

Increasing Patient Satisfaction and Compliance: An Examination of Physician Humor Orientation, Compliance-Gaining Strategies, and Perceived Credibility

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This study examined the impact that patients' perceptions of a physician's humor orientation, credibility, and compliance-gaining strategies had on their satisfaction and compliance. Perceived physician humor orientation positively related to perceived physician credibility, physician compliance-gaining strategies, and patient satisfaction. Other positive relationships among perceived physician credibility, physician compliance gaining strategies, and patient satisfaction emerged. Compliance did relate significantly to physician humor orientation and perceived credibility. Aspects of patient satisfaction and physician use of compliance-gaining strategies affected compliance. Additionally, this study revealed minimal differences among data collection methods (undergraduate (N = 44), graduate (N = 48), general public (N = 66), and online participation (N = 26)).

KEY CONCEPTS humor orientation, physician-patient interaction, credibility, compliance-gaining, patient satisfaction

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At the end of a visit to a personal physician, the physician generally prescribes some sort of medication, treatment, or change in lifestyle to help patients recover from, or cope with, medical problems. Since physicians reportedly have high credibility as healers in our society, one might assume that patients follow their physicians' directions. Yet, nearly 50% of all patients do not follow the prescribed treatment from their physicians (Stone, 1979). This statistic has not changed much in the last twenty years (Bullman, 1996). Such data link to a number of negative outcomes, not only involving noncompliant patients, but others in the community as well. People who do not comply may contribute to higher medical costs and insurance rates be-

cause they are often subject to re-treatment as a result of therapeutic failures, recurring, or lingering infections, which can ultimately lead to surgical interventions and hospitalizations that initially are not necessary (Baskin, 1998). Surprisingly, non-compliance rates are as high for individuals suffering from severe chronic pain as they are for those having symptomless diseases (Tamaroff, Festa, Adesman, & Waco, 1992; Turk & Rudy, 1991). One possible way to rectify this lack of compliance is better patient-physician interactions (Fitzpatrick, 1991). Therefore, it is useful to examine variables that may indicate whether one will follow a physician's directions.

Our study concerned how a physician's perceived humor orientation, credibility, and communication competence relate to patients' levels of satisfaction and their compliance. We begin this report by examining scholarly literature concerning patient compliance, patient satisfaction, and medical humor.

Patient Compliance

Since up to 50% of all patients do not comply with the prescribed treatments physicians give them, medical researchers have attempted to discover how to construct messages that encourage greater compliance (Bullman, 1996; Stone, 1979). Everything from interactive instruction sheets (Barone, 1996) to monetary incentives (Giuffrida & Torgerson, 1997) has surfaced as ways to achieve compliance.

Patient compliance refers to "the extent to which a person's behavior (in terms of taking medications, following diets, or executing life style changes) coincides with medical or health advice" (Haynes, Taylor, & Sackett, 1979, pp. 1-2). Given this definition, patient compliance is clearly a construct that at its very essence is interpersonally based (Vivian & Wilcox, 2000). For physicians to elicit desired behavior, they must have compliance-oriented messages embedded in the communication with their patients when discussing treatment protocols. In fact, the use of compliance-oriented messages reportedly relates to greater patient satisfaction (Buller & Buller, 1987) and compliance (Burgoon, Pfau, Parrott, Birk, Coker, & Burgoon, 1987). Klingle and Burgoon (1995) noted that physicians who used only reinforcing communication were less persuasive and induced less compliance than physicians who used both reinforcing (positive) and non-reinforcing (aversive) communication strategies. Ultimately, this study demonstrated that patients are more likely to comply with physicians who provide arguments for prescribed treatments when compared to those physicians who merely try to reinforce positive behavior. These arguments help patients complete a cost benefit analysis of the prescribed treatment (Donovan & Blake, 1992). The expense of a proposed treatment is one aspect of this cost benefit analysis. If patients do not believe the financial cost is worth the alleged benefits, they are not apt to be compliant. Although patients complain about the cost of medication and opt not to acquire it, Giuffrida and Rogerson (1997) noted that, ironically, medical costs escalate, in part, because people do not comply with prescribed treatments. In fact, one reason patients report for non-compliance with treatment regimens is the rising costs of some prescriptions (Baskin, 1998; Bullman, 1996; Giuffrida & Rogerson, 1997).

A second reason for patient non-compliance, as Becker and Rosenstock (1984) noted, is a patient's perception of the potential effectiveness of treatment. Personal factors (finances and background) and social variables (culture's perceptions) also affect the likelihood of compliance. A study conducted by the American Association of Retired Persons (1992) concerning why patients did not comply with treatments revealed that 21% of the respondents thought that the medicine would not work, and 22% were too

inkel (1998) noted in a joint study by the Harvard Medical team that poor individuals and the elderly had the assumption of medication, even when the medicine was concluded that the most common reason for non-compliance was physician communication, which leads to an uneasiness among the patients.

In both methods and modalities of medicine, patients desire possible medical options beyond traditional medicine. Insurance companies are willing to cover the expenses of non-traditional medicine. In the realm of traditional medical practices, the number of medical choices they can make in today's healthcare environment has led to the saturation of physicians in some communities. Patient satisfaction has emerged primarily as a consequence of the choices that patients view for themselves. Patient satisfaction is satisfaction; satisfied customers come back.

In 1993, patient satisfaction is the cognitive evaluation of the care. In addition, patient satisfaction should not be measured by a physician's efficiency or effectiveness. Instead, satisfaction is measured by which a patient has good interpersonal relations with the physician. Patients who are interpersonally satisfied find their physicians who are not interpersonally satisfied (Beck, Griffith, Conlon, Mandel, Ong, Pozniak, Tang, Tomlinson, & Tomlinson). Patient satisfaction has been investigated in a number of different contexts (Naftalin & Habiba, 2000) to substance abuse treatment. Overall, the research has shown that satisfied patients return to their physicians repeatedly (Baker, 1998). Further, ongoing association tends to increase patient satisfaction (Patients pleased, 1998). Patients tend to return for medical attention. If patients are not satisfied, they seek services of another qualified physician (Productivity, 1997). The physician has a vested interest in increasing patient satisfaction for financial outcomes.

Physician satisfaction is crucial for the patient. In a study by Becker and Rosenstock (1998), patients who were initiated to the duration of an illness. Patients who were initiated by primary care physicians showed significantly shorter duration of illness than those who were not satisfied. Lochman (1983) reported that patients who were satisfied in their relationship with their primary care physician had a higher compliance with a physician's prescription than those who were not satisfied.

In addition to patient satisfaction, there is no magical list of behaviors that will make patients satisfied (Cohen & Forbes, 1996). A number of factors have been shown to be related to patient satisfaction. These factors include waiting time, and billing problems (Markham, Dia-

determined that both patient satisfaction and technical compliance with the physician's Slater, Linn, &

Humor in the A

In a recent study by Mullooly, Dulmus, and others, patients who laughed more during medical practice suits. Patients who were positive for both patient satisfaction and compliance have lower levels of patient satisfaction rates (Lambert, 1993). (Berk, 1993), (1991), lower patient satisfaction rates (McClellan, 1991) which he or she received health care. Patients who posed to humor during post operative physician relations. Humor in the medical setting and seems like a good compliance with the physician.

Physicians who are coping with the stress of the medical profession and other factors and the enactment of the medical profession, which,

Despite the fact that not all physicians are not be unskillful in a language of humor. Patients who are of humorous and instead of a potential negative effect of positive patient satisfaction spend more time with individuals (Honeycutt & Honeycutt, 1993). Honeycutt and Honeycutt (1993) contingency of outcome.

determined that doctors who were friendly and respectful received higher ratings in both patient satisfaction and technical competence than did their less friendly and yet, technically competent, counterparts. Importantly, patients' satisfaction relates to compliance with the physicians' prescriptions (Beck et al., 1999; Burgoon & Burgoon, 1990; Slater, Linn, & Harris, 1982).

Humor in the Medical Context

In a recent article in the *Journal of American Medical Association*, Levinson, Roter, Mullooly, Dull, and Frankel (1997) reported that physicians who enacted humor and laughed more during patient-physician interactions were less likely to engender malpractice suits. The use of humor as a variable in medical research has proved to be positive for both patients and their caregivers. Patients exposed to humorous messages have lower levels of stress-related hormones (Berk, 1989), increased immunoglobulin rates (Lambert & Lambert, 1995; McClelland & Cheriff, 1997), increased helper T-Cells (Berk, 1993), lower levels of pain (Adams & McGuire, 1986; Cohen, 1990; Pasquali, 1991), lower blood pressure (Fry & Savin, 1982), and faster recovery rates from illnesses (McClelland & Cheriff, 1997). A patient's sense of humor and the degree to which he or she actively seeks humorous messages are predictive of her or his perceived health and morale (Simon, 1990). In a study by Gaberson (1991), patients exposed to humorous messages had lower levels of anxiety before operations and higher post operation recovery rates. The inclusion of humorous messages in the patient-physician relationship can reduce fear while promoting trust (Robinson, 1991). Overall, humor in the medical environment appears to have an overwhelmingly positive effect and seems likely to increase positive perceptions of care-givers and subsequently compliance with their directions (James, 1995).

Physicians and other medical professionals personally use humor as a means of coping with the uncertainty that surrounds the medical profession (Bosk, 1996; Wanzer, Booth-Butterfield, & Booth-Butterfield, 1997). The use of humor appears to allow doctors and other medical personnel to ease tension (Ditlow, 1993). Medically speaking, the enactment of humor causes us to laugh, which physiologically increases endorphin levels, which, in turn, are associated with decreased anxiety levels (McGhee, 1999).

Despite the benefits of integrating humor into the medical office, humor should not be unskillfully used. Mulkay (1988) mentions that humor has the potential to create a language of domination and opposition rather than collaboration. Misinterpretation of humorous language could force the individuals interacting to see each other as foes instead of collaborators (Witkin, 1999). Hence, communicators must be aware of potential negative effects of poorly enacted or misperceived humor, as well as the potential of positive outcomes. It may be diagnostic that highly humor-oriented individuals spend more time rehearsing jokes when compared to minimally humor-oriented individuals (Honeycutt & Brown, 1998). Hopefully, a portion of this rehearsal time involves considering the possible positive and negative implications of enacted humor. Honeycutt and Brown (1998) suggest that people who use humor well probably have a contingency plan if the first one fails to have the desired impact or leads to a negative outcome.

Recently, communication researchers have begun examining humor from an enactment perspective to see how individuals differ in the production of humorous messages (Booth-Butterfield & Booth-Butterfield, 1991; Purnyanunt, 1997, 2000; Wanzer, Booth-Butterfield, & Booth-Butterfield, 1995, 1996a, 1996b, in press; Wanzer & Frymier,

1999). Booth-Butterfield and Booth-Butterfield (1991) identified the concept of Humor Orientation (HO), or an individual's predisposition to enact humorous messages in interpersonal situations. Research has shown humor orientation to be a positive trait among nurses (Wanzer et al., 1996b, 1997), in supervisor-subordinate relationships (Rizzo, Wanzer, & Booth-Butterfield, 1999), and in teacher-student relationships (Punyanunt, 1997, 2000; Wanzer & Frymier, 1999). Although no research has directly examined the effects of humor orientation in physician-patient interactions, the link is readily made to satisfaction and compliance.

Fitzpatrick (1993) described patient satisfaction as an "emotional link to healthcare." And since humor creates a positive emotional state (Wrench & McCroskey, 2000), those patients who find their physicians humorous presumably would also be more satisfied than those patients who do not find their physicians humorous. Hence:

- H1: Physicians with higher levels of perceived humor orientation will also have higher levels of patient satisfaction.

Perceived Credibility

HO is also likely to be related to patients' perceptions of physician credibility. The modern conceptualization of credibility stems from the Aristotelian concept of ethos. Credibility (ethos) consists of three distinct factors: competence (the extent that an individual truly knows what he or she is discussing), trustworthiness (the degree to which one individual perceives another person as being honest), and goodwill (the perceived caring a receiver perceives in a source) (McCroskey & Teven, 1999). If patients believe their physician is competent, honest, and truly cares about their welfare, then they are going to be more likely to comply with medical directives.

Previous research in the field of instructional communication has demonstrated a positive relationship between perceptions of teacher humor enactment and teacher credibility (Wrench & Richmond, 2000). Assuming this relationship to be consistent across contexts, one should expect a similarly positive relationship between physician humor orientation and credibility. Specifically:

- H2: Physicians with higher perceived humor orientation scores will have higher levels of perceived credibility.

According to McCroskey (1998), affinity is the basis for the conceptualization of the credibility factor goodwill. Affinity as a basic construct is emotion laden. Additionally, affinity is a positive attribute that should positively affect Fitzpatrick's (1993) "emotional link to healthcare" and, thus, have a salutary effect on patient satisfaction. If a patient perceives that his or her physician truly cares about her or his welfare, then her or she will be more satisfied with her or his physician. Consequently, we tested the following hypothesis:

- H3: There will be a positive relationship between perceived physician credibility and patient satisfaction.

Compliance-Gaining Strategies

According to Wheelless, Barraclough, and Stewart (1983), compliance-gaining is "the performance by one person, the target, of the specific behaviors desired of the

target by another person, the agent" (p. 110). Although compliance-gaining is clearly a communication phenomenon, the formal concept originated with Gerald Marwell and David Schmitt (1967). These researchers identified a system of sixteen possible compliance-gaining techniques that people use. From research, Marwell and Schmitt (1967) narrowed the list to five clear ways people attempt to gain compliance: rewarding activity, punishing activity, use of expertise, activation of impersonal commitments, activation of personal commitments. McCroskey (1998) considers these compliance-gaining techniques as types of power.

In McCroskey's (1998) scheme, the types of power are the same as the bases of power that French and Raven identified over forty years ago: coercive, reward, legitimate, referent, and expert. The first type of power is coercive power, or power whereby an agent gains compliance because he or she has the ability to punish the target if he or she does not cooperate. The opposite of this type of power is reward power. Reward power is at the base of attempts to gain compliance by offering rewards to a target for doing as the source wishes. The third type of power is legitimate or assigned power. Legitimate, or assigned power, is power that others confer on an agent because they believe the agent, like a boss or the government, has the right to expect them to behave in a compliant manner. The fourth type of power is referent power, or the power that stems from desired associations. Referent power derives from qualities that attract people and lead them to admire sources of influence, as well as want to be associated with them. The final type of power is expert power. Expert power is power that accrues to an agent because of the amount of information or knowledge he or she possesses. When we go to the doctor, most people initially see him or her as having this type of power.

Wheless et al. (1983) have noted that compliance-gaining strategies can best be explained in the types of power they explain: expectancies/consequences, relationship/identification, and values/obligations. Expectancy/consequence compliance strategies underly messages that attempt to manipulate the consequences of a certain course of action. Relationship/identification compliance-gaining strategies entail attempts to determine one's relational position with the other person. Finally, values/obligations strategies are evident in messages that attempt to define values or obligations or both. Ultimately, people use a combination of all three compliance-gaining strategies in various degrees when getting someone to comply.

In response to compliance-gaining research, McLaughlin, Cody, and Robey (1980) posed four different compliance-resistance strategies: non-negotiation, negotiation, justification and identity management. Non-negotiation is the outright refusal to comply with an agent's request (An example in a medical encounter might be, "No, I will not take that drug."). Negotiation, on the other hand, is the presentation of an alternative to an agent's attempt to gain compliance ("How about if we try physical therapy instead of surgery?"). Justifying entails the examination of possible negative outcomes of a target compliance ("If I take that medication it makes me too drowsy to function."). Finally, the compliance resistance strategy of identity management represents the manipulation of the image of the agent ("That physician is such a nasty person. I would never put someone on that medication."). This last strategy attempts to create negative associations between the agent and the behavior he or she is attempting to elicit in the target.

Although there is research examining compliance-gaining in patient-physician communication (Burgoon et al., 1987; Klingle & Burgoon, 1995), research involving perceptions of physicians' humor orientation and credibility related to the types of compli-

ance-gaining tactics employed is lacking. In a study in the educational context, a sender's humor orientation appeared to affect perceptions of the effectiveness of particular compliance gaining techniques, and high HO teachers used different compliance-gaining strategies compared to Low HO teachers (Punyanunt, 1997, 2000). This study explored the differences in the techniques Low and High HO physicians are perceived to employ. Specifically, we addressed the following questions:

- RQ1: What is the relationship between a physician's perceived humor orientation and her or his perceived use of compliance-gaining strategies?
- RQ2: How does a physician's choice of compliance-gaining strategies relate to patient satisfaction?
- RQ3: How does a physician's choice of compliance-gaining strategies relate to perceived credibility?
- RQ4: To what extent do a physician's humor orientation, credibility, use of compliance gaining strategies, and patient satisfaction correlate with an individual's likelihood of complying with her or his physician's prescribed treatment?

METHODS

Participants

To maximize external validity, participants for this study represented four groups. Some participants were diverse undergraduates enrolled in communication courses at a large Middle Atlantic public university. This portion included 25 (56.8%) males and 19 (43.2%) females and constituted 16.9% of the total sample. The second segment of participants consisted of graduate students in an applied master's degree program. Individuals in this program are all adult students who primarily focus on their occupations while taking courses throughout the year in educational cohorts. This portion of the sample consisted of 7 (14.6%) males and 41 (85.4%) females and was 18.4% of the total sample. The third group included individuals from the general public, shopping at a Mid-Atlantic mall. Trained student interviewers conducted surveys in the mall. The mall was attractive because its patrons represent a diverse community, not just people associated with the University. This portion of the sample consisted of 76 (53%) males and 66 (46%) females and constituted 54.8% of the total sample.

The final portion of the sample was the product of fifty Internet postings in America On-line chat rooms asking for volunteers. The postings occurred over a two-day period in order to reach a wide range of individuals. Individuals in the chat rooms were also asked to forward the call for participants to friends and family members. Those who decided to participate in the study received information concerning the World Wide Web site where they could participate. This portion of the sample had 6 (23%) males and 20 (77%) females, or 10% of the total sample.

The overall sample included 146 females (55.5%) and 114 (43.3%) males. Mean ages were: undergraduate students, $M = 22$; master's students, $M = 38.6$; general public, $M = 38.7$; and Online, $M = 37.3$. The overall mean age was 35.7. The ethnic breakdown was: 46 (17.5%) African American, 189 (71.9%) Anglos/Caucasian, 9 (3.4%) Middle Eastern, 15 (5.7%) Asian, 6 (2.3%) Hispanic/Latino, 10 (3.8%) Native American, and 1 (4%) other. A final demographic category, highest level of education, showed the following statistics: 46 (17.5%) high school/ GED, 70 (26.6%) some college, 12 (4.6%) associate's degree, 79 (30%) college degree, 40 (15.2%) graduate/professional degree,

and 15 (5.7%) post graduate. Thus, the sample was quite diverse in background, representing a wide variety of perspectives.

Procedure

Participants completed the Humor Orientation Scale, Compliance-Gaining Questionnaire, Perceived Credibility Scale, and the Patient Satisfaction Scale, with their personal physician as the object of focus. If they did not have a regular personal physician, they were instructed to think of the most recent physician with whom they had interacted. Participants then indicated on a 0-100 scale the extent to which they had followed their physicians' prescriptions and/or treatments after their last visit.

Measurement

This study incorporated three measures of patient perceptions of their physician's communicative behavior (Humor Orientation, Physician Credibility, and Physician Compliance Gaining) and two others relating to perceptions of themselves (Satisfaction and Compliance).

Humor Orientation. The Humor Orientation Scale (HO) is a 17-item, self-report measure that uses a 5-point Likert format ranging from "strongly disagree" to "strongly agree." Booth-Butterfield and Booth-Butterfield (1991) developed the HO to permit an encompassing look at an individual's overall propensity to use humorous communicative messages in interpersonal situations. An adapted version of this instrument permitted examination of the perceived humor-orientation of a physician in a format similar to that in studies by Wanzer and Frymier (1999) and Rizzo, Wanzer, and Booth-Butterfield (1999) involving teachers and supervisors. Previous research examining humorous communication in the classroom has shown that perceived humor enactment enhances teacher evaluations (Bryant, Cominsky, Crane, & Zillmann, 1980; Javidi, Downs, & Nussbaum, 1988); student learning (Gorham & Christophel, 1990); perceptions of teacher nonverbal immediacy (Gorham & Christophel, 1990); and affect in the classroom (Wanzer & Frymier, 1999), suggesting criterion validity for HO.

The Humor Orientation scale demonstrates predictive validity in that it has specifically been related to enhanced perceptions of social attractiveness (Wanzer et al., 1996a), greater skill in humorous presentation of information (Wanzer et al., 1995), and heightened perceptions of liking for supervisors (Rizzo et al., 1999), all of which would be expected outcomes for someone who enacts humor effectively. Scores for the HO can range from 17-85. For the current sample, the HO had a Cronbach's alpha of .91 ($M = 52.74$; $SD = 10.47$).

Perceived Credibility. The 18-item McCroskey and Teven (1999) credibility measure assessed patients' perceptions of their physician's competence, trustworthiness, and goodwill. The scale has proven to be reliable and valid for determining perceptions of college instructors' credibility (McCroskey & Teven, 1999). All three factors of the Perceived Credibility measure positively related to believability and likeability of the instructor, which supports its face validity. Previous research has also demonstrated that a teacher's credibility positively relates to humor assessment and affective learning (Wrench & Richmond, 2000), cognitive learning (Teven & McCroskey, 1997), nonverbal immediacy (Thweatt & McCroskey, 1998), perceived quality of medical care, and perceived physician responsiveness (Richmond, Smith, Heisel, & McCroskey, 2002). These studies reflect the scale's predictive and criterion-based validity for credibility assessment in both educational and medical contexts.

Credibility items were bi-polar, with a range from one to seven. Scores for all sub-categories could range from 6-42. Cronbach's alpha for competence for this study was .86 ($M = 34.36$; $SD = 7.9$); for trustworthiness, .90 ($M = 33.92$; $SD = 8.17$); and for caring/goodwill, .88 ($M = 32.36$; $SD = 8.31$).

Compliance-Gaining. Wheelless, Stewart, and Barraclough's (1983) Compliance-Gaining Questionnaire (CGQ) was the measure of compliance gaining used in this study. The CGQ consists of twenty-one items in the Likert format that relate to use of power and range from (1) "My physician never uses this compliance-gaining strategy" to (5) "My physician always uses this compliance-gaining strategy." Each of the items was re-worded to reference the medical context by adding the words "physician" and "patient" instead of the words "teacher" and "student" used by Punyanunt (1997). Punyanunt reported that all three forms of teacher compliance-gaining positively related to a teacher's humor orientation. Although this scale has not been used extensively in communication research, results like those reported in the Punyanunt article indicate that the scale is both reliable and valid for examining compliance-gaining in interpersonal situations. It should be noted however, that no direct testing of the validity of the measure in the health arena has been published.¹

Each of the items corresponded to one of the categories in Wheelless et al.'s (1983) power typology: expectancies/consequences, relationship/identification, and values/obligations. Cronbach's alpha reliability for expectancies/consequences was .69 ($M = 20.78$; $SD = 4.6$); for relationship/identification coefficient was .82 ($M = 21.75$; $SD = 5.37$); and for values/obligation was .74 ($M = 19.27$; $SD = 4.82$). A Cronbach's alpha of .69 is reportedly "moderate/acceptable" (Crocker & Algina, 1986).

Patient Satisfaction. The Medical Interview Satisfaction Scale (MISS) enables one to gauge a patient's satisfaction with her or his primary care physician (Wolf, Putnam, James, & Stiles, 1978) and has been widely employed in health contexts to assess how pleased patients are with various aspects of medical interactions. Patient satisfaction reflects three areas: cognitive, affective, and behavioral (Wolf et al., 1978). The MISS has successfully been used to examine patient satisfaction in a variety of health care settings, including: general practice (Scott, Jennings, Standart, Ward, & Goldberg, 1999; Williams, Weinman, Dale, & Newman, 1995); internal medicine (Weaver, Ow, Walker, & Degenhardt, 1993); nephrology (Rose, Fliege, Hildebrandt, Schirop, & Klapp, 2002); and oncology (Feri, Bowels, & Michael, 2001). Specifically, criterion validity was supported when Scott et al. (1999) demonstrated that when physicians were trained to detect psychological problems in the medical interview, patients were more satisfied on all three levels of satisfaction, as compared to patients who had untrained physicians. Williams et al. (1995) reported that those patients whose expectations were met in the medical interview were more satisfied than those patients whose expectations were not met, and Weaver et al. (1993) used the MISS to validate a tool for examining humanistic physician behavior that positively related to all three forms of satisfaction. In another area, Rose et al. (2002) discovered that patients who had higher satisfaction scores also had higher perceived coping skills and greater quality of life. Ferri et al. (2001) determined that patients were more satisfied with physicians who provided them with an audiotaped version of their initial interaction than those who were not provided with an audiotape of the initial interaction. All of these studies demonstrate that the MISS has consistently and accurately been used to form hypotheses about constructs in patient satisfaction research, and they provide evidence of both construct and predictive validity of the scale.

The MISS includes 26 items, in a 5-point Likert format ranging from "strongly disagree" to "strongly agree." Scores can range from 26 to 130. Cronbach's alpha for cognitive satisfaction was .89 ($M = 33.65$; $SD = 7.03$); for affective satisfaction, it was .92 ($M = 33.81$; $SD = 7.3$); and for behavioral satisfaction, it was .85 ($M = 29.4$; $SD = 8$).

Compliance. Compliance with physicians' directions was measured using a method developed and tested by Dillard and Burgoon (1985), who found a positive relationship between compliance and aggression. Participants responded on a scale of 0 (did not follow my physician's treatment) to 100 (perfectly followed my physicians treatment) to indicate the extent to which they had followed their physicians' prescriptions and/or treatments following their most recent visit.

RESULTS

The first hypothesis was that a physician's perceived humor orientation would relate to her or his patient's level of satisfaction. Testing this hypothesis occurred by means of a series of bivariate linear regression analyses involving three dimensions of the patient satisfaction variable (cognitive, affective, and behavioral), with physician's humor orientation as the dependent variable. The regression equation for the first analysis was as follows: $Cognitive\ Satisfaction = .26\ Humor\ Orientation + 21.22$, $F(1, 260) = 36.66$, $p < .0001$. As hypothesized, the stronger physicians' humor orientation, the more likely were their patients to report cognitive satisfaction. This equation suggests that accuracy in predicting the overall cognitive satisfaction would be moderate. The correlation between physician humor orientation and patient cognitive satisfaction was .35. Approximately 12% of the variance of cognitive satisfaction was accounted for by its linear relationship with physician humor orientation.

The resulting regression equation for the second analysis was as follows: $Affective\ Satisfaction = .30\ Humor\ Orientation + 18.19$, $F(1, 261) = 57.52$, $p < .0001$. As hypothesized, physicians with a more pronounced humor orientation tended to have patients who were more affectively satisfied. With this equation, accuracy in predicting affective satisfaction would be moderate. The correlation between physician humor orientation and patient affective satisfaction was .43. Approximately 18% of the variance of affective satisfaction was accounted for by its linear relationship with physician humor orientation.

The regression equation for the last analysis relating to Hypothesis 1 was as follows: $Behavioral\ Satisfaction = .19\ Humor\ Orientation + 19.53$, $F(1, 261) = 31.38$, $p < .0001$. As physicians' humor orientation increased, patients were more behaviorally satisfied. The predictive accuracy of humor orientation for the behavioral satisfaction measure was moderate. The correlation between physician humor orientation and patient behavioral satisfaction was .33, which accounts for 11% of the variance of behavioral satisfaction from its linear relationship with physician humor orientation.

The second hypothesis predicted a positive relationship between a physician's perceived humor orientation and her or his perceived credibility. Testing this hypothesis involved a series of bivariate linear regression analyses for the dimensions of physician credibility (competence, caring/goodwill, and trustworthiness) when their humor orientation was the independent variable. The resulting regression equation for the first analysis was as follows: $Competence = .28\ Humor\ Orientation + 19.56$, $F(1, 253) = 41.60$, $p < .0001$. Physicians with more pronounced humor orientation tended to have patients who perceived them as being competent. The predictive accuracy suggested by the equation was moderate, with a correlation between physician humor orienta-

tion and competence of .38. In short, approximately 14% of the variance of physician competence was accounted for by the linear relationship of physician humor orientation to perceived competence.

The regression equation for the second analysis was as follows: *Caring/Goodwill* = .36 *Humor Orientation* + 13.43, $F(1, 253) = 66.54, p < .0001$. The more pronounced physicians' humor orientation, the more patients perceived them as caring. Predicting the overall caring/goodwill from knowledge of a physician's humor orientation with this equation would be moderately accurate. The correlation between physician humor orientation and caring/goodwill was .47, a value that indicates the relationship of humor orientation to perceptions of caring/goodwill has approximately 21% common variance.

The final regression equation, *Trustworthiness* = .31 *Humor Orientation* + 17.35, was significant, $F(1, 253) = 49.96, p < .0001$. As expected, the higher physicians' scores on the humor orientation measure, the more likely their patients were to perceive them as trustworthy. The equation suggests a moderate level of accuracy in predicting trustworthiness from humor orientation. The correlation between the two variables was .41. In short, they had approximately 17% shared variance.

The third hypothesis was that there is a positive relationship between perceived physician credibility and patient satisfaction. Pearson correlations served as the test of this hypothesis. The correlations were between the three factors of physician credibility (competence, caring/goodwill, and trustworthiness) and patient satisfaction (cognitive, affective, and behavioral). As Table 1 shows, all nine coefficients were statistically significant.

TABLE 1
Correlations Between Physician Credibility and Patient Satisfaction

	Cognitive	Affective	Behavioral
Competence	.46	.50	.44
Caring/Goodwill	.49	.54	.46
Trustworthiness	.42	.47	.40

All correlations are significant at the .0001 level of confidence

The first research question concerned the relationship between a physician's humor orientation and her or his use of compliance-gaining strategies. Patients' perceptions of physician humor orientation related positively to all three categories of compliance gaining strategies: expectancies/consequences, $r(258) = .280, p < .0001$; relationship/identification, $r(258) = .228, p < .0001$; and values/obligation, $r(258) = .250, p < .0001$.

The second research question addressed the relationship between compliance-gaining strategies and patient satisfaction. There were positive, but small correlations for all three of the aspects of patient satisfaction (cognitive, affective, and behavioral) with the first two categories of compliance-gaining strategies (expectancies/consequences and relationship/identification), but not with the values/obligations compliance-gaining strategy. The correlations appear in Table 2.

Research Question 3 involved the relationship between patients' perceptions of physician credibility and type of compliance-gaining strategies used. The three aspects of credibility (competence, caring/goodwill, and trustworthiness) related positively

with all three categories of compliance-gaining strategies (expectancies/consequences, relationship/identification, and values/obligations). Pertinent correlations appear in Table 3.

TABLE 2
Correlations Between Patient Satisfaction and Compliance-Gaining Strategy

	Cognitive	Affective	Behavioral
Expectancies/ Consequences	.23***	.19**	.20**
Relationship/ Identification	.19**	.16**	.14*
Values/Obligations	.09	.06	.09

* $p < .05$, ** $p < .005$, *** $p < .0005$

TABLE 3
Correlations Between Physician Credibility and Compliance-Gaining Strategy

	Competence	Caring/Goodwill	Trustworthiness
Expectancies/ Consequences	.23***	.22***	.17*
Relationship/ Identification	.25***	.24***	.22***
Values/Obligations	.14*	.19**	.13*

* $p < .05$, ** $p < .005$, *** $p < .0005$

Research Question 4 focused on the extent to which humor orientation, credibility, use of compliance-gaining strategies, and a patient's satisfaction affect individuals' likelihood of complying with physician's prescribed treatment. Multiple regression analysis revealed how well the independent variables could predict reported patient compliance. The predictor variables were humor orientation, credibility, compliance-gaining strategies, and patient satisfaction. The criterion variable was reported patient compliance. The linear combination of the predictor variables related significantly to reported patient compliance, $F(10, 239) = 2.981, p < .001$. The sample multiple correlation coefficient (R) was .33, which indicated that approximately 11% of the variance in a patient's reported compliance in the sample could be accounted for by the linear combination of the predictor variables. In Table 4, we present indices to indicate the relative strength of the individual predictors. Only four of the predictor variables accounted for the variance in reported patient compliance (expectancies/consequences, values/obligations, cognitive satisfaction, and behavioral satisfaction).

As a post hoc analysis, we looked for possible differences among the modes of data collection. We restricted our analysis to the three instruments with the highest reliability: humor orientation, patient satisfaction, and perceived credibility. No significant differences among the modes of survey delivery for humor orientation scale, $F(3, 262) = .485$, ns.; cognitive satisfaction, $F(3, 258) = 1.52$, ns.; affective satisfaction, $F(3, 259) = 2.18$, ns.; behavioral satisfaction, $F(3, 259) = .380$, ns.; and caring/goodwill, $F(3, 251) = 1.48$, ns., emerged. However, there were significant differences for competence, $F(3, 251) = 9.86, p < .0001$ and trustworthiness, $F(3, 251) = 5.71, p < .001$. Tukey post hoc analyses indicated where actual differences existed for these two dimensions of cred-

ibility (see Tables 5 and 6).

TABLE 4
Multiple Regression Analysis of Predictor Variables with Patient Compliance

Model	Standardized Betas Coefficient	t	Significance level	95% Confidence Interval	
				Lower Bound	Upper Bound
Humor Orientation	-.07	5.13	NS	-0.55	0.19
Expectancies/consequences	-.22	-0.96	p = .008	-2.26	-0.35
Relationship/identification	-.12	-2.69	NS	-1.64	0.36
Values/obligations	.31	3.17	p = .002	0.68	2.91
Cognitive satisfaction	.26	2.94	p = .013	0.21	1.81
Affective satisfaction	-.21	-1.63	NS	-1.66	0.16
Behavioral satisfaction	.22	2.19	p = .030	0.10	1.91
Competence	.05	0.41	NS	-.065	
Caring/goodwill	-.01	-.06	NS	-1.00	0.94
Trustworthiness	-.08	-.48	NS	-1.37	0.83

NS = Not Significant

TABLE 5
Post Hoc Analysis of Competence with Data Collection Modes

Data Collection Mode	N	M	SD	Traditional Undergraduate	Applied Master's Student	General Public
Traditional Undergraduate	44	35.98	6.17			
Applied Master's Student	46	37.73	6.89	NS		
General Public	138	32.07	8.41	*	*	
On-Line	27	37.74	5.19	NS	NS	*

Note: NS = non-significant differences between pair means, while an asterisk (*) = significance using the Tukey HSD procedure.

TABLE 6
Post Hoc Analysis of Trustworthiness with Data Collection Modes

Data Collection Mode	N	M	SD	Traditional Undergraduate	Applied Master's Student	General Public
Traditional Undergraduate	44	35.50	6.17			
Applied Master's Student	46	36.20	5.25	NS		
General Public	138	32.06	9.31	NS	*	
On-Line	27	37.00	6.57	NS	NS	*

Note: NS = non-significant differences between pair means, while an asterisk (*) = significance using the Tukey HSD procedure.

The results of the study showed that perceived use of humor by a physician positively correlated with patient satisfaction, perceived physician credibility, and perceived physician use of compliance-gaining strategies. Additionally, both patient satisfaction and perceptions of their physicians' credibility positively related to the perceptions of a physician's use of compliance gaining strategies. Finally, multiple regression analysis revealed that patient satisfaction (behavioral and cognitive satisfaction) and physician use of compliance gaining strategies (expectations/consequences and values/obligations) related to a patient's reported likelihood of compliance.

DISCUSSION

The primary goal of this study was to determine how physicians' humor orientation, credibility, and use of compliance-gaining strategies relate to patient satisfaction and compliance. The findings revealed significant relationships suggesting that better physician communication skills were associated with improved patient perceptions of physician credibility and patient satisfaction. The following paragraphs focus on the relationship that a physician's humor orientation has on patient satisfaction and physician credibility, the relationship between patient satisfaction and physician credibility, the relationship of compliance-gaining strategies with physician-patient interactions, and the post-hoc analysis of the data sources used.

The first major area of emphasis was patients' perceptions of physician humor orientation and how these perceptions related to patient satisfaction and physician credibility. Results for the first hypothesis indicated that a physician's humor orientation accounted for a moderate portion of the variance in each of Wolf et al.'s (1978) three dimensions of patient satisfaction (cognitive, affective, and behavioral). These results indicate that a physician's enactment of humor as an interpersonal communication tool, in general, positively relates to a patient's level of satisfaction. Although a physician's humor orientation accounts for some of the variation in a patient's satisfaction, the low coefficients of determination indicate that it is not the primary variable determining what ultimately causes patient satisfaction. This finding is similar to the one that Fitzpatrick (1991) reported in looking at patient satisfaction and physician friendliness, and previous research that has also linked humor orientation with friendliness (Wanzer, Booth-Butterfield, & Booth-Butterfield, 1996a).

The second hypothesis concerned the relationship of humor orientation to credibility. A physician's humor orientation significantly accounted for a moderate portion of the variance in each of McCroskey and Teven's (1999) three aspects of physician credibility (competence, caring/goodwill, and trustworthiness), and mirrors Wrench and Richmond's (2000) findings for teachers' credibility in the educational context. These results lead to the conclusion that a physician's use of humor as an interpersonal communication tool positively relates to a patient's perception that the physician is caring, trustworthy, and competent at his/her job. Although a physician's humor orientation accounts for some of the variation in a patient's perceptions of credibility, the comparatively low coefficients of determination suggest that the amount is relatively small.

The second major set of findings in this study concerns the relationship between patient satisfaction and perceptions of her/his physician's credibility. The results involving this part of the study revealed positive relationships between each of the factors of patient satisfaction (cognitive, affective, and behavioral) and each of the factors of physician credibility. Not only does this finding further validate those of Markham, Diamond, and Hermansen (1999) who uncovered a positive relationship between pa-

tient satisfaction and physician competence, but also demonstrates a positive relationship between patient satisfaction and the other two aspects of credibility (caring/goodwill and trustworthiness). It is not surprising to find the positive relationships between caring/goodwill and trustworthiness with patient satisfaction, since the three factors of credibility are highly inter-correlated (McCroskey & Teven, 1999; Teven & McCroskey, 1997; Wrench & Richmond, 2000).

The third set of findings pertain to compliance-gaining strategies. The study revealed a positive relationship between physician humor orientation and each of the compliance-gaining strategies. The higher their HO, the more physicians were likely to enact each of the influence strategies. Following is a possible argument for why this relationship surfaced. People who use humor as an interpersonal communication tool are more extraverted than those who do not (Wrench & McCroskey, 2000). At the same time, extraverted individuals reportedly are competent communicators (McCroskey, Heisel, & Richmond, 2001) and more likely to use a variety of tactics to gain compliance from someone (Burgoon, 2000). Hence, highly humor oriented people may be more skilled and, thus, be more likely to use a variety of compliance-gaining strategies.

Increased compliance-gaining communication was also related to patient satisfaction. There were significant positive relationships for all three dimensions of patient satisfaction (cognitive, affective, and behavioral) with two of the three compliance-gaining strategies (expectancies/ consequences and relationship/identification). These results appear to show that patients are more satisfied when physicians use compliance-gaining messages that manipulate the consequences of a certain course of action and/or use relationally oriented messages, but are less satisfied when physicians attempt to gain compliance through messages that define values or obligations. However, the correlations between patient satisfaction and physician use of compliance-gaining strategies were, in general, small. The lack of a significant finding for the values/obligations factor could be due to measurement problems.

The third set of findings for compliance-gaining involves the relationship of compliance-gaining strategies and perceived physician credibility. All of the compliance-gaining strategies positively related to a patient's perception of physician credibility. It is possible that patients who perceive physicians as using compliance-gaining techniques believe that those professionals are taking more time and energy to help them, which could translate into higher credibility ratings and personal satisfaction with the experience. Previous research has shown that patient satisfaction does relate to the length of time spent with a physician (Howie & Heaney, 1999).

In addition to findings associated with compliance-gaining strategies, this study provided data concerning patient self-reported compliance. Two strategies (expectancies/consequences and values/obligations) and two patient satisfaction factors (cognitive and behavioral) accounted for 11% of the variance in patient compliance. The negative relationship of expectancies/consequences to patient compliance was similar to findings of educational researchers showing that messages about punishment do not change behavior (McCroskey, 1998; Richmond, Wrench, & Gorham, 2001). At the same time, the study revealed that when physicians reportedly employed compliance-gaining messages linking compliance with patient values and obligations, this increased patient compliance. Ultimately, patients who see compliance as something to be valued, or who feel that they are obligated to comply, may be even more likely to do so in a clinical setting. At the same time, the use of "values/obligations" or the lack of "expectancies/consequences" compliance gaining strategies will not be the magical silver

bullet to gain patient compliance. The results do indicate, however, that the types of compliance gaining strategies used by a physician only minimally relate to patient compliance.

In regard to the relationship between patient satisfaction and compliance, the association apparently stems from a desire for information. Becker and Rosenstock (1984) noted that one major reason patients do not comply with their physicians is lack of information about the potential effectiveness of treatment/medication. Patients who believe a physician has fully explained the treatment/medication appear to be more cognitively satisfied. Similarly, patients who feel that their physician has been thorough in his or her clinical evaluation will be more behaviorally satisfied and, therefore, more likely to comply. At the same time, both cognitive and behavioral satisfaction may also reflect the length of time a patient is with her or his physician, as Howie and Heaney (1999) have suggested.

The last major element in this study concerns the comparability of varying survey delivery methods and samples. Sheehan and Hoy (1999) reported that there are definite benefits to using e-mail as a means for gathering data, but also noted that the Internet may not be the best tool for establishing evidence of generalizability. Additionally, Smith (1997) has pointed out that response rates to Internet surveys are lower than traditional postal surveys. In the present study, we examined the research variables in four different population groups (traditional students, nontraditional students in an applied masters program, the general public, and Internet participants). The post hoc analysis was in response to previously voiced concerns regarding the use of the Internet to collect data. Ascertaining whether there were differences in the reported measures of the three groups involved examination of the three most reliable surveys, and revealed very consistent outcomes.

No significant differences across the four sampling methods/groups appeared for either the humor orientation instrument (Booth-Butterfield & Booth-Butterfield, 1991) or the medical interview satisfaction questionnaire (Wolf, Putnam, James, & Stiles, 1978). A minor difference for the perceived credibility questionnaire (McCroskey & Teven, 1999) emerged. The means for perceived competence and trustworthiness were significantly lower for the people in the general public group than for those in the other three survey groups, but the magnitude of this difference was nonetheless small. Although no unequivocal answer can be derived from the data for why members of this group perceived their physicians as less competent and trustworthy than those in other groups, there are two possible explanations.

In previous research, Wright (2000) found a skewed sample, consisting primarily of college and graduate educated individuals in elderly online samples, and proportions not to be consistent with their distribution in the general public. It is possible that level of education is an intervening variable that contributes to creating differences in perceived competence and trustworthiness. People with higher levels of education may be more likely to have a regular physician with whom they have developed an ongoing relationship, which could lead to elevated perceptions of competence and trustworthiness, but this would not necessarily hold true for the student population.

A second possible explanation for this method/groups difference could be the misunderstanding of the practice of medicine by people in the general public. Some people may hold the belief that medicine is a perfect science with little room for judgment or error (Gigrenzer, 2002; Milloy, 2001). It is possible that when patients are not rapidly diagnosed and healed, that chips away at their doctors' perceived competence

and trustworthiness. However, for this explanation to be tenable would require that the applied master's student and online groups were more knowledgeable about the actual practice of contemporary medicine. Ultimately, future research in this area should be conducted to further examine the reasons for this difference.

Limitations. No matter how rigorously a study is conducted, there are always limitations. Measurement issues are of concern. First, using a single perception-oriented answer to determine whether or not a patient would comply with her or his doctor's medication/treatment may not be the best way to measure compliance. Although this was the method devised by Dillard and Burgoon (1985) and also used by Burgoon et al. (1987), the results could be enhanced by taking into account more situational variables that conceivably affect compliance.

The second major limitation in this study is the online sample used. Although individuals on America Online® and in the general public samples were randomly selected to participate in the study, the completed sample was still admittedly self-selected. In addition, the small number of individuals who did participate in the online version was somewhat unsettling. New and more accurate attempts at getting online participants should be developed. At the same time, contrary to Sheehan and Hoy's (1999) fear that online samples are not generalizable to a larger and more diverse population, the lack of a meaningful significant difference between the online sample and those involving the other means of data collection does show the promise of online samples. As use of the Internet becomes more prevalent, concerns about skewed online samples should recede.

Conclusion. This study clearly linked communication variables (humor orientation, credibility, and compliance gaining) to patient satisfaction and compliance. It also demonstrated why physicians need to think consciously about how they are using communication during patient-physician interactions. Although the results may seem to be intuitively obvious to communication researchers, further explanation of communication concepts in unique professional and social contexts helps to validate our theoretical conceptualizations of human communication in applied settings. Additionally, information concerning patient-physician communication has the potential for improving patient compliance, minimizing malpractice claims, and improving patient satisfaction.

NOTES

1. Although compliance-gaining behavior checklists have, in the past, received criticism of their validity (e.g., Burleson et al., 1988), other proponents maintain that such checklists are adequate and predictable methods of ascertaining what tends to work effectively to obtain compliance with specific messages (e.g., Boster, 1988; Hunter, 1988). The basic method has remained widely-used in the communication research literature (e.g., Burgoon et al., 1987; McLaughlin et al., 1980).

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