WHEN TO GIVE: DO CUES TO PATHOGEN
THREAT AFFECT CHARITABLE
BEHAVIOR?

by

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WHEN TO GIVE: DO CUES TO PATHOGEN THREAT AFFECT CHARITABLE BEHAVIOR?

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ABSTRACT

Disease cues in an individual’s environment can impact behavior, particularly when one has a heightened perceived vulnerability to disease. In this research, we looked at the likelihood for people to hold onto their resources more tightly when they believed there was an increased pathogen load in their immediate environment. This was studied particularly for the concept of philanthropic giving. Participants were given raffle tickets at the start of our experiment and were then shown an informational slideshow about the possibility of contracting disease from their surroundings. They also completed a questionnaire concerning their perceived vulnerability of disease. At the end, we provided participants the option to either give the money that the raffle tickets represented to charity, or put them in the raffle to win a cash prize for themselves. The results showed no significant effect of the slideshow condition upon likelihood to give to charity. We did find sex difference trends, as women were more likely to donate their tickets than men. Study limitations and proposed changes have been projected for future study.
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Introduction

December 2007 to June 2009, a period now referenced as the Great Recession, marked a severe economic downturn across America with the bust of an eight billion dollar housing bubble, sharp cutbacks in consumer spending, and the loss of 8.4 million jobs (Mishel, Bivens, Gould, & Shierholz, 2012). This was a period of extreme economic uncertainty within the United States. However, charitable donation rates to food banks in 40 different cities increased by 2.2% from 2007 to 2008 and by 31.9% from 2008 to 2009 (Reich & Wimer, 2012). In fact, Americans still gave the same percentage of their annual income to charitable endeavors as before the recession. This data suggests that Americans find giving to philanthropic causes important, even in the midst of a recession. Why is this? Proposals for the justification behind giving of an individual’s time and hard-earned money include selfishness, social norms, guilt, and empathy to name a few (Myers, & Twenge, 2013). But what role does the environment play? A body of research on life history theory, which looks at evolutionary biological factors to predict behavior, suggests that when the pathogen load of an immediate environment is high, people are more likely to invest in personal development and well-being (Charnov, 1993; Roff, 1992; Stearns, 1992). This means that when disease cues are present, individuals tend to hold onto resources more tightly in the event that they might need those resources in the near future. More specifically, we believe this could mean that an increase in pathogen cues in an individual’s immediate environment might lead to an unconscious shift in willingness to give to a charitable cause.
Philanthropy and Self-Interest

Prosocial behavior encompasses any helping acts that are beneficial to others within society or one’s social group (Penner, et al., 2005). But why do people so often give of their time and money help to others? Research suggests that this sacrifice happens for many reasons: societal norm fulfillment, emotional maintenance, and empathy, to name a few (Myers & Twenge, 2013). Individuals often partake in activities aimed at helping others, such as volunteering, voting, or donating goods and money. And yet, many of these behaviors can be personally costly to the giver, implying there may be other motives behind prosocial actions. It may seem that personal altruism is the main motivator behind these behaviors, but this is not always the case. In American culture, philanthropic giving has arguably become more about the pursuit of an individual’s projects over a means of wealth redistribution (Reich, 2013). More specifically, this means that there is an implied level of self-interest when it comes to philanthropy, more than working towards social justice for all. There is a prominence of image concern in philanthropic giving, mainly the desire to increase public praise and avoid public shame. Charitable actions therefore often reflect a mix of self-interest, social image, and altruistic motivation (Bénabou & Tirole, 2005). In a study conducted by Holmes, Miller, & Lerner (2001), people were shown to be more uncomfortable helping others merely because doing so was the “right” thing to do. Instead, they were more willing to give money when it became an economic transaction. When they received a product in return, even if the product was not anything in which they were particularly interested, participants reported more satisfaction.
External Effects on Philanthropy

According to the Blackbaud Index of charitable giving within the United States, November 2013 showed a significant increase in online charitable giving towards relief efforts due to the devastation from the Typhoon Yolaesnda, which hit the Philippines (Halper, 2015). By donating large amounts of money to the cause, Americans rallied behind these efforts to offer aid and rebuild the Philippines after this catastrophe struck. However, 2014’s Ebola outbreak seemed to have the opposite effect on philanthropic activity. Media coverage of the Ebola outbreak led to two-thirds of Americans expressing anxiety about a perceived large-scale Ebola outbreak. In some extreme cases, parents pulled their children out of school after their principal had visited Africa—though miles away from any Ebola activity, and a Texas community college refused to accept Nigerian applicants (Mulholland, 2014). Politicians supported travel bans from countries in West Africa as mass hysteria grew, though the likelihood of an individual infection was one in 13.3 million (Mulholland, 2014). The first reported case of Ebola in the United States was documented on October 1, 2014. That very next month showed a marked decline in charitable giving activity (“Ebola: Mapping the outbreak,” 2015). In fact, healthcare, international affairs, and human services all suffered drops in overall giving in 2014 (Halper, 2015). With this information, we cannot help but wonder if these trends have a greater meaning. Why would individuals be so willing to give money to a relief fund from a typhoon one year, but be less likely to give money in an environment permeated with the threat and fear of an Ebola outbreak? Could pathogen threat have an impact?

This subsequent research suggests that people’s willingness to engage in altruistic behaviors is impacted by several cues in their internal and external environments. Here,
we sought to build on this body of research by examining how altruistic behaviors are influenced by a factor that plays an important role in calibrating decisions about how to allocate limited bodily resources across the lifespan: the pathogen load in an individual’s environment. Research finds that pathogen-dense ecologies tend to promote behaviors aimed at improving one’s own bodily state or condition as a means of promoting survivability in the face of a growing risk of disease. We predicted that this effort allocation shift might extend to decisions about charitable giving: that individuals will give less to others in the face of disease cues.

**The Behavioral Immune System and Perceived Vulnerability to Disease**

Throughout history, infectious diseases have been an influential issue to the reproductive success of organisms, particularly for humans. As a protective measure, the immune system functions to both detect and defend against harmful pathogens entering the body. However, a complete immune system defense can be metabolically costly (Moretnsen, et al., 2010). Because of this potential cost, scientists have theorized the evolution of a psychological mechanism that encourages prophylactic behavior (Nesse, 2005). Such a mechanism is sensitive to cues that might resemble real symptoms of pathogen infection in the nearby environment. And so, it has been theorized that a behavioral immune system (BIS) has evolved to act as a “first line of defense” against those pathogens. Specifically, this means the behavioral immune system acts as a detection process of pathogens in the proximal surroundings. Once a potential threat is identified, it in turn sends avoidance cues before pathogens have time to make contact with the body (Schaller & Park, 2011). For example, a survey conducted in 2001 has shown the association of feces, urine, vomit, blood and spoiled food with “disgust
elicitors” (Curtis & Brian, 2001). These feelings of disgust encourage unpleasant arousal and subsequent avoidance from the items that are known to carry “bacterial, viral and protozoan pathogens” (Curtis & Brian, 2001). Cross-culturally, death and decaying bodies as well as foods not prepared in a hygienic manner have similar effects of disgust on individuals due to their potential pathogen contamination.

In both correlational and experimental studies, the BIS activation has been shown to be associated with specific disease-avoidance behaviors. The BIS has potential influence on ethnocentrism, xenophobia, and prejudicial responses against people who are different. For instance, those who feel vulnerable to pathogens are likely to choose contact with individuals from familiar groups instead of foreign ones (Schaller & Park, 2011). Further, individuals were more likely to associate danger with foreign outgroups.

A look into the regional prevalence of pathogens in a given environment also shows a strong positive correlation with collectivism and a strong negative correlation with individualism (Fincher et al., 2008). Further, in geographical areas with a higher prevalence of infectious disease, societies were more collectivistic. It is theorized that specific behaviors characterizing an individualistic society, such as extroversion, might additionally enhance the likelihood of pathogen transmission. A heightened perceived vulnerability to disease (PVD) can also cause the BIS to engage in higher speeds of avoidance mechanisms (Mortensen, et al., 2010). It is also correlated with negative attitudes towards obese individuals when obesity is viewed as being implicitly associated with disease and therefore a possibility of transmission (Park et al., 2007).
Perceived Vulnerability to Disease

An individual’s personal perception of likelihood to contract a disease present in the immediate or nearby environment plays a key role in their actions. A heightened personal sense of vulnerability to disease can impact with whom one interacts, as well as motivate other infection avoidance mechanisms, potentially triggering the behavioral immune system. For example, individuals consistently concerned with contracting disease are more likely to appraise themselves as less open to experience, less agreeable, and less extraverted (Mortensen, et al., 2010). This could be explained by an individual’s view of interpersonal behavior as a means of an increased likelihood of pathogen infection (Schaller & Park, 2011). This heightened perceived vulnerability can increase sensitivity to pathogen cues and therefore the reactivity of the BIS to the environment. For experimental purposes, this trait can be evaluated using the Perceived Vulnerability to Disease Scale, a measure that has been shown to reliably predict an individual’s reactivity to disease cues (Duncan, Schaller & Park, 2009).

The Current Research

In the current research, we test the hypothesis that when there are cues to pathogen threat in one’s immediate environment, people who have a high perceived infectability will be more likely to reserve resources for themselves than give resources towards a charity when presented with the option. This would be an adaptive response of the BIS, because if incapacitated by illness, it would be critical for survival that an individual have sufficient resources upon which to survive until recovery. And with prosocial behaviors like charitable giving often connected to self-interest, we are interested to see the results of PVD on these decisions. The subsequent research we have
conducted examines the relationship between cues to pathogen threat in the environment, perceived infectability, and charitable giving.

**Methods**

**Participants**

The participants were 105 undergraduate students (72 women, 33 men) recruited from a university psychology participant pool and received course credit in exchange for their participation.

**Materials**

All study procedures were complete on computer terminals using Qualtrics survey software. Envelopes for each participant containing eleven raffle tickets were prepared beforehand. The serial numbers of each raffle ticket had been previously recorded so they could be matched to the specific individual they would be given to, so that their responses could be tracked.

**Procedure**

The students were informed at the beginning of the experiment, via an informed consent document, they would not be harmed in any way, they were free to leave the experiment without penalty, and their responses would be kept confidential. Upon completing the informed consent, participants were randomly assigned to one of two conditions. In the control condition they were given the explanation that the researchers have partnered with the Geology Department at TCU to pilot test an informational slideshow presentation that would ostensibly be shown to the student body following pilot testing. In the experimental condition, it was explained that the researchers had partnered with the TCU Health Center to pilot test an informational slideshow
presentation pertaining to campus health issues that would be ostensibly shown to the student body following pilot testing.

Then participants would either view the TCU Geology Department slideshow, which served as the control condition, or the TCU Health Center slideshow, which served as the prime of disease threat depending on their random condition assignment. After watching the slideshow, participants were asked a series of distractor questions concerning information shown in the presentation in order to aid in the deception of the experimental manipulation. Participants were asked to recall information from the slideshow and for their opinions regarding both the quality of the presentation and how it might be improved.

The participants were then prompted to complete an advanced demographic questionnaire along with other questions regarding their socioeconomic status. Upon completing those questions, participants were asked to questions from the Personal Vulnerability to Disease (PVD) index, and a series of distractor personality questions to obfuscate the nature of the PVD. Items from the scale and distractor questions were shuffled together and randomized. Lastly, participants were given measures to evaluate their suspicions regarding the study and the nature of their participation. All of the previous measures were given to the students via the online survey system, Qualtrics.

In both conditions, participants were told that the TCU Psychology Department had purchased tickets for a charitable raffle for a nonprofit that a psychology club, Psi Chi, supports and that in addition to course credit, participants would receive raffle tickets as part of their compensation. At the beginning of the testing session, an envelope containing eleven raffle tickets was given to each student.
Participants were given the option to write their own names on the back of each ticket for a chance to be entered to win the cash prize, or write “charity” on the ticket to donate the portion of the ticket that normally goes to the prize pool to charity. After the Qualtrics survey was completed, participants were asked for fill out and return their raffle tickets to the experimenter. The amount of tickets the participant chose to donate to charity served as the behavioral measure of charitable giving.

Before leaving the computer lab, participants were given a debriefing form, which explains the nature of deception used. This form also contained contact information of the experimenters should the participants had any ethical concerns regarding the nature of the study.

**Results**

Scores of charitable giving were computed by summing the number of tickets each participant elected to donat to charity, resulting in a continuous scale ranging from 0 to 11. The mean score for charitable giving was 7.91 ($SD = 4.07$). To test the hypothesis that pathogen threat would result in less charitable giving, charitable giving scores were analyzed in a one-way between subjects analysis of variance with two slideshow conditions: pathogen threat and control. The results of the ANOVA revealed that slideshow condition had no effect on charitable giving scores, $F(1, 104) = .19, p = .66$.

To test for any potential sex effects, a one-way between subjects analysis of variance was performed. The results of Levene’s test for the homogeneity of variance revealed that the variances of the groups were heterogeneous ($F(1, 104) = 6.13, p = .02$), thus violating a key assumption of the ANOVA procedure. Using a cubic transformation,
the data were transformed such that they passed Levene’s test for the homogeneity of variance ($F(1, 104) = 2.87, p = .09$). The results of a one-way ANOVA using the transformed data revealed that sex had a significant effect on charitable giving, $F(1, 105) = 7.67, p < .01, \eta^2 = .07$, where women ($M = 8.63, SD = 3.66$) donated significantly more tickets than men ($M = 6.36, SD = 4.51$).

Because of the significant difference in charitable giving between men and women, a 2x2 (sex by condition) between subjects analysis of variance was performed to test for a possible interaction effect between sex and condition that may be suppressing the relationship between condition and charitable giving. The results of the 2x2 ANOVA revealed that there was not a significant interaction effect between sex and condition, $F(1, 101) = 1.55, p = .22$. To test for a potential moderating effect of PVD on the relationship between condition and charitable giving, two multiple linear regressions were performed. In the first, PVD (perceived infectability subscale) and condition were regressed on charitable giving scores. In the second, PVD (germ aversion subscale) and condition were regressed on charitable giving scores. The results revealed that there was no significant two-way interaction effect between PVD-PI and condition on charitable giving scores ($b = -.067, t(104) = -.103, p = .92$) nor was there a significant two-way interaction effect between PVD-GA and on charitable giving scores ($b = -.308, t(104) = -.369, p = .71$).

**Discussion**

Ultimately, our results did not support the hypothesis that when primed with disease cues, individuals with a higher PVD were more likely to preserve resources for potential future disease threats. And though some trends towards that end can be seen, we
certainly admit that there were limitations within the study that could certainly affect the interpretation of the data. However, there were definitive differences seen between men and women within this study. For example, as proposed in evolutionary theory, the mate value of males is often tied to resources. For example, cross-culturally, women value economic resources in a potential long-term mate (Buss & Schmitt, 1993). And when asked about short-term mating, women particularly valued cues that a man would expend resources on her within a short amount of time together (Buss & Schmitt, 1993). This implies that as a mating strategy for both the short-term and long-term encounters, economic resources are important for sexual selection. Regardless of condition, biological sex was an influential factor of resource allotment. For example, men were less likely to give their tickets, which represented the potential of money, to charity. Instead they were more likely to attempt to win the prize pool of money. Men may feel that it is more important to have the monetary means to attract women above giving in a philanthropic manner.

**Limitations**

There were some limitations within this study that might affect data interpretation. One particular aspect of these limitations is the strong female bias in our sample. While men were recruited as regularly as females for this study, we ended up with a skewed representation of the normal population, with 72 female participants and 33 male participants. We saw definite sex differences in responses in our data, so a more representative population might shed some more significant trends between the giving styles of men and women.
We also suggest that our dependent variable (DV) might have some limitations as seen through the abnormal distribution of responses. We had a bimodal distribution of behavioral responses, for most individuals either chose to donate all 11 tickets towards charity or donate 0 towards charity, and therefore putting all 11 towards the prize pool. The high variance in this sample therefore provides a definite limitation. We had initially chosen a behavioral measure, providing each participant with 11 tickets so we could capture more variation, but instead people often resorted to “all or nothing” giving.

**Future Research**

In the future we have considered trying a behavioral intention measure instead of a behavioral one, as this might capture more variability. Our hypothesis is concerned with the willingness to give towards charity as related to one’s PVD and BIS, not necessarily how much they are willing to give so in a case like this, a behavioral intention measure might be useful. As this would be a private survey, the social desirability of appearing charitable in front of others might not have a significant effect on the decision to give or how much to give. Another suggestion for future testing would be to provide the participants with physical money, so that the act of giving the money to charity or towards the prize pool would be more tangible and the effects of PVD and BIS more easily seen.

**Conclusion**

We did not find significant data to necessarily support our hypothesis that a heightened Perceived Vulnerability to Disease has strong effects on the likelihood of giving resources to charity versus reserving them for oneself in the event of future sickness. However, we did see trends in that direction, so we do not feel that our
hypothesis is altogether wrong. We have noted possible limitations and presented variations to the experiment for future testing. We still theorize that one’s PVD has effects upon resource consumption as well as philanthropic giving, and with some modifications to our original study, we hope to see if any significant trends can be found. It is also important to also note that the behavior of our male population supports the evolutionary theory connecting potential mate value to resources. We hope that this experiment encourages future studies that look into the links between PVD, BIS, and philanthropy.
References


