1-1-2012

Patient trust: predicting university students' trust in their physicians and the health care system

Lisa Elizabeth Stack
Wayne State University,

PATIENT TRUST: PREDICTING UNIVERSITY STUDENTS' TRUST IN THEIR PHYSICIANS AND THE HEALTH CARE SYSTEM

by

LISA ELIZABETH STACK

THESIS

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

MASTER OF ARTS

2012

MAJOR: SOCIOLOGY

Approved by:

_____

Advisor Date

ACKNOWLEDGMENTS

I would like to thank my advisor Dr. Janet Hankin, for her guidance in my ongoing development as a sociologist and researcher. Her dedication to her students is remarkable, and she has been an exceptional role model of the sociologist I hope to become. I am also appreciative of my committee members, Dr. David Merolla and Dr. Zachary Brewster for their helpful insights and suggestions they have provided me toward my research. Finally, I would like to express gratitude to my family and friends for their support during my ongoing academic journey.

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

Trust is a multidimensional concept that is integral to all relationships. High levels of trust are especially necessary in individual relationships, such as a patient and his/her physician, as well as structural relationships, such as a patient and the health care system. Previous research has focused on constructing the concept of trust, creating and expanding measurement instruments, examining trust between a patient and his/her physician, examining trust between a patient and the health care system and examining the consequences of various levels of patient trust. Few studies have examined whether the same factors predict patient trust in physicians and patient trust in the health care system.

The specific aim of this research project was to determine if sociodemographic characteristics of University students predict their level of trust with their physicians and their level of trust with the health care system. As trust is a multidimensional concept with several measurement methods, this study focused on the patient trust using the Primary Care Assessment Survey (PCAS) trust subscale to measure physician trust (Safran et al. 1998) and the Medical Mistrust Index to measure health care system trust (LaVeist et al. 2000).

Throughout the literature, trust is noted as necessary to the patient/physician relationship. Higher levels of trust are associated with patients who are more likely to adhere to treatment recommendations, form more effective communication with their physicians, and have more positive health outcomes (Hall et al. 2001). Trust in the health care system as a medical institution, whether it is insurance, hospitals or more global aspects of the system as a whole, is just as important as the individual relationship

between a patient and physician. Greater trust in the health care system is linked to higher patient adherence to medications, increased health seeking behaviors and an increase in maintaining long-lasting relationships with physicians (Boulware et al. 2003).

There are several important reasons for examining both 1) the relationship between the level of a patient's trust in his/her physician and the level of a patient's trust in the health care system and 2) the ability to predict levels of trust. Foremost, the literature has shown that high levels of trust in physicians and the health care system equate to better health outcomes for individuals. Determining which sociodemographic characteristics predict lower levels of trust on the individual and structural levels is the first step to alleviating health disparities, in addition to further adding to the literature on this topic. Lower levels of trust result in fewer health seeking behaviors, and poor communication, under diagnosis and under treatment. Lack of help-seeking behaviors, lack of diagnosis and proper treatment ultimately lead to poorer health outcomes.

Next, it is important to determine if there is a relationship between trust in one's physician and the health care system. This study was cross-sectional, correlations and predictors of said relationship were examined, but determining causality was beyond the scope of this project. Next, we need to determine which groups have the lowest levels of trust, if different variables predict physician trust and system trust, and why. To do so, several questions must be asked: What predicts trust in physicians?, What predicts trust in the health care system?, Are these kinds of trust related? What are predictors of the discrepancy between trust in one's physician and trust in the health care system? After answering these questions, policy recommendations can be made and interventions created to increase trust at an individual level and a structural level, which will allow

improvements in adherence to treatment and continuity of care, resulting in better health outcomes.

ORIGINATING QUESTIONS

What is the nature of the relationship between the level of a patient's trust in his/her primary care physician and the level of a patient's trust in the health care system among University students? Does this relationship vary among different patient sociodemographic factors? Are patient sociodemographic factors predictive of trust in one's physician? Are patient sociodemographic factors predictive of trust in the health care system?

LITERATURE REVIEW

The literature is filled with variations of the conceptualization of trust, studies examining a patient's trust in his/her individual physician and studies examining a patient's trust in the structure of the health care system. Only some of these studies examine correlates of trust between a patient's trust in his/her individual physician and a patient's trust in the structure of the health care system. Ultimately, lack in structural trust may begin to affect individual interpersonal trust and is necessary to study the relationship between the two and form policy changes to build trust if necessary.

The Concept of Trust

The first and most abundant focus within the literature is the discussion of the complex concept of trust itself. Mechanic (1998) discusses patient trust as the expectation that institutions and professionals will act in a patient's best interest. Five aspects of trust were examined: technical and interpersonal competence, physician agency, physician control, confidentiality, and open communication and disclosure. Goold (2002) further

discusses trust as a sociological construct. Patients may experience various forms of trust: expectant/presumptive trust (the predisposition the patient brings to first encounter), experiential trust (knowledge gained over time), and identification-based trust (a sense of shared values). Goold (2002) asserts that poor communication leads to low trust in each dimension of the construct. Jacobs (2006) describes trust was being determined by the interpersonal and technical competence of physicians as perceived by patients. Factors of distrust in physicians include: a lack of interpersonal and technical competence, perceived quest for profit and expectations of racism and experimentation during routine provision of health care. Hall (2001) encapsulates all of the dimensions of trust, describing trust as multidimensional and involving five key dimensions. First, fidelity or not taking advantage of a patient's vulnerability. Second, competence, avoiding mistakes while producing the best results. Next, honesty or telling your patients the truth. Also, confidentiality or protecting sensitive information and finally, global trust, a holistic aspect of trust overall. Each of these components of trust is increasingly important for not only individual trust, but also structural trust as the movement away from paternalism towards consumerism in patients continues (Heritage & Maynard 2006).

Kao et al. (1998) evaluated the extent to which physician payment was related to physician trust using the Patient Trust Scale. This scale is a 10-item scale with an internal consistency of chronbach's alpha =.94. Conducting a cross-sectional telephone survey, respondents who had a primary care physician visit recently and were enrolled in managed care or plans of a large, national health insurer (N=2086) were also asked to identify their physician's method of payment and answer the 10-item scale. Kao et al. then compared the perception of payment to the actual form of payment. The authors

found that most patients trusted their physicians. Fee-for service patients trusted their physicians the most, but nearly one-third of patients were incorrect about how they paid their physicians. Perceptions of payment were not associated with trust, but respondents that did not know the form of payment had higher levels of trust.

These ideas are furthered by Mollborn et al. (2005) when they examined fiduciary trust. Fiduciary trust is the patient's belief that his/her physician will act in the patient's best interests. The authors used the 1998-1999 Community Tracking Study, which is a cross-sectional sample representative of the noninstitutionalized population in the United states (n=29,994). Stratified sampling was used with probabilities proportionate to the general population. Random-digit dialing was used to ask the respondents who had a regular physician questions relating to delayed care and unmet health care needs, fiduciary trust in a physician, barriers to obtaining care, sociodemographic characteristics of the respondent, frequency of care and satisfaction with choice of physician. Using logistic regression models, they found this type of trust was negatively associated with the likelihood of unmet health care needs, specifically among minority members, the poor and the uninsured. This means that the higher the trust in a physician, the less likely unmet health care needs were found.

Using a cross-sectional telephone survey (n=255) of individuals who had been treated in a primary care practice or emergency room associated with the University of Pennsylvania health system from 2005-2008. Armstrong et al. (2008) found value distrust higher among blacks than white. Value distrust includes perceptions of respect, honesty, caring and confidentiality. The authors also found higher health care system distrust among blacks than whites, but did not find racial differences in technical competency

trust. This lack of significance in competency trust is contrary to research by Goold (2002) and Jacobs (2006).

Measuring Trust

In addition to varying conceptualizations of trust, measurement methods of trust fluctuate as well. The three main scales used for assessing physician trust are: Primary Care Assessment Survey, Trust in Physician Scale, and Patient Trust Scale. Freburger et al. (2003) assessed the psychometrics of the Trust in Physician Scale using secondary data from a longitudinal study, including mailed questionnaires of patients who had a primary diagnosis of rheumatoid arthritis. The authors found high internal consistency (cronbach's alpha = .87). The Trust in Physician scale assesses the domains of dependability, confidentiality and confidence, using eleven items, administered by an interviewer. All eleven items are in a 5-point Likert format. The Patient Trust Scale focuses largely on managed care aspects, such as payment structure. This scale includes ten items, administered through telephone survey. High reliability was found for the Patient Trust Scale, with a cronbach's alpha coefficient of .94.

The main scale used for assessing patients trust in institutional medicine is the Medical Mistrust Index. The entire index is includes seventeen statements, measuring mistrust in health care. The MMI uses a 4 point Likert scale, normally administered by an interviewer. Seven statements from the seventeen statement MMI are often used because of high test-retest reliability, ranging from .346-.697 (pearson correlation) found by LaVeist et al. (2009) and high internal consistency with a cronbach's alpha of .76. The authors conducted a telephone survey using random sampling of households in Baltimore City, Maryland (N=401, and N=327 for follow up three weeks after baseline interview).

Scale validity was examined using pearson's correlation between the Medical Mistrust Index, the trust in physician scale (TIPS). TIPS measures interpersonal trust in one's physician using an eleven item self-administered questionnaire with a 5 point Likert format. MMI was found to be significantly correlated with this scale.

Predictors of Trust

Predictors of trust are as integral to examining trust as conceptualization. Various sociodemographic factors such as race, religion, income, gender and age have been found to predict trust, as well as variables of access such as insurance status (Dovido et al. 2008, Schnittker 2004, Benjamins 2006, and Mascarenhas et al. 2006). Predictors of racial biases, whether implicitly or explicitly, produce mistrust as found by Dovido et al. (2008). The authors examined studies of prejudice published in the past 10 years combined with health disparity research since 2003. This conclusion is supported by Goodkind et al. (2010) who examined mistrust of health care in order to improve behavioral health care among American Indian/Alaskan Natives. They argue that AI/AN mistrust of health care has historically been reproduced overtime. Their review of the mental health of AI/AN youth produced seven main causes of behavioral health disparities, some of which include possible links to trust: past and current oppression, racism and discrimination, underfunded systems of care, lack of cultural competence among systems of care and providers and carriers to care.

Schnittker (2004) suggests the possibility of lower trust levels among minority group members as a result of social distance between the patient and the physician. Schnittker defines social distance broadly to include cultural, structural and ideological distances between two individuals. The author used data from the Community Tracking

Study (CTS) from 1996-1997 (N=27,672). Households were sampled randomly, and the sampling was performed in stages. Most interviews were conducted over the phone, with a small number interviewed in person. The face-to-face interviews served to ensure that homes without telephones were being represented. Schnittker used physician trust as a variable, measured with the Trust in Physician scale, as well as physicians' behavior as a variable using three questions about behaviors, and the respondent's sociodemographic characteristics as variables such as race/ethnicity, income and education.

In addition to other studies that discuss racial variation in trust, Boulware et al. (2003) discussed different trust patterns based on racial variation in trust of health insurance plans, physicians and hospitals. Telephone surveys were conducted by random selection in the Baltimore metropolitan area. Respondents (N=118), aged 18 to 75 years, rated levels of trust in physicians, health insurance plans and hospitals. The Trust in Physician Scale was used to assess trust in physicians and health insurance plans. The authors used the Medical Mistrust Index to assess fear and suspicion of hospitals. They found that black respondents were less likely to trust their physicians than white respondents and more likely to trust their health insurance plans compared to whites. The authors offer divergent cultural experiences and differences in expectations for care as possible explanations of these findings.

Strepanikova et al. (2006) found that racial variation in measured levels of patients' trust in a physician depends on specific physician behaviors, such as: providing patients with a referral, performing unnecessary tests or being influenced by insurance. The authors examined whether racial/ethnic/language-based variation in levels of

patients' trust in a physician exists depends on the survey items used to measure that trust using the 2000-2001 Community Tracking Study (n=33,930).

Using data from the 1998-1999 CTS, and analyzing areas where at least 5% of the population was Hispanic, and 5% was black (n=11,422), Armstrong et al. (2007) found that racial/ethnic differences in trust varied according to sociodemographic characteristics. Specifically, they found lower socioeconomic status (defined as lower income, lower education, and no health insurance) was associated with higher levels of distrust when examining the racial/ethnic and geographic variation in trust in physicians..

Benjamins (2006) examined the religious influence on physician trust and trust in the health care system and the subsequent influence of health behaviors such as adherence to treatments and use of preventive health services. Benjamins used a nationally representative sample from the General Social Survey from 1998 of adults in the United States, only including respondents that answered questions regarding health care beliefs (N=1,274). Multivariate analysis was used to examine associations between religious affiliation, attendance and strength of affiliation in relation to the previously mentioned variables of trust. The author found that religiously active individuals have higher levels of trust in physicians, but this trust varies by denomination.

Mascarenhas et al. (2006) compared trust perceptions of the elderly (defined as 65 years of age or older) to younger populations. The authors used a convenience sample of 515 patients with chronic diseases to assess four trust factors: cooperation attributes by doctors, quality and hospital reputation, confidence in doctors, and distrust of the health care system. Significant group differences were found between the elderly and younger individuals among trust of quality and hospital reputation and distrust of the health care

system. The elderly were found to have higher levels of trust in the quality and hospital reputation compared to younger individuals, but lower levels of trust in the health care system.

Individual and Institutional Trust

Some of the literature focuses on both individual and institutional trust, and this research project expands on this body of work. Mechanic (1996) conceptualizes patient trust in his/her physician, or interpersonal trust. This trust is dynamic, and is based on continuity of care, competence, and effective communication. He also conceptualizes patient trust in the health care system, or institutional trust. It is asserted that the erosion of institutional trust may create an erosion of interpersonal trust. As the exchange between a patient and physician interpersonally and institutionally moves toward consumerism, this erosion may continue if conscious efforts such as increased patient communication, time with patients, and policy issues that encapsulate trust are not put into effect.

Balkrishnan et al. (2003) compare trust in one's physician and institutional trust of one's health insurer and the medical profession in general. Using a random national telephone survey of 1117 individuals 20 years of age and older, the authors found that physician and insurer trust were significantly sensitive to the amount of contact and the amount of choice the participants had in selecting both their physicians and their insurers. Physician trust was found to be lower among subjects reporting poor health. Low trust in one's insurer occurs often with managed care and low trust in the profession in general occurs with lack of continuity in care.

The consequences of trust are numerous, and are important to examine for several reasons. Several studies stress the significant consequences of trust, or lack thereof. Fiscella et al. (1999) examined the effect of skepticism toward medical care on mortality using the 1987 National Medical Expenditure Survey. The authors found that skepticism toward medical care significantly predicted mortality, and that skepticism may be a risk factor for an earlier death after controlling for age, sex, race, education, income, marital status, morbidity, and health status.

Higher levels of trust increase patients' satisfaction and health outcomes, as found by Fiscella et al. (2004) when examining physician behavior and length of visit time. The authors used audio tapes of standardized patients with 100 primary care physicians to assess physician behavior with component of the Measure of Patient-Centered Communication scale. The authors found that a one standard deviation increase in the patient's experience of the disease and illness was associated with a .08 standard deviation increase in trust.

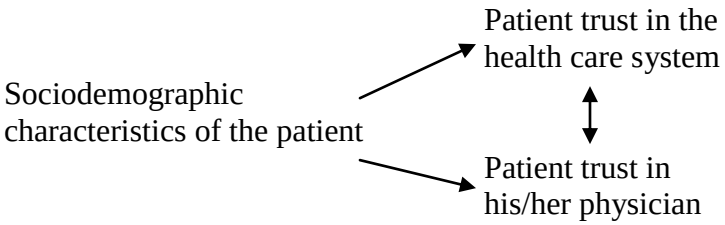
Adherence to treatment is also commonly found, (Hall et al. 2001) as well as higher utilization of routine check-ups. This allows for faster and more efficient treatment as well as prevention services, as found by Musa et al. (2009) when examining racial differences in the effects of trust in the health care system on preventive health among older adults using a telephone survey (N=1681). After identifying four types of trust through factor analysis (trust in one's physician, trust in the competence of physicians' care, trust in formal health information sources and trust in informal health information sources), the authors found that greater trust in one's own physician was associated with utilization of routine checkups, prostate-specific antigen tests, and mammograms. Greater

trust in information sources as associated with utilization of mammograms as well. Trust in the competence of physicians' care and trust in formal health information sources were not significantly associated with checkups, PSA testing or mammograms.

Erosion of trust in medical care is a continual theme in the literature. Mechanic & McAlpine (2010) examined the erosion of trust in medical care and how it contributes to health policy. Trust is high for individuals that have a primary care physician, but as managed care becomes more common, erosion of trust begins to occur. The authors go on to discuss the factors that have been found to contribute to an erosion of trust in institutions, such as: erosion of confidence in authority, conflicting information, and fraudulent activities. Declining trust in medical care has been linked to the emergence of patient consumerism, moving away from a paternalistic relationship (Timmermans & Oh 2010). Consumerism, along with managed care, and increased bureaucratization of care furthered the erosion of trust in medical care. Boyer and Lutfey (2010) add to the discussion of the evolving roles of patients. Patient roles are more active and consumer-based. With this change is patient roles, the establishment of trust in medical care is integral to treatment, continuity of care and health outcomes.

The literature examining patient trust is expansive, but few studies incorporate both patient trust in physicians, and patient trust in the health care system. Even fewer focus on subpopulations that are underserved in health care, such as students. This research project will examine such a population, adding a different perspective to the literature.

MODEL



This thesis presents a patient's sociodemographic characteristics as predicting trust in one's physician, as well as trust in the health care system. Trust in the health care system and trust in physicians may be reciprocally related such that trust in a physicians may contribute to trust in the health care system and vice versa. Specifically, in this study I tested the following hypotheses that were derived from the existing literature reviewed above:

HYPOTHESES

H_{o1}: There is no significant relationship between patient trust in his/her physician and patient trust in the health care system
H_{a1}: There is a relationship between patient trust in his/her physician and patient trust in the health care system

H_{o2a}: The amount of times a patient visited his/her physician in the past year does not significantly predict patient trust in his/her physician
H_{a2a}: The amount of times a patient visited his/her physician in the past year does predict patient trust in his/her physician

H_{o2b}: How a patient came to choosing his/her physician does not significantly predict patient trust in his/her physician
H_{a2b}: How a patient came to choosing his/her physician does predict patient trust in his/her physician

H_{o2c}: Patient age does not significantly predict patient trust in his/her physician
H_{a2c}: Patient age predicts patient trust in his/her physician

H_{o2d}: Patient race/ethnicity does not significantly predict patient trust in his/her physician
H_{a2d}: Patient race/ethnicity predicts patient trust in his/her physician

H_{o2e}: Patient gender does not significantly predict patient trust in his/her physician
H_{a2e}: Patient gender predicts patient trust in his/her physician

H_{o2f}: Patient income does not significantly predict patient trust in his/her physician
H_{a2f}: Patient income predicts patient trust in his/her physician

H_{o2g}: Patient marital status does not significantly predict patient trust in his/her physician
H_{a2g}: Patient marital status predicts patient trust in his/her physician

H_{o2h}: Patient health insurance status does not significantly predict patient trust in his/her physician
H_{a2h}: Patient health insurance status predicts patient trust in his/her physician

H_{o2i}: Patient education does not significantly predict patient trust in his/her physician
H_{a2i}: Patient education predicts patient trust in his/her physician

H_{o3a}: The amount of times a patient visited his/her physician in the past year does not significantly predict patient trust in the health care system
H_{a3a}: The amount of times a patient visited his/her physician in the past year does predict patient trust in the health care system

H_{o3b}: How a patient came to choosing his/her physician does not significantly predict patient trust in the health care system
H_{a3b}: How a patient came to choosing his/her physician does predict patient trust in the health care system

H_{o3c}: Patient age does not significantly predict patient trust in the health care system
H_{a3c}: Patient age predicts patient trust in the health care system

H_{o3d}: Patient race/ethnicity does not significantly predict patient trust in the health care system
H_{a3d}: Patient race/ethnicity predicts patient trust in the health care system

H_{o3e}: Patient gender does not significantly predict patient trust in the health care system
H_{a2e}: Patient gender predicts patient trust in the health care system

H_{o3f}: Patient income does not significantly predict patient trust in the health care system
H_{a3f}: Patient income predicts patient trust in the health care system

H_{o3g}: Patient marital status does not significantly predict patient trust in the health care system
H_{a3g}: Patient marital status predicts patient trust in the health care system

H_{o3h}: Patient health insurance status does not significantly predict patient trust in the health care system
H_{a3h}: Patient health insurance status predicts patient trust in the health care system

H_{o3i}: Patient education does not significantly predict patient trust in the health care system
H_{a3i}: Patient education predicts patient trust in the health care system

METHODS

Sample

The study examining whether the level of trust in a primary care physician by a patient is associated with the level of trust in the health care system is a cross-sectional study, consisting of a self-administered survey[1] of 188 University undergraduate and graduate students. Convenience sampling of undergraduate and graduate classes in the Departments of English, Criminal Justice, Political Science, and Sociology was performed during the 2011 fall semester and 2012 winter semester. I first contacted each department chair for approval. Then, I contacted each instructor for approval. I distributed all the surveys in each class, at the beginning of each class. Along with the survey, I also distributed a research information sheet and orally went over the research information sheet with the participants. The surveys took 5 to 10 minutes to complete in each classroom. I waited until all the participants were finished with their surveys, and collected them. A total of 211 surveys were distributed and 188 students participated, creating a response rate of 89%. Respondents were asked questions about various sociodemographic characteristics such as: race, age, gender, educational attainment, marital status, health insurance status and household income. This study was limited to students 18 years of age or older who recognize a specific physician as his/her primary care physician.

[1] Please see appendix A for full survey

Protection of Human Subjects

This study was reviewed by the Wayne State University Institutional Review Board and was found to qualify for exemption. Participants received a research information sheet, along with the questionnaire, describing the purpose, study procedures, benefits, risks, costs, compensation, confidentiality, voluntary participation, contact/question information and participation.[2] There was no direct benefit for participants, but information from the study may benefit other people in the future. There were no known risks at the time to participation in this study based on the content of the questionnaire. There was no cost to participation in the research study for the participant, and the participant was not be compensated for participation. All information was collected without any identifiers, and taking part in this study was voluntary. Completion of the questionnaire indicated agreement to participate in this research study.

Instrument

Trust in a primary care physician was measured using the Primary Care Assessment Survey (PCAS) trust subscale. Items one through seven were scored from 1 to 4, 1 indicating strongly disagree and 4 indicating strongly agree. Statements 2, 4, and 7 used reverse scoring when creating composite score. Item eight was scaled from 0, indicating not at all to 10, indicating completely. The PCAS trust subscale was chosen to measure trust in a primary care physician for several reasons. First, it is a self-administered written questionnaire. Participation is only required of the respondent once, while the student is in class. This limits the cost of the research project itself, as a paid interviewer is not necessary nor is additional follow-up. Costs and risks to the participant are reduced as well, as additional transportation is not needed, and questions are low-risk,

[2] Please see appendix B for full research information sheet

and the questionnaire itself is short. Next, the PCAS subscale is used to measure trust over time, not focusing on a single visit, which corresponds to the goals of this research project. High reliability was found by Pearson & Raeke (2000) for entire scale (although only the trust subscale was applicable for this research project), finding a cronbach's alpha coefficient for internal consistency between .81 and .95. Pearson & Raeke also found high correlations of the trust subscale with patient assessment of level of interpersonal treatment, physician's communication and knowledge of the patient. Internal consistency of this instrument was further measured by examining reliability through Cronbach's Alpha, as well as a principal components analysis. The principal components analysis served to avoid issues of multicollinearity among the statements. I ran bivariate correlations of the original doctor trust items from my survey, which are located in Table 1. All of the items were correlated at the 0.01 significance level except 'tell me the truth' and 'my doctor pretends', which was significant at the 0.05 level, and 'tell me the truth' and 'controlling costs', which was significant at the 0.1 level. The high correlations of all the items are not surprising, as they are meant to measure the construct of trust. The high correlations do underscore the need for principal components analysis because of multicollinearity, as well as a comparison with other studies (Freburger et al. 2003, and Benjamins 2004). A summed item score of physician trust was used in regression analysis as well for the purpose of comparison with other studies (Balkrishnan et al. 2003, Boulware et al. 2003, and Kao et al. 1998). The prompt and eight statements from the PCAS trust subscale are as follows:

Thinking about how much you trust your doctor, how strongly do you disagree or agree with the following statements:

1. I can tell my doctor anything, even things that I might not tell anyone else.

2. My doctor sometimes pretends to know things when he/she is not really sure.

3. I completely trust my doctor's judgments about my medical care.

4. My doctor cares more about holding down costs than about doing what is needed for my health.

5. My doctor would always tell me the truth about my health, even if there was bad news.

6. My doctor cares as much as I do about my health.

7. If a mistake was made in my treatment, my doctor would try to hide it from me.

8. All things considered, how much do you trust your doctor?

Trust in the healthcare system was measured using seven statements from the Medical Mistrust Index, as well as an additional comprehensive statement about trust in the healthcare system. Responses were scored from 1 to 4, 1 indicating strongly agree and 4 indicating strongly disagree. Statement 8 was scored from 0 to 10, 0 indicating not at all to 10, indicating completely. These seven statements from the MMI were used because of high internal consistency with a chronbach's alpha of .76. Scale validity was examined by LaVeist et al. (2009) using Pearson's correlation between the Medical Mistrust Index, the trust in physician scale (TIPS) and the generalized trust scale (GTS). MMI was significantly correlated with both scales. Internal consistency of this instrument was further measured by examining reliability through Cronbach's Alpha, as well as a principal components analysis. The principal components analysis served to avoid issues of multicollinearity among the statements. I ran bivariate correlations of the original system trust items from my survey, which are located in Table 2. All of the items were

Table 1 Bivariate Pearson Correlations of Doctor Trust Items N=186

	I can tell my doctor	Doctor pretends	Doctor's judgment	Costs	Tell me the truth	Cares about my health	Hides mistakes	Trust╪
I can tell my doctor	1							
Doctor pretends	0.282** 0.000	1						
Doctor's judgment	0.476** 0.000	0.493** 0.000	1					
Costs	0.264** 0.000	0.447** 0.000	0.344** 0.000	1				
Tell me the truth	0.280** 0.000	0.167* 0.022	0.398** 0.000	0.133 0.070	1			
Cares about my health	0.355** 0.000	0.381** 0.000	0.523** 0.000	0.341** 0.000	0.504** 0.000	1		
Hides mistakes	0.440** 0.000	0.437** 0.000	0.480** 0.000	0.393** 0.000	0.272** 0.000	0.465** 0.000	1	
Trust╪	-0.472** 0.000	-0.553** 0.000	-0.694** 0.000	-0.419** 0.000	-0.427** 0.000	-0.600** 0.000	-0.555** 0.000	1

**Correlation is significant at the 0.01 level (2-tailed) *Correlation is significant at the 0.05 level (2-tailed)

╪'Trust' was transformed by reflection and square root

correlated at the 0.01 significance level. The high correlations of all the items are no surprising, as they are meant to measure trust. The high correlations do underscore the need for principal components analysis because of multicollinearity, as well as a comparison with other studies (Freburger et al. 2003, and Benjamins 2004). A summed item score of physician trust was used in regression analysis as well for the purpose of comparison with other studies (Balkrishnan et al. 2003, Boulware et al. 2003, and Kao et al. 1998).

Table 2 Bivariate Pearson Correlations of System Trust Items N=186

	Cautious	Patients have been deceived	Cover up mistakes	Harmful experiment	Private information	Know what they are doing	Mistake	Trust
Cautious	1							
Patients have been deceived	0.501** 0.000	1						
Cover up mistakes	0.332** 0.000	0.481** 0.000	1					
Harmful experiment	0.282** 0.000	0.375** 0.000	0.262** 0.000	1				
Private information	0.363** 0.000	0.420** 0.000	0.320** 0.000	0.438** 0.000	1			
Know what they are doing	0.331** 0.000	0.419** 0.000	0.317** 0.000	0.349** 0.000	0.419** 0.000	1		
Mistake	0.278** 0.000	0.418** 0.000	0.321** 0.000	0.333** 0.000	0.349** 0.000	0.527** 0.000	1	
Trust	0.388** 0.000	0.494** 0.000	0.368** 0.000	0.326** 0.000	0.358** 0.000	0.474** 0.000	0.451** 0.000	1

**Correlation is significant at the 0.01 level (2-tailed)

The prompt, seven statements from the Medical Mistrust Index and the comprehensive statement are as follows:

Thinking about health care organizations and the health care system, how strongly do you disagree or agree with the following statements:

1. You'd better be cautious when dealing with healthcare organizations.

2. Patients have sometimes been deceived or mislead by healthcare organizations.

3. When healthcare organizations make mistakes they usually cover it up.

4. Healthcare organizations have sometimes done harmful experiments on patients without their knowledge.

5. Healthcare organizations don't always keep your information totally private.

6. Sometimes I wonder if healthcare organizations really know what they are doing.

7. Mistakes are common in healthcare organizations.

8. All things considered, how much do you trust the health care system?

DATA ANALYSIS AND RESULTS

Data Screening

Pre-analysis data screening was completed first to organize and ensure assumptions of statistical tests were met. Nominal and ordinal variables were dummy coded. The data set was probed for patterns in regard to missing data using dummy coding for the variable(s) in question and then running an independent samples *t* test to determine if there are significant mean differences between the two groups. The income variable had 17 missing cases, education had three missing cases, race had two missing cases, marital status had five missing cases, insurance had five missing cases, age had two missing cases, and number of visits had one missing case. Income, education, race, marital status and insurance were dummy coded 0 if the participant provided the variable in question, and 1 if the participant did not provide the variable in question. No significant differences between each of the groups was found. Mean values were used to replace the missing values of missing responses, ages, number of visits and income. This strategy of replacing missing values with a mean does reduce the variance somewhat, but allowed the retention of additional cases and/or variables. The three missing education cases were replaced based on the age of the individual combined with the class the participant was in (undergraduate or graduate class). Regression coefficients were used to determine missing values for race, marital status and insurance. If significant differences would have been found, cases or the variable in question (depending on the amount of cases involved) would have been deleted from the analysis. 24 respondents had not

visited a doctor in the past year. An independent sample *t* test was also performed to test differences in levels of trust between individuals that had seen a doctor in the past year and individuals that had not. No significant differences were found, so all cases remained in the analysis. Possible univariate outliers for the predictor variables were examined through a box plot of the data. One extreme univariate outlier was found within the 'how many times have you visited this doctor in the past year?' (times) variable. This case was removed from the analysis, making N=187.

Descriptive statistics of the original doctor and system trust items and the interval variables are located in Table 3. Overall, participants had higher scores (greater trust) for the items related to physician trust compared to system trust. 'Tell me the truth' and 'overall trust' were the items that had the largest mean values (greatest trust), 3.44 and 7.67, respectively. The items 'you'd better be cautious' and 'patients have been deceived' had the lowest mean values (lowest trust), 1.98 and 1.92, respectively. The summed doctor trust and system trust scores had means of 29.5 (minimum 13, maximum 38), and 20.8 (minimum 8, maximum 34), respectively. On average, respondents visited a doctor in the past year 2.3 times (minimum 0, maximum 12). The sample was 49.5% white, 57% female, 83.3% single, 61.3% with some college education, with a mean age of 24.5 (minimum 18, maximum 68) and most individuals had a household income of between $40,000-$59,999. As of 2010 (the most current student data available on the University website), the University demographics available were as follows: 57% female, 62% undergraduate and 48.5% white. The similarities of percentages of sample demographics to the population demographics provides evidence that, demographically, the sample is representative of the University population.

Normality was tested by assessing the skewness and kurtosis coefficients, the Kolmogorov-Smirnov statistic, with Lilliefors significance level, histograms and Q-Q plots. With values for skewness and kurtosis close to zero, not rejecting the null hypothesis of the Kolmogorov-Smirnov statistic, histograms with a bell shape and Q-Q plots along the line comparing expected v. observed values, normality is assumed and no transformations are necessary. Question #8 'how much do you trust your doctor' (trustdr) skew = -1.29, kurtosis = 2.14, 'how many times have you visited this doctor in the past year?' (times) skew = 11.9, kurtosis = 154.8, and age, skew = 2.325, kurtosis = 5.186, were variables that were not normally distributed. As a result, trustdr was transformed by reflecting and a square root. Taking only the square root of trustdr did not reduce the skew. For variables that have a negative skew, such as trustdr, a reflection is used before the square root. This involves subtracting the variable from +1 the highest value, in this case the highest value was 10 (SQRT(11-trustdr)). This resulted in reducing the skew statistic to 0.46. Times was transformed by using a square root, resulting in a reduced skew statistic of -0.28. Finally, age was transformed by taking the inverse, which reduced the skew statistic to -1.16. Linearity was tested by examination of a scatterplot matrix. Analysis of variance testing was conducted among each categorical independent variable with more than two levels to test for differences among the independent means of the factor scores for each subgroup. Significant differences were found among several variables with more than two groups, and the Bonferroni correction was used to determine where the differences lie. Significant differences were found among the categories for the statement 'How did you come to choosing your primary care physician'.

Table 3 Means of Doctor Trust, System Trust, Age and Times N=186

	Mean		Std. Deviation
	Statistic	Std. Error	Statistic
I can tell my doctor anything	2.97	0.056	0.763
My doctor pretends to know things	3.00	0.057	0.778
I trust my doctor's judgments	3.05	0.054	0.733
Controlling costs	3.10	0.058	0.793
Tell me the truth	3.44	0.046	0.623
Cares about my health	3.04	0.057	0.784
Hides mistakes	3.25	0.049	0.668
Dr Trust (original)	7.67	0.140	1.911
Dr Trust (transformed)*	1.76	0.037	0.502
Cautious	1.98	0.046	0.628
Patients have been deceived	1.92	0.045	0.614
Cover up mistakes	2.19	0.056	0.766
Harmful experiments	2.41	0.059	0.802
Private information	2.41	0.053	0.717
Know what they are doing	2.22	0.053	0.720
Mistakes are common	2.13	0.051	0.693
System Trust	5.50	0.146	1.987
Doctor Item summed score	29.51	0.375	5.120
System Item summed score	20.76	0.353	4.810
Age (original)	24.52	0.644	8.789
Age (transformed)**	.0441	0.001	0.010
How many times have you visited a doctor in the past year (original)	2.28	0.137	1.866
Times (transformed)***	1.35	0.051	0.670

*Reflected and Square root **Inverse ***Square root

I don't know, other, insurance referral and medical referral were combined, coded as 0, and peer referral and family referral were coded as 1. Significant differences were found among the categories for race/ethnicity. White, Native American/Alaskan Native, Asian/Pasific Islander, Latino, other and identify with more than one race were combined and coded as 0. Black/African American was coded as 1. Significant differences were found among the categories for marital status. Single was coded as 0. Cohabitating, married, divorced, and other were combined and coded as 1. Significant differences were found among the categories for education. High school, some college and Bachelor's degree were combined and coded as 0. Some graduate school and a graduate degree were

combined and coded as 1. Significant differences were found between males and females, coded 0 and 1, respectively. Significant differences were not found among the categories for income and type of insurance. The income variable was recoded as $0-39,999 (=0) and $40,000-$120,000+ (=1). The insurance variable was recoded as I don't know, none, other, Medicare, Medicaid (=0) and private (=1). Multivariate regression analyses were conducted with and without the income and insurance variables because of the lack of significant differences between each subgroup. Including the income and insurance variables in the multivariate models reduced the amount of variance accounted for and were not found to be significant. Homogeneity of variances was assessed using Levene's test for the variables to be included in the analysis. The null hypothesis assuming equal variances was not rejected. Multivariate outliers were assessed by calculating the Mahalanobis distance. One case exceeded the chi-square criteria, creating a final sample size of N=186. Frequencies of categorical variables are located in Table 4 and Table 5.

Table 4 Frequencies of Categorical Variables N=186

Variable	Definition	Frequency	Percent
Choosepcp (original)	IDK (I don't know)	15	8.1%
	Insurance referral	32	17.2%
	Peer/Family referral	114	61.3%
	Medical referral	8	4.3%
	Other	17	9.1%
Race (original)	White/Caucasian	92	49.5%
	Black/African American	61	32.8%
	Native American/Alaskan Native	1	0.5%
	Asian/Pacific Islander	5	2.7%
	Hispanic/Latino	12	6.5%
	Other	6	3.2%
	Identify with more than one race	9	4.8%
Gender	Male	80	43%
	Female	106	57%
Marital Status (original)	Single	155	83.3%
	Cohabitating	10	5.4%
	Married	16	8.6%
	Divorced	4	2.2%
	Other	1	0.5%
Education (original)	High School	23	12.4%
	Some College	114	61.3%
	Bachelor	19	10.2%
	Some Graduate	20	10.8%
	Graduate	10	5.4%
Income (original)	$0-19,999	29	16.6%
	$20,000-39,999	40	21.5%
	$40,000-59,999	50	26.9%
	$60,000-79,999	26	14.0%
	$80,000-99,999	13	7.0%
	$100,000-119,999	12	6.5%
	$120,000+	16	8.6%
Insurance (original)	IDK (I don't know)	15	8.1%
	Private	107	57.5%
	Medicare	1	0.5%
	Medicaid	22	11.8%
	None	34	18.3%
	Other	7	3.8%

Table 5 Frequencies of Categorical Variables (dichotomous) N=186

Variable	Definition	Frequency	Percent
Choosepcp (dichotomous)			
	IDK/Other/Insurance/Medical	72	38.7%
	Peer/Family	114	61.3%
Race (dichotomous)	White/NAAN/API/Latino/Other/More	125	67.2%
	Black	61	32.8%
Gender	Male	80	43%
	Female	106	57%
Marital (dichotomous)	Single	155	83.3%
	Married, Cohab, Divorced, and Other	31	16.7%
Education (dichotomous)	HS, Some College, Bachelor	156	83.9%
	Some Graduate, Graduate	30	16.1%
Income (dichotomous)	$0-39,999	69	37.1%
	$40,000-$120,000+	117	62.9%
Insurance (dichotomous)	IDK/None/Other/Medicare/Medicaid	79	42.5%
	Private	107	57.5%

Principal Components Analysis

Internal consistency of the two instruments was measured using a principal components analysis (PCA) using a varimax rotation. Eigenvalues (greater than one), communalities (all variables >.7, or mean communalities >.6), percent variance explained (at least 70%), scree plots, and residuals were used to determine the number of components to be retained. Principal components analysis also serves as a data reduction tool to isolate summary factors based on shared variance. This allows the generation of factors scores unrelated to one another that can be used in multivariate analysis to avoid multicollinearity bias from correlated items (Mertler & Vannatta 2010). Bartlett's test of sphericity was used to determine if principal components testing was necessary, testing the null hypothesis that the variables were uncorrelated. For every PCA that was conducted, the null hypothesis from Bartlett's test of sphericity was rejected, confirming the need for PCA.

For the eight doctor trust items, two, three and four component solutions were examined. The most parsimonious solution, explaining the most variance while limiting the percentage of nonredundant residuals with absolute values greater than 0.05, was a four component solution. The four retained components cumulatively explained a robust 79.4% of the variation in the original 8 items. Summary statistics and factor loadings for the doctor trust PCA are located in Table 6. The four components were labeled as follows:

1. *Knowledge*: 'my doctor sometimes pretends to know things when he/she is not really sure', 'I completely trust my doctor's judgments about my medical care', and 'how much do you trust your doctor'. After rotation, this component accounted for 24.4% of the total variance in the original items.

2. *Concern for patient*: 'my doctor would always tell me the truth about my health, even if there was bad news', and' my doctor cares as much as I do about my health'. After rotation, this component accounted for 21.4% of the total variance in the original items.

3. *Integrity*: 'I can tell my doctor anything, even things I might not tell anyone else', and 'if a mistake was made in my treatment, my doctor would try to hide it from me'. After rotation, this component accounted for 18.6% of the total variance in the original items.

4. *Greed*: 'my doctor cares more about holding down costs than about doing what is needed for my health'. After rotation, this component accounted for 15% of the total variance in the original items.

Table 6 Principal Component Analysis Doctor Trust

	Component			
Summary Statistics	1	2	3	4
Initial Eigenvalue	3.972	1.025	0.743	0.610
% of Variance Explained	49.647	12.808	9.293	7.620
Rotation Eigenvalue	1.950	1.708	1.490	1.201
% of Variance Explained	24.378	21.354	18.623	15.013
Rotated Factor Loadings	1	2	3	4
My doctor pretends to know things	0.861	0.018	0.052	0.295
I trust my doctor's judgments	0.672	0.367	0.402	0.026
Trust (transformed)*	-0.657	-0.424	-0.360	-0.189
Tell me the truth	0.058	0.910	0.121	-0.006
Cares about my health	0.348	0.702	0.183	0.261
I can tell my doctor anything	0.142	0.141	0.921	0.076
Hides mistakes	0.363	0.210	0.532	0.388
Controlling costs	0.220	0.093	0.126	0.924

Note. Extraction method: Principal Component Analysis.
Rotation method: Varimax with Kaiser Normalization. Rotation converged in five iterations.
**Variable was reflected and square root transformed. Hides mistakes <0.7 communalities*
11 (39%) nonredundant residuals with absolute values > 0.05.

For the eight health care system trust items, one, three and four component solutions were examined. The most parsimonious solution, explaining the most variance while limiting the percentage of nonredundant residuals with absolute values greater than 0.05, was a four component solution. The three retained components cumulatively explained 75.3% of the variation in the original 8 items. Summary statistics and factor loadings for the system trust PCA are located in Table 7. The four components were labeled as follows:

1. *Knowledge*: 'mistakes are common in healthcare organizations', 'sometimes I wonder if healthcare organizations really know what they are doing', and 'how much do you trust the healthcare system'. After rotation, this component accounted for 24.2% of the total variance in the original items.

2. *Harm to Patients*: 'healthcare organizations have sometimes done harmful experiments on patients without their knowledge', and 'healthcare organizations don't

always keep your information totally private'. After rotation, this component accounted for 18.5 % of the total variance in the original items.

3. *Deception*: 'you'd better be cautious when dealing with healthcare organizations', and 'patients have sometimes been deceived or mislead by healthcare organizations'. After rotation, this component accounted for 17.5% of the total variance in the original items.

4. *Cover up*: 'when healthcare organizations make mistakes they usually cover it up'. After rotation, this component accounted for 15.1% of the total variance in the original items.

Table 7 Principal Component Analysis System Trust

	Component			
Summary Statistics	1	2	3	4
Initial Eigenvalue	3.691	0.858	0.804	0.670
% of Variance Explained	46.138	10.731	10.055	8.376
Rotation Eigenvalue	1.937	1.481	1.399	1.207
% of Variance Explained	24.211	18.516	17.487	15.086
Rotated Factor Loadings	1	2	3	4
Mistakes are common	0.823	0.180	0.032	0.168
Know what they are doing	0.778	0.261	0.169	0.062
Trust	0.634	0.106	0.395	0.223
Harmful experiments	0.184	0.861	0.063	0.118
Private information	0.237	0.717	0.276	0.124
Cautious	0.140	0.171	0.908	0.103
Patients have been deceived	0.334	0.254	0.537	0.464
Cover up mistakes	0.177	0.144	0.141	0.932

Note. Extraction method: Principal Component Analysis.
Rotation method: Varimax with Kaiser Normalization. Rotation converged in six iterations.
Deceived, private, and trust <0.7 communalities
13 (46%) nonredundant residuals with absolute values > 0.05.

Internal consistency was also measured using the reliability coefficient of Cronbach's alpha. The original eight doctor trust items had a Cronbach's alpha of .672. The three new components for doctor trust with more than one item from the original eight (knowledge, concern for patient, and integrity) had Cronbach's alphas of .563, .659,

and .607, respectively. The original eight health care system trust items had a Cronbach's alpha of .774. The three new components for health care system trust with more than one item from the original eight (knowledge, harm to patients, deception) had Cronbach's alphas of .581, .606, and .668, respectively.

Hypothesis Testing

To test hypothesis one (there is no significant relationship between patient trust in his/her physician and patient trust in the health care system), bivariate correlations were examined between the four physician trust factors score and the four system trust factors (see Table 8) using Pearson correlation coefficients and a two-tailed test of significance using 0.05. The null hypothesis was rejected, as the *knowledge* physician trust factor was correlated with the *knowledge* system trust factor (p< 0.01 , 0.256), and the *greed* physician trust factor was correlated with the *cover up* system factor (p< 0.05 , 0.171). For comparative purposes, bivariate correlations were also examined between the doctor trust summed item score and the system trust summed item score using Pearson correlation coefficients, and a two-tailed test of significance using 0.05. The null hypothesis was rejected, as the summed items were correlated (p<0.01 , 0.337).

Table 8 Bivariate Correlations of Factors N=186

		Knowledge (Doctor)	***Concern***	***Integrity***	***Greed***
Knowledge (System)	Pearson Correlation Sig. (2-tailed)	0.256** 0.000	0.054 0.463	0.070 0.343	0.049 0.507
Harm	Pearson Correlation Sig. (2-tailed)	0.079 0.285	0.084 0.256	-0.075 0.310	-0.035 0.632
Deception	Pearson Correlation Sig. (2-tailed)	0.088 0.235	0.081 0.273	-0.022 0.769	-0.007 0.927
Cover Up	Pearson Correlation Sig. (2-tailed)	0.001 0.990	0.031 0.679	0.073 0.325	0.171* 0.019

* Correlation is significant at the 0.05 level ** Correlation is significant at the 0.001 level

To test hypotheses 2a-i and 3a-i (sociodemographic characteristics do not significantly predict trust in one's doctor, and sociodemographic characteristics do not significantly predict trust the health care system), a preliminary simple linear regression was conducted for each of the interval independent variables and dichotomous categorical variables in relation to the four doctor trust factor scores and the four system trust factor scores to determine individual predictability of the independent variables. The focus during this analysis was on the construct factor scores, as they eliminate issues of multicollinarity, as well as revealing the multidimensionality of trust. Summed scores were additionally included in the analysis to compare to other studies within the literature that used summed scoring. The significant models for doctor trust and system trust are located in Tables 9 and 10, respectively. How one chose his/her physician predicted the *knowledge (doctor*) factor, accounting for 3% of the variance in the *knowledge (doctor)* factor. Higher values of *knowledge (doctor)* were found when the participant chose his/her doctor based on a referral from a peer or family member. Three variables predicted the *concern* factor: marital status (3% of variance), education (3% of variance), and age (6% of variance). Higher values of *concern* were found when the participant was single, was in the high school/some college/bachelor's category and younger. Education and age predicted the *integrity* factor, accounting for 5% and 2% of the variance in the *integrity* factor, respectively. Higher values for *integrity* were found when the participant had some graduate school or a graduate degree, and were older. Race, and education predicted the *harm* factor, accounting for 4% and 2% of the variance, respectively. Higher values for *harm* were found when the participant was

Table 9 Linear Regression Doctor Trust

	R Square	F	Sig.	Unstandardized Coefficients		Standardized Coefficients	t
				B	Std. Error	β	
Knowledge							
Choose	0.031	5.921	0.016	0.362	0.149	0.177	2.433
Concern							
Marital	0.029	5.425	0.021	-0.453	0.194	-0.169	-2.329
Education	0.026	4.946	0.027	-0.439	0.197	-0.162	-2.224
Age	0.053	11.380	0.001	-0.027	0.008	-0.241	-3.373
Age*	0.057	11.123	0.001	24.264	7.275	0.239	3.335
Integrity							
Education	0.053	10.327	0.002	0.625	0.195	0.231	3.214
Age*	0.021	3.985	0.047	-14.797	7.412	-0.146	-1.996
Greed	No Significant Models						
DrSum	No Significant Models						

* transformed by inverse

white/NAAN/API/Latino/other/more, was in the high school/some college/bachelor's category, and was younger. One variable predicted the *deception* factor: gender,accounting for 3% of the variance. Higher values for *deception* were found when the participant chose his/her doctor based on a referral from a peer or family member, and were female. How one chose his/her physician and age predicted the *cover up* factor, accounting for 2% and 3% of the variance, respectively. Higher values for *cover up* were found when the participant chose his/her doctor based on a referral from a peer or family member, and were younger.

Multiple regression analysis procedures were completed next to further test hypotheses 2 and 3. All analyses were examined for multicollinearity of the IVs through the tolerance statistic, and multicollinearity was not present. First, an analysis was conducted using a standard (enter) multiple regression, in which all independent variables that were applicable (interval and dichotomous categorical) were entered at one time, using each factor as a DV. Table 11 shows the models contributing to doctor trust using

Table 10 Linear Regression System Trust

	R Square	F	Sig.	Unstandardized Coefficients		Standardized Coefficients	t
				B	Std. Error	β	
Knowledge	No Significant Models						
Harm							
Race	0.036	6.897	0.009	-0.404	0.154	-0.190	-2.626
Education	0.023	4.255	0.041	-0.408	0.198	-0.150	-2.063
Deception							
Gender	0.028	5.393	0.021	0.340	0.146	0.169	2.322
Cover up							
Age	0.024	5.571	0.019	-0.020	0.008	-0.171	-2.360
Age*	0.031	5.813	0.017	17.784	7.376	0.175	2.411
SystemSum							
Choose	0.035	6.617	0.011	1.835	0.713	0.186	2.572

*transformed by inverse

the enter method. Table 12 shows the models contributing to health care system trust. The model for *knowledge (doctor)* was not found to be significant. The model for *concern* was significant at the 0.05 level, accounting for 7% of the variance. The model for *integrity* was significant at the 0.05 level, accounting for 8% of the variance. The model for *greed* was not found to be significant. The models for *knowledge (system), harm, and deception* were not found to be significant. The model for *cover up* was significant at the 0.001 level, accounting for 7% of the variance.

Multiple regression analysis procedures were completed using the doctor items summed (Table 13), and the system items summed (Table 14). All analyses were examined for multicollinearity of the IVs through the tolerance statistic, and multicollinearity was not present. An analysis was conducted using a standard (enter) multiple regression, in which all independent variables that were applicable (interval and dichotomous categorical) were entered at one time, using each summed variable as a DV. The models for drsum and systemsum were not found to be significant. Table 15 shows the models contributing to doctor trust using the forward method, in which only independent variables that significantly contribute to the model based on variance are

Table 11 Multiple Regression Doctor Trust (Factors) (*Enter method*)

	R Square	F	Sig.	Unstandardized Coefficients		Standardized Coefficients	t
				B	Std. Error	β	
Knowledge	0.072	1.961	0.063				
Choose			0.003***	0.461	0.155	0.225	2.975
Race			0.248	0.186	0.161	0.088	1.158
Marital			0.682	0.094	.0228	0.035	0.410
Gender			0.663	0.065	0.149	0.032	0.437
Education			0.349	-0.228	0.243	-0.084	-0.940
Age*			0.192	-13.317	-0.131	-0.131	-1.310
Times**			0.147	0.156	0.107	0.107	1.455
Constant			0.972	0.019	0.526		0.035
Concern	0.083	2.306	0.028***				
Choose			0.324	-0.152	0.154	-0.074	-0.989
Race			0.149	0.232	0.160	0.109	1.451
Marital			0.571	-0.129	0.227	-0.048	-0.567
Gender			0.443	0.114	0.149	0.057	0.769
Education			0.606	-0.125	0.241	-0.046	-0.517
Age*			0.021***	23.478	10.105	0.231	2.323
Times**			0.785	-0.029	0.106	-0.020	-0.273
Constant			0.057	-1.003	0.523		-1.919
Integrity	0.075	2.072	0.049***				
Choose			0.068	0.284	0.154	0.139	1.836
Race			0.284	0.173	0.161	0.081	1.075
Marital			0.695	0.089	0.228	0.033	0.392
Gender			0.916	0.016	0.149	0.008	0.106
Education			0.023***	0.555	0.242	0.205	2.287
Age*			0.858	-1.814	10.148	-0.018	-0.179
Times**			0.834	0.022	0.107	0.015	0.210
Constant			0.576	-0.294	0.525		-0.560
Greed	0.018	.467	0.858				
Choose			0.721	0.057	0.159	0.028	0.358
Race			0.444	0.127	0.166	0.060	0.767
Marital			0.245	0.274	0.235	0.102	1.166
Gender			0.312	-0.156	0.154	-0.077	-1.014
Education			0.750	0.080	0.250	0.029	0.320
Age*			0.519	6.756	10.458	0.066	0.646
Times**			0.444	0.084	0.110	0.058	0.767
Constant			0.399	-0.458	0.541		-0.846

* transformed by inverse ** transformed by square root *** Significant at the 0.05 level

Table 12 Multiple Regression System Trust (Factors) (*Enter method*)

	R Square	F	Sig.	Unstandardized Coefficients		Standardized Coefficients	t
				B	Std. Error	β	
Knowledge	0.006	0.157	0.993				
Choose			0.784	0.044	0.160	0.022	0.275
Race			0.816	-0.039	0.167	-0.018	-0.233
Marital			0.814	0.056	0.236	0.021	0.235
Gender			0.737	-0.052	0.155	-0.026	-0.336
Education			0.715	0.092	0.251	0.034	0.366
Age*			0.480	-0.078	0.111	-0.054	-0.707
Times**			0.807	2.568	10.521	0.025	0.244
Constant			0.976	-0.017	0.544		-0.031
Harm	0.019	1.520	0.163				
Choose			0.886	0.022	0.156	0.011	0.143
Race			0.042	-0.332	0.162	-0.156	-2.044
Marital			0.586	0.126	0.230	0.047	0.546
Gender			0.911	-0.017	0.151	-0.008	-0.112
Education			0.306	-0.251	0.245	-0.093	-1.026
Age*			0.432	0.085	0.108	0.059	0.788
Times**			0.429	8.126	10.251	0.080	0.793
Constant			0.512	-0.348	0.530		-0.657
Deception	0.035	1.954	0.064				
Choose			0.079	0.273	0.155	0.134	1.766
Race			0.299	0.168	0.161	0.079	1.041
Marital			0.288	0.243	0.228	0.091	1.066
Gender			0.032	0.323	0.150	0.160	2.162
Education			0.127	-0.373	0.243	-0.137	-1.534
Age*			0.273	0.117	0.107	0.081	1.099
Times**			0.858	1.822	10.170	0.018	0.179
Constant			0.236	-0.626	0.526		-1.190
Cover Up	0.071	3.008	***0.005				
Choose			0.115	0.240	0.152	0.117	1.582
Race			0.320	0.158	0.158	0.074	0.998
Marital			0.362	0.205	0.224	0.077	0.915
Gender			0.171	0.202	0.147	0.100	1.375
Education			0.020	0.558	0.238	0.206	2.341
Age*			0.299	0.109	0.105	0.075	1.043
Times**			0.001	35.240	9.980	0.347	3.531
Constant			0.000	-2.140	0.516		-4.146

* transformed by inverse ** transformed by square root *** Significant at the 0.05 level

added one at a time, using the factors as the DVs. How one chose his/her physician predicted the *knowledge (doctor*) factor, accounting for 3% of the variance in the *knowledge (doctor)* factor. Higher values of *knowledge (doctor)* were found when the participant chose his/her doctor based on a referral from a peer or family member. Onevariable predicted the *concern* factor, age (6% of variance). Higher values of *concern* were found when the participant was younger. Education predicted the *integrity* factor, accounting for 5% of the variance. Higher values for *integrity* were found when the participant had some graduate school or a graduate degree. Race predicted the *harm* factor, accounting for 4% of the variance. Higher values for *harm* were found when the

Table 13 Multiple Regression Doctor Trust (Summed Item) (*Enter Method*)

	R Square	F	Sig.	Unstandardized Coefficients		Standardized Coefficients	t
				B	Std. Error	β	
DrSum	0.052	1.384	0.215				
Choose			0.022	1.850	0.801	0.176	2.310
Race			0.063	1.557	0.833	0.143	1.868
Marital			0.524	0.754	1.181	0.055	0.638
Gender			0.763	0.234	0.774	0.023	0.303
Education			0.902	0.155	1.257	0.011	0.123
Age*			0.775	15.081	52.624	0.029	0.287
Times**			0.228	0.669	0.553	0.090	1.209
Constant			0.000	26.017	2.721		9.560

* transformed by inverse ** transformed by square root

participant was in the white/NAAN/API/Latino/other/more category. One variable predicted the *deception* factor, gender, accounting for 3% of the variance. Higher values for *deception* were found when the participant was female. Age and education predicted the *cover up* factor, accounting for 3% of the variance including only the age variable, and accounting for 7% of the variance when education was added to the model. Higher

values for *cover up* were found when the participant had some graduate school or a graduate degree, and were younger.

Table 14 Multiple Regression System Trust (Summed Item) (*Enter Method*)

	R Square	F	Sig.	Unstandardized Coefficients		Standardized Coefficients	t
				B	Std. Error	β	
SystemSum	0.071	1.952	0.064				
Choose			0.034	1.589	0.745	0.161	2.133
Race			0.887	0.110	0.775	0.011	0.142
Marital			0.220	1.351	1.098	0.105	1.231
Gender			0.222	0.881	0.719	0.091	1.225
Education			0.955	0.067	1.169	0.005	0.057
Age*			0.065	90.772	48.915	0.186	1.856
Times**			0.279	0.559	0.514	0.080	1.087
Constant			0.000	14.260	2.530		5.638

* transformed by inverse ** transformed by square root

Table 15 Multiple Regression Doctor Trust and System (Factors) (*Forward method*)

	R Square	F	Sig.	Unstandardized Coefficients		Standardized Coefficients	t
				B	Std. Error	β	
KnowledgeD	0.031	5.921	0.016				
(Choose)			0.016	0.362	0.149	0.177	2.433
(Constant)			0.058	-0.222	0.116		-1.905
Concern	0.057	11.123	0.001				
(Age*)			0.001	24.264	7.275	0.239	3.335
(Constant)			0.001	-1.070	0.329		-3.256
Integrity	0.053	10.327	0.002				
(Education)			0.002	0.625	0.195	0.231	3.214
(Constant)			0.198	-0.101	0.078		3.214
Greed	No variables were entered into the equation						
KnowledgeS	No variables were entered into the equation						
Harm	0.036	6.897	0.009				
(Race)			0.009	-0.404	0.154	-0.190	-2.626
(Constant)			0.134	0.132	0.088		-2.626
Deception	0.028	5.393	0.021				
(Gender)			0.021	0.340	0.146	0.169	2.322
(Constant)			0.081	-0.194	0.110		-1.753
Cover up	0.031	5.813	0.017				
(Age*)			0.017	17.784	7.376	0.175	2.411
(Constant)			0.020	-0.784	0.333		-2.353
Cover up	0.067	6.589	0.002				
(Age*)			0.000	31.623	8.908	0.311	3.550
(Education)			0.008	0.636	0.238	0.235	2.678
(Constant)			0.000	-1.497	0.422		-3.545

*The variable age was transformed by inverse

Table 16 shows the models contributing to doctor trust using the forward method, in which only independent variables that significantly contribute to the model based on variance are added one at a time, using the summed items as DVs. No variables were entered into the equation for drsum. The model for systemsum was significant at the 0.05 level. How one chose his/her physician predicted the systemsum, accounting for 4% of the variance.

Table 16 Multiple Regression Doctor Trust and System (Summed) (*Forward method*)

	R Square	F	Sig.	Unstandardized Coefficients		Standardized Coefficients	t
				B	Std. Error	β	
DrSum	No variables were entered into the equation						
SystemSum	0.035	6.617	0.011				
(Choose)			0.011	1.835	0.713	0.186	2.572
(Constant)			0.000	19.639	0.558		35.169

The following summarizes the hypothesis testing results for 2a to 3i:

-Null hypothesis H_{o2a} (The amount of times a patient visited his/her physician in the past year does not significantly predict patient trust in his/her physician) was not rejected because the amount of times a patient visited his/her physician was not significantly predictive of physician trust for neither univariate nor multivariate models.

-Null hypothesis H_{o2b} (How a patient came to choosing his/her physician does not significantly predict patient trust in his/her physician) was rejected because choice of physician was significantly predictive of physician trust for both univariate (the component of knowledge) and multivariate models.

-Null hypothesis H_{o2c} (Patient age does not significantly predict patient trust in his/her physician) was rejected because age was significantly predictive of physician trust for both univariate (concern and integrity) and multivariate models.

-Null hypothesis H_{o2d} (Patient race/ethnicity does not significantly predict patient trust in his/her physician) was not rejected because race/ethnicity was not significantly predictive of physician trust for neither univariate nor multivariate models.

-Null hypothesis H_{o2e} (Patient gender does not significantly predict patient trust in his/her physician) was not rejected because gender was not significantly predictive of physician trust for neither univariate nor multivariate models.

-Although group differences were not found to be significant, income was included in initial regression analyses for exploratory purposes because it has been found to be a significant predictor in the literature. The null hypothesis H_{o2f} (Patient income does not significantly predict patient trust in his/her physician) was not rejected because income was not significantly predictive of physician trust for univariate models.

-Null hypothesis H_{o2g} (Patient marital status does not significantly predict patient trust in his/her physician) was rejected because marital status was significantly predictive of physician trust for both univariate (concern) and multivariate models.

-Although group differences were not found to be significant, insurance status was included in initial regression analyses for exploratory purposes because it has been found to be a significant predictor in the literature. Null hypothesis H_{o2h} (Patient health insurance status does not significantly predict patient trust in his/her physician) was not rejected because insurance status was not significantly predictive of physician trust for univariate models.

-Null hypothesis H_{o2i} (Patient education does not significantly predict patient trust in his/her physician) was rejected because education was significantly predictive of physician trust for both univariate (integrity) and multivariate models.

-Null hypothesis H_{o3a} (The amount of times a patient visited his/her physician in the past year does not significantly predict patient trust in the health care system) was rejected because the amount of times a patient visited his/her physician in the past year significantly contributed to the cover up system trust multivariate model. It is important to note that times was not significantly predictive of univariate models, and this should be explored in future studies.

-Null hypothesis H_{o3b} (How a patient came to choosing his/her physician does not significantly predict patient trust in the health care system) was rejected because patient choice was significantly predictive of system trust for both univariate (systemsum) and multivariate models. It is important to note that choice was not significantly predictive of components of trust created from PCA in univariate analysis, and that multicollinearity may have been a factor.

-Null hypothesis H_{o3c} (Patient age does not significantly predict patient trust in the health care system) was rejected because age was significantly predictive of system trust for both univariate (cover up) and multivariate models.

-Null hypothesis H_{o3d} (Patient race/ethnicity does not significantly predict patient trust in the health care system) was rejected because race/ethnicity was significantly predictive of system trust for both univariate (harm) and multivariate models.

-Null hypothesis H_{o3e} (Patient gender does not significantly predict patient trust in the health care system) was rejected because gender was significantly predictive of system trust for both univariate (deception) and multivariate models)

Although group differences were not found to be significant, income was included in initial regression analyses for exploratory purposes because it has been found to be a

significant predictor in the literature. The null hypothesis H_{o3f} (Patient income does not significantly predict patient trust in the health care system) was not rejected because income was not significantly predictive of system trust for univariate models.

-Null hypothesis H_{o3g} (Patient marital status does not significantly predict patient trust in the health care system) was not rejected because marital status was not significantly predictive of system trust for neither univariate nor multivariate models.

-Although group differences were not found to be significant, insurance status was included in initial regression analyses for exploratory purposes because it has been found to be a significant predictor in the literature. Null hypothesis H_{o3h} (Patient health insurance status does not significantly predict patient trust in the health care system) was not rejected because insurance status was not significantly predictive of system trust for univariate models.

-Null hypothesis H_{o3i} (Patient education does not significantly predict patient trust in the health care system) was rejected because education significantly predicted system trust for both univariate (harm) and multivariate models.

For exploratory purposes, a simple linear regression was conducted among each of the doctor factors and the system factors. *Knowledge (doctor*) positively predicted *knowledge (system),* and vice versa, accounting for 7% of the variance. *Greed* positively predicted *cover up,* and vice versa, accounting for 3% of the variance. Next, similar to the previous multiple regression analysis procedure discussion, a standard (enter) multiple regression was completed, including all independent variables applicable, as well as the inclusion of *knowledge (doctor), concern, integrity and greed* for the dependent variable of each of the system trust factors, and inclusion of *knowledge (system), harm, deception,*

and cover up as independent variables for the dependent variables of doctor trust factors. How one chose his/her physician, and *knowledge (system)* both positively predicted the *knowledge (doctor*) factor, accounting for 15% of the variance in the *knowledge (doctor)* factor. One variable predicted the *concern* factor, age, accounting for 10% of the variability. Higher values of *concern* were found when the participant was younger. Education, age, and *greed* predicted the *cover up* factor, accounting for 13% of the variance. Higher values for *cover up* were found when the participant was in the some graduate school/graduate degree category, was younger, and had higher *greed* factor scores.

Next, a forward multiple regression was conducted. *Knowledge (system)* and how one chose his/her physician predicted the *knowledge (doctor)* factor, accounting for 7% of the variance including only the *knowledge (system)* variable, and accounting for 9% of the variance when how one chose his/her physician was added to the model. Higher values for *knowledge (doctor)* were found when the participant had higher *knowledge (system)* scores, and chose his/her doctor based on a referral from a peer or family member. One variable predicted the *concern* factor, age, accounting for 6% of the variability. Higher values of *concern* were found when the participant was younger. Education predicted the *integrity* factor, accounting for 5% of the variance. Higher values for *integrity* were found when the participant had some graduate school or a graduate degree. *Cover up* positively predicted *greed*, accounting for 3% of the variance. *Knowledge (doctor)* positively predicted *knowledge (system),* accounting for 7% of the variance. Race predicted the *harm* factor, accounting for 4% of the variance. Higher values for *harm* were found when the participant was in the

white/NAAN/API/Latino/other/more category. One variable predicted the *deception* factor: gender, accounting for 3% of the variance. Higher values for *deception* were found when the participant was female. Age, education and *greed* predicted the *cover up* factor, accounting for 3% of the variance including only the age variable, accounting for 7% of the variance when education was added to the model, and accounting for 10% of the variance when greed was added to the model. Higher values for *cover up* were found when the participant was younger, in the some graduate school/graduate degree category, and had a higher *greed* factor score.

DISCUSSION AND CONCLUSION

Although this study was largely exploratory in nature due the convenience sampling method employed, several key points should be highlighted. First, the concept of trust is highly complex and multidimensional. The four component solutions for both doctor trust and system trust not only portray the multidimensional nature of trust, but are supported by the literature. The *knowledge (doctor and system)* factors and the *cover up* factor coincide with the discussion of the importance of competency in the literature (Jacobs 2006; Hall 2001; Mechanic 1998; Mechanic 1996), and the *concern* factor coincides with the discussion of the importance of fiduciary trust in the literature (Mollborn et al. 2005; Hall 2001). The *harm* factor is related to the discussion of fiduciary trust as well, with the addition of confidentiality (Armstrong 2008; Hall 2001; Mechanic 1998). The *integrity* factor and the *deception* factor both encompass honesty, discussed by Armstrong et al. (2008) and Hall (2001), and the greed factor is discussed often in the literature as well (Jacobs 2006; Kao et al. 1998). Seeing these components of

trust come up again and again, both in this study and the literature, points to the need for scale improvement focusing on these aspects of trust.

The regression analysis further showed the complexity of the relationship between trust and possible predictor variables through the low percentage of variance in the factors explained by the current models relying on sociodemographic characteristics. This is not surprising because of the convenience sample and small sample size used, as well as the limited availability of predictor variables to be included in each model.

Several of the significant predictors support the current literature, with a few surprises. First, is the predictor variable of race. In this study, race significantly predicted the *harm* factor, which consists of the items concerning harmful experiments and confidentiality. African Americans on average, had lower scores of trust compared to individuals in the White/NAAN/API/Latino/other/more category, similar to findings by Jacobs (2006), Armstrong et al. (2008), Goodkind et al. (2010), Schnittker (2004), Strepanikova et al. (2006), and Boulware et al. (2003). The authors offer several explanations for distrust, such as: communications issues (amount, type), expectations of racism and discrimination, historical experimentation (Tuskegee experiment - see Brandon et al. 2005) , and social distance (Schnittker 2004).

Next, the way one chooses a physician significantly predicted the *knowledge (doctor)* factor in this study. This supports the study conducted by Balkrishnan et al. (2003), when the authors found that physician trust was sensitive to the choice the participant had in selecting a physician. In this study, individuals that chose his/her physician based on a referral from a peer or family member had higher levels of trust than individuals that did not know, received a referral from an insurance company or medical

provider or other. The significance of peer/family referral may also be related to examining a student population. Socialization of trust through familial and peer experiences and teachings may be an additional factor that was not measured during this study. Further research is necessary to explore this avenue of socialization effects. What was not found to be significant in this study was a difference in trust based on frequency of visits. This is an interesting finding, because frequency of visits (either how many times one has seen a doctor in the past year, or if they have) was found to be predictive of trust by Mechanic (1996), and Balkrishnan et al. (2003). This may be due to the young age of the student population studied, and less possible health issues compared to an older population.

Age negatively predicted the *concern* factor and the *cover up* factor in this study. Older individuals having less trust in the system is supported in the literature by Mascarenhas et al. (2006), but older individuals having less trust in their doctors is contrary to the authors' findings. It is important to note at this time that this sample had a narrow age range, and this should be considered while examining age as a contributing factor in trust levels.

Surprisingly, socioeconomic status variables of income and insurance were not found to be significant predictors of doctor trust of system trust in this study. Education was found to be significant, with individuals in the some graduate school/graduate degree category having higher levels of trust in regard to the *integrity* factor and the *cover up* factor. Higher education predicting higher levels of trust supports the research by Armstrong et al. (2007), but the lack of significance of the other two SES predictors of

income and insurance is contrary to the authors' findings. They found that lower income and no health insurance was associated with lower levels of trust.

This study had several limitations. Sampling was based on convenience, not random sampling, limiting generalizability to a larger population. To address this issue, the sample was diversified by using different departments and undergraduate and graduate students. Generalizability to groups or populations other than this group of University students is limited to exploratory comparisons. Future research will employ randomized sampling to increase generalizability to other university populations. Other limitations include lack of variation in certain sociodemographic characteristics such as: educational attainment variation, and age variation. Diversification by the inclusion of graduate school students helped address this lack in variation.

Using self-administered surveys as the instrument has advantages and disadvantages. Self-administered surveys are inexpensive, and not time consuming for the participant or data entry purposes, which can allow larger samples to be gathered in a shorter period of time. Numerous questions can be asked in a short time period, and standardized questions allow more precision because definitions are uniform, increasing reliability. Standardization also limits questions to be general enough to be appropriate for most respondents. Recall bias and lack of honesty may be issues as well. Finally, a lack of open-ended responses limits additional context to be discovered. For future studies, a mixed methods approach using face to face interviews and focus groups would greatly add to the literature as support and/or create new knowledge.

Future studies should also be more specific in regard to the type of trust that is being studied, in particular when studying system trust. System trust is much too broad,

and needs to focus on parts of the system (hospitals, insurance companies, etc), as well as multidimensional aspects of trust (competency, honesty, confidentiality, etc).

Future studies should include additional predictor variables that have been found to be significant in the literature, such as; amount and type of communication (Goold 2002), and type, attendance and strength of affiliation of religion (Benjamins 2006). Characteristics of physicians and concordance with patients in regard to social status, gender and race (Schnittker 2004) should be examined as well. This is in addition to using qualitative methods to probe for new predictor variables that are not currently be discussed.

The importance of studying the relationship between the level of trust in a primary care physician by a patient is and the level of trust in the health care system among University students is multilayered. First, this research adds to the literature which lacks studies on specific populations such as students. Next, this research exposed the type of relationship that exists between the level of trust in a primary care physician by a patient and the level of trust in the health care system, as well as the sociodemographic characteristics that best predict trust in one's physician and trust in the system. Further examination of previously mentioned relationships will provide insight to creating interventions and policies to increase trust on an individual level and a structural level. Increasing trust in physicians and the health care system will improve adherence to treatment and continuity of care, resulting in better health outcomes.

APPENDIX A

SURVEY

Thinking about how much you trust your primary care physician, please circle how strongly you disagree or agree with the following statements:
(Primary care physician refers to the licensed medical practitioner you visit most often to receive medical care. This could include a specialist, such as an OB/GYN.)

	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**
1. I can tell my doctor anything, even things that I might not tell anyone else.	1	2	3	4
2. My doctor sometimes pretends to know things when he/she is not really sure.	1	2	3	4
3. I completely trust my doctor's judgments about my medical care.	1	2	3	4
4. My doctor cares more about holding down costs than about doing what is needed for my health.	1	2	3	4
5. My doctor would always tell me the truth about my health, even if there was bad news.	1	2	3	4
6. My doctor cares as much as I do about my health.	1	2	3	4
7. If a mistake was made in my treatment, my doctor would try to hide it from me.	1	2	3	4

8. All things considered, how much do you trust your doctor?

0 1 2 3 4 5 6 7 8 9 10
not at all completely

Thinking about health care organizations and the health care system, please circle how strongly you agree or disagree with the following statements:

	Strongly Agree	**Agree**	**Disagree**	**Strongly Disagree**
9. You'd better be cautious when dealing with healthcare organizations.	1	2	3	4
10. Patients have sometimes been deceived or mislead by healthcare organizations.	1	2	3	4
11. When healthcare organizations make mistakes they usually cover it up.	1	2	3	4
12. Healthcare organizations have sometimes done harmful experiments on patients without their knowledge.	1	2	3	4
13. Healthcare organizations don't always keep your information totally private.	1	2	3	4
14. Sometimes I wonder if healthcare organizations really know what they are doing.	1	2	3	4
15. Mistakes are common in healthcare organizations.	1	2	3	4

16. All things considered, how much do you trust the health care system?

0 1 2 3 4 5 6 7 8 9 10
not at all completely

17. Have you visited a doctor in the past year? Yes No

17a. If YES -How many times have you visited this doctor in the past year? _____

17b. If NO - When was the last time you saw a doctor? _____

18. How did you come to choosing your primary care physician? (Please circle)

Insurance referral

Peer/family referral

Medical referral

Advertisement

I don't know

Other : _____

19. What is your age? _____

20. What is your race/ethnicity? (Please circle)

Caucasian, White (not of Hispanic origin)

African American, Black (not of Hispanic origin)

Native American, Alaskan Native

Hispanic, Latino

Asian, Pacific Islander

Identify with more than one race (please specify): _____

Other: _____

21. What is your gender?

Male

Female

22. Which interval represents your annual total household income? ($)

0-19,999

20,000-39,999

40,000-59,999

60,000-79,999

80,000-99,999

100,000-119,999

120,000+

23. What is your marital status?

Single

Cohabitation

Married

Divorced

Widowed

Other: _____

24. What is your current health insurance?

Private health insurance

Medicare

Medicaid

No health insurance

I don't know

Other: _____

25. What is your highest level of education completed?

High School Diploma/GED

Some college

Bachelor Degree

Some graduate school

Graduate Degree (MA, MS, PhD, MD, etc.)

Other: _____

Thank you for completing this questionnaire. Again, any questions or comments should be directed to Lisa Stack from Wayne State University (ap3434@wayne.edu).

APPENDIX B

RESEARCH INFORMATION SHEET

Title of Study: *Patient Trust: Predicting Wayne State University Students' Trust in Their Physicians and the Health Care System*

Principal Investigator (PI): Lisa Stack
Sociology Department
ap3434@wayne.edu
(734) 377-9343

Purpose:
You are being asked to be in a research study about the level of trust you experience with your primary care physician, as well as the level of trust you experience with the health care system because you are a student of Wayne State University who is at least 18 years of age and recognize a specific physician as your primary care physician (a primary care physician refers to the licensed medical practitioner you visit most often to receive medical care). This study is being conducted at Wayne State University.

Study Procedures:
If you take part in the study, you will be asked to complete the following questionnaire asking you to evaluate the level of trust you experience with your primary care physician and the level of trust you experience with the health care system. Eight additional questions about your demographic characteristics (such as age and gender) are also included on the survey. This questionnaire will take approximately 5-10 minutes to complete and no additional participation after completion of the questionnaire is needed.

Benefits
As a participant in this research study, there may be no direct benefit for you; however, information from this study may benefit other people now or in the future.

Risks
There are no known risks at this time to participation in this study.

Costs
There will be no costs to you for participation in this research study.

Compensation
You will not be paid for taking part in this study.

Confidentiality:
All information collected about you during the course of this study will be kept without any identifiers.

Voluntary Participation:
Taking part in this study is voluntary. Your decision will not change any present or future relationships with Wayne State University or its affiliates. Participation will not affect your grade in any way.

Questions:
If you have any questions about this study now or in the future, you may contact Lisa Stack at the following e-mail address (ap3434@wayne.edu) or phone number (734)377-9343. If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

Participation:
By completing the questionnaire you are agreeing to participate in this study.

APPENDIX C

IRB CONCURRENCE OF EXEMPTION

WAYNE STATE UNIVERSITY

IRB Administration Office
87 East Canfield, Second Floor
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://irb.wayne.edu

CONCURRENCE OF EXEMPTION

To: Lisa Stack
Sociology

From: Dr. Scott Millis S. Millis, PhD
Chairperson, Behavioral Institutional Review Board (B3)

Date: December 01, 2011

RE: IRB #: 113111B3X

Protocol Title: Patient Trust: Predicting Wayne State University Students' Trust in Their Physicians and the Health Care System

Sponsor:

Protocol #: 1111010368

The above-referenced protocol has been reviewed and found to qualify for **Exemption** according to paragraph #2 of the Department of Health and Human Services Code of Federal Regulations [45 CFR 46.101(b)].

- Revised Protocol Summary Form (received in the IRB Office 11/30/2011)
- Protocol (received in the IRB Office 11/18/2011)
- The request for a waiver of the requirement for written documentation of informed consent has been granted according to 45 CFR 46.117(1)(2). Justification for this request has been provided by the PI in the Protocol Summary Form. The waiver satisfies the following criteria: (i) The only record linking the participant and the research would be the consent document, (ii) the principal risk would be potential harm resulting from a breach of confidentiality, (iii) each participant will be asked whether he or she wants documentation linking the participant with the research, and the participant's wishes will govern, (iv) the consent process is appropriate, (v) when used requested by the participants consent documentation will be appropriate, (vi) the research is not subject to FDA regulations, and (vii) an information sheet disclosing the required and appropriate additional elements of consent disclosure will be provided to participants not requesting documentation of consent.
- Research Information Sheet (dated 11/30/2011)
- Data collection tools: Survey
- Receipt of letter of support from Chair of WSU English Department (dated 11/17/2011), letter of support from Chair of WSU Department of Criminal Justice (dated 11/11/2011), letter of support from Chair of WSU Political Science Department (dated 11/09/2011), and letter of support from Chair of WSU Department of Sociology (dated 11/09/2011).

This proposal has not been evaluated for scientific merit, except to weigh the risk to the human subjects in relation to the potential benefits.

- Exempt protocols do not require annual review by the IRB.
- All changes or amendments to the above-referenced protocol require review and approval by the IRB **BEFORE** implementation.

- Adverse Reactions/Unexpected Events (AR/UE) must be submitted on the appropriate form within the timeframe specified in the IRB Administration Office Policy (http://irb.wayne.edu/policies-human-research.php).

NOTE: Forms should be downloaded from the IRB Administration Office website http://irb.wayne.edu at each use.

REFERENCES

Armstrong, K., McMurphy, S., Dean, L.T., Micco, E., Putt, M., Halbert, C.H., Schwartz, J.S., Sankar, P., Pyeritz, R.E., Bernhardt, B., Shea, J.A. (2008). Differences in the Patterns of Health Care System Distrust Between Blacks and Whites. *Journal of General Internal Medicine, 23*, 827-33.

Armstrong, K., Ravenell, K. L., McMurphy, S., Putt, M. (2007). Racial/ethnic differences in physician distrust in the United States. *American journal of public health, 97*, 1283-1289.

Armstrong, K., Rose, A., Peters, N., Long, J.A., McMurphy, S., Shea, J.A. (2006). Distrust of the Health Care System and Self-Reported Health in the United States. *Journal of General Internal Medicine, 21*, 292-7.

Balkrishnan, R., Dugan, E., Camacho, F. T., Hall, M. A. (2003). Trust and satisfaction with physicians, insurers, and the medical profession. *Medical Care, 9*, 1058-1064.

Benjamins, M. R. (2006). Religious influence on trust in physicians and the health care system. *International Journal of Psychiatry in Medicine, 36,* 69-83.

Boulware, L. E., Cooper, L. A., Ratner, L.E., LaVeist, T. A, and Powe, N.R. (2003). Race and trust in the health care system. *Public Health Reports, 118,* 358-365.

Boyer C. A. & Lutfey, K. E. (2010). Examining critical health policy issues within and beyond the clinical encounter: Patient-Provider relationships and help-seeking behaviors. *Journal of Health and Social Behavior, 51,* 80-93.

Brandon, D. T., Isaac, L. A., LaVeist, T. A. (2005). The legacy of Tuskegee and trust in medical care: Is Tuskegee responsible for race differences in mistrust of medical care? *Journal of the National Medical Association, 97,* 951-956.

Dovido, J. F., Penner, L. A., Albrecht, T. L., Norton, W. E., Gaertner, S. L., Shelton, J. N. (2008). Disparities and distrust: The implications of psychological processes for understanding racial disparities in health and healthcare. *Social Science & Medicine, 67,* 478-486.

Fiscella, K., Franks, P., Clancy, C. M., Doescher, M. P., Banthin, J. S. (1999) Does skepticism towards medical care predict mortality? *Medical Care, 37,* 409-414.

Fiscella, K., Meldrum, S., Franks, P., Shields, C. G., Duberstein, P., McDaniel, S. H., Epstein, R. M. (2004). Patient trust: Is it related to patient-centered behavior of primary care physicians? *Medical Care, 42,* 1049-1055.

Freburger, J. K., Callahan, L. F., Currey, S. S., Anderson, L. A. (2003). Use of the trust in physician scale in patients with rheumatic disease: Psychometric properties and correlates of trust in the rheumatologist. *Arthritis & Rheumatism, 49,* 51-58.

Goodkind, J. R., Ross-Toledo, K., Joh, S., Hall, J. L., Ross, L., Freeland, L., Coletta, E., Becenti-Fundark, T., Poola, C., Begay-Roanhorse, R., Lee, C. (2010). Promoting healing and restoring trust: Policy recommendations for improving behavioral health care for American Indian/Alaska Native adolescents. *American Journal of Community Psychology, 46,* 386-394.

Goold, S.D. (2002). Trust, Distrust and Trustworthiness. *Journal of General Internal Medicine, 17,* 79-81.

Hall, M. A., Dugan, E., Zheng, B., Mishra, A. K. (2001). Trust in physicians and medical institutions: What is it, can it be measured, and does it matter? *The Milbank Quarterly, 79,* 613-639.

Heritage, J., Maynard, D.W. (2006) Problems and Prospects in the Study of Physician-Patient Interaction: 30 Years of Research. *Annual Review of Sociology,* 351-374.

Jacobs, E.A., Rolle, I., Ferrans, C.E., Whitaker, E.E., Warnecke, R,B. (2006). Understanding African Americans' Views of the Trustworthiness of Physicians. *Journal of General Internal Medicine, 21,* 642-7

Kao, A. C., Green, D. C., Zaslavski, A. M., Koplan, J. P., Cleary, P. D. (1998). The relationship between method of physician payment and patient trust. *Journal of the American Medical Association, 280,* 1708-1714.

LaVeist, T. A., Issac, L. A., Williams, K. P. (2009). Mistrust of health care organizations is associated with underutilization of health services. *Health Services Research , 44,* 2093-2105.

LaVeist, T. A., Nuru-Jeter, A., Jones, K. E. (2003). The association of doctor-patient race concordance with health services utilization. *Journal of Public Health Policy, 24,* 312-323.

LaVeist, T. A., Nickerson, K. J., Bowie, J. V. (2000). Attitudes about racism, medical mistrust, and satisfaction with care among African American and White cardiac patients. *Medical Care Research and Review, 57,* 146-161.

Mascarenhas, O. A., Cardozo, L. J., Afonso, N. M., Siddique, M., Steinberg, J., Lepczyk, M., Aranha, A.N. (2006). Hypothesized predictors of patient-physician trust and

distrust in the elderly: Implications for health and disease management. *Clinical Interventions in Aging, 1,* 175-188.

Mechanic, D. (1998). The Functions and Limitations of Trust in the Provision of Medical Care. *Journal of Health Politics, Policy and Law, 23,* 661-86.

Mechanic, D. (1996). Changing medical organization and the erosion of trust. *The Milbank Quarterly, 74,* 171-189.

Mechanic, D. & McAlpine, D. D. (2010) Sociology of health care reform: Building on research and analysis to improve health care. *Journal of Health and Social Behavior, 51,* 147-159.

Mertler, C. A. & Vannatta, R. A. (2010). *Advanced and multivariate statistical methods*. Los Angeles, CA: Pyrczak Publishing.

Mollborn, S., Stepanikova, I., Cook, K. S. (2005). Delayed care and unmet needs among health care system users: When does fiduciary trust in a physician matter? *Health Services Research, 40,* 1898-1916.

Musa, D., Schulz, R., Harris, R., Silverman, M., Thomas, S. B. (2009). Trust in the health care system and the use of preventive health services by older black and white adults. *American Journal of Public Health, 99,* 1293-1299.

Pearson, S. D., Raeke, L. H. (2000). Patients' trust in physicians: Many theories, few measures, and little data. *Journal of General Internal Medicine, 15,* 509-513.

Safran, D. G., Kosinski, M, Tarlov, A. R., Rogers, W. G., Taira, D. A., Lieberman, N., Ware, J. E. (1998). The primary care assessment survey: Tests of data quality and measurement performance. *Medical Care, 36,* 728-739.

Schnittker, J. (2004). Social distance in the clinical encounter: Interactional and

sociodemographic foundations for mistrust in physicians. *Social Psychology Quarterly, 67,* 217-234.

Strepanikova, I., Mollborn, S., Cook, K. S., Thom, D. H., Kramer, R. M. (2006). Patients' race, ethnicity, language, and trust in a physician. *Journal of Health and Social Behavior, 47,* 390-405.

Timmermans, S. & Oh H. (2010). The continued social transformation of the medical profession. *Journal of Health and Social Behavior, 51,* 94-106.

ABSTRACT

PATIENT TRUST: PREDICTING UNIVERSITY STUDENTS' TRUST IN THEIR PHYSICIANS AND THE HEALTH CARE SYSTEM

by

LISA ELIZABETH STACK

May 2012

Advisor: Dr. Janet Hankin

Major: Sociology

Degree: Master of Arts

The purpose of this thesis was to determine if sociodemographic characteristics of University students predict their level of trust with their physicians and their level of trust with the health care system. This study used the Primary Care Assessment Survey (PCAS) trust subscale to measure physician trust and the Medical Mistrust Index to measure health care system trust through a self-administered survey (N=186) using convenience sampling. A principle components analysis was conducted to avoid issues of multicollinearity and examine underlying constructs. Bivariate correlations, and regression analyses were conducted to examine the relationship between patient trust in his/her physician and patient trust in the health care system. Physician trust and system trust were significantly correlated. How one chose his/her physician, marital status, education, and age significantly predicted trust in one's physician. How one chose his/her physician, race, education, gender and age significantly predicted trust in the health care system.

AUTOBIOGRAPHICAL STATEMENT

Lisa Elizabeth Stack received her Bachelor of Arts Degree in Sociology from Wayne State University in 2007, and is receiving her Masters of Arts Degree in Sociology from Wayne State University in 2012. She began a research assistantship in the Department of Urban Planning in 2009, collaborating on journal articles on measuring and classifying land use patterns, as well as the causes and consequences of land use patterns. Her other research interests include health disparities, social epidemiology and neighborhood effects on health. She is currently in the Sociology PhD program, specializing in Medical Sociology.