

The Relationship Between Physician Humility, Physician-Patient Communication, and Patient  
Health

Peter M. Ruberton,<sup>a,\*</sup> Ho P. Huynh,<sup>b</sup> Tricia A. Miller,<sup>a</sup> Elliott Kruse,<sup>c</sup> Joseph Chancellor,<sup>d</sup> &  
Sonja Lyubomirsky<sup>a</sup>

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<sup>a</sup>Department of Psychology, University of California, Riverside, USA

<sup>b</sup>Department of Psychology, Armstrong State University, Savannah, GA, USA

<sup>c</sup>Owen Graduate School of Management, Vanderbilt University, Nashville, TN, USA

<sup>d</sup>Facebook, Inc., Menlo Park, CA, USA

\*Corresponding author at: Department of Psychology, 900 University Ave., Riverside, CA  
92521, USA. Tel: +1 951-827-5243; fax: +1 951-827-3985. Email:  
peter.ruberton@email.ucr.edu (P.M. Ruberton)

### Abstract

**Objective:** Cultural portrayals of physicians suggest an unclear and even contradictory role for humility in the physician-patient relationship. Despite the social importance of humility, however, little empirical research has linked humility in physicians with patient outcomes or the characteristics of the doctor-patient visit. The present study investigated the relationship between physician humility, physician-patient communication, and patients' perceptions of their health during a planned medical visit.

**Methods:** Primary care physician-patient interactions (297 patients across 100 physicians) were rated for the physician's humility and the effectiveness of the physician-patient communication. Additionally, patients reported their overall health and physicians and patients reported their satisfaction with the interaction.

**Results:** Within-physician fluctuations in physician humility and self-reported patient health positively predicted one another, and mean-level differences in physician humility predicted effective physician-patient communication, even when controlling for the patient's and physician's satisfaction with the visit and the physician's frustration with the patient.

**Conclusions:** The results suggest that humble, rather than paternalistic or arrogant, physicians are most effective at working with their patients.

**Practice Implications:** Interventions to improve physician humility may promote better communication between health care providers and patients, and, in turn, better patient outcomes.

*Keywords:* Humility, perceived health, physician-patient communication

## 1. Introduction

“Treating illnesses is why we became doctors; treating patients is what makes most doctors miserable.”

— Dr. Gregory House, *House* (Shore & Singer, 2004)

Portrayals of physicians in popular culture, such as Dr. House, may offer the impression that the arrogant, self-absorbed physician is—or at least can be—a highly effective physician. Indeed, even some non-fictional medical experts have proposed that paternalism and authoritarianism, if not outright arrogance, are beneficial qualities in physicians [1]. In contrast to this perspective, we propose that humble physicians are, in fact, the best physicians, both in terms of the effectiveness of their communications with patients and their patients’ perceived health. In this paper, we examine empirical evidence collected from 297 physician-patient interactions to address the question: Are humble physicians also better physicians?

### 1.1. Humility

Humility is a psychological state characterized by a secure and accepting identity, an accurate view of oneself and one’s strengths and weaknesses, an egalitarian view of all individuals, and a high level of other-valuation and other-focus [2,3]. It has been described as a character strength [4] and is considered by laypeople to be a valuable personal quality [5]. Humility has also been related to a variety of socially desirable outcomes. Humble individuals are more likely to help a peer in need [6], more generous with their time and money [7], and more cooperative and less selfish in economic games [8,9] than less humble individuals. Notably, humility is not characterized by poor self-esteem or low self-confidence [3]—an important distinction in a medical context in which forwardness and assertiveness may be adaptive (e.g., when a physician needs to give a clear, direct recommendation to a patient; see [10]).

Humility may be considered both as a stable individual difference (e.g., [11]) and as a malleable psychological state (e.g., [12,13]). The present research examines humility primarily from a state perspective; that is, it investigates the variability of humility within a single individual (the physician) in a single type of situation (physician-patient interactions). Accordingly, consistent with the state view of humility, this study tests whether or not humility can vary meaningfully within physicians, rather than simply between physicians, and whether or not such fluctuations are associated with relevant outcomes, such as physician-patient communication. Importantly, stable differences in physician humility when interacting with patients may also predict more effective physician behaviors (e.g., a physician who is particularly humble with patients also generally communicates effectively with patients). However, because these differences occur in a single, narrow context—a physician-patient interaction—a physician’s “trait” level of humility across other contexts may be of little importance to effective communication and patient outcomes.

## **1.2. Physician Humility, Physician-Patient Communication and Patient Outcomes**

Consistent with general theoretical definitions of humility, medical humility has been described as “unflinching self-awareness; empathetic openness to others; and a keen appreciation of, and gratitude for, the privilege of caring for sick persons” [14]. Yet despite the social importance of humility, little empirical research has linked humility in physicians with patient outcomes, such as improved physician-patient communication and patients’ perceptions of their health.

Physician humility may be positively associated with patient outcomes in several ways. Because humility involves a relatively high focus on others rather than on oneself [2], humble physicians should be more attuned to their patients’ physical and emotional needs than less

humble physicians, and therefore communicate more instructive and relevant information to patients. Effective physician-patient communication, in turn, is associated with improved patient outcomes, including greater adherence to treatment regimens [10] and better subjective (i.e., patient-reports of overall health) and objective (e.g., physical signs) health [15,16]. An experimental study found that physician communication training increased patients' satisfaction with their physicians and promoted discussions of health-promoting behaviors [17]; this improvement in physician communication may in turn promote better patient health outcomes. Additionally, physicians communicate less effectively with patients of low socioeconomic status (SES; [18]); however, because humble individuals are highly egalitarian [19] (see also [2]), humble physicians are likely to treat all patients as equals, regardless of the patients' SES. Humility may therefore mitigate the negative effect of low patient SES on physician-patient communication. Finally, patient health may actually promote more humble behaviors in physicians: Physicians react more negatively to distressed patients than to healthy patients [20], so relatively healthy patients may enable physicians to behave more comfortably and securely, and thus more humbly, than they do with their less healthy patients during physician-patient interactions.

### **1.3. Overview of Study**

Following past research on humility and physician-patient interactions, we hypothesized that physicians' humility during interactions with their patients would be positively associated with ratings of the physicians' communication effectiveness during those interactions, as well as with patients' self-reported overall health and satisfaction with interpersonal care. Furthermore, humility was expected to be related to physician communication and patient-reported health above and beyond the general positivity (or negativity) of the interaction. That is, we expected

that the effect of humility would persist even after controlling for the physician's and the patient's satisfaction with the visit and each other and the physician's frustration with the patient. In addition, patients whose physicians behave particularly humbly, both relative to other physicians and relative to the physician's own average level of humility, were predicted to report better perceived health and higher satisfaction with their physicians. Finally, we explored whether the physician humility-perceived health link could be explained by the effectiveness of humble physicians' communication with their patients or by physicians behaving more humbly with healthier patients than with less healthy patients.

## 2. Method

### 2.1. Participants

**2.1.1. Physicians.** Physicians were 100 primary care doctors (61 male) from three specialties (obstetrics/gynecology, family medicine, and internal medicine) employed at one of three practice sites: a university research hospital on the West Coast ( $n=61$ ), a Department of Veterans Affairs medical clinic ( $n=2$ ), and a staff model HMO ( $n=37$ ). Physicians' ages ranged from 26 to 67 ( $M=37.5$ ,  $SD=9.71$ ); 39% were residents and they held their M.D. for an average of 11.68 years ( $SD=9.43$ ). Two of the physicians were African American, 44 were Asian or Asian American, 47 were Caucasian, and 7 were Hispanic. Each physician saw three patients, with three exceptions who saw only two patients.

**2.1.2. Patients.** This study involved 297 (130 male, 164 female, 3 not reported) patients in interaction with the study physicians. Three patients were selected from each of the 100 physicians.<sup>1</sup> Patients were selected based on their socioeconomic status, such that the highest, median, and lowest income patients for each physician were included. Of the 297 patients, 180

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<sup>1</sup>Three patients, with three different physicians, were excluded due to poor audio quality, leaving a final sample of 297 patients.

(60.6% of total; 48.3% male, 2 not reported) were recruited from the university research hospital, 6 (2.0% of the total; all male) from the Veterans Affairs clinic, and 111 (37.4% of total; 33.3% male, 1 not reported) from the staff model HMO. Patients ranged in age from 18 to 87 years ( $M=48.8$ ,  $SD=16.6$ ). Twenty-two patients (7.4% of total) were African American, 18 (6.1%) were Asian or Asian American, 172 (57.9%) were Caucasian, 61 (20.5%) were Hispanic, 8 (2.7%) were Native American, and 12 (4.0%) reported other ethnicities (e.g., Samoan, Lebanese). Four participants did not report their ethnicities. All patients had seen their physician at least once prior to the study; 41.4% had been a patient of their current physician for less than 6 months, 19.2% for 6 months to 1 year, 17.5% for 1 to 3 years, and 15.8% for 3 years or more. (Eighteen participants did not know or did not report their tenure with their physician.) The majority of the patients (67.0%) were visiting their physician for follow-up treatment of an earlier problem; 25.9% visited for a new problem, either alone or in addition to a follow-up.

## **2.2. Procedure**

Patients were recruited to participate in the waiting or examining rooms while they waited for scheduled (i.e., not emergency or urgent) medical appointments. Over 95% of patients approached by research staff agreed to participate; reasons given for not participating included concerns about confidentiality, discomfort with recording the visit, and lack of interest in the study. Patients were literate and able to communicate in either English or Spanish, and all study materials were available in both languages. Spanish-speaking patients were included if both the interaction with their physicians and the patient questionnaire were completed in Spanish. Each physician-patient interaction was recorded with the participants' consent. Patients then completed a post-visit questionnaire either at the clinic or by mail. Physicians completed a post-visit questionnaire regarding their satisfaction with the visit immediately after the visit.

The data included in this study were collected from 1996 to 1998 as part of a larger study on physician and patient communication training (for more information, see [17]). Although the larger study included experimental training conditions for both physicians and patients, this study only examined baseline data collected before participants received training.

### 2.3. Patient Questionnaire

**2.3.1. Demographics.** Patients reported their sex, age, ethnicity, and income in 1996 in \$10,000 increments.

**2.3.2. Perceived health.** Patients reported global evaluations of their health using a 4-item Likert scale (sample item “I am as healthy as anybody I know”) from 1 (*definitely false*) to 5 (*definitely true*), with 2 reverse-coded items (e.g., “I seem to get sick a little easier than other people”). Items were drawn from the SF-36 Health Scale [21]. The composite scale demonstrated acceptable reliability ( $\alpha=.75$ ).

**2.3.3. Satisfaction with interpersonal care.** Patients reported their satisfaction with their physician’s overall skill, personal manner, and quality of care (e.g., “courtesy, respect, sensitivity, friendliness”; 4 items) and with specific aspects of their physician’s communication effectiveness (e.g., “Explaining side effects of medications”; 6 items; from [22]). All 10 items were assessed on a scale from 1 (*poor*) to 5 (*excellent*). The items were combined into a single patient satisfaction composite with excellent reliability ( $\alpha=.96$ ).

### 2.4. Physician Satisfaction

Physicians’ satisfaction with their interactions with patients was measured using a 20-item scale (sample item “I would have liked to spend more time with this patient”; [23]), using Likert scales from 1 (*strongly disagree*) to 5 (*strongly agree*). The composite scale demonstrated good reliability ( $\alpha=.85$ ).



## 2.5. Physician-Patient Interaction Coding

Two sets of ratings by two independent groups of raters were made on the physician-patient interaction recordings. The raters for each set of ratings were blind to the study hypotheses, as well as to the other set of ratings and the patients' and physicians' responses to their respective questionnaires. The first set of ratings assessed the effectiveness of the physicians' communication during the interactions. Ratings consisted of 8 items drawn from the Physician-Patient Global Rating Scale [17], which assesses characteristics such as the physician's empathy and connection with the patient as a person and the physician's overall communication skill. Each interaction was rated by 2 independent judges selected from a larger pool of adult raters. Items were rated on a scale from 1 (*poor*) to 7 (*excellent*). Ratings were *z*-scored within each rater to account for differences in mean ratings and variability among the raters and *z*-scored ratings were combined to form an average rating for each interaction on each item. The average ratings of the 8 items were then combined into a single composite variable of physician communication. The interrater agreement of the ratings ranged from poor to adequate across the 8 items: ICC(1, 2) ranged from .26 to .51. The sum of the mean ratings was then converted to a single composite variable. The final composite variable had excellent reliability,  $\alpha=.94$ .

The second set of ratings assessed the physician's humility and frustration during the interaction. Each interaction was rated by 4 trained undergraduate raters from a pool of 12 total raters. Raters rated the physicians on the characteristics of "humble" and "frustrated with the patient" on a scale from 1 (*not at all*) to 7 (*a great deal*). Raters received two waves of training. In the first wave, each item on the rating scale was explained in detail to ensure consensus on the meaning of each item. The item "humble" was defined using the hallmarks identified by

Chancellor and Lyubomirsky [2]. The item “frustrated with the patient” was marked by physician behaviors demonstrating frustration, such as using a pointed tone of voice, providing progressively briefer responses as the interaction progressed, and interrupting or talking over the patient. After receiving descriptions of the items, all raters listened to the same audio recording (not included in the sample) and provided initial practice ratings. Then the raters, along with the second author, discussed each item at length with regard to the target audio recording. The goal of this exercise was not necessarily to gain consensus for the ratings themselves but for the raters to fully comprehend the meaning and intent of each item. In the second wave of training, raters listened to and coded two additional audio recordings and discussed them in a group with the second author until consensus was formed about the meaning of each item.

The interrater agreement when considering all 4 raters was poor to adequate:  $ICC(1, 4) = .23$  and  $.58$  for humility and frustration, respectively. Excluding the most deviant rater from each interaction (determined by highest absolute deviation from the median rating for that interaction<sup>2</sup>) improved agreement considerably:  $ICC(1, 3) = .73$  and  $.87$  for humility and frustration, respectively. Humility and frustration scores were therefore calculated from the 3 least deviant ratings of each interaction.<sup>3</sup>

### 3. Results

#### 3.1. Analytic Approach

This study focused on three primary outcome variables: 1) the composite self-reported patient health scores, 2) the composite physician communication ratings, and 3) the patient-reported satisfaction with interpersonal care scores. Because of the nested nature of the study

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<sup>2</sup>If two raters were equally deviant but in opposite directions, whichever rater was arbitrarily listed first in the data set was excluded.

<sup>3</sup>Analyses run using the 4-rater averages revealed a similar pattern of results but with slightly stronger effects predicting physician communication and slightly weaker effects, but in the same direction as in the reported models, predicting patient-reported health.

design, we first estimated an unconditional means multilevel model, with physician and site as random grouping variables, and calculated an intraclass correlation (ICC) for each grouping variable and outcome pair. An ICC above .10 indicates meaningful interdependence within physicians or sites on the outcome, necessitating a multilevel approach to the analyses. The ICCs for physicians and sites for the outcomes of patient-reported health and patient satisfaction with care were all below .05; therefore, we used ordinary least squares regression for models predicting patient-reported health and satisfaction with care. The ICCs for the outcome of physician communication for physicians and sites were .29 and .00, respectively; therefore, we used multilevel models with physician as a grouping variable to predict physician communication. Both outcome variables were grand-mean centered in all models.

The primary predictor variable was the physicians' rated humility. Humility was scored in two ways. First, each physician-patient interaction was scored as the physician's mean humility across all patients, reflecting between-physician (mean-level) variation in humility. Second, humility scores were centered on each physician's mean, reflecting within-physician fluctuations in humility.

Five models were estimated for each of the three outcome variables. Each model estimated the effect of mean-level and physician-centered humility with a different set of control variables: 1) no controls; 2) patient demographics only (sex, age, income, and ethnicity); 3) physician and patient satisfaction with the visit (physician satisfaction only for models with patient satisfaction as the outcome); 4) the physician's rated level of frustration with the patient; and 5) all control variables from the first four models. Income was converted to a two-level factor (less than \$20,000 per year vs. \$20,000 per year and above) and dummy-coded with low income as the 0-coded group. Ethnicity was converted to a two-level factor (White vs. non-

White) and dummy-coded with White as the 0-coded group. All other control variables were grand-mean centered. The simple correlation matrix among all model variables is given in Table 1.

### **3.2. Physician Communication as Outcome**

Physician communication effectiveness was predicted using multilevel models. Physician-centered humility and all control variables were level 1 predictors. Mean-level humility was constant within physicians and was therefore a level 2 predictor of level 1 intercepts. All models included random effects for physician-centered humility only.

Model coefficients and fit statistics are listed in Table 2. Patient satisfaction was the only control variable that significantly predicted physician communication effectiveness, such that communication was more effective when patients were more satisfied with their physicians. Additionally, physician frustration was a marginally significant negative predictor of communication effectiveness when no other control variables were included in the model. As hypothesized, the physicians' mean-level humility positively predicted communication effectiveness across all 5 models (final model:  $\gamma_{01}=.23, p < .001$ ). However, within-physician changes in humility did not predict effective physician communication in any models.

### **3.3. Patient-Reported Health as Outcome**

Regression coefficients and model  $R^2$  values for each of the 5 models predicting patients' perceptions of their health are given in Table 3. Among control variables, only income, physician satisfaction, and physician frustration significantly predicted perceived health in any of the models. As hypothesized, within-physician changes in humility positively predicted perceived health across all 5 models (final model:  $b=.13, p=.038$ ). However, the effect of mean-level

humility was consistently near zero and nonsignificant, which may be due to the relatively low variance in patient-reported health among the physicians.

### **3.4. Within-Physician Humility as Outcome**

An alternative explanation for the relationship between humility and patient health perceptions is that healthy patients elicit relatively more humble behaviors from their physicians. To explore this possibility, we tested a series of models predicting within-physician humility from perceived patient health. Models were estimated using OLS regression, controlling for the same sets of variables as in the previous models. Regression coefficients and model  $R^2$  values for each of the models are listed in Table 4. No control variables were significantly associated with physician humility in any of the models. However, perceived patient health was a significant positive predictor of within-physician humility in all 5 models (final model:  $b=.13$ ,  $p=.020$ ).

### **3.5. Patient Satisfaction with Interpersonal Care as Outcome**

Regression coefficients and model  $R^2$  values for each of the models predicting patient satisfaction with care are reported in Table 5. Among control variables, only age significantly predicted patient satisfaction. Contrary to our hypothesis, neither between- nor within-physician humility predicted patient satisfaction with care in any of the models. However, a follow-up model (see Table 5) revealed a significant effect of physician communication effectiveness (grand-mean centered) on patient satisfaction,  $b=0.23$ ,  $p<.001$ . As established above, physician communication effectiveness was itself predicted by mean-level physician humility, suggesting an indirect effect of physician humility on patient satisfaction via physician communication effectiveness.

To test this possible indirect effect, we averaged all data across patients within physicians ( $N=97$  due to missing data) and estimated a mediation model (without controls) with physician

humility as the predictor, physician communication effectiveness as the mediator, and patient satisfaction with care as the outcome. The indirect effect of physician humility on patient satisfaction was 0.074, with a bias-corrected bootstrap confidence interval (5000 resamples) of [0.026, 0.16]. The confidence interval does not contain zero, suggesting that the indirect effect was significantly greater than zero. The residual direct path between physician humility and patient satisfaction was nonsignificant,  $c'=-0.080$ ,  $p=.21$ , indicating that physician humility and patient satisfaction were related entirely by way of physician communication effectiveness.

#### **4. Discussion and Conclusion**

##### **4.1. Discussion**

This study is the first to our knowledge to demonstrate a relationship between the humility of physicians and the quality of their communication with their patients. Physicians who were generally humble around their patients were rated as communicating more effectively with those patients than physicians who were generally less humble. This finding is consistent with the theoretical view of humility as a highly other-focused and low self-focused state [2,13]. Rather than “shutting out” the patient with their own authority, humble physicians were sensitive and empathic when communicating with their patients. Contrary to our prediction, this association cannot explain the link between physician humility and perceived patient health, because communication effectiveness was associated only with mean-level differences in physicians’ humility, whereas patient health was associated only with within-physician fluctuations in humility. This discrepancy may be because effective communication is a learned skill that is relatively insensitive to moment-to-moment changes in the physician’s manner. Nevertheless, the humility-communication link is of particular clinical interest because of the importance of effective physician communication to patient outcomes, such as adherence to

physicians' recommendations [10]. Indeed, in this study, physician communication strongly predicted patients' satisfaction with the care they received, suggesting that physician humility may provide indirect benefits for patient satisfaction. Although the causal direction of the relationship cannot be inferred, the results suggest that increasing physicians' levels of humility may be a means of promoting improved physician-patient communication and thus better patient outcomes and better patient satisfaction with care.

**4.1.1. Physician humility and patient-reported health.** Patients reported better health when their physicians were viewed as particularly humble during a medical visit. This association remained even after controlling for the patients' demographics, the physicians' and patients' satisfaction with the visit, and the physicians' frustration with their patients, suggesting that the relationship is not merely an artifact of a generally positive interaction or physicians behaving in a more negative manner with their less healthy patients.

Why might physician humility and perceived patient health be related? One possibility is that humble physicians steer patients to behave in health-promoting ways. Because humility involves an acceptance of one's shortcomings, humble physicians may be more willing to consider multiple diagnoses and care regimens, rather than assuming that their initial recommendations were beyond reproach (see [24]). Chochinov [25] proposed that humble physicians are more patient-focused, rather than simply illness-focused, and thus treat patients with greater dignity. This increased patient-focus may encourage patients not just to adhere to the physician's recommendations but also to take an active role in caring for their own health (e.g., by bolstering their efficacy beliefs about their ability to manage and prevent illness). However, if physician humility causes patients to feel healthier (even momentarily), then patients should report better health if their physicians are humble in general rather than just on a patient-

to-patient basis. The results of this study do not support this possibility: Patient health did not vary meaningfully among the physicians and therefore mean-level physician humility did not predict patient-reported health in any models. Furthermore, patients may have felt relatively healthy before their physicians behaved humbly around them, suggesting that the physician's humility could not have been a cause of patients reporting better health in this study. As such, although these data are not inconsistent with a perceived-health-as-outcome model, they do not clearly support it.

Alternatively, according to the reverse causal path, healthy patients may prompt physicians to behave in a relatively humble fashion. For example, physicians may feel more secure and affirmed when interacting with their healthiest patients than with their less healthy patients, allowing them to focus more attentively on the patient's needs. This model may explain why within-physician humility, but not between-physician humility, was associated with superior perceived patient health: Although physicians may behave more humbly than usual with healthier patients, their average humility is unchanged because they behave correspondingly *less* humbly with less healthy patients (e.g., dominating the interaction). These fluctuations in humility may in turn feed back into the patients' emotions and behaviors to promote better (or worse) perceptions of health, although the present results do not necessarily support such a model. Notably, the humility-as-outcome model is consistent with the state perspective of humility by demonstrating that humility is not a fixed characteristic of physicians, but rather a product of both the physician's own dispositions and specific characteristics of the physician-patient interaction.

**4.1.2. Limitations and future directions.** The primary limitation of this study is the temporal conflation of humility and perceived patient health—that is, it is impossible to



determine whether patient health preceded or followed physician humility. Because the patients' perceptions of their health likely preceded the physician visits in this study, physician humility specifically in those visits should not have affected patient health, although physician humility during those visits may have affected patients' *temporary* perceptions of their health (i.e., immediately after the visit when they completed the questionnaire). However, physicians who behaved particularly humbly with certain patients in one visit may also have behaved humbly with the same patients during previous visits. In other words, humility in the visits rated for this study may be an indicator of humility during previous visits. This assumption is a necessary condition for any model based on these data proposing humility as a cause of patient health. Future studies could parse the directionality of the humility-health link by experimentally inducing humility in physicians prior to interactions with patients, such as by periodically prompting physicians to affirm their professional values and the importance of their patients, an approach that has already proved to be effective in boosting state humility [12].

This study was also limited by the lack of a self-rated measure of physician humility. The external ratings of physician humility were hindered by poor reliability, suggesting that it may be difficult to discern humility in physician-patient interactions, although the reliability of the ratings improved considerably when extreme raters were excluded. Furthermore, physicians' manifest humility, or modesty, may not reflect their inner psychological states while interacting with patients. For example, a physician may be inwardly insecure or arrogant, but act secure and humble when interacting with a patient to avoid upsetting him or her. This limitation has trivial practical implications, however, if humility causes changes in patient health, because the patient's behaviors can only be influenced by the physician's observable behavior. False humility should also be, at worst, inconsequential to physician-patient communication; that is,

acting humble without feeling humble should not be uniquely detrimental to the effectiveness of a physician's communication. However, the potential for false humility may limit the implications of this research for the state humility perspective, as it is unclear whether or not within-physician fluctuations in rated humility reflect true changes in inner humility. Future research could address this limitation by using a self-rated measure of humility that minimizes self-presentation biases (e.g., [19]).

Furthermore, the nature and severity of the reasons for patients' medical visits, and the success or failure of treatment, may influence the role of humility in physician-patient interactions. For example, physician humility may be particularly important for successful physician-patient communication when a patient's treatment is ineffective, because humble doctors will be less prone than arrogant doctors to blame the patient for the treatment's failure and thus more able to convey optimism about subsequent treatment efforts. Finally, patients' expectations for their medical care may have changed since the data in this study were collected (e.g., due to rising healthcare costs and the advent of the Internet as a resource for self-diagnosis); this possible change in expectations may moderate the importance of physician humility for patient health and satisfaction with care.

#### **4.2. Conclusion**

In contrast with the "Dr. House" perspective, the results of this study suggest that humble, rather than paternalistic or arrogant, physicians are most effective at working with their patients. Humble physicians were viewed as better at communicating with patients than non-humble physicians, and patients reported better health when their physicians acted particularly humbly.

### **4.3. Practice Implications**

Although our results do not permit causal conclusions, they do suggest that interventions to improve physician humility may promote better communication between physicians and patients and, in turn, better patient outcomes. Furthermore, interventions to improve patients' health, or at least, perceived health, may provide concurrent boosts to their physicians' humility. Indeed, such an intervention may even reveal reciprocal benefits for the patient's health by improving the quality of the physician-patient interaction—benefits that may be compounded by training physicians to behave more humbly with patients. The physician humility-patient health link thus represents an exciting new direction in health psychology.

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Table 1

*Simple correlation matrix of all variables included in analyses*

Variable	1	2	3	4	5	6	7	8	9
1: Physician humility (uncentered)									
2: Physician-centered physician humility	***.76								
3: Physician communication effectiveness	*.13	-.03							
4: Perceived patient health	*.14	** .15	.08						
5: Patient satisfaction with care	.05	.06	***.20	.01					
6: Physician satisfaction with visit	.08	†.10	.08	***.24	.03				
7: Patient income (\$10k increments)	.09	.04	.09	***.23	.02	.06			
8: Patient sex (0 = Male, 1 = Female)	*.13	.02	*.12	†.10	-.03	.03	-.03		
9: Patient ethnicity (0 = White, 1 = Non-White)	.04	-.02	.01	-.03	†-.11	-.07	*-.13	.15	
10: Patient age	*-.14	-.07	-.08	-.08	*.15	-.07	-.07	***-.25	***-.24

Note. † $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .



Table 2

*Multilevel models predicting physician communication effectiveness*

	Model 1: Humility only	Model 2: Humility & patient demographics	Model 3: Humility & DR/PT satisfaction	Model 4: Humility & physician frustration	Model 5: Humility & all controls
Fixed effects					
Physician-centered humility ( $\gamma_{10}$ )	-0.026	-0.018	-0.041	-0.034	-0.043
Physician mean-level humility ( $\gamma_{01}$ )	***0.237	***0.244	***0.237	***0.230	***0.233
Income (0 = less than \$20k)		0.119			0.097
Sex (0 = Male)		0.049			0.046
Ethnicity (0 = White)		0.090			0.100
Age		0.001			0.002
Patient satisfaction			**0.157		**0.168
Physician satisfaction			0.163		0.165
Physician frustrated				†-0.093	-0.083
Random parameters					
Intercept	0.117	0.116	0.099	0.110	0.097
Physician-centered humility	0.001	0.002	0.003	0.002	0.005
Model AIC	619.2	585.2	610.9	618.1	576.3
Model BIC	645.0	624.9	644.0	647.6	626.8

Note. † $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Table 3

*Ordinary least squares regression models predicting patient-reported health*

Predictor	Model 1: Humility only	Model 2: Humility & patient demographics	Model 3: Humility & DR/PT satisfaction	Model 4: Humility & physician frustration	Model 5: Humility & all controls
Physician-centered humility	**0.169	*0.164	*0.145	*0.144	*0.130
Physician mean-level humility	0.046	-0.015	0.043	0.025	-0.028
Income (0 = less than \$20k)		***0.405			**0.372
Sex (0 = Male)		0.169			0.107
Ethnicity (0 = White)		0.037			0.071
Age		-0.002			0.000
Patient satisfaction			-0.002		-0.018
Physician satisfaction			***0.545		**0.442
Physician frustrated				***-0.288	***-0.245
Model <i>R</i> -squared	.025	.081	.074	.074	.154
Denominator degrees of freedom	290	264	288	289	261

*Note.* \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . Degrees of freedom vary due to missing data.

Table 4

*Ordinary least squares regression models predicting physician-centered physician humility*

Predictor	Model 1: Health only	Model 2: Health & patient demographics	Model 3: Health & DR/PT satisfaction	Model 4: Health & physician frustration	Model 5: Health & all controls
Patient reported health	**0.141	*0.148	*0.127	*0.127	*0.128
Income (0 = less than \$20k)		0.022			0.010
Sex (0 = Male)		0.022			-0.002
Ethnicity (0 = White)		-0.058			-0.047
Age		-0.052			-0.056
Patient satisfaction			0.060		0.101
Physician satisfaction			0.147		0.121
Physician frustrated				-0.076	-0.060
Model R-squared	.024	.032	.031	.027	.045
Denominator degrees of freedom	291	265	289	290	262

*Note.* \* $p < .05$ . \*\* $p < .01$ . Degrees of freedom vary due to missing data.

Table 5

*Ordinary least squares regression models predicting patient satisfaction with interpersonal care*

Predictor	Model 1: Humility only	Model 2: Humility & patient demographics	Model 3: Humility & physician satisfaction	Model 4: Humility & physician frustration	Model 5: Humility & all controls	Model 6: Humility & all controls + physician communication
Physician-centered humility	0.057	0.082	0.055	0.060	0.082	†0.089
Physician mean-level humility	-0.001	0.024	-0.001	0.002	0.025	-0.031
Income (0 = less than \$20k)		0.070			0.070	0.046
Sex (0 = Male)		0.005			0.006	-0.008
Ethnicity (0 = White)		-0.070			-0.069	-0.075
Age		*0.007			*0.007	*0.006
Physician satisfaction			0.051		0.039	0.016
Physician frustrated				0.031	0.013	0.031
Physician communication effectiveness						***0.228
Model <i>R</i> -squared	.004	.036	.005	.005	.036	.078
Denominator degrees of freedom	294	268	293	293	266	263

Note. † $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . Degrees of freedom vary due to missing data.