Measuring Patients' Trust in Their Primary Care Providers

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*Existing scales to measure trust in physicians have differing content and limited testing. To improve on these measures, a large item pool (nx) was generated following a detailed conceptual model and expert review. After pilot testing, the best-performing items were validated with a random national sample (*n = *9) and a regional sample of HMO members (*n = *99). Various psychometric tests produced a 10-item unidimensional scale consistent with most aspects of the conceptual model. Compared with previous scales, the Wake Forest physician trust scale has a somewhat improved combination of internal consistency, variability, and discriminability. The scale is more strongly correlated with satisfaction, desire to remain with a physician, willingness to recommend to friends, and not seeking second opinions; it is less correlated with insurer trust, membership in managed care, and choice of physician; and correlations are equivalent with lack of disputes, length of relationship, and number of visits.*

This work was funded by a grant from the Robert Wood Johnson Foundation, under its Patient-Provider Relationship Initiative. Surveys were conducted by Dr. Robert Oldendick and the staff of

Medical Care Research and Review, Vol. 59 No. 3, (September 2002) 293-318

> The importance of trust in patient-physician relationships is not questioned, but our understanding of it has depended largely on the passionate thoughts and anecdotes of physicians who cherish the special bond they feel with their patients. . . . A widely accepted empirical conceptualization and understanding of trust is yet to come. In recent years, other complex and once believed intangible concepts, those of "satisfaction" and "health status," have yielded to rigorous qualitative and quantitative research. . . . Although attempts to operationalize patient-physician trust are in their infancy, with models emerging recently through the effort of investigators such as Kao and Safran, a refinement and convergence of techniques may soon allow trust to be measured and discussed as routinely and rigorously as many other elements of health care. For patient-physician trust to be strengthened, our ability to measure the mediators and outcomes of trust must mature.
>
> —Pearson and Raeke (2000, 513)

The central importance of trust in medical relationships has long been recognized (Mechanic 1996; Pellegrino, Veatch, and Langan 1991; Parsons 1951; Peabody 1927), but until recently, trust has not been systematically analyzed or measured (Pearson and Raeke 2000). In part, this is due to the late development of validated scales to measure trust in physicians. A multi-item measure of physician trust was developed in the 1970s, but it was not published and so has been largely overlooked (Caterinicchio 1979). The first widely available measure was published in 1990 (Anderson and Dedrick 1990) and later modified (Thom et al. 1999), and two additional measures were published in the late 1990s (Safran et al. 1998; Kao, Green, Zaslavski, et al. 1998). As a result of these instruments, there is growing awareness of the need to study trust empirically and a burgeoning body of work measuring various aspects of trust.

As summarized in Table 1 (which compares existing scales with the new Wake Forest scale presented here), previous trust scales have good reliability (with alpha coefficients ranging from .85 to .94), but closer examination reveals the need for additional development and testing. First, previous scales are somewhat inconsistent in how they conceptualize trust (Pearson and Raeke 2000). For instance, using the conceptual categories described below, the Safran scale (Safran et al. 1998) differs from others by not including trust in physicians' competence (although competence is assessed in separate scales).

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the Survey Research Laboratory at the University of South Carolina. Several of our current and former colleagues contributed to this work, including Douglas Levine, Ph.D., Shari Barkin, M.D., and Jeff Mullis, Ph.D. We are grateful for this support and assistance. This article, submitted to *Medical Care Research and Review* on April 25, 2001, was revised and accepted for publication on September 19, 2001.

TABLE 1 Content and Psychometric Statistics for Different Trust Instruments

	Anderson/Dedrick (and Thom Modification)	*Safran*	*Kao*	*Wake Forest*
Content (number of items)	Fidelity (4) Competence (1) Honesty (2) Confidentiality (1) Global (1) Behavior (2)	Fidelity (2) Honesty (3) Confidentiality (1) Global (2)	Fidelity (4) Competence (4) Confidentiality (1) Global (1)	Fidelity (2) Competence (3) Honesty (1) Global (4)
Sample items	I trust my doctor so much, I always try to follow his/her advice	I can tell my doctor anything	How much do you trust your doctor to put your health and well-being above keeping down the health plan's costs?	See Table 2
Number of items				
Total	11	8	10	10
Negative	3	3	0	3
Using the term "trust"	5	2	10	2
Candidate items	25	Unreported	19	78
Sample size and location	266 older diabetic men at a southern Virginia clinic; 414 family medicine patients at a California clinic	6,094 Massachusetts state employees	2,086 HMO members in three larger cities	959 national general population; 1,199 southern HMO members
Mean (of 100)	78.9 (75.3)	75.7	87.5	77.0
Standard deviation	Unreported (14.2)	16.0	15.3	15.5
Alpha	.85 (.89)	.86	.94	.93
Test-retest reliability	.77	Unreported	Unreported	.75
Kurtosis/ skewness	Unreported	3.23/–0.56	5.58/–2.16a	2.55/–1.07

Source: Anderson/Dedrick: Anderson and Dedrick (1990). Thom modification: Thom et al. (1999). Safran: Safran et al. (1998). Kao: Kao, Green, Zaslavski, et al. (1998).

a. Based on the national sample reported in this study.

The Kao scale (Kao, Green, Zaslavski, et al. 1998) is focused mainly on managed care issues whereas other scales refer to a broader or more generic range of trust concerns. Also, the Anderson/Dedrick scale (Anderson and Dedrick 1990) includes behavioral measures (following advice and obtaining second opinions) whereas the other scales are restricted to measures of attitude or opinion.

Second, each of these scales was developed from relatively small pools of candidate items and without a detailed conceptual model, so the true dimensionality of trust may not have emerged.[1] Third, most were tested on specialized or limited populations, so their utility for a more broadly representative population is unknown. Also, these scales were developed with respect only to physicians and not to other care providers (although the Anderson 1990 scale has since been adapted for this purpose). Fourth, the scales differ somewhat in their item wording. Anderson/Dedrick (Anderson and Dedrick 1990) and Kao (Kao, Green, Zaslavski, et al. 1998) use the term "trust" in most or all items, whereas Safran (Safran et al. 1998) does so in only one item. And Anderson/Dedrick and Safran use a mix of positively and negatively worded items, whereas Kao uses only positively worded items. Fifth, no one existing scale has the best combination of psychometric properties. Kao's internal consistency is superior to the others (alpha = .94 vs. .85-.89), but this is achieved by using items that produce a very high mean (88 vs. 75-79), which diminishes the ability to detect variation at the upper end, where trust scores tend to cluster. Finally, detailed psychometric properties have not been reported for most of these scales (e.g., test-retest reliability, kurtosis, skewness, and discriminability).

NEW CONTRIBUTION

The quality of patient-provider relationships has assumed tremendous significance in the medical policy arena, owing in part to the pressures created by managed care. Previously, measures of these relationships focused primarily on satisfaction and communication. While these are undeniably important attributes and are related to trust, trust itself may prove to be the most fundamental relationship attribute, one that pervasively affects behaviors, outcomes, and other attitudes. Trust is vital to patients' relationships with physicians and other health care providers and may mediate critically important behaviors and outcomes.

To advance the state of the art in measuring trust in physicians and other care providers, this article reports on a new version of a trust scale, one that attempts to address each of the shortcomings outlined above. Not every previous scale contains each of these shortcomings, but no one scale appears to be

superior, and substantial differences exist among these scales. The Wake Forest scale presented here combines features of previous ones, but it has important conceptual and content differences, as well as an improved combination of internal consistency, variability, and discriminability. Moreover, this is the first health care provider trust scale to be developed with a large pool of candidate items and to be validated in a national sample that included nonphysician primary care providers. Also, this is the first attempt to compare and reconcile differences among existing trust instruments.

DEVELOPMENT OF THE WAKE FOREST PHYSICIAN TRUST SCALE

CONCEPTUAL MODEL

We developed a conceptual model of patients' trust in their primary care providers (Hall, Dugan, Zheng, et al. 2001) after a review of the limited theoretical literature in medical settings (Mechanic 1996; Pellegrino, Veatch, and Langan 1991; Mechanic and Schlesinger 1996; Mechanic 1998; Rogers 1994) and the extensive theoretical and empirical literature in nonmedical settings (Baier 1986; Baker 1987; Barber 1983; Blackburn 1998; Kramer and Tyler 1996; Holmes and Rempel 1989; Hardin 1991; Luhmann 1973; Gambetta 1988; Govier 1997, 1998; Seligman 1997; Braithwaite and Levi 1998; Hollis 1998; Cook 2001; Hardin 2002). Trust has been defined as

> the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party, (Mayer, Davis, and Schoorman 1995)

or more succinctly, "accepted vulnerability to another's possible but not expected ill will (or lack of good will)" (Baier 1986). Theorists have distinguished between interpersonal trust, which characterizes a relationship between two individuals, such as a specific doctor-patient relationship, and institutional or system trust, which characterizes attitudes toward collective or social organizations (Mechanic 1998; Luhmann 1973; Goold 1998). Our conceptual focus here is on interpersonal trust from a patient to a known physician or other health care provider. (Henceforth, references to physicians or providers include other primary care providers such as nurse practitioners or physician assistants.)

Based on theoretical and empirical work by others on patient trust and interpersonal trust generally (Hall, Dugan, Zheng, et al. 2001; Goold and

Klipp 2002; Pearson and Raeke 2000; Thom and Campbell 1997; Mechanic and Meyer 2000; Semmes 1991; Trojan and Yonge 1993; Thorne and Robinson 1988), we conceptualized patient trust as having potentially five overlapping domains: (1) fidelity, which is caring and advocating for the patient's interests or welfare and avoiding conflicts of interest; (2) competence, which is having good practice and interpersonal skills, making correct decisions, and avoiding mistakes; (3) honesty, which is telling the truth and avoiding intentional falsehoods; (4) confidentiality, which is proper use of sensitive information; and (5) global trust, which is the irreducible soul of trust, or aspects that combine elements from some or all of the separate dimensions. Detailed elaboration of this conceptual model is presented elsewhere (Hall, Dugan, Zheng, et al. 2001)

Our model describes the association between physician trust and other constructs. First, physician trust is related to insurer trust, especially in managed care organizations (Mechanic and Schlesinger 1996). Patients who trust their physicians may worry less about their insurer since they count on their physicians to make appropriate referrals, to monitor the quality of services, or to provide the care that they need despite barriers imposed by the insurer. Similarly, trust in one's insurer may carry over to the health care professionals who are affiliated with that organization. Second, trust is related to, but distinct from, satisfaction. In contrast with satisfaction, which is an evaluation of previous experiences, trust characterizes a relationship or a cluster of personality and behavioral traits, and it is primarily future oriented ("willingness to be vulnerable") (Goold and Klipp 2002; Thom et al. 1999; Murray and Holmes 1997). Last, our conceptual model suggests that physician trust would be related to potential determinants or outcomes of trust, such as enough choice in selecting physician, recommendation to friends, dispute with physician, and desire to switch physician.

ITEM GENERATION AND SELECTION

Following this conceptual model, questions were generated for pilot testing through the following steps. First, the existing scales (noted above) that measure trust in physicians were reviewed. Items from these scales that fit our conceptual model were retained or modified. Also, items from more general social and interpersonal trust scales were reviewed and adapted to refer to physician trust (Rotter 1967; Yamagishi and Yamagishi 1994; Johnson-George and Swap 1982; Rempel, Holmes, and Zanna 1985; Mishra and Spreitzer 1998). To address domains not adequately covered within these existing scales, new items were generated by the study team, with relevant expertise in medicine, law, management, psychology, sociology, social science, and health services research.

Overall, 78 questions were generated and/or modified for pilot testing. Most items were categorized into one of the four dimensions previously discussed (fidelity, competence, honesty, or confidentiality). A few items tapped into two or more dimensions, or reflected an overlap in the underlying components, and so were classified as global trust items. To enhance construct validity, an attempt was made to avoid the word "trust" and its cognates such as "confidence" when creating or modifying items. This was done to assemble an instrument measuring trust based on an independent conceptualization rather than each participant's internal definition.

We tested several question formats (e.g., vignettes, rating categories, and positive and negative statements) and response categories (e.g., excellent-to-poor, extent of agreement, and frequency or quantity scales), both statistically and through focus groups, looking for formats that were easiest to understand yet produced greater internal consistency and variability in response. This testing, consistent with similar work by others (Ware et al. 1983), resulted in a question format consisting of a mix of positive and negative statements with responses in the following Likert-type categories: *strongly agree* (SA), *agree* (A), *neutral* (N), *disagree* (DA), and *strongly disagree* (SDA). Other formats were rejected because they were too complex or ambiguous (vignettes) and because they tended to produce more positively skewed and less varied responses (rating scales and items worded in a single direction).

The study team's generation and subsequent modification of items was informed by an expert review panel, two focus groups, and pilot testing. The expert review panel consisted of eight academicians with established national expertise in the disciplines of primary care medicine, health law and public policy, health services research, medical sociology, trust measurement, doctor-patient communication, and bioethics. The panel was asked to review and comment on both the conceptual model and the candidate items; the panel's suggestions were used to draft or modify a number of additional candidate items.

The study team conducted two focus groups with a total of 21 participants (drawn from general community groups and including 62 percent women and 33 percent African Americans). Opening discussions centered on a general definition of patient trust and the uniqueness of the doctor-patient relationship. Participants were then presented with candidate trust items and asked to discuss whether the items were related to trust in physicians and other care providers, which items best represented their understanding of provider trust, and whether the items were clear and easily understood. A similar process was used in individual, qualitative interviews with 8 participants from the pilot-testing phase. Information from these focus groups and interviews was used to confirm and refine the conceptual model and to create,

modify, or delete candidate items, based on trust-related concerns that participants expressed that were not captured in the draft items or based on ambiguities or difficulties participants expressed in understanding draft items.

The revised candidate items were field tested and revised through eight rounds of piloting, with a total sample of 297 male and female adults from various community groups (e.g., jury pool, health fair participants, airport passengers, university students, and clinic patients), representing a range of socioeconomic backgrounds. Throughout the piloting process, items were modified or deleted if there was a high rate of "don't knows" or if the responses were concentrated in one or two adjacent categories, indicating lack of discriminatory power. Data from 184 of these participants, collected during the final three rounds of piloting, were analyzed to determine preliminary factor structure, internal consistency, and item-to-scale correlations. Items were rejected if they were weakly correlated with the overall scale or the relevant subscale.

Based on these iterations of content review, field testing, modification, and statistical analysis, 26 candidate items were selected for use in the national telephone survey described below, and a subset of 12 that performed the best in the national sample were later used in a telephone survey of a regional sample of HMO members described below. Table 2 lists the 26 items and their sources. They cover the four dimensions of physician trust—fidelity (items 1-4, 6, 7, 19, and 15), competence (items 5, 8-12, 15, 17, and 20), confidentiality (item 21), and honesty (items 16, 18, and 24)—as well as global trust (items 13, 14, 22, 23, and 26).

VALIDATION OF THE WAKE FOREST PHYSICIAN TRUST SCALE

SAMPLE SELECTION: NATIONAL SAMPLE

The national sample was selected by random-digit dialing, with the sampling frame generated by a random sample from a proprietary database of working residential telephone exchanges in the continental United States. A total of 4,028 numbers were dialed, of which 2,637 (65 percent) were residential households. Households with no one older than 20 were excluded ($n = 66$). Respondent selection within eligible households was done using the next birthday method (Oldendick et al. 1988). Once a respondent was selected, they were asked two screening questions: (1) "During the past 12 months, have you had health insurance that pays some of your medical costs?" and (2) "Is there a doctor or health professional that you have gone to at least twice during the

TABLE 2 Item Sources, Wording, Means, Standard Deviations, and Item-to-Total Correlations

		National Sample			*Regional Sample*		
Item	*Source*	M	SD	r	M	SD	r
1. [Your doctor] cares about your health just as much or more than you do.	Safran et al. (1998) (modified)	4.21	0.79	.67			
2. [Your doctor] will do whatever it takes to get you all the care you need.	Study team	4.29	0.76	.69	4.48	0.63	.66
3. [Your doctor's] medical decisions are influenced by how much money [he or she] can make.	Study team	3.97	0.88	.52			
4. [Your doctor] is the kind of person who would fight hard to get your health insurance to pay for your treatment.	Study team	3.87	0.85	.52			
5. Sometimes you worry that [your doctor's] medical decisions are wrong	Study team	3.87	0.94	.65			
6. Sometimes [your doctor] cares more about what is convenient for [him or her] than about your medical needs.	Study team	4.03	0.85	.72	4.13	0.86	.62
7. If [your doctor] asked you to be in a medical research study, you would worry that [he or she] cares more about the research than about what is best for you.	Study team	3.81	0.86	.56			
8. No matter what health problem you might have, [your doctor] will always be able to figure out exactly what is wrong.	Study team	3.73	0.97	.55			

(continued)

TABLE 2 Continued

Item	Source	National Sample			Regional Sample		
		M	SD	r	M	SD	r
9. [Your doctor's] medical skills are not as good as they should be.	Study team	4.06	0.78	.72	4.17	0.8	.59
10. You think [your doctor] can handle any medical situation in [his or her] field, even a very serious one.	Study team	3.96	0.83	.66			
11. [Your doctor] does not always give you a chance to say everything you think [he or she] needs to know.	Study team	3.93	0.99	.63			
12. [Your doctor] is extremely thorough and careful.	Study team	4.17	0.73	.74	4.3	0.68	.73
13. You completely trust [your doctor's] decisions about which medical treatments are best for you.	Anderson and Dedrick (1990) (modified)	4.04	0.82	.75	4.22	0.78	.74
14. [Your doctor] will listen with care and concern to any problem you might have, even problems that are small or silly.	Study team	4.15	0.79	.73			
15. [Your doctor] would never prescribe the wrong medicine for you.	Study team	3.87	0.89	.52			
16. [Your doctor] is totally honest in telling you about all of the different treatment options available for your condition.	Study team	4.11	0.73	.72	4.29	0.71	.7
17. [Your doctor] has better medical skills than most other doctors in [his or her] field.	Study team	3.51	0.82	.49			
18. [Your doctor] sometimes pretends to know things when [he or she] is really not sure.	Safran et al. (1998)	4.01	0.75	.62			

TABLE 2 Continued

Item	*Source*	*National Sample*			*Regional Sample*		
		M	SD	r	M	SD	r
19. [Your doctor] only thinks about what is best for you.	Study team	4.06	0.7	.73	4.18	0.71	.7
20. Sometimes [your doctor] does not pay full attention to what you are trying to tell [him or her].	Safran et al. (1998) (modified)	3.94	0.9	.71	4.09	0.82	.68
21. You worry that [your doctor] may share embarrassing information about you with people who have no business knowing it.	Study team	4.24	0.68	.52			
22. [Your doctor] always uses [his or her] very best skill and effort on your behalf.	Study team	4.21	0.64	.7			
23. You have no worries about putting your life in [your doctor's] hands.	Study team	3.98	0.88	.74	4.13	0.8	.76
24. [Your doctor] would never mislead you about anything.	Study team	4.1	0.7	.69			
25. [Your doctor] is the kind of person who would take care of you even if you could not afford to pay.	Study team	3.63	0.95	.61			
26. All in all, you have complete trust in [your doctor].	Safran et al. (1998) (modified)	4.1	0.78	.8	4.23	0.72	.82

Note: Items in boldface were selected for the final scale. In place of [your doctor], each item referred by name to the participant's regular physician or other health care provider.

past 2 years?" For the first criterion, any type of health coverage was accepted, including government programs such as Medicaid or the Veterans Administration, and indigent care programs at clinics or hospitals. For the second criterion, health care providers other than physicians were accepted, including

chiropractors, physician assistants, and nurse practitioners, and the designated provider was referred to by name throughout the remaining questions.

One hundred fifty-one individuals did not have health insurance, and 248 individuals had not been to their doctor twice in the past year. Contacts with the 2,172 potentially eligible individuals resulted in the following dispositions: 1,117 (51.4 percent) were interviewed, 571 (26.3 percent) refused, and 484 (22.2 percent) were unable to participate (not home, ill, not English speaking). A minimum of 15 attempts were made to reach those numbers that were not answered. The fielding period for this study was April to June 1999. Telephone interviews lasted approximately 25 minutes. Data were collected on trust in the participant's regular physician or health care provider, trust in the participant's current health insurer, demographic characteristics, satisfaction with care, and physical and mental health.

Data used in the following analyses were from 959 (85.9 percent) participants who answered a subset of 24 of the 26 physician trust questions. (Two questions were deleted at the outset of analysis due to high rate of nonresponse). Participants who failed to respond to 1 or more of the 24 trust questions were older, less educated, had lower income, and had more visits to their physicians than those with complete responses, but they did not differ significantly with respect to gender, race, mental or physical health, length of time with their physicians, or satisfaction.

SAMPLE SELECTION: REGIONAL SAMPLE

In the second sample, 2,020 members of an HMO in North Carolina were randomly selected for a telephone interview in September 1999 as part of a study of the impact of financial incentive disclosure on patient trust (Hall, Dugan, Balkrishnan, et al. 2002). This study included adults who were at least 21 years old, had been with the HMO at least 2 years, and had made at least two visits to their primary care provider. Telephone contact was made with 1,908 of these members (94.4 percent), resulting in the following dispositions: 319 (17 percent) were ineligible, 378 (20 percent) declined to be interviewed, and 1,211 (76 percent) agreed to be interviewed. Of these, 1,199 (99 percent) completed all of the physician trust questions, and their data were used in the following analyses. Two months later, a random subsample of 306 of these participants was resurveyed to assess test-retest reliability.

MEASURES

The variables in the theoretical model were measured in the following way. A scale previously published by Kao and colleagues (Kao, Green, Zaslavski,

et al. 1998) was used to independently assess physician trust. Insurer trust was measured by an 11-item scale that assesses HMO members' trust in their insurers (Zheng et al. 2002). Satisfaction was measured in two ways: a single item on patients' satisfaction with their physicians ("Overall, you are extremely satisfied with [your doctor]") and a 12-item scale on patients' satisfaction with the health care that they have been receiving from all sources during the past few years (Hall et al. 1990). Other variables thought to be related to physician trust were measured as follows: whether one had enough choice in selecting a physician (yes, no); number of years with physician; willingness to recommend to friends (SA to SDA); past disagreement or dispute with the physician (yes, no); desire to switch physicians (SA to SDA); and whether the participant belongs to a managed care plan. An insurer is considered managed care if at least two of these three possible attributes are reported: prior authorization, provider network, or gatekeeping (Blendon et al. 1998). All of the above measures were collected in the national sample, while the regional sample included all except general satisfaction, willingness to recommend to friends, and Kao and colleagues' trust scale.

STATISTICAL METHODS

The response distribution of each item was first checked. Items were deleted if there was a high rate of missing responses or if the responses were concentrated in one or two categories, indicating lack of discriminatory power. An exploratory iterated principal factor analysis was then conducted with squared multiple correlations as initial communality estimates. Initial factors were extracted by selecting only those with above average eigenvalues. Unidimensional and multidimensional factor structures were explored using varimax and promax rotations. In addition, we verified the number of factors by considering a scree plot and the overall root mean square assessing the magnitudes of the residual correlation matrix.

After determining that the factor structure is best explained by a single latent dimension, we adopted several criteria for shortening the scale. First, items with the lowest absolute loadings on the main factor and the lowest item-to-total correlations (below .60) were deleted. Second, items ranked by their absolute loadings were successively deleted until the main factor could explain close to 100 percent of the estimated common variance. Third, we evaluated Tucker reliability measures (Tucker and Lewis 1973) resulting from a maximum likelihood factor analysis on successively shortened scales and also the difference in Akaike information (Khattree and Naik 2000) between one-factor and two-factor models. Fourth, we sought to maintain a balance

between appropriate parsimony, internal consistency, and covering important components of the conceptual model. Internal consistency was assessed by Cronbach's alpha.

Construct validity of the final instrument was established by Pearson's correlation (*r*) between physician trust and insurer trust, general satisfaction, and a previously published measure of physician trust (Kao, Green, Zaslavski, et al. 1998). Validity was also assessed by the association between physician trust and its potential predictors or outcomes that theory predicts should be related. Specifically, Pearson's correlation was used for length of time with physician; Spearman's correlation (*s*) was used for total number of lifetime visits, intention to switch physician, willingness to recommend to friends, and satisfaction with physician; and a two-sample *t*-test was used for those variables with a binary response format, such as prior dispute with physician, enough choice in selecting physician, having sought a second opinion, and membership in managed care. Finally, in the national sample, the same correlation statistics were calculated for the physician trust scale developed by Kao and colleagues and compared with the statistics for the Wake Forest scale.

RESULTS

SAMPLE CHARACTERISTICS

The demographic characteristics of the two samples are summarized in Table 3. The majority of the national sample are white (83.6 percent), female (67.8 percent), between 30 and 60 years old (60 percent), and college educated (65.7 percent). About half of the participants (45.6 percent) have income greater than $40,000. The median length of time with insurer is about 5 years. Most participants report good physical (86.6 percent) and mental (94.9 percent) health. The majority have private insurance (77.8 percent), and about half (57.7 percent) belong to a managed care plan. Almost all (98.3 percent) use a physician for their primary source of care.

The gender distribution in the national sample is due to the inclusion criteria that required a regular physician and two recent physician visits. Men are less likely to have a regular physician and to have been to their doctor recently (Sandman, Simantov, and An 2000; U.S. Department of Health and Human Services 2000). A more equal gender mix exists in the regional HMO sample, in which 45.5 percent of participants are male. In other respects, the regional sample characteristics are substantially the same as in the national sample (see Table 3).

TABLE 3 Demographic Characteristics of National and Regional Samples (Maximum n = 959 and 1199, Respectively)

	National		*Regional*	
	n	%	n	%
Female	650	67.8	665	55.5
White	745	83.6	1,032	86.4
Mean age ± standard deviation (in years)	48.8 ± 17.2		46.5 ± 11.2	
Some college education	544	65.7	757	63.2
Income greater than $40,000	405	45.6		
Median time with physician (in years)	5		4	
At least good physical health status	773	86.6	1,085	90.5
At least good mental health status	849	94.9	1,166	97.2
Managed care insurance	240	57.7	1,199	100

FACTOR STRUCTURE AND ITEM SELECTION

Table 2 presents the 26 candidate items with their means, standard deviations, and item-to-total correlations from the 959 participants of the national sample and the same statistics for 12 of the 26 items from the regional HMO sample. In analyzing the national sample data, questions 17 and 25 were deleted at the outset because of their high rates of nonresponse (n = 107 and 88). The remaining items have a much lower nonresponse rate (n = 55 and 51 for items 18 and 24; n = 40-50 for items 7, 15, 21, 22, 23 and 27; n = 30-40 for items 3, 4, 9, 10, 16, 19, 20; and $n < 30$ for the rest) and acceptable response patterns, with standard deviations ranging from .64 to .99, and item means ranging from 3.73 to 4.29.

The initial squared multiple correlations used in the factor analysis ranged between .30 and .68. We found one factor with an eigenvalue of 11.3, which explained about 89 percent of the variance, and a second factor with an eigenvalue of 0.9. All remaining factors were eliminated for having eigenvalues lower than the mean of 0.5 and based on an inspection of the scree plot.

A principal factor analysis of the two strongest factors showed that together, both explained 100 percent of the estimated common variance. In addition, the overall root mean square was .031, well below the recommended cutoff of .05 (Khattree and Naik 2000). A varimax rotation yielded two factors accounting for 56 percent and 44 percent of the variance. Visual inspection of the factor loadings did not provide clear support for a simple structure; no

item loadings seemed to exclusively load on one of the two factors. Furthermore, a promax rotation yielded two factors with a .72 intercorrelation. One factor consisted entirely of all items worded in a positive direction (trust) and the other factor consisted of all items worded in a negative direction (distrust), clearly revealing that this clustering was an artifact of scoring. Given the high correlation between the oblique factors, their artifactual distinction, and the large eigenvalue of the initial main factor, we concluded that the items are best explained by a unidimensional construct.

To reduce the length of the scale and preserve reliability, we deleted 6 items (3, 4, 7, 8, 15, and 21 in Table 2) with substantially lower item-to-total correlations and lower absolute factor loadings (.52-.56) than the others (.69-.81). An additional 5 items were eliminated (1, 5, 10, 11, and 18) based on improvements in the variance explained by the main factor (from .93 to 1.0), and in the Tucker reliability (from .90 to .95) and Akaike scores, which show a clear gain in unidimensionality. The resulting 13-item scale had an alpha of .94 and a maximum eigenvalue of 7.3, which explained 100 percent of the variability in the data. In our quest for parsimony, we deleted 3 additional items (14, 22, and 24) that were redundant (with 20, 19, and 16, respectively) and had a slightly more skewed frequency distribution. Deletion of additional items would omit important content and lower the scale's reliability.

The remaining 10 items reflect most hypothesized dimensions of physician trust (fidelity = 2 and 6; competence = 9, 12, and 20; honesty = 16; global = 13, 19, 23, and 27). Factor analysis of the 10 items still found one factor in both samples with eigenvalue 5.6 (national) and 5.5 (regional), which explained about 100 percent of the estimated common variability (national and regional). Cronbach's alpha in each sample was .93 (national) and .92 (regional).

Physician trust is measured by the sum of the 10 item scores (reverse-scored for negative items), ranging from 10 to 50, with a higher score indicating more trust. In the national sample, the scale had a range of 10 to 50, a mean of 40.8 (77.0 on a scale of 100), and a standard deviation of 6.2 (15.5). In the regional sample, the scale had a range of 15 to 50, a mean of 42.2 (80.5 on a 100-point scale), and a standard deviation of 5.8 (14.5). The 2-month test-retest reliability in the regional sample was $r = .75$. The scale distribution was skewed to the left (the Shapiro-Wilk test, Shapiro and Wilk 1965, rejects normality at a p value of .0001, skewness = –1.07) and exhibited a positive kurtosis (2.55, indicating a thinner than normal shape).

VALIDATION

In the national sample, Cronbach's alpha was .93 for Kao and colleagues' (Kao, Green, Zaslavski, et al. 1998) physician trust scale, .91 for the insurer

TABLE 4 Correlations of Physician Trust with Insurer Trust, General Satisfaction, and Other Continuous Variables, in National and Regional Samples

	Pearson's Correlation		*Spearman's Correlation*	
Variable	*National*	*Regional*	*National*	*Regional*
Insurer trust	.23	.15**		
General satisfaction	.51**			
Length of time with physician	.13	.09**		
Kao, Green, Zaslavski, et al.'s (1998) physician trust	.75**			
Physician satisfaction			.75	.78**
Recommend to friends			.74**	
Switch doctor			–.69	–.71**
Number of visits to physician			.15	.15**

**$p = .0001$.

trust scale, and .89 for the general satisfaction scale. Table 4 displays the Pearson's r and Spearman's s correlations among our measure of physician trust and various continuous variables of interest. At the $p = .0001$ significance level, physician trust is associated in the predicted directions with each of these variables, in both of the samples (national/regional), as follows: the Kao physician trust scale ($r = .75$), insurer trust ($r = .23/.15$), general satisfaction with health care ($r = .51$), satisfaction with physician ($s = .75/.78$), length of time with physician ($r = .13/.09$), number of prior visits to doctor ($r = .15/.15$), willingness to recommend to friends ($s = .74$), and intent to switch physician ($s = –.69/–.71$). Table 5 displays the group mean of physician trust for the binary variables, again with consistent significant associations in the predicted directions in each sample. Lower physician trust is associated with not enough choice in selecting physician (mean = 42/43 vs. 36/38), prior dispute with physician (mean = 42/43 vs. 32/34), having sought a second opinion (mean = 42/43 vs. 33/35), and membership in managed care (mean = 42 vs. 40).

COMPARISON WITH PREVIOUS PHYSICIAN TRUST SCALES

Several other scales have been published previously to measure trust in physicians. To determine whether our scale performs differently, we compared its statistics and correlation patterns with the scale most recently

TABLE 5 Sample Sizes, Means, and Standard Deviations of Physician Trust for Binary Variables in National and Regional Samples

	n		M ± SD	
Question/Response	*National*	*Regional*	*National*	*Regional*
Enough choice selecting physician				
Yes	749	1,011	41.9 ± 5.0**	42.9 ± 5.1**
No	164	181	35.7 ± 8.3	38.3 ± 7.2
Sought second opinion				
Yes	107	105	33.1 ± 8.08**	35.4 ± 7.4**
No	817	1,091	41.7 ± 5.1	42.8 ± 5.1
Dispute with physician				
Yes	75	62	32.4 ± 9.0**	34.1 ± 8.1**
No	847	1,135	41.5 ± 5.2	42.6 ± 5.2
Managed care				
Yes	240		40.2 ± 6.8*	
No	176		42.0 ± 5.1*	

*$p < .01$. **$p = .0001$.

published, developed by Kao and colleagues (Kao, Green, Zaslavski, et al. 1998), which also has the highest internal consistency of previous scales. The side-by-side comparison of these two instruments, administered to the same participants in the national sample, is reported in Table 6. The two scales have almost identical internal consistency (alpha coefficients), variability (standard deviation), and ranges. However, the Wake Forest scale has a lower mean (77.0 vs. 89.2 on a 100-point scale), a more normal (less skewed) distribution (kurtosis = 2.55 vs. 5.58; skewness = –1.07 vs. –2.16), and better discriminatory power (Ferguson index = 0.94 vs 0.86) (Streiner and Norman 1991). Also, our scale has an equivalent mean, similar distribution, and somewhat higher internal consistency than those reported for the physician trust scales developed by Anderson and Dedrick (1990) (mean = 78.9/75.3; alpha = .85/.90) and Safran et al. (1998) (mean = 75.7; alpha = .86; kurtosis = 3.23; skewness = –0.56), based on different and somewhat more homogeneous study populations (see Table 1).

The correlation patterns of our scale and the Kao scale (Kao, Green, Zaslavski, et al. 1998) are also similar, with the following notable exceptions. The Kao scale is somewhat more strongly correlated with insurer trust, membership in managed care, and choice of physician. This is likely due to the fact that it contains more items that are specific to managed care issues, such as

TABLE 6 Comparison of Physician Trust Scales in National Sample

	Wake Forest Scale	*Kao, Green, Zaslavski, et al. (1998) Scale*
Cronbach's alpha	.93	.93
Mean	40.8	45.7
Range	10-50	12-50
Standard deviation	6.2	6.1
Discriminatory index	.94	.86
Kurtosis	2.55	5.58
Skewness	–1.07	–2.16
Insurer trust (*r*)	.25	.31
General satisfaction (*r*)	.51	.49
Physician satisfaction (*s*)	.76	.53
Time with physician (*r*)	.13	.15
Total visits (*s*)	.16	.16
Recommend to friends (*s*)	.74	.49
Desire to switch (*s*)	–.69	–.49
Difference in means		
Choice of physicians	6.5	7.1
Second opinion	8.7	8.2
Dispute with physician	9.4	9.3
Managed care	1.7	2.5

Note: *r* = Pearson's correlation; *s* = Spearman's correlation.

putting the patient's well-being above cutting costs for the health plan or above following the insurer's rules and referring patients to specialists or admitting them to the hospital when needed. The Wake Forest scale is substantially better correlated with physician satisfaction, willingness to recommend to friends, and desire to switch physicians and has a modestly better correlation with having sought a second opinion. This indicates our scale is directed more to personal qualities of the physician and more strongly predicts some behavioral intentions. In other respects, however, the two scales perform the same, especially with respect to relationship factors that predict trust (length of time, total visits, and prior disputes with physician).

DISCUSSION

Scales measuring trust in physicians, other care providers, and medical institutions potentially have great utility in health services research and the

management of health care delivery. Trust measures can reveal new insights about, and help to improve, key attributes of treatment relationships; they can be used to evaluate the impact of various changes in health care financing and organization; and they offer another tool for monitoring the performance of providers and delivery systems.

To advance the ability to measure patients' trust in their primary care providers, we constructed a multidimensional conceptual model of trust, which guided our development of a 10-item instrument to measure trust in physicians and other care providers. Although the general content of our scale is similar to other trust scales, the specific items are significantly different. Based on psychometric testing in a national sample, our scale retains only 1 item (modified) from the Anderson/Dedrick (Anderson and Dedrick 1990) scale, 2 items from Safran (Safran et al. 1998), and none from Kao (Kao, Green, Zaslavski, et al. 1998). Compared with the Kao scale, ours applies more broadly than to managed care issues. Compared to Safran, our scale includes physician competence as an aspect of trust. Compared to Anderson/Dedrick, our scale focuses on attitudes rather than patient behaviors, and it avoids using "trust" in most of its items. These features are important for conceptual precision (e.g., distinguishing trust from its related effects). Also, our scale has more global items than any of the other three scales, consistent with the single-factor structure of physician trust discussed below. This gives the scale greater utility for assessing trust beyond the more specific concerns contained in the more focused items.

Like these other scales, our instrument has high reliability, good construct validity, and acceptable scale and item means. Our scale offers a modest improvement by achieving an alpha statistic greater than .9 and a scale mean lower than 80 (on a 100-point scale). Other scales have one or the other feature, but not both. Also, our scale demonstrates these properties both in a general, national population and in a regional, managed care population and with respect to both physicians and other care primary care providers. Finally, our scale improves on the skewed distribution found in the Kao scale (Kao, Green, Zaslavski, et al. 1998). (Distribution statistics are not reported for the Anderson/Dedrick, Anderson and Dedrick 1990, scale. The Safran, Safran et al. 1998, scale has somewhat less skew, but also somewhat less spread, than ours, based on a different study population). These psychometric characteristics are useful in measures of subtle or complex psychological phenomena where small differences sometimes produce large or important behavioral effects (Ware and Davies 1983).

Despite our efforts to allow a multifactor structure to emerge, we found, consistent with other studies (Kao, Green, Zaslavski, et al. 1998; Thom et al. 1999; Safran et al. 1998), that physician trust is unidimensional. This means

that people do not appear to distinguish trust among the dimensions of fidelity, competence, and honesty. This unidimensional conceptual model is further confirmed by the fact that global items account for the largest category and that the most global item (item 26, "All in all, you have complete trust in [your physician]") has the highest correlation to the overall scale (.80/.82).

The failure to differentiate between competence and other aspects of trust is especially notable. Theory predicts that patients are capable of distinguishing between a physician's abilities and how much the physician cares about them personally, but such distinctions were not common and consistent enough in any of the independent assessments of trust for competence to emerge as a distinct domain. There are several possible explanations. First, it may be that there are simply too few actual instances of patients with divergent levels of global and competence trust for this distinction to be important, possibly because patients who lack global trust are not inclined to view competence favorably. Second, if such differences exist, it may not be possible, using our approach, to detect them. This measurement difficulty arises from two critical distinctions: technical competence versus interpersonal competence and predictors of trust versus measures of trust (Hall, Dugan, Zheng, et al. 2001). Other studies reveal that patients are limited in their ability to assess physicians' technical skills and so tend to base assessments of competence on interpersonal skills (Roberts and Aruguete 2000). However, interpersonal skills such as communication are both measures of competence and strong predictors of trust (Thom, Bloch, and Segal 1999; Safran et al. 1998). Also, the measures we used to assess interpersonal skills such as history taking (items 11, 14, and 20) included aspects of global trust such as caring. Therefore, it is possible that viable competence measures are not capable of distinguishing trust in competence from global trust.

It is also notable that items measuring confidentiality were not retained in the final scale. Of the 8 confidentiality items that were pilot tested, all performed too poorly to include in the national survey except for item 21, and it was not included in the regional survey because its item-to-scale correlation (.52) was among the lowest. Also, this confidentiality item was among the highest item means (4.24) of all tested items, even though it is negatively worded, which tends to produce lower means due to acquiescence bias (Ware 1978). (The means for the other 8 negative items ranged from 3.81 to 4.06 and averaged 3.95.) This indicates that most of our participants were not greatly concerned about confidentiality, and the variation in concern that did exist was poorly correlated with responses to other trust questions. This finding is consistent with findings from other studies of physician trust (Mechanic and Meyer 2000; Kao, Green, Davis, et al. 1998; Thom et al. 1999). However, we would expect different results in more specialized populations such as some

minority groups, HIV or sexually transmitted disease patients, or patients with mental illness or some genetic conditions. Also, we found in another part of this study that confidentiality is an integral aspect of insurer trust (Zheng et al. 2002).

Physician trust exhibits a strong association with satisfaction, having enough choice in selecting one's physician, willingness to recommend the physician, no desire to switch physicians, no prior dispute with the physician, and not seeking second opinions. Physician trust has a weaker, but still significant, association with length of time with a physician, total lifetime visits with the physician, insurer trust, and membership in managed care. These correlations are all consistent with prevailing conceptual theories of trust, and there were no expected associations that were not observed. The overlap between trust and satisfaction is much stronger for the single-item measure of satisfaction, which directly assesses satisfaction in the physician, than with the more general measure of satisfaction with care received from all sources.

Finally, in comparing our physician trust scale with the one most recently published, developed by Kao and colleagues (Kao, Green, Zaslavski, et al. 1998), we found a strong association and many commonalities but also distinct differences. Tested in the same population, our scale has stronger associations than Kao's with physician satisfaction, willingness to recommend to friends, desire to switch physicians, and having sought a second opinion. The Kao scale, consistent with its focus on managed care issues, is more strongly correlated with insurer trust, membership in managed care, and having enough choice of physician. This indicates that although both of these scales are well validated for physician trust, they measure somewhat different aspects of trust, and they may have their greatest relevance or utility in different contexts. Similar side-by-side comparisons with the Anderson/Dedrick (Anderson and Dedrick 1990) and Safran (Safran et al. 1998) scales would be informative but were not performed in this study.

This study has the following limitations. Because it was based on a general population of English speakers with insurance and with established provider relationships, the scale may perform differently in more specialized demographic groups or in populations with particular health conditions of interest, such as mental illness, chronic disease, or life-threatening acute conditions. Another limitation is that the validation measures are all self-reported attitudes, events, and predicted behaviors rather than objective measures. Finally, cross-sectional survey data provide only a snapshot of dynamic, temporally distributed, nonlinear phenomena. Despite these limitations, trust measures are well validated and are being used increasingly in research to supplement satisfaction and other performance measures. Additional research is needed to determine the causative factors of trust and whether

differences and changes in trust affect behaviors and other outcomes of interest. The improvements made in this scale make it especially suited to measuring trust in settings where it is likely to be high and where it is important to make subtle distinctions between trust and other related constructs.

NOTE

1. In general, a larger candidate pool provides more opportunity for latent factors to emerge and produces a more stable factor structure (Gorsuch 1983).

REFERENCES

Anderson, L., and R. F. Dedrick. 1990. Development of the Trust in Physician Scale: A measure to assess interpersonal trust in patient physician relationships. *Psychological Reports* 67:1091-1100.

Baier, A. 1986. Trust and antitrust. *Ethics* 96:231-60.

Baker, J. 1987. Trust and rationality. *Pacific Philosophical Quarterly* 68:1-13.

Barber, B. 1983. *The logic and limits of trust*. New Brunswick, NJ: Rutgers University Press.

Blackburn, S. 1998. Trust, cooperation and human psychology. In *Trust and governance*, edited by Valerie Braithwaite and Margaret Levi, 28-45. New York: Russell Sage.

Blendon, R. J., M. Brodie, J. M. Benson, D. E. Altman, L. Levitt, T. Hoff, and L. Hugick. 1998. Understanding the managed care blacklash. *Health Affairs* 17 (4): 80-94.

Braithwaite, V., and M. Levi. 1998. *Trust and governance*. New York: Russell Sage.

Caterinicchio, R. P. 1979. Testing plausible path models of interpersonal trust in patient-physician treatment relationships. *Science and Medicine* 13A:81-99.

Cook, K. S. 2001. *Trust in society*. New York: Russell Sage.

Gambetta, D. 1988. *Trust: Making and breaking cooperative relations*. Oxford, UK: Basil Blackwell.

Goold, S. 1998. Money and trust: Relationships between patients, physicians, and health plans. *Journal of Health Politics, Policy and Law* 23:688-95.

Goold, S., and G. Klipp. 2002. Managed care members talk about trust. *Social Science & Medicine* 54:879-88.

Gorsuch, R. L. 1983. *Factor analysis*. Hillsdale, NJ: Lawrence Erlbaum.

Govier, T. 1997. *Social trust and human communities*. Montreal, Canada: McGill-Queen's University Press.

———. 1998. *Dilemmas of trust*. Montreal, Canada: McGill-Queen's University Press.

Hall, J. A., M. Feldstein, M. D. Fretwell, J. W. Rowe, and A. M. Epstein. 1990. Older patients' health status and satisfaction with medical care in an HMO population. *Medical Care* 28 (3): 261-70.

Hall, M. A., E. Dugan, R. Balkrishnan, and D. Bradley. 2002. How disclosing HMO physician incentives affects trust. *Health Affairs* 21 (2): 197-206.

Hall, M. A., E. Dugan, B. Zheng, and A. K. Mishra. 2001. Trust in physicians and medical institutions: What is it, can it be measured, and does it matter? *Milbank Quarterly* 79 (4): 613-39.

Hardin, R. 1991. Trusting persons, trusting institutions. In *Strategy and choice*, edited by Richard Zeckhauser, 185-209. Cambridge, MA: MIT Press.

———. 2002. *Trust and trustworthiness*. New York: Russell Sage.

Hollis, M. 1998. *Trust within reason*. Cambridge, UK: Cambridge University Press.

Holmes, J. G., and J. K. Rempel. 1989. Trust in close relationships. In *Close relationships*, edited by Clyde Hendrick, 187-220. Newbury Park, CA: Sage.

Johnson-George, C., and W. C. Swap. 1982. Measurement of specific interpersonal trust: Construction and validation of a scale to assess trust in a specific other. *Journal of Personality and Social Psychology* 43:1306-17.

Kao, A., D. C. Green, N. A. Davis, J. P. Koplan, and P. D. Cleary. 1998. Patients' trust in their physicians: Effects of choice, continuity, and payment method. *Journal of General Internal Medicine* 13:681-86.

Kao, A., D. C. Green, A. Zaslavski, J. P. Koplan, and P. D. Cleary. 1998. The relationship between method of physician payment and patient trust. *Journal of the American Medical Association* 280:1708-14.

Khattree, R., and D. Naik. 2000. *Multivariate data reduction and discrimination*. Cary, NC: SAS Institute.

Kramer, R., and T. Tyler. 1996. *Trust in organizations: Frontiers of theory and research*. Thousand Oaks, CA: Sage.

Luhmann, N. 1973. *Trust and power*. Chichester, UK: Wiley.

Mayer, R. C., J. H. Davis, and F. D. Schoorman. 1995. An integrative model of organization trust. *Academy of Management Review* 20:709-33.

Mechanic, D. 1996. Changing medical organization and the erosion of trust. *Milbank Quarterly* 74:171-89.

———. 1998. The functions and limitations of trust in the provision of medical care. *Journal of Health Politics, Policy and Law* 23:661-86.

Mechanic, D., and S. Meyer. 2000. Concepts of trust among patients with serious illness. *Social Science & Medicine* 51:657-68.

Mechanic, D., and M. Schlesinger. 1996. The impact of managed care on patients' trust in medical care and their physicians. *Journal of the American Medical Association* 275:1693-97.

Mishra, A. K., and G. M. Spreitzer. 1998. Explaining how survivors respond to downsizing: The roles of trust, empowerment, justice, and work redesign. *Academy of Management Review* 23:567-88.

Murray, S. L., and J. G. Holmes. 1997. A leap of faith? Positive illusions in romantic relationships. *Personality and Social Psychology Bulletin* 23 (6): 586-604.

Oldendick, R. W., G. F. Bishop, S. B. Sorenson, and A. J. Tuchfarber. 1988. A comparison of the next and last birthday methods of respondent selection in telephone surveys. *Journal of Official Statistics* 4:307-18.

Parsons, T. 1951. *The social system*. Glencoe, IL: Free Press.

Peabody, F. W. 1927. The care of the patient. *Journal of the American Medical Association* 88 (12): 877-82.

Pearson, S. D., and L. H. Raeke. 2000. Patients' trust in physicians: Many theories, few measures, and little data. *Journal of General Internal Medicine* 15:509-13.

Pellegrino, E. D., R. M. Veatch, and J. P. Langan. 1991. *Ethics, trust, and the professions: Philosophical and cultural aspects*. Washington, DC: Georgetown University Press.

Rempel, J. K., J. G. Holmes, and M. P. Zanna. 1985. Trust in close relationships. *Journal of Personality and Social Psychology* 49:95-112.

Roberts, C. A., and M. S. Aruguete. 2000. Task and socioemotional behaviors of physicians: A test of reciprocity and social interaction theories in analogue physician-patient encounters. *Social Science & Medicine* 50 (3): 309-15.

Rogers, D. E. 1994. On trust: A basic building block for healing doctor-patient interactions. *Journal of the Royal Society of Medicine* 87:2-5.

Rotter, J. B. 1967. A new scale for the measurement of interpersonal trust. *Journal of Personality* 35: 651-65.

Safran, D., M. Kosinski, A. R. Tarlov, W. H. Rogers, D. A. Taira, N. Lieberman, and J. E. Ware. 1998. The Primary Care Assessment Survey: Tests of data quality and measurement performance. *Medical Care* 36:728-39.

Sandman, D., E. Simantov, and C. An. 2000. *Out of touch: American men and the health care system*. New York: Commonwealth Fund.

Seligman, A. B. 1997. *The problem of trust*. Princeton, NJ: Princeton University Press.

Semmes, C. E. 1991. Developing trust: Patient-practitioner encounters in natural health care. *Journal of Contemporary Ethnography* 19 (4): 450-70.

Shapiro, S., and M. Wilk. 1965. An analysis of variance test for normality (complete samples). *Biometrika* 52:591-611.

Streiner, D. L., and G. R. Norman. 1991. *Health measurement scales*. New York: Oxford University Press.

Thom, D., and B. Campbell. 1997. Patient-physician trust: An exploratory study. *Journal of Family Practice* 44:169-76.

Thom, D. H., D. A. Bloch, and E. S. Segal. 1999. An intervention to increase patients' trust in their physicians. *Academic Medicine* 74 (2): 195-98.

Thom, D. H., K. M. Ribisl, A. L. Steward, D. A. Luke, and The Stanford Trust Study Physicians. 1999. Further validation and reliability testing of the Trust in Physician Scale. *Medical Care* 37:510-17.

Thorne, S. E., and C. A. Robinson. 1988. Reciprocal trust in health care relationships. *Journal of Advanced Nursing* 13:782-89.

Trojan, L., and O. Yonge. 1993. Developing trusting, caring relationships: Home care nurses and elderly clients. *Journal of Advanced Nursing* 18:1903-10.

Tucker, L. R., and C. Lewis. 1973. A reliability coefficient for maximum likelihood factor analysis. *Psychometrika* 38:1-10.

U.S. Department of Health and Human Services. 2000. *Health insurance status of the civilian noninstitutionalized population: 1998*. **LOCATION?**: Agency for Healthcare Research and Quality.

Ware, J. E. 1978. Effects of acquiescent response set on patient satisfaction ratings. *Medical Care* 16:327-36.

Ware, J. E., Jr. and A. R. Davies. 1983. Behavioral consequences of consumer dissatisfaction with medical care. *Evaluation and Program Planning* 6:291-97.

Ware, J. E., Jr., M. K. Snyder, W. R. Wright, and A. R. Davies. 1983. Defining and measuring patient satisfaction with medical care. *Evaluation and Program Planning* 6:247-63.

Yamagishi, T., and M. Yamagishi. 1994. Trust and commitment in the United States and Japan. *Motivation and Emotion* 18:129-66.

Zheng, B., M. A. Hall, E. Dugan, K. E. Kidd, and D. Levine. 2002. Development of a scale to measure patients' trust in health insurers. *Health Services Research* 37:187-204.