

# MOS MEMORANDUM

**To:** Patient Satisfaction Interest List      **Date:** August 19, 1987  
**From:** Ron D. Hays, Allyson Ross Davies,      **MOS Memo No.:** 866  
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**Subject:** SCORING THE MEDICAL OUTCOMES STUDY  
PATIENT SATISFACTION QUESTIONNAIRE:  
PSQ-III

In the Medical Outcomes Study (MOS), patient satisfaction with medical care is measured every six months regardless of utilization and following specific physician visits. Different batteries are used to assess periodic and visit-specific satisfaction. This memo provides background information, results of psychometric analyses, and scoring rules for measures constructed from the periodic satisfaction surveys. The instrument used in these surveys represents the third generation of the Patient Satisfaction Questionnaire (i.e., the PSQ-III). A later memo will present similar information for the visit-specific satisfaction survey instrument.

## **Previous PSQs: PSQ-I and PSQ-II**

The Patient Satisfaction Questionnaire developed by Ware, Snyder, and Wright (1976a,b) over a decade ago for the National Center for Health Services Research (NCHSR) provided the foundation for PSQ-III. The NCHSR project was carried out between 1972 and 1976 at the Southern Illinois University School of Medicine. Its goals were to:

develop a short, self-administered satisfaction survey that would be applicable in general population studies and would yield reliable and valid measures of concepts that had both theoretical and practical importance to the planning, administration, and evaluation of health services delivery programs (Ware et al., 1983; p. 247).

The project yielded an initial 80-item battery (PSQ-I; Ware, Snyder, and Wright, 1976a,b) and a revised 68-item questionnaire (PSQ-II; Ware, Snyder, and Wright, 1976a,b; Ware et al., 1983). A 43-item short-form (Ware, Snyder, and Wright, 1976a,b) was designed for use in two national surveys fielded jointly by the University of Chicago's Center for Health Administration Studies and the National Opinion Research Center (Aday, Andersen, and Fleming, 1980; Aday, Fleming, and Andersen, 1984); the short-form PSQ was also used in RAND's Health Insurance Experiment (Davies et al., 1986; Davies et al., forthcoming).

Based on literature reviews and empirical studies, the NCHSR project developed a taxonomy of characteristics of health care providers and services that might influence patients' attitudes toward (or satisfaction with) medical care. The theoretical and empirical literature on patient satisfaction through 1976 was reviewed to evaluate the state of the art of measurement, and an extensive content outline of the satisfaction questionnaires used in previous research was prepared (Ware, Snyder, and Wright, 1976a; pp. 12–20). Items were also based on content analysis of the comments people made about their recent experiences with physicians and medical care services.

Analyses of PSQ-I, fielded in a survey of three southern Illinois counties (Ware and Snyder, 1975), led to substantial revisions in item wording and construction of PSQ-II. The results of a variety of methodological analyses that addressed the structure and focus of PSQ items, number of response choices, response set effects, and administration methods are summarized by Ware et al. (1983).

Multitrait and factor analytic scaling studies resulted in the construction of 17 PSQ-II subscales and eight global scales (Ware and Snyder, 1975). Of the 68 PSQ-II items, 55 were used to assess satisfaction with the following characteristics of physicians and medical care services (global scales listed in italics, with relevant subscales in parentheses): *access to care* (emergency care, convenience of services, nonfinancial access); *availability* (availability/family doctors, availability/hospitals,

availability/specialists); *finances* (cost of care, insurance coverage, payment mechanisms); *continuity* (continuity of care/family, continuity of care/self); *interpersonal manner* (consideration, explanations); *quality of care* (doctor's facilities, prudence/expenses, quality/competence); *access total* (access, finances); *doctor conduct* (interpersonal manner, quality of care), and general satisfaction.

Both internal consistency and test-retest methods were used to estimate the reliability of PSQ-II scales. As summarized by Ware et al. (1983) for the NCHSR project and by Davies et al. (forthcoming) for the Health Insurance Experiment (HIE), reliability estimates for most multi-item scales generally met and usually well exceeded the 0.50 standard recommended for studies that involve group comparisons (see Ware et al., 1983, pp. 257–259 for details).

As summarized by Ware et al. (1983) and Davies et al. (forthcoming), the validity of the PSQ measures has been supported by results from a variety of studies during the past decade. Norms are available for general adult populations (Ware et al., 1983), and for representative samples of the U.S. non-institutionalized population (Aday, Andersen, and Fleming, 1980; Aday, Fleming, and Andersen, 1984). The content validity of the PSQ has been systematically examined against published satisfaction scales and theory about the universe of patient satisfaction concepts (Ware et al., 1976b). Factor analytic and discriminant validity studies of the PSQ items and scales indicate that the scales assess distinct dimensions of attitudes toward care (Davies, 1983; Ware et al., 1983). Multitrait-multimethod analysis of the PSQ subscales and global scales with measures using other methods provide convergent and discriminant validity for the PSQ scales (Hays, Hayashi, and Ware, 1987; Ware, Snyder, and Wright, 1976b; Ware et al., 1983). A number of validity studies have linked PSQ scores to health care experiences, expectations, behavioral intentions, and various health and illness behaviors (Ware and Davies, 1983). The predictive validity of the PSQ has received empirical support as well (Marquis, Davies, and Ware, 1983; Ware and Davies, 1983).

### **PSQ-III**

Modifications to the PSQ-II were made with several objectives in mind. Most involved addition or revision of items; for one concept, items were deleted entirely. These modifications were tested in several pilot studies before they were adopted for use in the MOS in PSQ-III.

First, to improve the relevance of item content across medical care settings that differ in organizational and financial arrangements (e.g., prepaid and fee-for-service care), new and more generic items were developed to assess attitudes toward financial aspects of health care.

Second, given its importance as a summary indicator, items were added to the General Satisfaction scale to increase its reliability and thus precision for hypothesis-testing.

Third, to improve the content validity of the PSQ with respect to quality of care, certain items were added to assess the adequacy of communication between doctor and patient. Other items were added or revised to improve the discriminant validity of scales to measure interpersonal and technical aspects of quality of care.

Fourth, items that focus on resources whose availability is likely to be affected by current cost-containment pressures were improved (i.e., hospital services, specialty care) or added (i.e., time spent with the physician).

Fifth, many of the PSQ items that referred to doctors or medical care in general were rewritten to refer specifically to the respondent's own medical care experiences. This change was made in response to criticism that items with general referents assess beliefs about medical care overall rather than satisfaction with one's own care.

Finally, scales assessing satisfaction with continuity of care were eliminated because their items were judged to be descriptions or reports rather than evaluations.

### *Item Content for PSQ-III*

Table 1 presents abbreviated item content for the 50 PSQ-III items, and indicates the order of their placement in PSQ-III, the item's variable label for scoring purposes in the MOS, and the direction of item wording (i.e., whether the item represents a favorable (+) or unfavorable (-) opinion about medical care).

### *Response Format and Instructions*

As in PSQ-I and PSQ-II, PSQ-III items are constructed as statements of opinion. Each item is accompanied by five response categories (strongly agree, agree, uncertain, disagree, strongly disagree). The response format, tested in methodological studies during the NCHSR research project and used for PSQ-II and the 43-item short-form, places the precoded responses to the right of the items, and labels these responses at the head of each page, as shown in the example below:

	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
I'm very satisfied with the medical care I receive	1	2	3	4	5

The following instructions to the respondent appear at the beginning of the battery:

On the following pages are some things people say about medical care. Please read each one carefully, keeping in mind the medical care you are receiving now. (If you have not received care recently, think about what you would expect if you received care today.)

We are interested in your feelings, good and bad, about the medical care you have received. How strongly do you AGREE or DISAGREE with each of the following statements?

The respondent is then asked to circle the number for each statement that represents the opinion that is closest to his or her view.

### *Item Scoring Rules*

All 50 items in the PSQ-III are used to score the PSQ-III subscales; each item appears in only one module. Item scoring rules depend on whether the item represents a favorable or unfavorable opinion about medical care. Because all subscales are scored so that higher scores indicate greater satisfaction with the aspect of care named by the subscale's label, items need to be scored so that high scores indicate greater satisfaction. Thus, given the precoding of item responses (where 1 = strongly agree and 5 = strongly disagree, as shown above), precoded responses to all favorably worded items are recoded so that higher item scores will indicate greater satisfaction. Item scoring rules appear in Table 2.

### *Scale Scoring Rules*

Scaling decisions for the PSQ-III were based on hypothesized item groupings and analyses of data from the baseline administration of the battery in the MOS. The sample included adult patients (age 18 to 108) with one or more of four chronic conditions (hypertension, diabetes, heart disease, and depression); data were collected on self-administered questionnaires using mail-out/mail-back methods between July 1986 and February 1987. The correlations between items and subscales (corrected for relevant item inclusion)<sup>1</sup> estimated in the MOS baseline sample appear in Table 3. On the strength of these results, the 50 items in PSQ-III are used to score seven multi-item subscales: general satisfaction, technical quality, interpersonal care, communication, financial aspects, time spent with provider, and access/availability/convenience.

Items are grouped in Table 1 according to their scale placement. Once scored as shown in Table 2, items within each subscale are simply

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<sup>1</sup>To correct the correlation for relevant item inclusion, the item is correlated with the total scale score after the item is removed from the total.

summed to yield the subscale score. Thus, for example, the General Satisfaction subscale comprises six items: PSQ01, PSQ02, PSQ03, PSQ04, PSQ05, and PSQ06. As shown in Table 2, precoded responses to three items (PSQ01, PSQ03, and PSQ05) are recoded; precoded responses for the remaining three items are not changed. Following this step, scores on the six items are summed to score General Satisfaction, as follows:

$$\text{General Satisfaction} = \text{PSQ01} + \text{PSQ02} + \text{PSQ03} + \text{PSQ04} + \text{PSQ05} + \text{PSQ06}$$

Table 4 presents complete scoring rules for the seven PSQ-III subscales. Subscales are balanced to control for the effects of acquiescent response set on scores (Ware, 1978).

### *Reliability*

Analyses of baseline MOS data also provided reliability estimates for the seven PSQ-III subscales. Table 5 presents internal-consistency reliability and homogeneity estimates for each subscale. Reliability estimates ranged from 0.77 to 0.89 in the MOS baseline sample, and fell below 0.80 only for the two-item Time Spent with Doctor subscale. As expected, the Access/Availability/Convenience subscale proved to be the most heterogeneous, as reflected in its low homogeneity estimate. As illustrated in Davies et al. (1986), we recommend item-by-item analyses before relying on a summary score where comparing systems of care in terms of satisfaction with accessibility, availability, and convenience.

### *Descriptive Statistics*

Table 6 presents descriptive statistics for the PSQ-III subscales from the MOS baseline; for reference, it also notes the range and midpoint of possible scores on each subscale. For all seven subscales, observed mean scores were somewhat higher than scale midpoints, indicating some skewness with more respondents scoring toward the favorable end of the continuum.

Table 1

ABBREVIATED ITEM CONTENT AND SCALE GROUPINGS, PSQ-III

Item Placement[a]	Abbreviated Item Content, by Scale	Direction of Wording	Variable Label
General Satisfaction (GSAT)			
3	Very satisfied with care	+	PSQ01
33	Some things could be better	-	PSQ02
42	Medical care is excellent	+	PSQ03
21	Things need to be improved	-	PSQ04
11	Care just about perfect	+	PSQ05
49	Dissatisfied with some things	-	PSQ06
Technical Quality (TECH)			
15	Careful to check everything	+	PSQ07
2	Doctors need to be more thorough	-	PSQ08
8	Office has everything needed	+	PSQ09
12	Wonder if diagnosis is correct	-	PSQ10
23	Know latest medical developments	+	PSQ11
36	Lack experience with my problems	-	PSQ12
50	Doctors competent, well-trained	+	PSQ13
45	Doubt about ability of doctors	-	PSQ14
31	Never expose me to risk	+	PSQ15
41	Doctors rarely give advice	-	PSQ16
Interpersonal Aspects (INTER)			
29	Too business-like, impersonal	-	PSQ17
47	Do best to keep me from worrying	+	PSQ18
39	Should pay attention to privacy	-	PSQ19
17	Genuine interest in me	+	PSQ20
26	Make me feel foolish	-	PSQ21
34	Very friendly and courteous	+	PSQ22
9	Should give me more respect	-	PSQ23



Table 1, continued

Item Placement[a]	Abbreviated Item Content, by Scale	Direction of Wording	Variable Label
Communication (COMM)			
6	Explain the reason for tests	+	PSQ24
18	Use terms without explaining	-	PSQ25
13	Say everything that's important	+	PSQ26
38	Ignore what I tell them	-	PSQ27
43	Doctors listen carefully	+	PSQ28
Financial Aspects (FINAN)			
14	Care without financial setback	+	PSQ29
4	Worry about large bills	-	PSQ30
27	Protected from financial hardship	+	PSQ31
10	Problem to cover share of cost	-	PSQ32
44	Insured, protected financially	+	PSQ33
24	Pay more than can afford	-	PSQ34
32	Amount I pay is reasonable	+	PSQ35
19	Go without care because too expensive	-	PSQ36
Time Spent with Doctor (TIME)			
46	Doctors spend plenty of time	+	PSQ37
35	Hurry too much when treat me	-	PSQ38
Access/Availability/Convenience			
1	Get hospital care without trouble	+	PSQ39
16	Hard to get care on short notice	-	PSQ40
5	Easy to get care in an emergency	+	PSQ41
22	Office should be open more hours	-	PSQ42
37	Care conveniently located	+	PSQ43
28	Wait too long for emergency treatment	-	PSQ44

Table 1, continued

Item Placement[a]	Abbreviated Item Content, by Scale	Direction of Wording	Variable Label
40	Can reach doctor for help with medical question	+	PSQ45
48	Hard to get appointment right away	-	PSQ46
20	Office hours are convenient	+	PSQ47
7	Kept waiting at doctor's office	-	PSQ48
25	Easy access to specialists	+	PSQ49
51	Get medical care whenever need it	+	PSQ50

[a]Order of item in PSQ-III is administered in the MOS. This section of the MOS questionnaire included 51 items; item 30 refers to beliefs about a crisis in health care and is not used in scoring the satisfaction subscales.

Table 2

SCORING RULES FOR PSQ-III ITEMS

Item[a]				Precoded Value[b]	Recoded Value[c]
PSQ01,	PSQ03,	PSQ05,	PSQ07,	1	5
PSQ09,	PSQ11,	PSQ13,	PSQ15,	2	4
PSQ18,	PSQ20,	PSQ22,	PSQ24,	3	3
PSQ26,	PSQ28,	PSQ29,	PSQ31,	4	2
PSQ33,	PSQ35,	PSQ37,	PSQ39,	5	1
PSQ41,	PSQ43,	PSQ45,	PSQ47,		
PSQ49,	PSQ50				
PSQ02,	PSQ04,	PSQ06,	PSQ08,	1	1
PSQ10,	PSQ12,	PSQ14,	PSQ16,	2	2
PSQ17,	PSQ19,	PSQ21,	PSQ23,	3	3
PSQ25,	PSQ27,	PSQ30,	PSQ32,	4	4
PSQ34,	PSQ36,	PSQ38,	PSQ40,	5	5
PSQ42,	PSQ44,	PSQ46,	PSQ48		

[a]See Table 1 for identification of items by item label.

[b]Response codes printed in the PSQ-III.

[c]Coding used to score items for subscales (see text).

Table 3

MEANS, STANDARD DEVIATIONS, AND ITEM-SCALE  
CORRELATIONS (CORRECTED FOR OVERLAP) FOR  
HYPOTHESIZED PSQ-III SCALES  
(MOS BASELINE DATA)

ITEM	MEAN	SD	ITEM-SCALE CORRELATIONS						
			GSAT	TECH	INTER	COMM	FINAN	TIME	ACCS
PSQ01	4.061	0.893	0.68*	0.67	0.60	0.61	0.24	0.55	0.56
PSQ02	2.883	1.024	0.67*	0.61	0.52	0.54	0.24	0.50	0.54
PSQ03	4.057	0.825	0.73*	0.71	0.66	0.67	0.28	0.61	0.63
PSQ04	3.073	1.099	0.66*	0.60	0.52	0.53	0.23	0.51	0.57
PSQ05	3.686	0.984	0.74*	0.69	0.60	0.62	0.29	0.58	0.58
PSQ06	3.476	1.102	0.73*	0.69	0.60	0.61	0.25	0.61	0.61
PSQ07	3.745	0.980	0.70	0.67*	0.62	0.68	0.29	0.60	0.57
PSQ08	3.242	1.198	0.54	0.54*	0.53	0.49	0.21	0.47	0.43
PSQ09	3.950	0.897	0.48	0.47*	0.41	0.43	0.25	0.34	0.44
PSQ10	3.206	1.112	0.58	0.61*	0.53	0.55	0.27	0.47	0.45
PSQ11	3.818	0.783	0.50	0.54*	0.49	0.48	0.19	0.44	0.48
PSQ12	3.542	1.029	0.54	0.58*	0.50	0.50	0.23	0.46	0.46
PSQ13	4.126	0.734	0.61	0.62*	0.59	0.57	0.17	0.52	0.52
PSQ14	3.862	0.937	0.62	0.65*	0.60	0.57	0.26	0.52	0.52
PSQ15	3.673	0.870	0.45	0.47*	0.43	0.45	0.23	0.39	0.38
PSQ16	3.555	1.087	0.44	0.47*	0.47	0.46	0.19	0.41	0.39
PSQ17	3.866	0.914	0.56	0.59	0.67*	0.62	0.27	0.57	0.54
PSQ18	3.711	0.895	0.59	0.61	0.55*	0.61	0.21	0.60	0.49
PSQ19	3.602	0.983	0.31	0.39	0.40*	0.37	0.24	0.30	0.35
PSQ20	3.932	0.912	0.63	0.64	0.63*	0.66	0.21	0.59	0.55
PSQ21	3.838	0.998	0.51	0.56	0.59*	0.60	0.32	0.50	0.48
PSQ22	4.287	0.679	0.53	0.55	0.60*	0.57	0.18	0.52	0.47
PSQ23	3.862	1.032	0.44	0.50	0.53*	0.48	0.23	0.43	0.41
PSQ24	3.903	0.975	0.56	0.59	0.58	0.62*	0.26	0.49	0.51
PSQ25	3.541	1.091	0.43	0.48	0.50	0.49*	0.26	0.41	0.42
PSQ26	4.187	0.817	0.56	0.57	0.62	0.61*	0.22	0.54	0.48
PSQ27	3.585	1.018	0.64	0.68	0.66	0.66*	0.27	0.61	0.52

Table 3, continued

ITEM	MEAN	SD	ITEM-SCALE CORRELATIONS						
			GSAT	TECH	INTER	COMM	FINAN	TIME	ACCS
PSQ28	3.938	0.848	0.69	0.69	0.71	0.71*	0.27	0.65	0.58
PSQ29	3.761	1.070	0.35	0.36	0.35	0.37	0.73*	0.29	0.38
PSQ30	3.243	1.412	0.11	0.16	0.16	0.15	0.65*	0.08	0.17
PSQ31	3.350	1.166	0.28	0.29	0.28	0.28	0.64*	0.23	0.32
PSQ32	3.849	1.175	0.14	0.19	0.20	0.17	0.69*	0.10	0.23
PSQ33	3.419	1.110	0.34	0.34	0.31	0.32	0.71*	0.27	0.35
PSQ34	3.839	1.048	0.21	0.25	0.25	0.22	0.73*	0.16	0.28
PSQ35	3.575	1.046	0.26	0.27	0.25	0.25	0.56*	0.22	0.28
PSQ36	4.064	1.083	0.27	0.30	0.32	0.30	0.66*	0.23	0.36
PSQ37	3.658	0.995	0.61	0.61	0.63	0.62	0.21	0.63*	0.54
PSQ38	3.515	1.082	0.65	0.65	0.65	0.64	0.25	0.63*	0.55
PSQ39	4.254	0.853	0.37	0.36	0.36	0.34	0.31	0.30	0.48*
PSQ40	3.781	1.028	0.47	0.45	0.42	0.41	0.24	0.37	0.61*
PSQ41	4.105	0.878	0.35	0.34	0.30	0.32	0.28	0.25	0.51*
PSQ42	3.488	0.976	0.46	0.43	0.41	0.37	0.26	0.37	0.50*
PSQ44	3.556	0.974	0.47	0.47	0.47	0.41	0.24	0.40	0.56*
PSQ45	3.717	1.017	0.59	0.57	0.54	0.55	0.20	0.51	0.63*
PSQ46	3.662	1.077	0.52	0.48	0.47	0.45	0.18	0.46	0.64*
PSQ48	3.586	1.110	0.41	0.38	0.39	0.39	0.18	0.36	0.42*
PSQ49	3.860	0.912	0.51	0.53	0.49	0.48	0.32	0.42	0.57*
PSQ50	3.967	0.879	0.58	0.53	0.50	0.50	0.27	0.47	0.68*
PSQ43	3.985	0.852	0.32	0.33	0.31	0.31	0.19	0.27	0.40*
PSQ47	4.065	0.834	0.45	0.41	0.42	0.39	0.30	0.37	0.53*

NOTE: Standard error of correlation = 0.02. MEAN = average item score; SD = standard deviation; see Table 1 for translation of scale labels.

Table 4

SCORING RULES FOR PSQ-III SUBSCALES

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Subscale	Sum these items after scoring as shown in Table 2
General Satisfaction	PSQ01 + PSQ02 + PSQ03 + PSQ04 + PSQ05 + PSQ06
Technical Quality	PSQ07 + PSQ08 + PSQ09 + PSQ10 + PSQ11 + PSQ12 + PSQ13 + PSQ14 + PSQ15 + PSQ16
Interpersonal Aspects	PSQ17 + PSQ18 + PSQ19 + PSQ20 + PSQ21 + PSQ22 + PSQ23
Communication	PSQ24 + PSQ25 + PSQ26 + PSQ27 + PSQ28
Financial Aspects	PSQ29 + PSQ30 + PSQ31 + PSQ32 + PSQ33 + PSQ34 + PSQ35 + PSQ36
Time Spent with Doctor	PSQ37 + PSQ38
Access/Availability/ Convenience	PSQ39 + PSQ40 + PSQ41 + PSQ42 + PSQ43 + PSQ44 + PSQ45 + PSQ46 + PSQ47 + PSQ48 + PSQ49 + PSQ50

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Table 5

RELIABILITY AND HOMOGENEITY ESTIMATES, PSQ-III SUBSCALES  
(MOS BASELINE DATA)

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Scale	Number of Items	Reliability	Homogeneity
General Satisfaction	6	0.88	0.56
Technical Quality	10	0.85	0.37
Interpersonal Aspects	7	0.82	0.39
Communication	5	0.82	0.47
Financial Aspects	8	0.89	0.51
Time Spent with Doctor	2	0.77	0.63
Access/Availability/ Convenience	12	0.86	0.34

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NOTE: Reliability estimates based on internal consistency method (Cronbach's (1951) Alpha); homogeneity = average inter-item correlation.

Table 6  
DESCRIPTIVE STATISTICS, PSQ-III SUBSCALES  
(MOS BASELINE DATA)

Subscale	Possible Scores		Midpoint of Possible ScoreRange	0–100 Range [a]			
	Low	High		Mean	SD	Mean	SD
General Satisfaction	6	30	18	21.24	4.74	63.50	19.75
Technical Quality	10	50	30	36.72	6.38	66.80	15.95
Interpersonal Aspects	7	35	21	27.10	4.47	71.79	15.96
Communication	5	25	15	19.15	3.63	70.75	18.15
Financial Aspects	8	40	24	29.10	6.90	65.94	21.56
Time Spent with Doctor	2	10	6	7.17	1.88	64.62	23.50
Access/Availability/ Convenience	12	60	36	46.03	7.23	70.90	15.06

[a]Means and SDs after transforming scale scores linearly to a 0–100 possible range.



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