat, authoritarianism may not be activated.

However, there is some evidence to suggest that the relationship between threat and authoritarianism may not be direct. Duckitt and Fisher (2003) have found evidence that suggests that the relationship between threat and authoritarianism is fully mediated by dangerous world beliefs. In other words, the more that an individual perceives societal threat

the more dangerous they will believe the world to be, which in turn leads to authoritarianism.

Consistent with theoretical reasoning, studies have demonstrated that increases in perceived threat ultimately lead to greater support for censorship. For example, Hetherington and Suhay (2011) found that when perceived threat of terrorism was low, those who espoused authoritarian attitudes showed significantly more support for the censorship of media. However, when perceived threat of terrorism was high, there were no significant differences in the support for censorship amongst high versus low authoritarians, suggesting a convergence in beliefs in response to threat. Therefore, we would expect those who perceive a stronger threat to their safety to be significantly more likely to endorse the censorship of media.

B. The Third Person Perception and Support for Censorship

Another framework that researchers have attempted to use to investigate support for censorship has been the third person effect. Davison (1983) first formulated the third-person effect hypothesis that states, in part, that individuals will overestimate the effects of messages on others relative to themselves. This hypothesis has received consistent empirical support across many studies in different contexts (e.g., Davison, 1983; Rojas, Shah, & Faber, 1996; Eveland, Nathanson, Detenber, & McLeod, 1999; Reid, Byrne, Brundidge, Shoham, & Marlow, 2007; Tsafi & Cohen, 2009).

There are varying explanations as to why the third-person effect occurs. Some researchers believe that individuals overestimate the effects of media on others relative to

themselves in order to maintain and reinforce a positive self-image (Gunther & Mundy, 1993). Others researchers maintain that the third-person effect arises based upon inferences about whether or not, and to what extent, specific others will be exposed to particular harmful media (Eveland et al., 1999). Thus, the more that an individual assumes that some "other" will be exposed to pornography, the more likely they will be to assume it will have harmful effects on that other. Self-categorization has also been forwarded as a possible explanation for third-person effects (Reid & Hogg, 2005; Reid et al., 2007), suggesting that the third-person effect occurs when an individual is evaluating the effects of some media on an out-group member and the form of influence is perceived to be normative for that out-group.

In a critical test of these three perspectives, Reid et al. (2007) conducted an experiment in which they found strongest support for the self-categorization explanation, while finding no support for the exposure explanation. Thus, it appears group norms and normative influence play a strong role in determining third-person person perceptions. Zhang (2010) later refined Reid et al.'s (2007) application of self-categorization theory to the third-person effect by reformulating it as a dual process model combining both self-categorization and self-enhancement processes. Zhang (2010) suggests that the third-person effect is influenced by self-enhancement when the presumed influence is normatively neutral. However, when the presumed influence has a normative component, self-categorization processes act as a "leash" on self-enhancement, bringing the assessment of either first-person or third-person effects in line with the relevant norm. Zhang (2010) found strong support for this dual process model, and it currently provides the best explanation for the third-person

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effect based upon the available data.

Many researchers have suggested that third-person effect has direct implications for the censorship of media. If the perceived effects of media on others, versus the self, are vastly overestimated, then the concern that others are much more at risk could potentially influence our support of censorship. Several earlier studies claimed to find evidence that increases in the "gap" between first-person and third-person perceptions of media effects strengthen the willingness to censor media (particularly pornography). Rojas et al. (1996) conducted a study in which they asked participants to evaluate the effects of media on themselves and others, as well as whether they supported different forms of media censorship. They found that the more that individuals claimed that media generally, as well as pornography specifically, affected others more than themselves, the more willing they were to censor. Another study by Gunther (1995) also found a significant correlation between the perceptual gap of third and first-person effects, and support for the censorship of pornography.

Later studies, however, have questioned the robustness of the perceptual gap in predicting support for censorship. Feng and Guo (2012) undertook a meta-analysis of third-person effects studies, and found that the overall effect size for the perceptual gap was actually quite weak. However, what might account for the significance of these earlier findings?   More recent studies have found that the perceived effects on both self and others together are a better predictor of support for censorship. For example, Lo and Paddon (2000) statistically compared the relative impact of the magnitude of the perceptual gap in pornography effects (i.e., the difference between first-person perceptions, which is the extent

to which one perceives media to affect oneself, and third-person perceptions) to the perceived influence of pornography on both self **and** others on support for censorship of pornography. The results of their study demonstrated that the perceptual gap was not a significant predictor of support of censorship, but both the perceived effects on self and others were. Lo, Wei and Wu (2010) directly compared the influence of third-person and first-person perceptions on support for the censorship of pornography and also found that both perceived effects on self and others better explained support for censorship than either did individually. McLeod, Detenber, Eveland (2001) similarly found that both the perceived effects on others, as well as the perceived effects on oneself, equally predicted support for censorship. Thus, while most individuals overestimate the effects on others relative to themselves, it appears that overall perceived effects significantly predict support for censorship. Interestingly, Lo and Wei (2002) found that perceived effects on males (whether they were oneself or other males) were a stronger predictor of support of pornography censorship than perceived effects on females. This is what we would predict if individuals were assessing the risks of pornography according to normative judgments of who is most vulnerable. Thus, according to self-categorization theory, perceived effects on both self and others should have a stronger influence on support for censorship when the form of influence is normative for the group supposedly being affected.

To summarize, while earlier research suggested that the third-person effect and the "perceptual gap" between the perceived effects of harmful media on oneself versus others was an important determinant of support for the censorship of that media, this notion has been challenged by more recent studies. Regardless of the third-person effect, individuals are

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more likely to support censorship of pornography if they believe it has negative effects on anyone, themselves included (e.g., Lo et al., 2010). Furthermore, there is some limited evidence to suggest that individuals are more likely to support the censorship of pornography if they believe that there is a particularly vulnerable sub-population that could potentially be affected (Lo and Wei, 2002).

C. A Unique Link Between Pathogens, Authoritarianism, and Censorship?

Now that prior research investigating the effects of authoritarianism and third person perceptions on censorship has been reviewed, the possible influence of pathogens will be discussed. First, research on the effect of pathogens on human behavior and the concept of the behavioral immune system will be introduced. Next, recent studies extending the behavioral immune system to cultural phenomena will be reviewed, including the theoretical model forming the basis of the current work. Finally, this model will be integrated with the prior research on pornography censorship, and a set of hypotheses will be proposed to test whether pathogens and the behavioral immune system can provide a system of explanation for the censorship of pornography.

1. The Evolutionary Importance of Pathogen-Stress

Infectious diseases have been a recurrent threat to many organisms across the span of evolutionary history. The scope of this threat has been so great that it has dramatically impacted the evolution of most macro-organisms. For example, evolutionary biologists (e.g., Hamilton, 1982; Tooby, 1982) have suggested that sexual reproduction (in contrast to asexual reproduction) evolved specifically as a defense against pathogens. Because they

have very short lifespans, pathogens are able to quickly evolve to adapt to the defenses of hosts. But, due to genetic recombination, sexual reproduction increases genetic diversity amongst kin, making it more difficult for pathogens to adapt to different hosts.

2. The Behavioral Immune System

Sexual reproduction is but one example of adaptations that evolved to cope with the threat posed by pathogens. The most commonly recognized of these other adaptations are the immunological systems that fight pathogens within the organism after infection has already occurred. However, biologists now recognize that many organisms also evolved behavioral adaptations that help avoid infection altogether (Breed & Moore, 2011). These adaptations are sometimes referred to as the behavioral immune system, and act as the first line of defense against threats from pathogens (Schaller & Park, 2011).

According to evolutionary psychologists, human beings have also evolved adaptations to avoid infection by pathogens. Schaller and Murray (2009a) suggest that human beings have behavioral immune systems that are specifically designed to detect particular perceptual cues that have been generally reliable indicators of pathogens in ancestral history. The most obvious examples of such cues would be characteristics of physical materials that are vectors for diseases (e.g., feces), such as noxious odors (Oaten, Stevenson, & Case, 2009).

However, adaptations designed to recognize perceptual cues associated with pathogens are not sufficient to function as a behavioral immune system. Along with the ability to recognize pathogen cues, there must also be adaptations that motivate or direct the

organism to avoid these cues when they are encountered. Several evolutionary psychologists (Pinker, 1998; Curtis & Biran, 2001) have suggested that the emotion of disgust evolved to fulfill this function. Disgust is a universal emotion that is uniquely associated with specific set of facial expressions (e.g., wrinkling of the nose), physiological symptoms (e.g., nausea, lowering of blood pressure), and feelings (e.g., revulsion and the desire to withdraw) (Rozin, Haidt, & McCauley, 2000; Curtis & Biran, 2001). Further, while some of the cues that are commonly cited as elicitors of disgust vary across culture, many cues are cross-culturally considered disgusting. Further, those cues that are cross-culturally regarded as disgusting are overwhelmingly vectors for disease: bodily excrement, sexual fluids, open wounds and sores, spoiled food, decaying corpses etc. (Curtis & Biran, 2001). Given that disease vectors are universally regarded as disgusting, and that disgust functions to motivate avoidance of said vectors, it would appear, at first glance, that disgust shows some evidence of design by natural selection.

However, this hypothesis is somewhat complicated by the fact that not all cues that elicit disgust are vectors of disease. For example, moral transgressions such as vulgarity (Curtis & Biran, 2001) or sexual acts performed by other people (Tybur, Lieberman, and Griskevicius, 2009) can also cause individuals to feel disgust. If disgust evolved specifically as an adaptation for pathogen avoidance, why would this be the case? Tybur, Lieberman, Kurzban, and Descioli (2013) suggest that, while disgust did indeed evolve to as an adaptive solution to avoiding pathogens, it was later co-opted to solve two other distinct adaptive problems: avoiding sexual contact with potential mates of low reproductive value and coordinating the condemnation and punishment of those who break the moral rules of their

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social group.

Sexual contact with a mate of low value carries with it a variety of potentially negative reproductive costs (e.g., investing time and resources in a partner that lacks quality genes to pass onto one's offspring. See Buss and Schmitt (1993) and Gangestad & Simpson (2000) for an overview of the various adaptive problems related to mating), while being able to effectively coordinate the condemnation and punishment of those that break the moral rules of the group is necessary to appropriately take sides in conflicts among group members (DeScioli and Kurzban, 2012). Tybur et al. (2013) argue that, in order to solve these two adaptive problems, two distinct sets of cognitive mechanisms evolved as a means of inducing disgust to fulfill each adaptive function. While the emotion (disgust) is experienced in the same way as in response to pathogens, the set of cues that activate that emotion are distinct to each adaptation. With regard to the problem of mate selection, disgust provides an adaptive solution by causing emotional aversion to sexual contact with mates that have been determined, based upon a variety of inputs (e.g., physical attractiveness), to be of low value. For the problem of the coordination of condemnation, disgust provides an adaptive solution by providing an emotional aversion to certain actions, thereby increasing their perceived "wrongness" (DeSciolo and Kurzban, 2012). Furthermore, because disgust is a universal emotion with cross-culturally recognized facial expressions (Curtis & Biran, 2001), it provides a clear signal to others regarding one's emotional reaction to "immoral" actions, which facilitates communication of condemnation (Tybur et al., 2013).

Following from the adaptive functions that disgust serves, Tybur et al. (2009) have hypothesized that disgust can be broadly categorized into three different domains: pathogen

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disgust, sexual disgust, and moral disgust. Results of factor analyses have supported their three-domain model of disgust, with both Tybur et al. (2009) and Olatunji et al. (2012) finding that a three-factor model fits the data significantly better than a single-factor model. In addition, other studies have found evidence that suggest that the three domains of disgust demonstrate associations with other variables that are consistent with Tybur et al.'s (2009) evolutionary hypotheses. For example, given that females would incur greater costs to their reproductive fitness as a result of sexual contact with mates of low value than would males (due to gestation), we should expect that females have a higher sensitivity to sexual disgust. Consistent with these predictions, Tybur, Bryan, Lieberman, Hooper and Merriman (2011) found that, while the factor structure between males and females on the three domains of disgust did not significantly differ, the mean difference between males and females on sexual disgust was quite large (d=1.44). In addition, while females also showed higher pathogen and moral disgust sensitivity than males, the effect sizes of these differences were small (d=0.32 and d=0.23, respectively), which precludes the possibility that females merely have an overall higher disgust sensitivity.

With regard to adaptive function of disgust on morality, Moretti and Di Pellegrino (2010) conducted a study where different affective states (i.e., sadness, disgust, or a neutral control) were first elicited in participants, and were later asked to play an ultimatum game in which they were proposed different offers by either a supposed participant in the study or a computer device. Participants who were primed with disgust judged inequitable offers as being more unfair than participants in either the sadness or neutral condition, and also reported higher condemnation of the proposers of unfair offers. Moreover, the effect of

disgust was only found for those who thought that a human had made the offer, suggesting that disgust does not affect judgments of unfairness unless a particular social norm has been perceived to been broken (Moretti and Di Pellegrino, 2010).

In summary, while disgust originally evolved as an adaptive mechanism to avoid contact with pathogens (Curtis & Biran, 2001), Tybur et al. (2013) suggest that disgust was later co-opted by mechanisms that were designed by natural selection to solve adaptive problems related to mating and coordination of condemnation. Thus, while each domain is activated by a distinct set of cues related to their adaptive function, they all activate the same underlying emotion. Furthermore, activation of disgust in one domain can influence or transfer to reactions related to other domains (e.g., disgust elicited by pathogens can caused increased moral condemnation).

3. Pathogens, Intergroup Attitudes, and Authoritarianism

In addition to mechanisms that cause an organism to avoid direct physical contact with pathogens (e.g., disgust), the behavioral immune system has been hypothesized to influence behaviors that indirectly facilitate pathogen avoidance. For example, some birds will often line their nest with aromatic green plant material to ward off parasites (Clark and Mason, 1985), while certain animals eat particular foods that adversely affect parasites in the digestive systems (Freeland, 1983). Research has even shown that whitefish eggs will hatch earlier than normal if waterborne cues of other infected eggs are detected (Wedekind, 2002), Due to the prevalence of pathogens across human evolutionary history, we should expect that certain human behaviors similarly evolved to act as indirect defenses against pathogens.

Indeed, evolutionary psychologists (Schaller & Murray, 2010; 2011) have hypothesized that the generation of particular cultural practices may have arisen because they indirectly influenced pathogen avoidance. One relevant example of an adaptive cultural phenomenon is collectivism, intergroup attitudes, and authoritarianism.

Fincher, Thornhill, Murray, & Schaller (2008) undertook a study that analyzed data from existing epidemiological and cross-culture studies to examine the link between pathogen prevalence and cultural variation in individualism and collectivism. They hypothesized that collectivism may be an evolved anti-pathogen defense for two reasons. First, collectivism is associated with stronger in-group and out-group distinctions than individualism. Because intergroup interaction was less frequent in ancestral environments, contact with unfamiliar others carried with it a greater risk of exposure to novel pathogens for which the immune system was unprepared. Particularly in environments in which disease was widespread, there would be significant adaptive pressure to avoid contact with outgroups to avoid the danger of novel disease. Subsequently, a heightened sense of out-group aversion would function to safeguard against this risk. Second, Fincher et al. (2008) point out that collectivism is also associated with greater emphasis on conformity and tradition, and that many norms within human societies act as buffers against disease transmission (such as with food preparation). Therefore, in areas with a high concentration of pathogens, heightened conformity and authoritarianism amongst group members would function to reinforce adherence to behaviors that would facilitate avoidance of infectious diseases. The results of their study demonstrated that, even when controlling for confounding cultural variables, there were strong positive correlations (ranging from .44 to

.73) between both historical and current pathogen prevalence and collectivism. This finding has since been replicated in other studies examining disease prevalence and cross-cultural variation in collectivism (Murray & Schaller, 2010; Thornhill, Fincher & Aran, 2009), as well as specific cultural differences concerning the emphasis on conformity and obedience (Murray, Trudeau, & Schaller, 2011)

Several studies that have utilized individuals as the unit of analysis have corroborated Fincher et al.'s (2008) conclusions that threat from pathogens may increase intergroup discrimination. For example, Green et al. (2010) found that individuals who had higher aversion to germs were more likely to endorse attitudes related to social dominance and beliefs in a dangerous world. Subsequently, these individuals were also more likely to hold exclusionary and xenophobic attitudes concerning immigration than those who were less averse towards germs. However, based upon the results of this study, it is unknown whether the pathogen threat was responsible for the negative out-group attitudes, or whether those who hold negative out-group attitudes are also more likely to feel threatened by pathogens. However, Navarette, Fessler, & Eng (2007) undertook a longitudinal study of intergroup attitudes in pregnant females that found support for the former hypothesis. Given that a fetus is most vulnerable to pathogens in the woman's first trimester, they hypothesized that women should have elevated intergroup bias during the beginning of their pregnancy. Indeed, this hypothesis was supported, lending credence to the idea that intergroup attitudes may shift as a disease avoidance strategy.

There have also been several experimental studies that have found evidence of causal effects on intergroup attitudes by pathogen threat. For example, Reid et al. (2012) primed

American participants with pathogen cues and then had them assess the linguistic similarity of a person speaking foreign accented English. They found that for those participants most disgusted by pathogens, being exposed to the parasite prime increased the perceived linguistic dissimilarity of the foreign-accented English speaker. In other words, the threat of pathogens was found to increase the perceptions of intergroup distinction. A separate experiment conducted by Faulkner, Schaller, Park, and Duncan (2004) similarly manipulated disease salience, and found that participants who were primed with pathogens had more negative attitudes towards foreign (versus familiar) immigrants and they were less likely to support policies that would support their immigration.

Fincher et al.'s (2008) conclusion that pathogen threat increases conformity was also recently supported in an experiment undertaken by Murray and Schaller (2012). Participants were primed with pathogens by being asked to recall and explain a time when they felt vulnerable to disease. They were then given both attitudinal measure of conformity, as well as a behavioral measure of conformity that gave them the opportunity to either vote with or against a majority opinion. Results demonstrated both increased behavioral and attitudinal conformity after being primed with pathogens cues. Furthermore, Murray and Schaller (2012) found that this effect was especially pronounced when the participants were asked about violations of norms that could potentially result in the transmission of pathogens (e.g., selling expired meat).

In sum, the aforementioned studies indicate strong evidence linking the threat of pathogens to intergroup attitudes, collectivism, and conformity. This link is crucial in understanding how pathogens may have an underlying influence on support for censorship.

D. The Link Between Pathogens and Censorship

The relationship between pathogens, in-group attitudes and conformity has led some researchers to hypothesize that pathogens play a formative role in the establishment of democracy in particular cultures. Thornhill, et al. (2009) theorize that pathogen load can affect the democratization of societies in three important domains: the willingness of those in power to extend economic and social resources outside of their own kin and ethnic group, the perceived validity of rank and authority by the general population, and attitudes about non-traditional ideas and ways of life.

As was discussed earlier, increased intergroup distinction has served as a functional defense against novel pathogens across human ancestral history. Subsequently, those in power where pathogen prevalence is high will be less willing to extend economic and social resources to those outside of their kin and ethnic groups because of the heightened emphasis on the importance of the in-group, as well as hostility toward the out-group (Thornhill et al., 2009). In addition, the amount of emphasis placed upon conformity, authoritarianism, and upholding norms will be heightened in pathogen loaded environments, as well. Therefore, individuals (particularly out-groups) from these areas will be less willing to challenge hierarchies and power structures and demand participation in governance (Thornhill et al., 2009). Following from these two conditions, attitudes about non-traditional and alternative ways of life will be highly discouraged by both those in power and the general populace (Thornhill et al., 2009).

However, when pathogen load decreases within a particular region, Thornhill et al. (2009) hypothesize that the benefits of intergroup interaction begin to outweigh the costs. This then decreases the emphasis on intergroup boundaries and hostility, and increases the willingness of those in power to extend social and economic resources to out-groups. Further, when the threat of pathogens decreases, this will simultaneously cause a decreased emphasis amongst the general population upon conforming to authority and traditional norms. These factors will then result in increased acceptance of non-traditional and alternative behaviors and lifestyles.

There are two particularly important cultural outcomes that have been observed to arise as a result of decreased pathogen stress in a society: increased acceptance of casual sex and increased gender equality. In their study of pathogens and democratization, Thornhill et al. (2009) found that there was a strong negative correlation ($r = -.5$) between the amount of pathogens in a particular country and the amount of political and economic participation and decision-making that women had in that country. They concurrently found a moderately strong positive correlation ($r = .43$) between gender equality and the permissiveness towards sexual relationships without long-term commitments (Thornhill et al., 2009). However, this relationship was even stronger when explicitly examining the relationship between gender equality and women engaging in casual sex ($r = .62$). Therefore, Thornhill et al. (2009) conclude that decreasing the level of pathogens in a given society will result in greater equality for women, and thus less restrictive norms regarding female sexuality. In a similar study, Schaller and Murray (2008) directly correlated permissiveness towards casual sex with pathogen prevalence, and found a strong negative correlation for women ($r = -.62$), and

a weak but significant correlation for men ($r = -.27$). The correlation between pathogen prevalence and sexual permissiveness for women remained strongly negative ($\beta = -.56$), even when controlling for GDP (Schaller & Murray, 2008). In addition, Low (1990) found evidence to suggest that the prevalence of polygyny, which is a joint sexual strategy wherein females relinquish control of their sexuality to the most powerful males in exchange for increased access to resources (Smuts, 1995), is positively related to the pathogen load in the environment. Therefore, there seems to be significant evidence to suggest that pathogens play an important role in the development of both gender equality and unrestricted female sexuality.

To sum the literature so far, pathogens have been found to influence several key attitudinal and behavioral variables: inter-group attitudes and hostility (e.g., Fincher et al., 2008), conformity (e.g., Murray & Schaller, 2012), gender equality (Thornhill et al., 2009), and permissiveness of unrestricted sexuality, particularly for females (Schaller & Murray, 2008). Based upon prior research, many of these variables should be expected to influence the support of pornography censorship. As was discussed earlier, authoritarianism is a strong predictor of support for censorship (e.g., Suedfeld et al., 1994; Fisher et al., 1994), and a large component of authoritarianism is conformity, emphasis on norms, and hostility against norm-violators (Altemeyer 1998). Therefore, we would predict that threat from pathogens should increase authoritarianism, which will subsequently increase support for the censorship of pornography. Therefore, the following is hypothesized:

H1A: Exposure to pathogens will increase the endorsement of authoritarian attitudes and beliefs

H1B: There will be an indirect effect of exposure to pathogens on support for the censorship of pornography, mediated by authoritarianism.

Previous research has also found evidence that unrestricted attitudes concerning sexuality are associated with greater tolerance towards pornography (and vice versa). Fisher et al. (1994) found that those individuals who expressed more sexually conservative attitudes were much more likely to support the censorship of pornography. Similarly, both Lo and Paddon (2000) and Lo et al. (2010) found that stronger endorsement of sexual permissiveness was associated with lower endorsement of pornography censorship. This relationship naturally makes sense, as greater acceptance towards casual sex should lead to greater acceptance of displays of casual sex. Therefore, given that pathogen threat has been demonstrated to negatively impact permissiveness towards casual sex, the following is hypothesized:

H2A: Exposure to pathogens will decrease permissiveness towards casual sex.

H2B: There will be an indirect effect of exposure to pathogens on support for the censorship of pornography, mediated by permissiveness towards casual sex.

1. Disgust Sensitivity, Pathogens, and Authoritarianism

In addition to various studies that have shown that either exposure to pathogen cues (e.g., Murray & Schaller, 2012) or actual pathogen prevalence (Fincher et al., 2008) influence authoritarianism, there is also a growing body of literature that has found that the emotion of disgust is related to authoritarian attitudes and behaviors. As was discussed

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earlier, disgust primarily evolved to facilitate avoidance of pathogens (Curtis & Biran, 2001). Furthermore, Fincher et al. (2008) suggest that authoritarian attitudes and behaviors would have served an adaptive purpose in avoiding pathogens by facilitating aversion towards unfamiliar others who may carry novel infectious diseases, as well as reinforcing group traditions and norms that would deter group members from engaging in behaviors that may cause transmission of pathogens. Therefore, given that these behaviors are pathogen avoidance strategies, we should hypothesize that pathogen disgust should be correlated with authoritarianism.

A variety of studies have supported this assertion. Navarette and Fessler (2006) found that American participants who reported a higher degree of sensitivity to disgust (i.e., they are more easily disgusted), also were more likely to express preference for an American rather than a foreigner. In addition, Terrizzi, Shook, and Ventis (2010) found that sensitivity to disgust was positively correlated to socially conservative values related to intergroup relations (e.g., immigration) and morals (e.g., opposition to gay marriage), but not fiscally conservative values (e.g., opposition to raising minimum wage). Similarly, Inbar, Pizarro, and Bloom (2009) also found that disgust sensitivity was most strongly related to socially conservative, rather than fiscally conservative, attitudes and beliefs.

However, one problem with these earlier studies is that disgust was measured using global measures (e.g., Haidt, McCauley, and Rozin's (1994) disgust sensitivity scale) that do not distinguish between the three specific domains of disgust identified by Tybur et al. (2009). Therefore, it was previously unclear whether specific domains of disgust are differentially related to authoritarianism, or whether the emotion of disgust has a general

impact on authoritarianism. However, more recent research has begun to indicate that all three domains of disgust may each predict authoritarian attitudes. Terizzi, Clay, and Shook (2014) have found that each domain of disgust mediated observed sex differences on both collectivism and religious fundamentalism, particularly for sexual disgust. Furthermore, based upon the adaptive functions of disgust proposed Tybur et al's (2013) three-domain model, there is significant theoretical grounding to support that each disgust domain may be inextricably linked with these attitudes. First, with regard to those sensitive to moral disgust, we would predict that these individuals would tend to react more strongly to violations of social norms, as moral disgust evolved to coordinate the condemnation of individuals who break group norms (Tybur et al., 2013). Given this strong emotional reaction to norm violations, there should theoretically be corresponding strong attitudes regarding those who do and do not break social norms (i.e., authoritarian aggression and submission), as well as the stressed importance of those norms themselves (i.e., authoritarian conventionalism). Secondly, because sexual disgust evolved to facilitate the avoidance of mates of low relative value, those individuals with high sensitivity to sexual disgust should demonstrate a particularly high threshold when choosing with whom and under what circumstances they are willing to initiate sexual contact. Though disgust is the emotional component underlying this aversion, we would predict that the emotion would also have corresponding attitudes and beliefs. For example, socially conservative beliefs discouraging sexual intercourse out of wedlock are strongly rooted in beliefs about the importance of purity and sanctity, which are known to be positively correlated to sexual disgust (Olatunji et al., 2012). In other words, sexual disgust and the belief that one must maintain their sexual purity for marriage are

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complementary and co-occurring within the same constellation of psychological characteristics that function to restrict sexual activity to a single committed mate within a context consistent with traditional norms. This constellation of psychological characteristics, in turn, is known to be reliably associated with authoritarian attitudes (e.g., Olatunji et al., 2012, Terizzi et al., 2014). While females have significantly higher baseline sexual disgust, Tybur et al. (2011) did not find any differences between males and females on the factor structure or validity of the scale, indicating that this relationship should also hold for males that are high in sexual disgust sensitivity.

However, based upon Tybur's (2013) model alone, it is somewhat unclear why sensitivity to pathogen disgust would be related to authoritarianism or support for the censorship of pornography. However, integrating Thornhill et al.'s (2009) conceptualization of authoritarianism as a pathogen avoidance strategy can provide this missing theoretical linkage. Historically, individuals who lived in areas saturated with pathogens would have needed to both be particularly averse to cues associated with vectors of disease, as well as develop more authoritarian attitudes and beliefs to deter the transmission of pathogens. Therefore, individuals who exhibit high sensitivity to disgust towards pathogens should also tend to be more authoritarian, which has been supported by recent research (Clay, Terizzi, & Shook, 2012; Terrizzi et al., 2014), Furthermore, because authoritarianism has been shown to predict support for the censorship of pornography (e.g., Lambe, 2008), we should expect a negative indirect effect of sensitivity to pathogen disgust on support for the censorship of pornography, mediated by authoritarianism. Therefore, the following is hypothesized:

H3A: Sensitivity to pathogen disgust will be positively related to authoritarianism,

controlling for sexual and moral disgust.

H3B: There will be an indirect effect of sensitivity to pathogen disgust on support for the censorship of pornography, mediated by authoritarianism.

Similarly, it makes theoretical sense that sexual disgust would be negatively related to permissiveness towards casual sex, as its evolved function is to facilitate sexual avoidance and impose restrictions on who an individual is willing to mate with (Tybur et al, 2013). It would also make sense if moral disgust were negatively related to casual sex, as those who have stronger disgust reactions to moral infractions have been found to be higher in collectivist attitudes (Clay et al. 2012; Terizzi et al., 2014), which have been found to be negatively correlated to sociosexuality (Fong & Goetz, 2010). However, only if there were evolutionary advantages associated with restricting sexuality when faced with pathogens (e.g., Schaller & Murray, 2008; Thornhill et al., 2008) would it follow that pathogen disgust is negatively related to permissiveness towards casual sex. Moreover, if pathogen disgust contributes to lower permissiveness towards casual sex, this means pathogen disgust should also have a positive indirect effect on the support for the censorship of pornography. Therefore, the following are hypothesized:

H3C: Sensitivity to pathogen disgust will be negatively related to permissiveness towards casual sex, controlling for sexual and moral disgust.

H3D: There will be an indirect effect of sensitivity to pathogen disgust on support for the censorship of pornography, mediated by permissiveness towards casual sex.

Those who are sensitive to pathogen disgust would naturally be expected to have the strongest aversive reactions to pathogen cues. These aversive reactions evolved to fulfill the adaptive function of avoiding pathogen transmission, and the behavioral immune system reacts both directly and indirectly to facilitate this avoidance. Subsequently, those individuals who have stronger emotional reactions to pathogens should accordingly have stronger behavioral and cognitive reactions as well. As a result, the effects of exposure to pathogen cues should be highest for those who are most sensitive to pathogen disgust. Following from this, we should also predict that those individuals who exhibit very little disgust sensitivity to pathogens should be more likely to have weaker behavioral and cognitive reactions to pathogen exposure. Therefore, the following are hypothesized:

> **H3E:** Sensitivity to pathogen disgust will moderate the effect of exposure to pathogens on authoritarianism, such that increasing pathogen disgust sensitivity will accentuate the positive effect of pathogen exposure on support on authoritarianism, while decreasing pathogen disgust sensitivity will suppress the effects of pathogen exposure.
>
> **H3F:** Sensitivity to pathogen disgust will moderate the effect of exposure to pathogens on permissiveness towards casual sex, such that increasing pathogen disgust sensitivity will accentuate the negative effect of pathogen exposure on support for the censorship of pornography, while decreasing pathogen disgust sensitivity will suppress the negative effect of pathogen exposure.
>
> **H3G:** Sensitivity to pathogen disgust will moderate the indirect effect of exposure to pathogens on support for the censorship of pornography, such that increasing

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pathogen disgust sensitivity will accentuate the indirect effect of pathogen exposure on support for the censorship of pornography (as mediated by authoritarianism and permissiveness towards casual sex), while decreasing pathogen disgust sensitivity will suppress the effects of pathogen exposure.

2. Pathogens, Gender Equality and Pornography

Furthermore, the link between pathogens and gender equality leads to counter-intuitive predictions regarding the relationship between support for the censorship of pornography and gender equality. Several second-wave feminist critiques of pornography have alleged that pornography is a causal antecedent to the subjugation and inequality of women (Dworkin, 1985; MacKinnon, 1986). Much of the evidence for this argument is based upon observation of the content of pornography itself, which some feminists argue is often degrading and humiliating to women (Gorman, Monk-Turner, & Fish, 2010). Therefore, they argue that by restricting and censoring pornography, sexism and discrimination against women can be reduced and ultimately abolished. However, based upon Thornhill et al.'s (2009) parasite model of democratization, we would predict that tolerance for pornography and gender equality are actually co-occurring phenomena which are both influenced by decreased pathogen stress in the environment. Reduced pathogen stress has been shown to be negatively correlated with restrictiveness of female sexuality (Thornhill & Gangestad, 2008),as well as increased participation of women in economic and political spheres (Thornhill et al., 2009) This restriction of female sexuality is rooted in an ideology of rigid gender roles and male superiority (Thornhill et al., 2009), wherein females are confined within traditional marriages that carry strong prescriptive norms for women

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regarding chastity to one's husband, dedication towards child-rearing, and abstaining from activities outside of the household. When such cultural attitudes are absent, women are afforded increased economic, political, and sexual freedom. Societies where females enjoy greater sexual freedom should also have fewer restrictions on pornography, as women engaging in short-term mating is less proscribed, Thus, any society in which women hold a more equal role in both political and social decision-making and access to resources should also be a society in which pornography is generally tolerated. Conversely, societies in which women hold subordinate roles should also be societies that strictly censor pornography. In either case, both of these variables will be a function of the extent to which threat from pathogens is present, mediated through both strict adherence to norms (authoritarianism) and sociosexuality Thus, the following is hypothesized:

H4A: Exposure to pathogens will decrease support of gender equality.

H4B: There will be a negative indirect effect of exposure to pathogens on support for gender equality, mediated by authoritarianism.

H4C: There will be a positive indirect effect of exposure to pathogens on support for gender equality, mediated by permissiveness towards casual sex.

H4D: There will be a strong negative correlation between support for the censorship of pornography and support for gender equality

Furthermore, concurrent with prior reasoning regarding the moderating effect of pathogen disgust on exposure to pathogens, we should expect that the negative effect of pathogen

exposure on support for gender equality should be strongest for those high in pathogen disgust and weakest for those low in pathogen disgust. Thus, the following is hypothesized:

H4E: Sensitivity to pathogen disgust will moderate the indirect effect of exposure to pathogens on support for gender equality, such that increasing pathogen disgust sensitivity will accentuate the indirect effect of pathogen exposure on support for gender equality (as mediated by authoritarianism and permissiveness towards casual sex), while decreasing pathogen disgust sensitivity will suppress the effects of pathogen exposure**.**

3. Distinguishing General Threat from Pathogen Threat

Based upon prior research, there are some alternative explanations that could threaten the proposed pathogen hypothesis. Sales (1973) and others (e.g., Doty et al., 1991; Huddy et all., 2005) have demonstrated that increased perceived threat also leads to increased authoritarianism, and authoritarianism increases support for the censorship of pornography (e.g., Fisher et al., 1994; Lambe, 2004). Therefore, it may be the case that pathogens are not at all unique in their effects, but are just one out of many possible types of threats that may have equivalent effects. However, recent evidence suggests this alternative explanation may be unsupported. Murray and Schaller (2012) found that disease threat had a significantly stronger effect on conformist attitudes than disease-irrelevant effects, suggesting that pathogens have a unique influence on behavior. However, there have been no other studies that have attempted to control for the possible confounding relationship between threats generally and the specific threat of pathogens. Therefore, the following is hypothesized:

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H5: Exposure to pathogens will result in significantly greater increases in support for the censorship of pornography than other threats.

4. Third-Person and First-Person Effects, Pathogens, and Support for Censorship

Another potential confound to the pathogen hypothesis is influence of the perceived effects of pornography, particularly the third-person effect. For example, it could be the case that those individuals who are more sensitive to threat from pathogens also have a lower threshold for becoming concerned about many different types of threats (including the effects of pornography). Because pornography has been blamed for a variety of violent and anti-social acts (rape, aggression, discrimination against women, etc.), these individuals are motivated to censor pornography because they are concerned that allowing it to proliferate would be harmful to society. If this were true, the relationship between support for the censorship of pornography and threat from pathogens is actually confounded by a generalized sensitivity to all forms of threat. However, if the pathogen hypothesis is true, then we should expect that, while controlling for concern about the effects of pornography on self and others, the threat of pathogens still exert an influence on support for the censorship of pornography. Therefore, the following is hypothesized:

H6: Exposure to pathogens will result in significantly higher increased support for the censorship of pornography relative to other threats, controlling for concern about the effects of pornography

Furthermore, according to self-categorization theory, third-person and first-person effects should be stronger when the form of influence is normative for the group being

affected (Reid et al., 2007). Therefore, in the context of pornography, assessments concerning the strength of negative effects should be higher when evaluating males than females. Based upon Lo and Wei's (2002) study, concern about the effects of pornography on males should lead to greater support for the censorship of pornography than concern about the effects of pornography on females. Moreover, according to pathogen research, emphasis on inter-group boundaries and distinctions is elevated when threat of pathogens is present (Fincher et al., 2008; Thornhill et al, 2009). Based upon this research, the pathogen hypothesis would predict that normative judgments about the pornography's effects should also be stronger when pathogen threat is present. In contrast, if the underlying mechanism is actually some form of generalized sensitivity to threat, normative evaluations shouldn't change in response to pathogen threat. Therefore, the following is hypothesized:

H7: Exposure to pathogens will result in significantly stronger normative judgments about the negative effects of pornography on males.

III. Study 1

A. Method

1. Sample.

Study 1 is a secondary analysis of country-level data that attempts to predict aggregate differences in gender-equality, socio-sexuality, and censorship of pornography using prevalence of pathogens. While theoretically the sample includes all current countries, inclusion is dependent upon whether there is available data for each of the different measures. This will be discussed in more detail for each measure.

1. Measures

Pathogen Prevalence. Pathogen prevalence was measured using Murray and Schaller's (2009) indices of historical pathogen prevalence in 230 geopolitical regions. This measure was computed by examining epidemiological atlases that estimate the prevalence of various diseases in different regions. Based upon these atlases, nine diseases were coded: leishmanias, schistosomes, trypanosomes, leprosy, malaria, typhus, filariae, dengue, and tuberculosis (Murray and Schaller, 2009). For the vast majority of geopolitical regions (160), the prevalence of all nine of these diseases could be estimated. However, 70 countries lacked historical data estimating the prevalence of tuberculosis and leprosy. Therefore, Murray and Schaller (2009) also computed a six and seven item scale of historical pathogen prevalence, which excluded leprosy and tuberculosis, and leprosy, tuberculosis, and malaria, respectively. However, the nine-item index has both the highest reliability (Cronbach's alpha = .84) and yields the strongest correlations (Murray and Schaller, 2009). Therefore, the nine-item index was used for this study.

Sexual permissiveness. Sexual permissiveness was measured using Schmitt's (2005) study of sociosexuality across 48 different nations. Schmitt (2005) calculated the country-level means of Simpson & Gangestad's (1991) Socio-Sexual Orientation Inventory for both males and females. This scale asks seven questions about behaviors and attitudes related to casual sex. Both ratio and interval level measures are included within the scale, which are then aggregated using a weighting scheme to account for the different levels of measurement of the individual items (see Appendix B in Simpson & Gangestad (1991)). Examples items include "With how many different partners have you had sex on *one* and *only one*

occasion?", "I can imagine myself being comfortable and enjoying "casual" sex with different partners.", "Sex without love is OK". Both the country-level means of males and females were used in this study, but each was treated as a separate variable.

Gender equality. Gender equality was measured using the World Economic Forum's Global Gender Gap Index (Hausmann, Tysobn, Bekhouche, & Zahidi, 2011). The GGGI is an aggregated index comprising of four subindices that measure a particular dimension of gender equality: economic participation and opportunity, educational attainment, health and survival, and political empowerment. Examples of the variables that comprise the index include wage equality, female literacy, sex ratio, and number of women that hold seats in the legislature of the government (Hausmann et al., 2011). Because each variable is on a different scale of measurement, the four subindices are normalized and weighted in order to bound the index between 0 (complete inequality) and 1 (complete equality). One hundred and thirty five countries had sufficient data to be able to estimate an overall GGGI score.

Collectivism. Unfortunately, there is no country-level or regional measure of authoritarianism. However, given the conceptual overlap between collectivism and authoritarianism (emphasis on intergroup distinction, conformity, etc.), cross-cultural measures of collectivism should serve as a useful proxy. Gelfand, Bhawuk, Nishii and Bechtold's (2004) scale measuring in-group collectivist practices was used to measure collectivism. This scale is taken from Gelfand et al's (2004) "Global Leadership and Organizational Behavior Effectiveness Program" study. This study sampled 17,370 managers from 951 organizations in 62 different countries between the years of 1994 and 1997. The scale itself consists of four questions asking about various collectivist attitudes

and behaviors, each on a seven-point scale. These four items are then summed to create a

single measure of collectivism, with higher scores indicating greater collectivism.

Censorship of pornography. Unfortunately, there are no country-level indices for the

support of the censorship of pornography. Instead, the legal status of pornography was

utilized as a measure of censorship. The Family Online Safety Institute maintains the Global

Resource and Information Directory (GRID), which aggregates and keeps records the efforts

of educational, legislative, and regulatory bodies of each country to ensure online safety. As

part of these records, the GRID notes if the country has laws against the distribution or sale

of pornographic materials. By extension, if adult pornography is legal in a particular country,

then there should be a lack of any mention of more general pornography laws in its GRID

record. To insure that countries are not coded as having legalized pornography by an error of

omission, this information was checked against the country's penal code, if possible.

Countries were coded as having pornography illegal if there was a criminal penalty for the

possession, sale or distribution of consensual adult pornography. From this database, 185

countries were able to be either coded as having pornography legalized or criminalized.

Control variables. There are a number of potential confounding variables that were

statistically controlled for within the regression model. Because richer countries could both

have better health care as well as stronger democracies and freedom of speech laws, the

GDP of each country was added as a covariate. Similarly, countries with more wealth

inequality could be both more authoritarian and less likely to provide adequate healthcare for

the majority of its citizens. Therefore, the gini coefficient, a widely used measure of wealth

inequality within a country, was also added as a covariate. Because the amount of pathogens

could be confounded by how densely populated a given country is (i.e., more densely populated areas have more transmission of pathogens, and the pathogen effect disappears when accounting for this relationship), population density was controlled for, as well. Finally, given that many studies have found that religiosity strongly predicts the endorsement of the censorship of pornography (e.g., Fisher et al., 1994; Lambe, 2004), the religiosity of the country was also included as a covariate. Religiosity was measured using a Gallup (2008) poll that asked representative samples from 143 different countries whether religion is an important part of their daily life. The percentage from each country that indicated that religion is important to their daily life was used to measure religiosity.

B. Results

1. Descriptives and Data Screening.

Table 1 displays the means, standard deviations, and intercorrelations of all continuous variables. None of the mediators or dependent variables exhibited substantial non-normality or outliers.

2. Data Analysis.

The results of Study 1 tested eight hypotheses: H1A, H1B, H2A, H2B, H4A, H4B, H4C, and H4D. In order to test H1A, H2A, and H4A, a multiple regression was run separately for collectivism, socio-sexuality (both male and female), and gender equality. In addition to entering historical pathogen prevalence as a predictor variable, the control variables (GDP per capita, gini coefficient, population density, and religiosity) were also entered into the regression equation.

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Because pornography legality is measured on a dichotomous scale, in order to test H1B and H2B, a procedure for mediation with dichotomous outcomes was run for both collectivism and socio-sexuality. Using standard mediation procedures with logistic regression would result in the coefficients in the analysis being in different scales (I.e., regression coefficients versus odds ratios). However, Hayes' (2013) PROCESS macro allows tests for mediation to be run with dichotomous mediator or dependent variables. Two separate mediation models were run each for pornography legality (H1B, H2B) and gender equality (H4B, H4C): one which specified only collectivism as a mediator, and another that specified both male and female sociosexuality as mediators. Each model used bootstrapped 95% bias-corrected confidence intervals generated from 5000 samples to estimate the indirect effects. As with the previous analyses, the covariates were included in the model. Finally, to test H4D a t-test will be run to examine whether significant differences in gender equality exist between countries in which pornography is legal versus illegal.

3.Hypothesis 1A.

H1A: Exposure to pathogens will increase the endorsement of authoritarian attitudes and beliefs

Based upon the results of the regression, H1A was not supported. While the overall regression model was significant, $R^2 = .67$, $F (5, 45) = 18.56$, $p < .001$, historical pathogen prevalence was not a significant predictor of collectivism, $\beta = .17$, $t = 1.16$, $p = .25$, though the coefficient was in the predicted direction. The strongest significant predictors of collectivism in the model were GDP, $\beta = -0.51$, $t = -3.54$, $p < .001$, and population density, β

$= 0.23$, $t = 2.36$, $p < .05$.

4. Hypothesis 1B.

H1B: There will be an indirect effect of exposure to pathogens on support for the censorship of pornography, mediated by authoritarianism.

The results of the mediation analysis indicated that H1B was not supported. In Step 1 of the mediation model, the logistic regression of legality of pornography on historical pathogen prevalence, ignoring the mediator, was not significant $b = 0.14$, $e^b = 1.12$, $p = .88$. Step 2 showed that the regression of collectivism on historical pathogen prevalence was also not significant, $\beta = .17$, $t = 1.16$, $p = .25$. Finally, Step 3 of the mediation process showed that the mediator (collectivism), controlling for historical pathogen prevalence, was significant, $b = -2.73$, $e^b = 0.06$, $p < .05$. However, the estimated indirect effect was -1.25, 95% CI[-6.02, 0.95], indicating no evidence of mediation,

5. Hypothesis 2A.

H2A: Exposure to pathogens will decrease permissiveness towards casual sex.

H2A was partially supported. For female sociosexuality, the overall regression model was significant $R^2 = .57$, $F (5, 34) = 8.99$, $p < .001$, and historical pathogen prevalence was the strongest predictor, $\beta = -0.43$, $t = -2.39$, $p < .05$. With regard to male sociosexuality, while the overall regression model was significant, $R^2 = .34$, $F (5, 34) = 3.46$, $p < .05$, historical pathogen prevalence was not, $\beta = -0.33$, $t = -1.51$, $p = .14$. Thus, there seems to be some evidence that pathogen prevalence is negatively correlated with permissiveness

towards sex for females, but not males.

6. Hypothesis 2B.

H2B: There will be an indirect effect of exposure to pathogens on support for the censorship of pornography, mediated by permissiveness towards casual sex.

The results of the mediation analysis indicated that H2B was not supported. In Step 1 of the mediation model for female sociosexuality, the logistic regression of legality of pornography on historical pathogen prevalence, ignoring the mediator, was not significant b = 0.14, e^b = 1.12, p =.88. Step 2 showed that the regression of female sociosexuality on historical pathogen prevalence was significant, β = -0.43, t= -2.39, p < .05. Step 3 of the mediation process showed that the mediator (female sociosexuality), controlling for historical pathogen prevalence, was not significant, b = -0.08, e^b = 0.92, p = .61. As expected, the bootstrapped confidence intervals found no evidence of mediation in the model, with an indirect effect of 0.36, 95% CI[-18.52, 4.35].

In Step 1 of the mediation model for male sociosexuality, the logistic regression of legality of pornography on historical pathogen prevalence, ignoring the mediator, was, as before, not significant b = 0.14, e^b = 1.12, p =0.88.. Step 2 showed that the regression of male sociosexuality on historical pathogen prevalence was not significant, β = -0.33, t= -1.51, p = .14. Finally, Step 3 of the mediation process showed that the mediator (male sociosexuality), controlling for historical pathogen prevalence, was not significant, b = -0.05, e^b = 0.95, p = 0.58. As such, the indirect effect was 0.20, 95% CI[-5.61, 4.98], indicating no evidence for mediation.

7. Hypothesis 4A.

H4A: Exposure to pathogens will decrease support of gender equality.

H4A was not supported. While the overall regression model was significant, $R^2 =$ .54, F (5, 68) = 16.10, p < .001, historical pathogen prevalence did not significantly predict gender equality, $\beta = -0.15$, $t= -1.15$, p = .26. The only significant predictor of gender equality was GDP, $\beta = 0.51$, $t= 4.04$, p < .001.

8. Hypothesis 4B.

H4B: There will be a negative indirect effect of exposure to pathogens on support for gender equality, mediated by authoritarianism.

H4B was not supported. Step 1 showed that historical pathogen prevalence did not significantly predict gender equality, $\beta = -0.15$, $t= -1.15$, p = .26, while Step 2 showed that historical pathogen prevalence did not significantly predict collectivism, $\beta = .17$, $t= 1.16$, p = .25. Finally, Step 3 showed that collectivism, controlling for historical pathogen prevalence, did not significantly predict gender equality, $\beta = -0.25$, $t= -1.33$, p = .19. Accordingly, the indirect effect was -.004, 95% CI[-.0.02, 0.002], suggesting no evidence for mediation.

9. Hypothesis 4C.

H4C: There will be a positive indirect effect of exposure to pathogens on support for gender equality, mediated by permissiveness towards casual sex.

H4C was not supported. As before, historical pathogen prevalence did not have a

direct effect on gender equality, although pathogen prevalence did significantly predict

female sociosexuality, β = -0.43, t= -2.39, p < .05. While female sociosexuality, controlling

for historical pathogen prevalence, was a marginally significant predictor of gender equality

β = -0.48, t= 1.76, p < .10, male sociosexuality was not, β = -0.12, t= -0.56, p = .58. The

indirect effect of pathogen prevalence, as mediated by male sociosexuality, was 0.003, 95%

CI[-.0.009, 0.03], while the indirect effect through female sociosexuality was -0.18, CI[-

.0.05, 0.008]. Therefore, there was no evidence to suggest either variable acted as a mediator

for pathogen prevalence on gender equality.

10. Hypothesis 4D.

H4D: There will be a strong negative correlation between support for the censorship

of pornography and support for gender equality

Finally, H4D was supported. The independent samples t-test revealed a significant

difference on gender equality in the predicted direction, $t(123)$ = -4.91, $p < .001$. Countries

where porn was illegal (M = 0.66, SD = 0.06) were found to have lower gender equality than

countries where porn was legal (M = 0.71, SD = 0.05), with the magnitude of this difference

being relatively large (Cohen's d = -.88). Therefore, there seems to be strong evidence to

suggest that acceptance of pornography (at least legally) corresponds with expanded political

and economic equality for women.

11. Supplementary Analysis

Although not originally hypothesized, one alternative possibility is that pathogen

avoidance may not be the only process acting to influence the censorship of pornography. Gangestad and Simpson (2000) note that, in regions where pathogen prevalence is high, females are sometimes willing to trade off parental investment from males and engage in short-term mating with men that appear to be of high genetic fitness. By doing so, females can potentially obtain high quality genes that would allow their offspring to better survive the pathogens in the local environment. However, this trade-off is conditional; if the environment is so difficult that it necessitates biparental care, then pursuing this strategy might be too risky even despite the potential benefits (Gangestad and Simpson, 2000). Furthermore, since only a small percentage of men will display obvious markers of genetic fitness, the majority of males will be genetically disadvantaged (e.g., cuckolding) as a result of females pursuing this sexual strategy. Given they have sufficient power to do so, males could try to control and restrict female sexuality as a counterstrategy (Gangestad and Simpson, 2000). Therefore, pathogens can push females towards unrestricted sexuality, but only under certain conditions.

With regard to the censorship of pornography, if pathogen prevalence is high but female sociosexuality is also high, it is less likely that pornography will be actively censored. However, areas where pathogen prevalence is high but female sexuality is restricted should be the most likely to censor pornography, while areas with low pathogen prevalence but unrestricted female sexuality should be the least likely. To test this, a logistic regression was run specifying historical pathogen prevalence, female sociosexuality, the interaction between pathogen prevalence and female SOI, and four covariates (GDP, gini coefficient, population density, and religiosity) as predictors of the legality of pornography. The logistic regression

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was significant, $\chi^2(7) = 29.96$, p < .001, and the interaction was also significant, $b = 1.76$, e^b = 5.81, $p < 0.05$. While interpreting interactions between continuous variables in logistic regression can be difficult, Figure 1 displays the scatterplot for female sociosexuality and pathogen prevalence. As can be seen, the majority of countries with pornography legalized are approximately above the mean on female SOI (M = 26.74), and below the mean for pathogen prevalence (M = 0.13). Conversely, the majority of the countries where pornography is legal are approximately below the mean on female SOI, while above the mean on pathogen prevalence. Therefore, while this analysis is post-hoc and should be regarded with a certain degree of caution, there does seem to be some evidence to suggest that the probability of a country having pornography legalized is associated with the confluence of high female sociosexuality and low pathogen prevalence.

IV. Study 2

A. Method

1. Sample.

Participants were 638 undergraduates (464 females, 174 males) at the University of California, Santa Barbara who volunteered as part of a research participation requirement for the Communication pre-major. Participation was completely voluntary, and an alternative non-research assignment was available to meet the pre-major requirement.

2. Measures

Authoritarianism. Authoritarianism was measured using a shortened version of Altemeyer's (1998) right-wing authoritarianism scale, developed by Rattazzi, Bobbio and

Canova (2007). The scale consists of fourteen items that each present a statement that is authoritarian (or, for reverse-coded items, anti-authoritarian) in nature. Authoritarianism is broken down into two dimensions: authoritarian aggression and submission and conservatism. Participants indicate how they feel about each statement using a seven-point Likert-scale ranging from -3 (Strongly Disagree) to +3 (Strongly Agree). Higher scores indicate stronger endorsement of authoritarian attitudes. Sample items measuring authoritarian submission and aggression include "The fact on crime, sexual immorality and the recent public disorders all show we have to crack down harder on deviant groups and troublemakers, if we are going to save our moral standards and preserve law and order." and "What our country needs most is disciplined citizens, following national leaders in unity". Sample items measuring conservatism include "Everyone should have their own lifestyle, religious beliefs, and sexual preferences, even if it makes them different from everyone else" and "People should pay less attention to organized religion, and instead develop their own personal standards of what is moral and immoral" (both reverse-coded).

Disgust. Disgust was measured using Tybur et al.'s (2009) three domain scale of disgust. The scale contains 21 items that measure how disgusting the respondent would find concepts or situations related to pathogens, sex, and moral violations. Each item is measured on a scale ranging from 0 (not at all disgusting) to 6 (extremely disgusting). Example items measuring pathogen disgust include "Accidentally touching a person's bloody cut", "Stepping on dog poop", and "Sitting next to someone with red sores on their arm". Example items measuring sexual disgust include "Bringing someone you just met back to your room to have sex", "Performing oral sex", and "Watching a pornographic video".

Example items measuring moral disgust include "Deceiving a friend", "Stealing from a neighbor", and "Forging someone's signature on a legal document".

Perceived negative effects of pornography. In order to measure third-person and first-person effects of pornography, three modified scales from Lo and Wei's (2002) study were utilized. These scales each consist of five items that ask participants to estimate the effects of pornography on moral values, attitudes towards the opposite sex, sexual knowledge, sexual attitudes, and sexual behavior. Each item is measured using a five-point Likert scale, in which one indicates "no negative effect at all", while five indicates a "very strong negative effect" (Lo and Wei, 2002, p. 21). These five items are each asked about oneself, other males, and other females. Each set of five items is then averaged. Thus, a single observed variable is used each to measure the perceived negative effects of pornography on oneself, the perceived negative effects of pornography on other males, and the perceived negative effects on other females. In addition, perceived effects on other males and other females were also aggregated, in order to yield a generalized third-person effect measure.

Political orientation. Political orientation was measured using a one item, 7-point Likert scale asking participants to identify their political orientation. The scale ranges from Very liberal (1) to Very conservative (7).

Sexual permissiveness. Sexual permissiveness was measured using a modified version of Simpson & Gangestad's (1991) Socio-Sexual Orientation Inventory. This modified version drops two questions regarding past sexual partners (as this is a recollection of past behavior, it should be insensitive to our manipulation), as well as a question regarding how often the individual thinks about sex with someone other than their current

dating partner (as this is problematic in a college sample, as many individuals may not have a single exclusive dating partner).

Support for gender equality. Support for gender equality was measured using the 11-item short form of the Liberal Feminist Attitude and Ideology Scale (Morgan, 1996). The LFAIS uses a six-point Likert-scale ranging from 1 (strongly disagree) to 6 (strongly agree). Higher scores on the scale are indicative of more egalitarian gender attitudes. The scale addresses a variety of attitudes regarding social, political, and economic inequalities faced by females. Example items include "A woman should have the same job opportunities as a man", "Although women can be good leaders, men make better leaders (reverse-coded)", and "Women can best overcome discrimination by doing the best that they can at their jobs, not by wasting time with political activity (reverse-coded)". These items are then aggregated and average to create a single observed variable.

Support for the censorship of pornography. Support for the censorship of pornography was measured using a slightly modified version of Lo and Paddon's (2000) 4-item index. Each item is measured on a five-point likert type scale, with 1 indicating "strongly disagree" and 5 indicating "strongly agree". The scale asks respondents to state whether they agree with government legislation to ban the sale of R-rate pornographic films or programs, X-rated pornographic films or programs, pornographic publications, and pornography on the Internet. All four items are aggregated and averaged to produce a single observed variable.

Religiosity. As was mentioned earlier, religiosity has consistently been found to be a strong predictor of support for the censorship of pornography. Thus, in order to ensure our

model is properly specified, religiosity was included as a covariate. Religiosity was measured using the Duke University Religion Index, which is a five item scale that captures three identified sub-components of religiosity: organizational religious activity, non-organizational religious activity, and intrinsic religiosity (Koenig and Bussing, 2010). The items measuring both the frequency of engaging in organizational and private religious activity are measured on a 6 point scale ranging from 1 (never) to 6 (more than once/week). Intrinsic religiosity is measured with three statements related to respondents' religious experiences and the extent to which they integrate their religious beliefs into their everyday lives. Each item is measured on a 5 point scale ranging from 1 (definitely not true of me) to 5 (definitely true of me). All five items are then summed to create a single observed variable ranging from 5 to 27. The Duke University Religion Index has been demonstrated to be both a valid and reliable measure of religiosity (Koenig and Bussing, 2010).

Brief Mood Introspection Scale. One potential concern with priming participants with pathogen cues is that the strong emotional response evoked by seeing such images might be much stronger than images of other types of threats (such as weapons). Thus, it could be the case that pathogen primes may have a stronger effect on the endogenous variables not because of any particular property of pathogens, but because such primes merely put participants into a more negative emotional state, thus confounding the results. In order to control for such a possibility, Mayer and Gaschke's (1988) Brief Mood Introspection Scale was used as a manipulation check to ensure the effect of the experimental manipulation is not confounded by the respondents emotional reaction to the prime. The BMIS is a 16 item scale that asks participants to evaluate whether they feel a variety of

different emotions, and is measured on a four point scale ranging from 1 (definitely do not feel) to 4 (definitely feel). Example items include "Happy", "Sad", "Content", and "Nervous". Positively valenced emotions were reverse-coded, and the 16 items were aggregated to create a single observed variable measuring emotional state.

   3.Materials and Procedure

   An experiment was administered online through the survey software LimeSurvey during Spring and Fall Quarter of 2013, which was linked to through the Department of Communication undergraduate research participation portal (SONA). An online experiment was deemed preferable to a laboratory experiment due to the threat of volunteer bias in sexuality research. Wiederman (1999) has found that, even amongst college students, there are significant differences between volunteers and non-volunteers of sexuality studies. Volunteers tend to be male, more sexually experienced, hold less traditional sexual attitudes, and score higher in sexual sensation seeking. Moreover, Saunders, Fisher, Hewitt, and Clayton (1985) found evidence to suggest this volunteer bias can significantly alter the results and conclusions of sexuality studies. However, Wiederman (1999) found that this effect did not occur if the study was an anonymous questionnaire. Thus, this effect should be dampened if the study can be completed anonymously over the Internet.

   Participants were randomly assigned to be primed with a disease-relevant threat (n = 214), a disease-irrelevant threat (n = 205), or a non-threatening control (n = 220). The disease-relevant and gun primes were drawn from a study by Schaller, Miller, Gervais, Yager, and Chen (2010), while the control condition was assembled from public domain photos. In the disease-relevant threat condition, participants are shown a slide show of

images depicting different types of disease (e.g., sneezing, open sores, etc). In the disease-irrelevant threat condition, participants are shown a slide show depicting various threatening images of guns (e.g., a gun being pointed towards the viewer). In the control condition, participants are shown a slideshow of nonthreatening and healthy people. Figure 1 shows an example image from each condition. After receiving one of these three primes, participants were then asked to respond to the items measuring authoritarianism, perceived negative effects of pornography, sexual permissiveness, and support for gender-equality. Finally participants were asked to respond to the questions measuring support for the censorship of pornography.

B. Results

1. Manipulation Check.

A one-way analysis of variance was conducted on the Brief Mood Introspection Scale (Mayer and Gaschke, 1988) to test whether a) the two threat conditions elicited significantly more negative affect than the control condition (signifying that they were actually perceived as threatening), and b) whether there was a significant difference in negative affect between the disease and gun prime that may confound the influence of the pathogen prime. The overall F-test was significant, F (2, 634) = 54.39, p < .001, indicating significant differences between the three conditions. Tukey-post hoc tests revealed that those exposed to the pathogen prime had more negative affect (M=2.34) than either those exposed to the gun prime (M=2.47, p < .001), or the control (M=2.70, p < .001). In addition, the difference between the gun prime and the control was also significant (p < .001). While this indicates that the gun and pathogen primes had the desired effect relative to the control, the significant

difference in negative affect between the pathogen and gun primes could confound the results. Therefore, the BMIS will be included as a covariate in subsequent analyses.

2. Descriptives and Data Screening.

Table 2 displays the means, standard deviations, and intercorrelations of all continuous variables. All collapsed variables demonstrated adequate reliability (.78 < α < .95). Initial data screening revealed five significant outliers on sociosexuality. The scores were 48, 54.67, 59.33, 65.33, 66.67, with the median being 11.67 and the 95th percentile being 28.87. Therefore, these cases were excluded from the analysis. After dropping these cases, sociosexuality still exhibited significant positive skewness (0.94, SE = 0.1) and large kurtosis (0.97, 0.2). Therefore, a square root data transformation was applied. The transformation decreased the skewness (0.23, SE = 0.1), and kurtosis (-0.37, 0.2) substantially, and examination of the Q-Q plots indicated that the distribution closely approximated normality. Thus, the square root of SOI was used in all further analyses.

It was also found that support for pornography censorship was significantly positively skewed (Skewness = 0.60, SE = 0.1) and had a relatively high kurtosis (Kurtosis = -0.54, SE = 0.19). In order to correct for this, a log transformation was undertaken. However, while this helped decrease the skewness (Skewness = -0.03, SE = 0.1), the kurtosis increased substantially (Kurtosis = -1.37, SE = 0.19). Examination of the histogram and Q-Q plots also indicated that the distribution was not more normal as a result of the transformation. Therefore, the non-transformed variable was used in the analysis.

3. Data Analysis.

The results of Study 2 tested all nineteen hypotheses. Of these, all except for H5 and H7 were initially analyzed using path analysis in Mplus. The experimental manipulation was dummy-coded, with the pathogen-prime condition serving as the reference group, and the two dummy variables entered into the model as exogenous variables, as per the group-code approach (Russell, Kahn, Spoth,& Altmaier, 1998). In addition, the interaction effects between experimental prime and pathogen disgust were measured by taking the product of the dummy coded variables and Tybur et al.'s (2012) pathogen disgust subscale. These multiplicative terms were then entered into the model as exogenous variables. In addition, although authoritarianism is ideally measured using two separate dimensions, including them in the model separately would have significantly increased the number of parameters estimated in the model. Since the reliability of the collapsed scale ($\alpha=0.86$) was comparable to the subscales for authoritarian aggression ($\alpha=0.85$) and conventionalism ($\alpha=0.85$), it was judged that collapsing the scales would not significantly alter the results. Figure 3 illustrates the specification of the path model. Finally, three covariates were added to the path analysis: mood, religiosity, and political orientation. These were controlled for by regressing each of the endogenous variables on the covariates.

This model contains 16 observed variables and 45 free parameters, which means the $df = 91$. Because the degrees of freedom are greater than zero, this means that the model is overidentified, and amenable to model-fitting using path analysis. In addition, because the model is recursive, it is identified (Kline, 2010). One potential pitfall with using path analysis within an experiment design is that structural equation modeling techniques are a

large sample technique (Kline, 2010), and experiments tend to have smaller sample sizes. Jackson (2003) has found evidence to suggest that the ideal ratio of participants to free parameters in a model is 20:1, with a minimum ratio of 10:1. Given that the current proposed model has 45 free parameters, this means the ideal sample size is 900. While current study had 636 participants, the n:q ratio was 14.1:1, which at least safely exceeds the minimum ratio of 10:1.

The tested model did not demonstrate adequate fit, χ^2 (17, N = 636) = 75.69, $p <$ .001, CFI = .948, TLI = .842 RMSEA = 0.074, 90% CI (0.057, 0.091) SRMR = .022. The only fit index to have a favorable value was the SRMR; however the SRMR is known to favor models that test more parameters or have a large sample size (Hooper, Coughlan, and Mullen, 2008), with the former arguably being the case for the current model. Post-hoc modification indices were examined to improve the fit of the model, but none of the most significant modifications were defensible from a theoretical standpoint (e.g., regressing authoritarianism on first person perceptions). Therefore the model was not retained.

Because the theoretical model did not adequately fit the data, the mediating hypotheses were instead tested using the MEDIATE procedure for testing mediation with multicategorical independent variables developed by Hayes and Preacher (2013). This procedure uses a bootstrapping method in order to estimate the standard errors for the indirect effects, as well as allows for omnibus testing of direct, indirect, and total effects for a set of independent variables. The 95% confidence intervals for the indirect effects were generated based upon 10,000 bootstrapped samples. Two separate mediation models were tested. The first model included authoritarianism and sociosexuality as mediators, support

for censoring pornography as the dependent variable, and mood, religiosity, sexual disgust, moral disgust, first-person perceptions, and third-person perceptions as covariates. The second model also included authoritarianism and sociosexuality as mediators, but instead specified support for gender equality as the dependent variable, and only mood, religiosity, sexual disgust, and moral disgust as covariates. Both models specified the dummy-coded experimental conditions, pathogen disgust, and the interaction terms as the independent variables.

To test the hypotheses specifying direct effects on the mediators (i.e., H1A, H2A, H3A, and H3C), two multiple regressions were run specifying authoritarianism and sociosexuality as the dependent variables. The independent variables (dummy-coded conditions, interaction terms, and pathogen disgust), along with mood, religiosity, sexual disgust, and moral disgust, were entered into all four models. In addition, since H5 is testing the effect of pathogen absent third and first person perceptions, a regression model that specified support for censoring pornography as the dependent variable, but omiting first person and third person perceptions as covariates, was also run.

4. Hypothesis 1A.

H1A: Exposure to pathogens will increase the endorsement of authoritarian attitudes and beliefs

H1A was not supported. Neither of the dummy-coded contrasts between the pathogen and gun prime ($\beta = .04$, $t= -1.07$, $p = .29$), or between the pathogen-prime and control (β -.006, $t= -0.13$, $p = .90$.) significantly predicted authoritarianism.

5. Hypothesis 1B.

H1B: There will be an indirect effect of exposure to pathogens on support for the censorship of pornography, mediated by authoritarianism.

The results of the mediation analysis indicated that H1B was not supported. Step 1 indicated that neither the dummy-coded contrasts between the pathogen and gun prime (β = -0.04, t= -0.97, p = 0.33), nor between the pathogen-prime and control (β = -.01, t= -0.28, p = .78.) significantly predicted support for pornography censorship. Step 2 indicated that both the contrast between the pathogen-prime and gun prime (β = .04, t= 1.07, p = .29), as well as between the pathogen-prime and control (β = -.006, t= -0.13, p = .90.), did not significantly predict authoritarianism. Finally, while Step 3 indicated that authoritarianism significantly predicted support for pornography censorship, controlling for the experimental primes, (b = 0.29, t= 5.64, p < .001.), the 95% bias corrected confidence intervals indicated that neither contrast had an indirect effect through authoritarianism. The indirect effect for the contrast between the pathogen-prime and gun prime was 0.02, 95% CI[-.03, .06], while the indirect effect for the contrast between the pathogen-prime and the control was -0.02, 95% CI[-.06, .02].

6. Hypothesis 2A.

H2A: Exposure to pathogens will decrease permissiveness towards casual sex.

H2A was not supported. Neither of the dummy-coded contrasts between the pathogen and gun prime (β = -.05, t= -1.34, p = .18),, or between the pathogen prime and control (β = -.12, t= -0.28, p = .77), significantly predicted permissiveness towards casual

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sex.

7. Hypothesis 2B.

H2B: There will be an indirect effect of exposure to pathogens on support for the censorship of pornography, mediated by permissiveness towards casual sex.

The results of the mediation analysis indicated that H2B was not supported. Step 1 indicated that neither the dummy-coded contrasts between the pathogen and gun prime (β = -.04, t= -0.97, p = .33), nor between the pathogen-prime and control (β = -.01, t= -0.28, p = .78.) significantly predicted support for pornography censorship. Step 2 indicated that both the contrast between the pathogen-prime and gun prime (β = -0.05, t= -1.34, p = .18), as well as between the pathogen-prime and control (β = -0.12, t= -0.28, p = .77), did not significantly predict sociosexuality. Finally, Step 3 indicated that sociosexuality, controlling for the experimental primes, did not significantly predict support for pornography censorship (b = -0.2, t= -0.38, p = .70.). As expected, the 95% bias corrected confidence intervals indicated that neither contrast had an indirect effect through permissiveness towards sex. The indirect effect for the contrast between the pathogen-prime and gun prime was 0.002, 95% CI[-0.006, 0.02], while the indirect effect for the contrast between the pathogen-prime and the control was 0.003, 95% CI[-0.007, 0.01].

8. Hypothesis 3A.

H3A: Sensitivity to pathogen disgust will be positively related to authoritarianism, controlling for sexual and moral disgust.

H3A was not supported. Sensitivity to pathogen disgust did not significantly predict

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authoritarianism (β = -.003, t= -0.049, p = .96). While moral disgust also did not predict authoritarianism (β = -.059, t= -1.58, p = .11), sexual disgust was significant (β = .16, t= 4.05, p < .001).

9. Hypothesis 3B.

H3B: There will be an indirect effect of sensitivity to pathogen disgust on support for the censorship of pornography, mediated by authoritarianism.

H3B was not supported. Step 1 indicated that pathogen disgust did not significantly predict censorship (β = -.01, t= -0.20, p = .84), while Step 2 indicated that pathogen disgust did not significantly predict authoritarianism (β = -.003, t= -0.049, p = .96), Finally, while Step 3 indicated that authoritarianism, controlling for pathogen disgust, significantly predicted support for pornography censorship (b = .29, t= 5.64, p < .001.), the indirect effect through authoritarianism was -0.01, 95% CI[-0.04, 0.02], indicating no evidence of mediation.

10. Hypothesis 3C.

H3C: Sensitivity to pathogen disgust will be negatively related to permissiveness towards casual sex, controlling for sexual and moral disgust.

H3C was not supported. Although sensitivity to pathogen disgust significantly predicted permissiveness towards casual sex, it was in the opposite direction of what was hypothesized (β = 0.16, t= 2.75, p < 0.01). Moral disgust did not predict permissiveness towards casual sex (β = .008, t= 0.22, p = .83), while sexual disgust was strongly significant (β = -.48, t= -13.06, p < 0.001).

11. Hypothesis 3D

H3D: There will be an indirect effect of sensitivity to pathogen disgust on support for the censorship of pornography, mediated by permissiveness towards casual sex.

H3D was also not supported. Step 1 indicated that pathogen disgust did not significantly predict censorship, while Step 2 indicated that pathogen disgust did significantly predict sociosexuality, but in the opposite direction of what was predicted ($\beta = 0.16$, $t = 2.75$, $p < 0.01$). Finally, Step 3 indicated that sociosexuality, controlling for pathogen disgust, did not significantly predict support for pornography censorship ($b = -0.2$, $t = -0.38$, $p = 0.70$.) The indirect effect on support for pornography censorship through permissiveness towards casual sex was -0.003, 95% CI[-0.02, 0.01], indicating no evidence of mediation.

12. Hypothesis 3E

H3E: Sensitivity to pathogen disgust will moderate the effect of exposure to pathogens on authoritarianism, such that increasing pathogen disgust sensitivity will accentuate the positive effect of pathogen exposure on support on authoritarianism, while decreasing pathogen disgust sensitivity will suppress the effects of pathogen exposure.

H3E was not supported. The interaction terms between pathogen disgust and the pathogen/gun contrast ($\beta = -.001$, $t = -0.12$, $p = .99$), as well as the pathogen/control contrast ($\beta = -.03$, $t = -0.57$, $p = .57$.) on authoritarianism were both insignificant. Therefore, there is no evidence to suggest pathogen disgust moderates the effects of being exposed to pathogens

on authoritarianism.

13. Hypothesis 3F

H3F: Sensitivity to pathogen disgust will moderate the effect of exposure to
pathogens on permissiveness towards casual sex, such that increasing pathogen
disgust sensitivity will accentuate the negative effect of pathogen exposure on
support for the censorship of pornography, while decreasing pathogen disgust
sensitivity will suppress the negative effect of pathogen exposure.

H3F was not supported. The interaction between pathogen disgust and the
pathogen/gun contrast ($\beta = -.03$, $t = -0.57$, $p = .57$), as well as the pathogen/control contrast
($\beta = .74$, $t = 1.62$, $p = .10$.) on sociosexuality were both insignificant. Therefore, there is no
evidence to suggest pathogen disgust moderates the effects of being exposed to pathogens on
sociosexuality.

14. Hypothesis 3G

H3G: Sensitivity to pathogen disgust will moderate the indirect effect of exposure to
pathogens on support for the censorship of pornography, such that increasing
pathogen disgust sensitivity will accentuate the indirect effect of pathogen exposure
on support for the censorship of pornography (as mediated by authoritarianism and
permissiveness towards casual sex), while decreasing pathogen disgust sensitivity
will suppress the effects of pathogen exposure.

H3G was also not supported. The standardized direct effect on censorship was
insignificant for both the interaction between pathogen disgust and the pathogen/gun
contrast ($\beta = -.002$, $t = -0.04$, $p = .97$.), as well as the pathogen/control contrast ($\beta = -.01$, $t = -$

0.34, p = .81.), In addition, the 95% bias corrected confidence intervals indicated that neither interaction had an indirect effect through authoritarianism or permissiveness towards casual sex. The indirect effect through authoritarianism for first multiplicative term was -0.02, 95% CI[-0.02, 0.06], while the indirect effect for the second multiplicative terms was 0.02, 95% CI[-0.02, 0.07]. Similarly, the indirect effect through permissiveness towards sex for the first multiplicative term was 0.0006, 95% CI[-0.005, 0.02], while the indirect effect for the second multiplicative terms was -0.02, 95% CI[-0.03, 0.007]. Thus, there is no evidence that pathogen disgust moderates the indirect effect of pathogen exposure on support for the censorship of pornography.

15. Hypothesis 4A

H4A: Exposure to pathogens will decrease support of gender equality.

H4A was not supported. Neither of the dummy-coded contrasts between the pathogen and gun prime (β = .11, t= 0.74, p = 0.46), nor between the pathogen-prime and control (β = .19, t= 1.20, p = .23.) significantly predicted support for gender equality.

16. Hypothesis 4B

H4B: There will be a negative indirect effect of exposure to pathogens on support for gender equality, mediated by authoritarianism.

H4B was not supported. Step 1 indicated that neither of the dummy-coded contrasts predicted gender equality, and Step 2 indicated that both the contrast between the pathogen-prime and gun prime (β = .04, t= 1.07, p = .29), as well as between the pathogen-prime and

control (β = -.006, t= -0.13, p = .90.), did not significantly predict authoritarianism, Finally, while Step 3 indicated that authoritarianism, controlling for pathogen disgust, significantly predicted support for gender equality (b = -0.42, t= -10.43, p < .001.), the indirect effect for the contrast between the pathogen-prime and gun prime was -0.03, 95% CI[-0.09, 0.03], while the indirect effect for the contrast between the pathogen-prime and the control was 0.008, 95% CI[-0.05, 0.73]. Thus, there was no evidence of mediation through authoritarianism.

17. Hypothesis 4C

H4C: There will be a positive indirect effect of exposure to pathogens on support for gender equality, mediated by permissiveness towards casual sex.

H4C was not supported. Step 1 indicated that neither of the dummy-coded contrasts predicted gender equality, and Step 2 indicated that both the contrast between the pathogen-prime and gun prime (β = -.05, t= -1.34, p = .18), as well as between the pathogen-prime and control (β = -.01, t= -0.28, p = .77), did not significantly predict sociosexuality, Finally, while Step 3 indicated that sociosexuality, controlling for pathogen disgust, significantly predicted support for gender equality (b = -0.07, t= -2.00, p < .05.), the indirect effect for the contrast between the pathogen-prime and gun prime was 0.07, 95% CI[-0.02, 0.03], while the indirect effect for the contrast between the pathogen-prime and the control was 0.0007, 95% CI[-0.01, 0.20]. Thus, there was no evidence of mediation through permissiveness towards casual sex.

18. Hypothesis 4D

H4D: There will be a strong negative correlation between support for the censorship of pornography and support for gender equality

H4D was partially supported. While there was a significant negative correlation between support for gender equality and support for the censorship of pornography, the effect was relatively small ($r = .08$, $p < .05$). However, if the correlation is broken down by gender, a significant difference emerges: for females this correlation is much stronger ($r = 0.22$, $p < .01$) than for males ($r = -0.02$, $p = .84$). Using Preacher's (2002) program to calculate the difference between two correlation coefficients, it was revealed that this difference is statistically significant ($p < .05$).

19. Hypothesis 4E

H4E: Sensitivity to pathogen disgust will moderate the indirect effect of exposure to pathogens on support for gender equality, such that increasing pathogen disgust sensitivity will accentuate the indirect effect of pathogen exposure on support for gender equality (as mediated by authoritarianism and permissiveness towards casual sex), while decreasing pathogen disgust sensitivity will suppress the effects of pathogen exposure.

H4E was also not supported. The standardized direct effect on gender equality was insignificant for both the interaction between pathogen disgust and the pathogen/gun contrast ($\beta = -.03$, $t = -0.55$, $p = .59$.), as well as the pathogen/control contrast ($\beta = -.06$, $t = -1.17$, $p = .24$.), In addition, the 95% bias corrected confidence intervals indicated that neither

interaction had an indirect effect through authoritarianism or permissiveness towards casual

sex. The indirect effect through authoritarianism for first multiplicative term was -0.04, 95%

CI[-0.1, 0.02], while the indirect effect for the second multiplicative terms was -0.03, 95%

CI[-0.09, 0.04]. Similarly, the indirect effect through permissiveness towards sex for the first

multiplicative term was 0.003, 95% CI[-0.008, 0.02], while the indirect effect for the second

multiplicative terms was -0.008, 95% CI[-0.03, 0.002]. Thus, there is no evidence that

pathogen disgust moderates the indirect effects of pathogen exposure on support for gender

equality.

20. Hypothesis 5

H5: Exposure to pathogens will result in significantly greater increases in support for

the censorship of pornography than other threats.

H5 was not supported. The dummy-coded contrast between the pathogen prime and

gun prime was not significant ($\beta = -.05$, $t = -0.36$, p = .72), indicating that the pathogen prime

did not elicit a greater increase in support for censorship than the gun prime.

21. Hypothesis 6

H6: Exposure to pathogens will result in significantly higher increased support for

the censorship of pornography relative to other threats, controlling for concern about

the effects of pornography

H6 was not supported. The dummy-coded contrast between the pathogen prime and

gun prime, controlling for first and third person effects, was not significant ($\beta = -.04$, $t = -$

0.97, p = .33), indicating that there was no difference in espoused support for the censorship of pornography between those exposed to the pathogen prime and those exposed to the gun prime. Third person perceptions were a significant predictor of censorship, (β = .20, t= 4.73, p < .001), while first person perceptions were not (β = .01, t= 0.2, p = .84).

22. Hypothesis 7

H7: Exposure to pathogens will result in significantly stronger normative judgments about the negative effects of pornography on males

In order to test H7, two-way ANOVAs (gender X experimental condition) were run each for perceived effects on self, perceived effects on other males, and perceived effects on other females. H7 was not supported. The main effect of the experimental manipulation was not significant on third person perceptions of males F (2, 631) = 0.83, p = .19, or third person perceptions of females F (2, 631) = 0.28, p = .75. Furthermore, the interaction between gender and experimental condition was not significant for first person effects, F (2, 631) = 0.45, p = .64, indicating that there was no evidence that males and females differentially assessed their susceptibility to pornography effect based upon exposure to the pathogen prime.

V. Discussion

This discussion section will first provide a summary and interpretation of the findings from both studies. Second, the implications of these findings and directions for future research will be considered. Finally, the limitations of this study will be discussed.

A. Summary and Interpretation of Findings

Broadly speaking, the current study sought to answer four major questions. First, can the behavioral immune system account for the production of certain psychological and cultural processes known to be associated with support for censorship (H1A, H2A, H3A, H3C, H3E, and H3F)? Second, do these processes mediate a causal relationship between exposure to pathogens and the censorship of pornography (H1B, H2B, H3B, H3D, and H3G)? Third, does this causal model provide a stronger explanation for the censorship of pornography than previously theorized mechanisms (H1B, H3B, H5, H6, and H7)? Finally, do the same effects occur concurrently on individuals' support for gender equality (H4A-E)? Each of these questions will be considered in light of each study's findings.

1. Does the behavioral immune system have an influence?

With regard to the question of whether the behavioral immune system can account for authoritarianism and permissiveness towards casual sex, the results of the two studies were fairly inconclusive. Historical pathogen prevalence did not significantly predict collectivism in Study 1, a finding that directly contradicts several prior studies (e.g., Thornhill et al., 2009; Fincher et al., 2008; Murray and Schaller, 2010). In Study 2, neither the pathogen prime nor sensitivity to pathogen disgust significantly predicted authoritarian attitudes, nor was there an interaction. While it may be tempting to question this prior work in light of these findings, there are important differences in the variables measured and controlled for that can account for this discrepancy.

First, Study 1 used religiosity as a covariate, which has not been done in much of the

prior research. Controlling for only GDP, population density, and the gini coefficient, the correlation between collectivism and historical pathogen prevalence is significant, $r(48) = .28$, $p < .01$. Furthermore, religiosity and historical pathogen prevalence are highly correlated, $r(128) = 0.71$, $p < .001$, and this relationship holds even when controlling for GDP, population density, and the gini coefficient, $r(73) = .35$, $p < .01$. However, Fincher and Thornhill (2012) argue that religiosity actually serves an adaptive function to maintain in-group assortativeness, and thus buffer against pathogen stress. This occurs through a form of costly signaling: religions require significant time, effort, and resources to practice; thus, practicing them signals commitment to an in-group that practices those beliefs. This acts to separate oneself from out-groups with differing beliefs that may harbor novel pathogens, as well as strengthening ties between in-group members, which facilitates adherence to social norms. While religiosity was specified as a covariate to ensure it did not confound the relationship between pathogen prevalence and pornography censorship, it may be inappropriate to include in analyses that are examining other outcomes of pathogens (e.g., collectivism).

For Study 2, the dependent measure was a modified version of Altemeyer's (1998) right wing authoritarianism scale, which measures much more extreme attitudes than prior research. For example, Murray and Schaller's (2012) study examining the link between disease sensitivity and conformist attitudes measured conformity with items such as, "Breaking social norms can have harmful, unintended consequences". This is contrasted with parallel items from the RWA scale, such as "Obedience and respect for authority are the most important values children should learn". Given that the present work's sample was

fairly liberal (political ideology had a median score of 3, corresponding to "slightly liberal"), it is likely that opposition to such extreme attitudes was too entrenched to be influenced by the pathogen prime.

With regard to permissiveness towards sex, there was some limited support for females. While Study 1 did not find that historical pathogen prevalence was a significant predictor of male sociosexuality, it was the strongest predictor of female sociosexuality. Interestingly, in Study 2, although sensitivity to pathogen disgust significantly predicted sociosexuality, it was in the opposite direction from what was predicted. That is, higher sensitivity to pathogen disgust was associated with higher permissiveness towards casual sex, even while controlling for sexual and moral disgust. Follow-up analyses revealed that pathogen disgust was still significant when adding gender as a covariate ($\beta = 0.15$, $t = 2.66$, p < 0.01). What may account for these findings? When looking at the correlations with other variables, it was found that pathogen disgust also positively correlated with support for gender equality, even while controlling for gender, sexual disgust, and moral disgust, $r(614) = .14$, $p < .001$. Furthermore, the undergraduate population from which the participants were sampled is known for being both socially liberal and sexually permissive. Given that Murray and Schaller (2012) found that perceived vulnerability to disease was correlated with self-reported conformist attitudes, it could be that those who are more sensitive to pathogen disgust also more strongly conform to perceived norms regarding gender roles and sexuality. However, if this is the case, it is not clear why there was no interaction between the pathogen prime and sensitivity to pathogen disgust, so this interpretation should be treated with some caution.

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2. Do these processes act as mediators?

Across both studies, there was no evidence to suggest that either authoritarianism or permissiveness towards casual sex mediated the relationship between exposure to pathogens and the censorship of pornography. In addition, the initially proposed causal model for Study 2 was shown to not adequately fit the data. However, although the hypothesized relationships were not supported, this may not necessarily mean that no mediating relationships exist. Thornhill et al. (2009) suggest that GDP and wealth inequality are actually outcomes of pathogen prevalence and using them as covariates is more for the sake of completeness than accuracy. If GDP is an outcome of pathogen prevalence, then there is the possibility that it could act as a mediator. To test this, bootstrapped 95% confidence intervals for the indirect effect were generated using Hayes' (2013) PROCESS macro. Results indicate that there was a significant indirect effect of pathogen prevalence on censorship of pornography through GDP, -1.07, 95% CI[-2.62, -0.17]. However, this begs the question of why economic circumstances would affect the legal status of pornography, and there are several possible explanations. First, it could be that GDP is acting as a proxy for democratization. Second, it could also be that democratization acts a mediator between GDP and censorship of pornography. Third, increased distribution of resources may allow for greater economic and political opportunities for women, which, in turn, leads to greater tolerance towards pornography. While exploring these relationships is beyond the scope of the current work, they do suggest the possibility of exploring alternative mediating hypotheses.

3. Do pathogens provide the best explanation of censorship?

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The results of Study 1 and Study 2 cannot establish that pathogens and the behavioral immune system provide a better explanation of pornography censorship than previously theorized mechanisms. Study 1 attempted to use mediational procedures to test whether pathogen prevalence could account for the relationship between collectivism and censorship of pornography. However, there was no evidence of an indirect effect of pathogen prevalence through collectivism. Aside from the inclusion of religiosity as a covariate, an indirect effect was not found due to the lack of statistical power. Gelfand et al.'s (2004) study of collectivism covered 62 countries, and a proportion of those countries did not have data for every covariate included in the analysis. This meant that the total sample size was only 50. If the mediation analysis is rerun with only GDP and the gini coefficient included as covariates (as per Thornhill et al., 2009), the bootstrapped (5000 samples) indirect effect of pathogen prevalence through collectivism is significant, -3.07, 95% CI[-7.97, -0.21]. So it is possible that pathogen prevalence can account for censorship of pornography, at least at the macro level.

Study 2 attempted to use a randomized experiment, in conjunction with a path analysis, to demonstrate, in part, that authoritarianism is a proximal mechanism of the behavioral immune system that mediates the relationship between exposure to pathogens and support for censorship. It also attempted to show that the proximal mechanisms of the behavioral immune system provided a better explanation of support for the censorship of pornography than either first- or third-person perceptions. This was not supported: neither the pathogen prime nor pathogen disgust significantly affected authoritarianism, nor were they stronger predictors of support for censorship than first- or third-person perceptions of

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pornography. In addition, exposure to pathogens did not significantly affect normative judgments of pornography's effects on males. There are two related reasons why these results may have occurred. First, the characteristics of the sample meant it was likely not as susceptible to the psychological effects of exposure to pathogens. Participants tended to be liberal, not particularly religious, relatively high in sociosexuality, and generally unsupportive of pornography censorship (see Table 2). Second, because authoritarianism and support for censoring pornography are relatively extreme attitudes, a single exposure to a pathogen prime may not be sufficient to exert influence if the sample is not already predisposed toward those attitudes. Thus, it is possible that an effect might be found if the experiment was replicated in a more heterogeneous sample and/or pathogen exposure was repeated over a significant length of time.

4. Do the same effects occur for gender equality?

While it was the case that gender equality was inversely related to support for censorship across both studies, there was no evidence to suggest that this was caused by pathogen prevalence. In Study 1, there was not a significant direct effect between pathogen prevalence and gender equality, and neither authoritarianism nor female sociosexuality were found to be mediators. However, the reasons for this are likely to be similar to why there was no relationship found for collectivism. Thornhill et al. (2009) had previously found that gender equality and pathogen prevalence remained negatively correlated even while controlling for GDP and wealth inequality. The current study, on the other hand, also included religiosity as a covariate, which is negatively correlated to gender equality, $r(115) = -0.57$, $p < .001$. As a result, while only controlling for GDP, wealth inequality, and

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population density, the partial correlation between pathogen prevalence and gender equality is significant, $r(73) = 0.30$, $p < .01$.

Based upon Thornhill et al.'s model (2009), it may be that GDP should also be treated as a mediator rather than a covariate. As pathogen load decreases, trade and economic activity is predicted to increase, which subsequently increases GDP. With a stronger economy and more available resources, women would be given increased opportunities to participate in economic and political spheres. This was tested, as before, by using Hayes' (2013) PROCESS macro to estimate bootstrapped 95% confidence intervals for the indirect effect of pathogen prevalence on gender equality through GDP. The indirect effect was significant, -0.02, 95% CI[-0.04, -0.007], indicating support for mediation. While this analysis is post-hoc and should be treated with caution due to the possibility of capitalizing on chance, it does converge with the earlier finding for authoritarianism.

For Study 2, the pathogen prime did not significantly affect support for gender equality, nor was there any evidence that authoritarianism and sociosexuality mediated this relationship. Furthermore, there was not an interaction between the pathogen prime and sensitivity to pathogen disgust. As was the case for support for censorship, this is in part due to both the homogeneous sample and an insufficient degree of exposure to pathogen cues to produce an effect.

B. Implications of Findings and Directions For Future Research

Despite the inconclusiveness of many of the results, there are still some significant implications that can be drawn from these findings. First, religiosity may be an important

variable to consider when examining the influence of pathogens. Religiosity and pathogen prevalence were closely correlated in Study 1 and, as a result, at least two well-established findings (i.e., the correlation between pathogen prevalence and collectivism and gender equality) from Thornhill et al. (2009) and others (e.g., Murray and Schaller, 2010, Fincher et al., 2008) became nonsignificant. However, this is not to say that religiosity somehow negates these previous findings. In fact, Fincher and Thornhill (2012) have found evidence to suggest religiosity is actually influenced by pathogen stress. However, given the close correspondence between the adaptive functions of collectivism and religiosity (both facilitate avoidance of out-groups, and increase adherence to in-groups), it is not currently clear to what extent these constructs interact or are redundant with each other. Future research should explore this relationship.

Second, while prior research has tended to focus on socially conservative attitudes (e.g., Terrizzi et al., 2014), there is limited evidence from Study 2 that sensitivity to pathogen disgust can also facilitate conformity to socially liberal attitudes. Pathogen disgust was positively associated with both higher sociosexuality and higher support for gender equality, even while controlling for gender, religiosity, political orientation, sexual disgust, and moral disgust. While these findings have not been found in earlier research, they are consistent with an increased conformity to norms specific to the socially liberal population from which Study 2 was sampled. Future research should examine whether this finding can be replicated within a similar context, and whether exposure to pathogens may attenuate this effect.

Finally, a follow up analysis from Study 1 revealed that there was a significant moderating relationship between historical pathogen prevalence and female sociosexuality

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on the censorship of pornography. Because this finding is post-hoc, it should be replicated by future research. While measures of female sexual freedom aside from the SOI are scarce, there may be some analogs available. Median age of first marriage could serve as a marker for female sociosexuality, as marriage at an earlier age for women could indicate lack of opportunity to pursue short-term mating before choosing a long-term mate. The marriageable age of females by law is also an alternative, as the ability to wed younger females might indicate greater control over female sexuality. In either case, all variables should be analyzed for convergent validity with female sociosexuality before testing.

If this interaction is revealed to be stable, it provokes several additional questions. Are there any conditions under which this moderation does not occur? Would this moderation hold in a larger sample? Does this also apply to contemporary pathogen prevalence? Furthermore, it would have interesting implications for the synthesis of Gangestad and Simpson's (2000) theory of good-gene sexual selection and Thornhill et al.'s (2009) parasite model of democratization. For example, are the effects of decreased pathogen stress on democratization dampened if there is a disparity in sex ratio and a lack of available mates? Sexual selection may interact with other cultural and psychological phenomena that pathogen research has investigated (e.g., collectivism) in ways not previously predicted by either theory alone.

C. Limitations

Both Study 1 and 2 had certain limitations that may have had an impact on the results; these limitations will be discussed in the following sections.

1. Study 1

Study 1 had several limitations. First, there was significant missing data for many of the countries because several of the scales that were utilized (e.g., collectivism, sociosexuality) were drawn from cross-cultural surveys that included between 40-60 counties. Therefore, although information about pornography legality was available for over 185 countries, many of these did not have data on all of the variables included in the study. Unfortunately, accurate data of cultural attitudes (especially related to sensitive issues such as sexuality) are difficult to gather, especially among more authoritarian and socially conservative regions. Therefore, there is a possibility that the estimation of the parameters is biased in some way.

Additionally, the use of pornography legality as a measure of support for pornography censorship is limited in several respects. First, although there is likely to be a significant correlation between legislation and cultural attitudes, the laws of governmental bodies do not necessarily reflect the beliefs and opinions of their citizens. Unfortunately, country level indices of support for pornography censorship are not available. Second, although legality was coded to include any country that criminalized pornography, criminal punishments varied widely. For example, in Latvia the law states that anyone who produces or distributes pornography "is liable to imprisonment for up to one year, custodial arrest, community service or a fine of up to 30 times the minimum monthly wage" ("Latvia – GRID", 2014). In contrast, Iranian law states that distributing pornography can carry a life sentence if "the offense was committed systematically or professionally" ("Iran – GRID", 2014). These two penalties are obviously quite different, but the current analysis does not

distinguish between them. Examining differences between the severities of punishment would be an interesting direction for further research.

Finally, although historical pathogen prevalence—which at least establishes a temporal order—was the independent variable, ultimately the data is correlational and definitive causal claims cannot be established. Unfortunately, eliminating all possible alternative explanation is difficult, due to the lack of data for many of the necessary indices and the scale of the unit of analysis. While country-level analyses can detect broad cultural trends, the effect of mid-level and local phenomenon on the aggregate is more difficult to determine. For example, how do variations in pathogen prevalence within regions affect democratization? While some researched has examined the influence of pathogen prevalence at a state-by-state level (e.g., Fincher and Thornhill, 2012), the current study cannot account for the differences between smaller geographic regions.

2. Study 2

Study 2 also had significant limitations. First, an online experiment was used to administer the manipulation. While this method has the advantage of more easily sampling a greater number participants and reducing volunteering bias for sexuality studies (Wiederman, 1999), there is a loss of experimental control when compared to the laboratory. Participants could not move on with the experiment without viewing the primes (the page reloaded each time, forcing the participant to reorient the mouse and click on the next button located under the image), and the manipulation check was significant (F (2, 634) = 54.39, p < .001). However, there was not a method for standardizing the amount of time participants

viewed each image as per prior experiments (Reid et al., 2012), and this may have influenced the results.

Second, support for censorship was low and the distribution of scores was significantly positively skewed. Therefore, if there was an effect of the manipulation on censorship attitudes, it may have been too difficult to detect. Part of the reason for this is likely that there was an insufficient amount of nuance in the way support for censorship was asked. Participants were asked whether they would support legislation to ban certain types of pornography, which many students indicated they would not. However, if they were instead asked to support particular censorship policies of varying severity, there may have been a greater amount of variability in responses. For example, it is possible there would be more support for an "opt-out" system, similar to the United Kingdom, where pornography is filtered unless an individual contacts their ISP to tell them to not block pornography. Alternatively, participants could have been asked if they would support banning more extreme forms of pornography. Given that many forms of pornography that have the potential to be found obscene in the United States often include pathogen vectors (e.g., bestiality, fecal play, vomiting), this might have had interesting implications.

Third, while participants were asked about their own sociosexuality, they were not asked about what they thought of the sexual activity of others. Therefore, it cannot be determined from this study whether norms about appropriate sexual behavior for males and females contribute to support for censorship. For example, it could be that individuals who believe that casual sex is acceptable for males, but not females, are more likely to be willing to support censorship. In addition, pathogen exposure could have conditional effects on these

norms. For example, if a male has had few short-term sexual partners and is exposed to pathogens, there could be a decreased perceived appropriateness for female casual sex (as per good-gene selection theory, Gangestad and Simpson, 2000).

D. Conclusions

To summarize, this dissertation attempted to employ both a country-level analysis of secondary data and an experimental design to: (1) examine whether the behavioral immune system could account for psychological and cultural processes associated with pornography censorship, (2) analyze whether these processes mediated the relationship between pathogens and censorship, (3) test whether a causal model of pathogens could provide a better explanation for the phenomenon of pornography censorship, and (4) confirm whether a concurrent causal process influenced gender equality. While the two studies produced inconclusive results and were, therefore, unable to provide definitive answers to these questions, they illuminated several potential avenues for future research to explore. It is hoped that the current work can spur further discussion and research on how communicative phenomena may be analyzed through the lens of evolutionary psychology, generally, and the parasite model of democratization more specifically.

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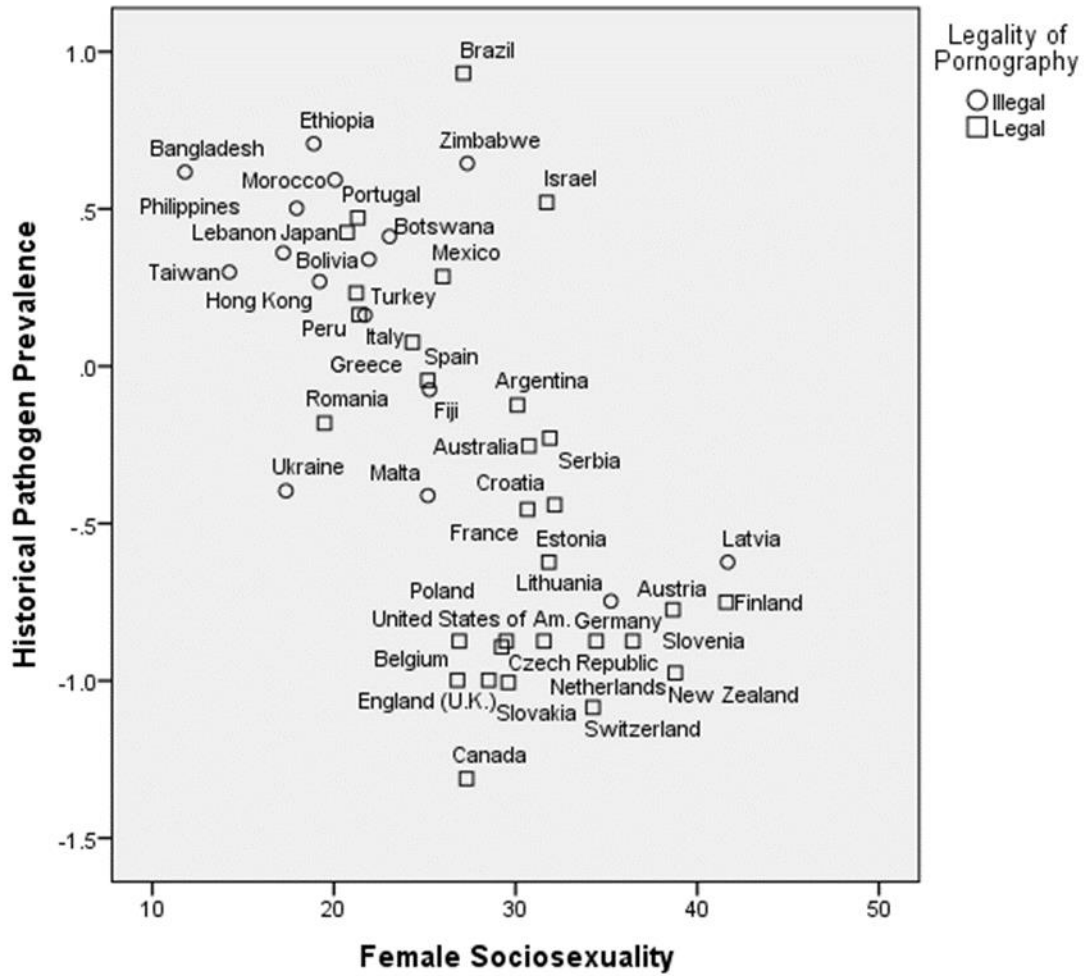
Research, *36*(2), 190–215. doi:10.1111/j.1468-2958.2010.01373

Appendix

Figure 1. Scatterplot of historical pathogen prevalence, female sociosexuality, and pornography legality
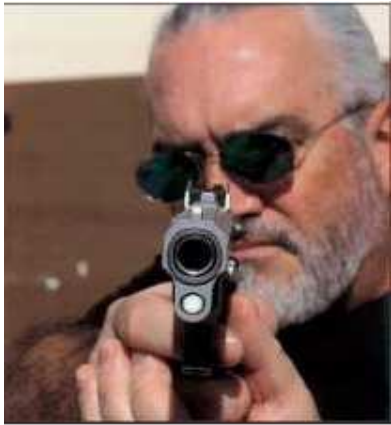
Figure 2. Example images for pathogen prime, gun prime, and control.
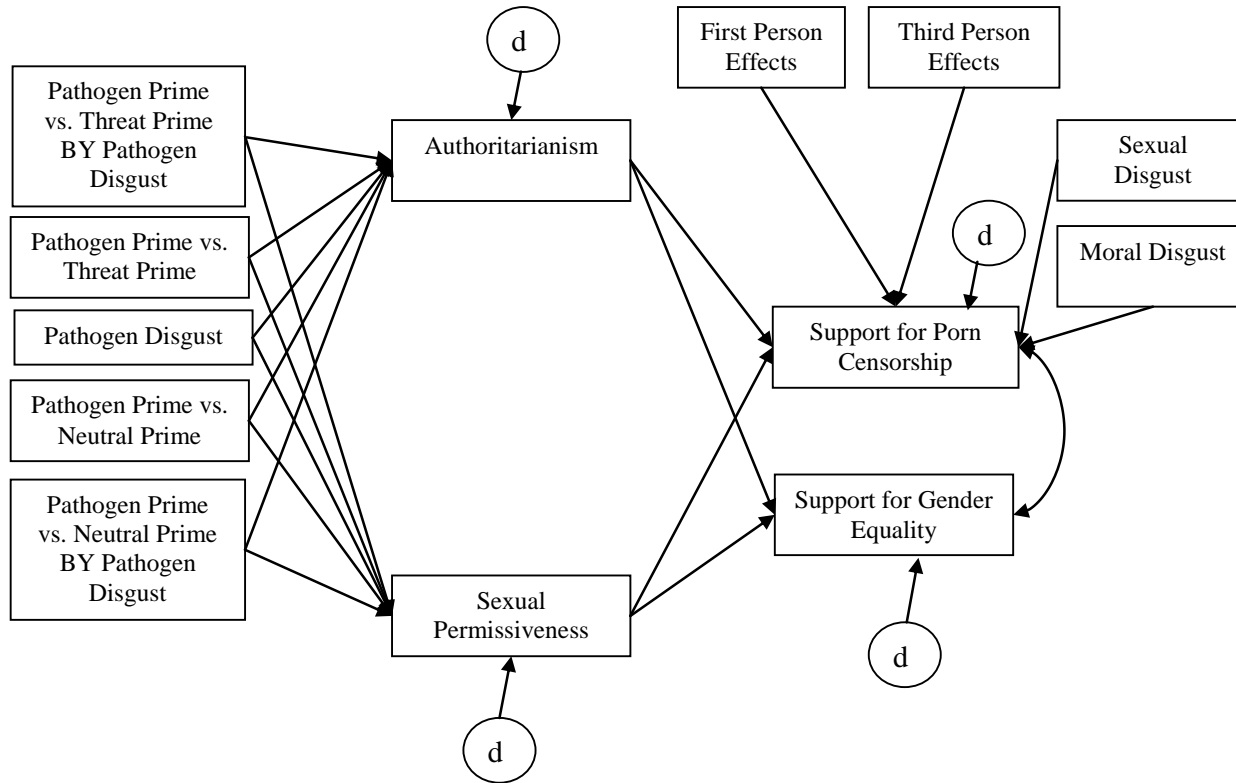
Figure 3. Hypothesized path model for Study 2.

	1	2	3	4	5	6	7	8
1.Historial pathogen prevalence	1							.
2. GDP per capita	-.672***	1						
3. Population density	.134	.092	1					
4. Religiosity	.714***	-.587***	.038	1				
5. Gini coefficient	.526***	-.408***	-.135	.517***	1			
6. SOI among males	-.254	-.153	-.548***	.093	-.013	1		
7. SOI among females	-.604***	.366**	-.408**	-.509***	-.298*	.540***	1	
8. Collectivism	.684***	-.714***	.160	.667***	.414**	-.074	-.666**	1
Mean	0.13	15022.81	1.9	73.22	40.53	47.88	26.74	5.20
Standard Deviation	0.66	13504.34	0.66	25.09	10.23	9.08	7.12	0.73

*Note: *p < .05, **p < .01, ***p < .001*

Table 1

Correlation Matrix, Means, and Standard Deviations for Observed Continuous Variables (Study 1)

	1	2	3	4	5	6	7	8	9	10	11	12
1. Third Person Perceptions	1											
2. First Person Perceptions	.666***	1										
3. Political Orientation	.144***	.178***	1									
4. Duke University Religion Index	.303**	.300***	.275***	1								
5. Brief Mood Introspection Scale	.011	-.015	.088*	.036	1							
6. Moral Disgust Subscale	.052	.049	-.013	.133***	.059	1						
7. Sexual Disgust Subscale	.342***	.261***	.110**	.322***	-.009	.195***	1					
8. Pathogen Disgust Subscale	.109***	.078	-.023	.102*	.016	.255***	.302***	1				
9. Support for Porn Censorship	.412***	.321***	.256***	.375***	.015	.103*	.521***	.126***	1			
10. LFAIS Scale	.016	-.117**	-.263***	-.064	-.011	.139***	.060	.147***	-.082*	1		
11. Sociosexuality Inventory	-.268***	-.206***	-.121**	-.296***	.080*	-.059	-.473***	-.005	-.312***	-.049	1	
12. Authoritarianism	.296***	.338***	.537***	.470***	.019	.024	.279***	.059	.445***	-.438***	-.245***	1
Mean	2.97	2.26	3.29	12.45	2.50	3.59	3.10	3.84	2.23	5.38	3.44	3.08
SD	0.89	1.09	1.31	6.01	0.40	1.14	1.27	1.02	1.14	0.85	1.04	0.92

Table 2

Correlation Matrix, Means, and Standard Deviations for Observed Continuous Variables (Study 2)

Measures from Study 2

Now you will be asked a series of questions. You will not be able to go back to any previous questions once you have moved on, so please carefully answer all of the questions on each page before pressing the "Next" button. You are allowed to skip any questions that you do not feel comfortable answering. All of your responses are anonymous.

What is your gender?
Please choose **only one** of the following:

○ Male

○ Female

BMIS
Choose the response on the scale below that indicates how well each adjective or phrase describes your present mood.
Please choose the appropriate response for each item:

	Definitely do not feel	Do not feel	Slightly feel	Definitely feel
Lively	O	O	O	O
Drowsy	O	O	O	O
Happy	O	O	O	O
Grouchy	O	O	O	O
Sad	O	O	O	O
Peppy	O	O	O	O
Tired	O	O	O	O
Nervous	O	O	O	O
Caring	O	O	O	O
Calm	O	O	O	O
Content	O	O	O	O
Loving	O	O	O	O
Gloomy	O	O	O	O
Fed up	O	O	O	O
Jittery	O	O	O	O
Active	O	O	O	O

Overall my mood is:
Please choose the appropriate response for each item:

Very unpleasant -10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	Very pleasant 10
O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

Authoritarianism Aggression and Submission
To what extent do you agree with the following statements:

	Strongly Disagree (-3)	(-2)	(-1)	Neither Agree Nor Disagree (0)	(+1)	(+2)	Strongly Agree (+3)
Our country desperately needs a mighty leader who will do what has to be done to destroy the radical new ways and sinfulness that are ruining us	O	O	O	O	O	O	O
The majority of those who criticize proper authorities in government and religion only create useless doubts in people's minds	O	O	O	O	O	O	O
The situation in our country is getting so serious, the strongest method would be justified if they eliminated the troublemakers and got us back to our true path	O	O	O	O	O	O	O
What our country really needs instead of more ''civil rights'' is a good stiff dose of law and order	O	O	O	O	O	O	O
Obedience and respect for authority are the most important values children should learn	O	O	O	O	O	O	O
The fact on crime, immorality and the recent public disorders all show we have to crack down harder on deviant groups and troublemakers, if we are going to save our moral standards and preserve law and order	O	O	O	O	O	O	O
What our country needs most is disciplined citizens, following national leaders in unity	O	O	O	O	O	O	O

Authoritarianism Conventionalism and Conservatism
To what extent do you agree with the following statements:

	Strongly Disagree (-3)	(-2)	(-1)	Neither Agree Nor Disagree (0)	(+1)	(+2)	Strongly Agree (+3)
Atheists and others who have rebelled against the established religions are no doubt every bit as good and virtuous as those who attend church regularly	○	○	○	○	○	○	○
A lot of our rules regarding sexual behavior are just customs which are not necessarily any better or holier than those which other people follow	○	○	○	○	○	○	○
There is absolutely nothing wrong with nudist camps	○	○	○	○	○	○	○
Homosexuals and feminists should be praised for being brave enough to defy ''traditional family values	○	○	○	○	○	○	○

	Strongly Disagree (-3)	(-2)	(-1)	Neither Agree Nor Disagree (0)	(+1)	(+2)	Strongly Agree (+3)
Everyone should have their own lifestyle, religious beliefs, and sexual preferences, even if it makes them different from everyone else	○	○	○	○	○	○	○
People should pay less attention to organized religion, and instead develop their own personal standards of what is moral and immoral	○	○	○	○	○	○	○
It is good that nowadays young people have greater freedom ''to make their own rules'' and to protest against things they don't like	○	○	○	○	○	○	○

In general, do you think of yourself as:
Please choose the appropriate response for each item:

Extremely liberal	Liberal	Slightly liberal	Moderate, middle of the road	Slightly conservative	Conservative	Extremely conservative
○	○	○	○	○	○	○

Perceived Effects of Pornography
How strong of a negative effect do you believe pornography has on the following:
Please choose the appropriate response for each item:

	No negative effect at all (1)	(2)	(3)	(4)	A strong negative effect (5)
Other males' moral values	○	○	○	○	○
Other males' attitudes toward the opposite sex	○	○	○	○	○
Other males' sexual knowledge	○	○	○	○	○
Other males' sexual attitudes	○	○	○	○	○
Other males' sexual behavior	○	○	○	○	○
Other females' moral values	○	○	○	○	○
Other females' attitudes toward the opposite sex	○	○	○	○	○
Other females' sexual knowledge	○	○	○	○	○
Other females' sexual attitudes	○	○	○	○	○
Other females' sexual behavior	○	○	○	○	○
My moral values	○	○	○	○	○
My attitudes toward the opposite sex	○	○	○	○	○
My sexual knowledge	○	○	○	○	○
My sexual attitudes	○	○	○	○	○
My sexual behavior	○	○	○	○	○

LFAIS

Please choose the appropriate response for each item:

	Strongly Disagree (1)	(2)	(3)	Neither Agree nor Disagree (4)	(5)	(6)	Strongly Agree (7)
Women should be considered as seriously as men for the Presidency of the United States.	O	O	O	O	O	O	O
Although women can be good leaders, men make better leaders.	O	O	O	O	O	O	O
A woman should have the same job opportunities as a man.	O	O	O	O	O	O	O
Men should respect women more than they currently do.	O	O	O	O	O	O	O
Many women in the work force are taking jobs away from men who need the jobs more.	O	O	O	O	O	O	O
Doctors need to take women's health concerns more seriously.	O	O	O	O	O	O	O
America should pass the Equal Rights Amendment, which guarantees equal rights for women.	O	O	O	O	O	O	O
Women have been treated unfairly on the basis of their gender throughout most of human history.	O	O	O	O	O	O	O
Women are already given equal opportunities with men in all important sectors of their lives.	O	O	O	O	O	O	O
Women in the U.S. are treated as second-class citizens.	O	O	O	O	O	O	O
Women can best overcome discrimination by doing the best they can at their jobs, not by wasting time with political activity.	O	O	O	O	O	O	O

Religiosity
How often do you attend church or other religious meetings?
Please choose the appropriate response for each item:

Never (1)	Once a year or less (2)	A few times a year (3)	A few times a month (4)	Once a week (5)	More than once/week (6)
○	○	○	○	○	○

How often do you spend time in private religious activities, such as prayer, meditation or Bible study?
Please choose the appropriate response for each item:

Rarely or never (1)	A few times a month (2)	Once a week (3)	Two or more times/week (4)	Daily (5)	More than once a day (6)
○	○	○	○	○	○

The following section contains 3 statements about religious belief or experience. Please mark the extent to which each statement is true or not true for you.
Please choose the appropriate response for each item:

	Definitely not true (1)	Tends not to be true (2)	Unsure (3)	Tends to be true (4)	Definitely true of me (5)
In my life, I experience the presence of the Divine (i.e., God)	○	○	○	○	○
My religious beliefs are what really lie behind my whole approach to life	○	○	○	○	○
I try hard to carry my religion over into all other dealings in life	○	○	○	○	○

SOI

The following set of questions will ask you about your sexual attitudes and behaviors. Please keep in mind that all of your answers are completely anonymous.

With how many different partners do you foresee yourself having sex with during the next five years? (Please give a *specific*, *realistic* estimate)

Please write your answer here:

To what extent do you agree with the following statements:

Please choose the appropriate response for each item:

	Strongly disagree (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Strongly agree (9)
Sex without love is OK.	○	○	○	○	○	○	○	○	○
I can imagine myself being comfortable enjoying "casual" sex with different partners	○	○	○	○	○	○	○	○	○
I would have to be closely attached to someone (both emotionally and psychologically) before I could feel comfortable and fully enjoy having sex with him or her.	○	○	○	○	○	○	○	○	○

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Support for Porn Censorship
How much would you agree with government legislation to ban the following types of pornography:
Please choose the appropriate response for each item:

	Strongly disagree (1)	(2)	(3)	(4)	Strongly agree (5)
R-rated pornographic films or programs	○	○	○	○	○
X-rated pornographic films or programs	○	○	○	○	○
Pornographic publications	○	○	○	○	○
Internet pornography	○	○	○	○	○

Disgust
The following items describe a variety of concepts. Please rate how disgusting you find the concepts described in the items, where 0 means that you do not find the concept disgusting at all and 6 means that you find the concept extremely disgusting.
Please choose the appropriate response for each item:

	Not at all disgusting (0)	(1)	(2)	(3)	(4)	(5)	Extremely disgusting (6)
Shoplifting a candy bar from a convenience store	○	○	○	○	○	○	○
Hearing two strangers having sex	○	○	○	○	○	○	○
Stepping on dog poop	○	○	○	○	○	○	○
Stealing from a neighbor	○	○	○	○	○	○	○
Performing oral sex	○	○	○	○	○	○	○
Sitting next to someone who has red sores on their arm	○	○	○	○	○	○	○
A student cheating to get good grades	○	○	○	○	○	○	○
Watching a pornographic video	○	○	○	○	○	○	○
Shaking hands with a stranger who has sweaty palms	○	○	○	○	○	○	○
Deceiving a friend	○	○	○	○	○	○	○

	Not at all disgusting (0)	(1)	(2)	(3)	(4)	(5)	Extremely disgusting (6)
Finding out that someone you don't like has sexual fantasies about you	○	○	○	○	○	○	○
Seeing some mold on old leftovers in your refrigerator	○	○	○	○	○	○	○
Forging someone's signature on a legal document	○	○	○	○	○	○	○
Bringing someone you just met back to your room to have sex	○	○	○	○	○	○	○
Standing close to a person who has body odor	○	○	○	○	○	○	○
Cutting to the front of a line to purchase the last few tickets to a show	○	○	○	○	○	○	○
A stranger of the opposite sex intentionally rubbing your thigh in an elevator	○	○	○	○	○	○	○
Seeing a cockroach run across the floor	○	○	○	○	○	○	○
Intentionally lying during a business transaction	○	○	○	○	○	○	○
Having anal sex with someone of the opposite sex	○	○	○	○	○	○	○
Accidentally touching a person's bloody cut	○	○	○	○	○	○	○