DOCUMENT RESUME

ED 430 045 TM 029 789

AUTHOR Witta, E. Lea; Gupton, Sandra Lee
TITLE Crossvalidation and Confirmatory Factor Analysis of the 30-Item Leadership Behavior Description Questionnaire: Implications for Use by Graduate Students.
PUB DATE 1999-04-00
NOTE 37p.; Paper presented at the Annual Meeting of the American Educational Research Association (Montreal, Quebec, Canada, April 19-23, 1999).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Administrators; Coding; Elementary Secondary Education; *Factor Structure; *Graduate Students; Graduate Study; Higher Education; Leadership; Reliability; *Teachers; *Test Use; Textbooks
IDENTIFIERS Confirmatory Factor Analysis; Cross Validation; *Leadership Behavior Description Questionnaire

ABSTRACT

The construct validity and internal consistency (reliability) of the 30-item form of the Leadership Behavior Descriptive Questionnaire (E. Fleishman, 1957; A. Halpin and B. Winer, 1957) as presented in a current leadership text was assessed. Classroom teachers and administrators (n=187) completed the instrument. Although reliability was found to be acceptable, neither the two-factor nor the five-factor model was adequate. Although the two-factor model produced adequate estimates of reliability, it should not be used without reverse coding. Reasons for these findings are discussed. An appendix contains two-factor and five-factor rotated convergent matrices. (Contains 5 figures, 3 tables, and 15 references.) (Author/SLD)

Running Head: CFA of the LBDQ

Crossvalidation and Confirmatory Factor Analysis of the 30-item Leadership Behavior Description Questionnaire: Implications for Use by Graduate Students

E. Lea Witta & Sandra Lee Gupton

The University of Southern Mississippi

Department of Educational Leadership and Research

Paper presented at the American Educational Research Association 1999 Annual Conference in Montreal, Canada (April 19-24).

Abstract

The construct validity and internal consistency (reliability) of the 30-item form of the Leadership Behavior Descriptive Questionnaire as presented in a current leadership text was assessed. One hundred eighty-seven classroom teachers and administrators completed the instrument. Although reliability was found to be acceptable, neither the two-factor nor the five-factor model were adequate. Reasons for these findings are discussed.

Crossvalidation and Confirmatory Factor Analysis of the 30-item Leadership Behavior Description Questionnaire: Implications for use by Graduate Students

The Leadership Behavior Description Questionnaire (LBDQ), an instrument developed in the early 50's and revised in the early 60's, is used widely by graduate students in educational administration to conduct research on leader behaviors. "The LBDQ, in its original and expanded versions," write Short and Greer, "remains today as the primary research instrument available to gather observations of leadership behavior from group members" (1997, p.21).

Shartle (1957) has stated that when the Ohio State Leadership Studies were begun, there was no theory of leadership to form its foundation. Further research led to two factors, *consideration* and *initiation of structure* (Fleishman, 1957; Halpin & Winer, 1957), forming the original leadership behavior questionnaire (LBDQ). Stogdill (1959), however, did not think it was reasonable to believe two factors were sufficient to account for the variability in leadership behaviors. Through empirical research, new factors were developed, tested, and revised multiple times resulting in the 12 constructs of Form XII.

The researchers' early work with this instrument was exploratory in nature . . . an attempt to provide additional information on the popular research instrument in order to address its appropriateness for use with an increasingly diverse cadre of leaders today whose leadership behaviors have often been shown to vary considerably from the behaviors of leaders that dominated the field during the time this instrument was developed and on whom its contents were based. A number of different forms of the LBDQ were found (a 40-item version dated 1957; a 100-item version [Form XII] dated 1962; and a 30-item version with no date given in a 1995 textbook on the principalship); it is unknown just how many versions exist today. For the

current study, the researchers chose the 30-item form to use in assessing the reliability and validity of the scores produced. This form seemed particularly problematic since (1) it was readily available to graduate students to reproduce and use free of charge; (2) it omitted all items from the factors of *representation, reconciliation, predictive accuracy, and superior orientation* included in the longer instruments; and (3) although many of the questions were the same as those on Form XII, no estimates of reliability or validity of the scores produced were included with the instrument. Because measurement soundness is essential to the integrity of social science research, any study, however well designed, is suspect if information concerning the measuring instrument is inadequate or absent (Daniel & Witta, 1997).

Although this study dealt with only one form of the LBDQ, the central issue underlying this and the researchers' earlier studies related to the LBDQ was whether or not the widespread use of this instrument for investigating today's leadership issues is justified in light of its date of development and the significant changes that have occurred in leadership thought since that time.

Although the 30-Item form used in the current study was developed from Form XII, it measures only two constructs: Consideration and Initiating Structure. This 30-Item form is of most concern in this study - not because it appears to be the better questionnaire. Rather, this form is currently included in a popular textbook, *Leadership and Organizational Behavior*, by Jeffrey Kaiser (1995, p.26) and appears to have serious flaws in its construction.

Questions forming the LBDQ are 5-point Likert coding with 1 representing NEVER and 5 representing ALWAYS. Directions for scoring Form XII specify certain items to be reverse coded and summed per construct. Scores for the two constructs of the 30 Item form are also produced by summing. The odd numbered question scores form the *initiating structure* construct.

The even numbered question scores form the *consideration* construct. This creates a serious problem when summing items to produce a *consideration* or *structure* score for the 30-Item form. No items were reverse coded. For example, question 10, 'Keeps to himself/herself', and question 24, 'Is friendly and approachable', both purportedly measure *consideration.* If question 10 is coded 5, 'ALWAYS keeps to him/herself', how can a 5 represent 'ALWAYS friendly and approachable' (question 24)? Or, if 5 represents 'Always refuses to explain his/her actions' (question 14), how can 5 represent 'Always treats all staff members as equals' (question 20)? What does a high score for *consideration* indicate? In Form XII, question 10 is question 57 and question 14 is question 87. Both are reverse coded. Thus a high score in *consideration* for Form XII would represent 'NEVER keeps to himself/herself' and 'ALWAYS is friendly and approachable.

Within the construct of *initiating structure*, the 30-Item form has similar problems. Question 11, 'Works without a plan', and question 27, 'Sees that staff members are working to capacity', are both coded as 5=Always. How can a supervisor *ALWAYS work without a plan* and *ALWAYS see that staff members are working to capacity*? Again, what does a high score indicate?

In addition, behaviors frequently cited as necessary to successful leadership of today's schools are quite different from the behaviors considered appropriate during the time that the LBDQ was developed. Thus, although the original LBDQ's usefulness in dealing with the two-dimensional factors of leading known as *initiation* and *consideration* has been well-established with male leaders, the present researchers questioned its generalizability for use with the wide range of behaviors considered appropriate for today's leaders. Meanwhile, the researchers' own

doctoral students along with many others as documented in the literature continue to use the LBDQ, an instrument developed over 40 years ago, as a major instrument for investigating today's leaders' behaviors (Short & Greer, 1997).

The specific purpose of this study was to assess the 30-item form of the Leadership Behavior Descriptive Questionnaire (LBDQ) as presented by Kaiser (1995). We sought to answer four questions:

(1) Do any of the questions on the 30-item LBDQ require reverse coding?

(2) Is the 2-factor model adequate (as measured by chi square), or would another model be preferable?

(3) Are the scores produced by the instrument and each factor reliable?

(4) Are the factors measured by this instrument the same across samples?

Literature Review

Background and Development of the LBDQ.

The LBDQ was developed by Hemphill and Coons in 1957 for the Personnel Research Board at Ohio State University. From a factor analysis of the responses to the LBDQ, Halpin and Winer and Fleishman identified two dimensions of leader behavior--consideration and initiation. The validity and reliability of scores produced by the instrument was established in studies of leaders in organizations such as the military, industry, and hospitals. It was grounded in a model of leadership as *behaviors,* a departure in the fifties from former models of leadership most commonly based on *traits.* The behaviors assessed in the instrument consistently revealed a two-factor analysis of leadership along the lines of consideration and initiation behaviors, more commonly recognized as people and organizational dimensions of leadership, first identified by

Halpin and Winer (Halpin, 1966).

The LBDQ, originally created in 1957 and revised in 1962, as well as most of the knowledge base related to organizational leadership was derived from research involving white male administrators in business, industry, or the military. Through empirical research, new factors to be included in the original instrument were developed, tested, and revised multiple times resulting in the 12 constructs of Form XII (Representation, Demand Reconciliation, Tolerance of Uncertainty, Persuasiveness, Initiation of Structure, Tolerance of Freedom, Role Assumption, Consideration, Production Emphasis, Predictive Accuracy, Integration, and Superior Orientation). Internal consistency (reliability) for the constructs produced by LBDQ's Form XII of the LBDQ ranged from a low of 0.60 to 0.80 for college presidents. The constructs, Initiating structure and Consideration, produced a 0.80 and 0.76 respectively. Other groups used to test the questionnaire produced both higher and lower reliabilities. These studies investigating the psychometric properties of the LBDQ, however, were conducted in the 1960s and 1970s. Since that time there have been changes in what is considered to be effective leadership.

Major Shifts in Leaders and Leadership Thinking

Much of today's literature on leadership calls for better representation of diverse leadership models to be included in the knowledge base of organizational leadership. Programs preparing administrators are now proliferated with women and minority candidates whose leadership styles and behaviors are often quite different from the models included in their traditional curricula (i.e. Klein & Ortman, 1994; Naisbitt & Aburdene 1990; Patterson, 1993; Shakeshaft, 1986). Too, since 1980 there has been a decided increase in the number of women and minorities in educational administrative positions, particularly leadership positions-a trend

that seems likely to continue.

Along with the increased pluralism of school leaders, there has been a significant shift in thinking about what constitutes effective leadership behavior. In his work on leadership for today's schools, Patterson claims in the organization of tomorrow, leading will become a process of influencing others to achieve mutually agreed upon purposes for the organization (Patterson, 1993). According to Loden, the leader effectively aids in facilitating agreement between opposing points of view to develop consensus problem solving models (Langford, 1995).

An issue integral to changing leadership perspectives is the restructuring efforts in schools (Beyer-Houda & Ruhl-Smith, 1995). Unlike past educational reforms which focused on changing components of the education system, today's systemic reform encompasses the impact of change on all aspects of the education system. Systemic reform, therefore, takes into consideration the interrelatedness of all the components which function together in the education system, and realizes that as one component changes so must the others in order to maintain the integrity, continuity and consistency of the entire system (Slick & Gupton, 1993). Systemic reform is viewed as a shift from a more traditional educational system to one that emphasizes inter-connectedness, active learning, shared decision making, and high levels of achievement for all students (Anderson, 1993).

Problems with Leadership Research.

With regard to research's sensitivity to this paradigm shift in thinking about leadership, Clark and Clark (1990) in their edited book on measures of leadership sponsored by the Center for Creative Leadership contend, "Only in the past decade has there appeared a serious interest in *leadership*, as opposed to management. The study of leadership has, in our view, been neglected

in favor of a focus on what might best be called `supervisory management . . . . We believe that over the past decade a paradigm shift has occurred with respect to leadership theory, a shift which is just now appearing in terms of research and application" (pp. 300-315). With the trends toward participatory style leadership and decentralization of power on the upswing, a tendency toward a more integrative leadership style has emerged. Criswell and Betz (1995) further corroborate these changes as "The trends toward site-based decision making and Total Quality Management in the nation's educational systems are signs that schools as a workplace are undergoing transformation. The new school environment calls for a new kind of administrator---`one who puts instructional issues in the forefront and one who solicits involvement of others in decision-making.'". (p. 30) They further refer to this phenomena as "a new paradigm of leadership".

The increased *complexity* of leadership also suggests the need for updated instrumentation and methodology for today's studies related to leader behaviors. The current research and work of Robert Hooijberg illustrates this point. "Most leadership research," writes Hooijberg, "continues to examine leadership as a purely downward-directed phenomenon of influencing subordinates and does not do justice to the complexity of the work environments of modern managerial activities. While leadership research has made great strides in better understanding what kind of leadership works best under specific circumstances, for the most part the target of the leadership behavior has remained unchanged" (1996, p.918). In stressing the lack of appropriate leadership research, Hooijerg argues "Future leadership research should use more sophisticated evaluations of the interactional processes of leaders with subordinates, peers, and superiors and also more sophisticated evaluations of the interactional processes of leaders as

members of cross-functional, cross-departmental, cross-company, and cross-national teams (1996, p. 943).

Today's leadership research obviously lacks in quality and quantity in the estimation of most practitioners as well as researchers themselves. The significant shifts that have occurred in leadership theory, the fast-growing emergence of a pluralistic cadre of leaders and aspiring leaders, not to mention the national deficit of effective school leaders should motivate researchers and professors guiding the leadership research of students to select carefully (and to develop better) instruments and tools to conduct studies on school leadership that will increase the quality and usefulness of leadership research results.

Method

Using the 30-item form of the LBDQ, the researchers selected schools (elementary, middle, and high school) in which to administer the questionnaire to all teachers in these schools. Both male and female principals were included in the study. The schools were all located in the southeast, in the same state, in relatively close proximity (but not in the same district).

Analysis of the data then progressed in steps to answer the research questions. The first question was concerned with the lack of any reverse coding for questions in the 30-item LBDQ. To answer this question, data was subjected to confirmatory factor analysis in AMOS 3.5. The results from this analysis was used to determine which (if any) questions should be reverse coded.

The second question was concerned with the 2-factor model versus another model. To answer this question data was entered into the principal components procedure of SPSS 8.0, the solution constrained to two-factors, and rotated using both varimax and oblique (promax)

rotation. An additional factor model was developed using the criteria of eigenvalues greater than 1. This solution was also rotated by varimax and oblique rotation. These solutions were then entered into confirmatory factor analysis in AMOS 3.5 for model comparisons.

The third question of this analysis concerned reliability of the scores produced by the instrument and each factor. Reliability (Cronbach's alpha) estimates were determined for the scores produced by each of the factors suggested by each model, the total instrument, and the two factors suggested by the questionnaire.

Finally, the data from the questionnaires were analyzed by splitting the sample into two groups. The factor model for the initial sample was determined using exploratory factor analysis in SPSS 8.0. This model was crossvalidated using the holdout sample.

Results

One hundred seventy-eight classroom teachers representing four schools responded to this survey. An additional five administrators also responded. Of the 183 respondents, only 149 answered all questions. Because this represented a small number of respondents, the sample was not further stratified by class level.

Research Question 1 - Is reverse coding needed for some questions?

Confirmatory factor analysis using AMOS 3.5 was used to test the efficacy of the LBDQ as suggested by Kaiser (1995). The two-factor solution (as defined by Kaiser) consisted of odd numbered questions representing "Structure" and the even number items representing "Consideration". Respondents were instructed to add their scores to determine their "Structure" and "Consideration" totals. When the data was analyzed, however, several questions had negative loadings on each factor (see Figure 1). Questions 7 (Criticizes poor work), 9 (Speaks in

a manner not to be questioned), and 11 (Works without a plan) were inversely correlated to the construct 'Structure' which included questions 25 (Sees staff know what is expected), 29 (Sees staff work is coordinated), and 21 (Sees individual's part is understood). In addition, questions 10 (Keeps to self), 14 (Refuses to explain actions), 16 (Acts without consulting staff), and 18 (Slow to accept new ideas) were inversely correlated to the construct 'Consideration' which included questions 24 (Friendly/approachable), 26 (Puts staff suggestions into operation), and 22 (Willing to make changes). This data produced a coefficient alpha of 0.74 for the consideration factor and 0.65 for the structure factor. Coefficient alpha for the total test was 0.81.

Insert Figure 1 About Here

Each question loading negatively on a factor was then examined to determine if the wording on the questions indicated a need for reverse coding. This resulted in eight reverse coded items (Questions 5, 7, 9, 10, 11, 14, 16, and 18). Coefficient alpha for the consideration and structure factors with the recoded (reverse coded) questions was 0.79 and 0.94 respectively. Thus the answer to our first questions was 'yes'. Some questions do need reverse coding. Further analyses and the confirmatory factor analysis were conducted using these recoded questions (see Figure 2).

Insert Figure 2 About Here

Research question 2 - Is the 2-factor model suggested by Kaiser (1995) adequate, or would

another model be preferable?

To provide a comparable model to the two-factor model suggested by Kaiser, an exploratory factor model constrained to two factors was also obtained using SPSS 8.0. The resulting two-factor solution explained 48.6% of the variance in the questionnaire. One factor, structure, consisted of six questions (3 odd numbered, 3 even numbered) and produced a reliability coefficient of 0.50. The remaining 24 questions formed the second factor, consideration, and produced a reliability coefficient (coefficient alpha) of 0.94. The same solution was produced by both varimax and promax rotations (see Table 1).

Insert Table 1 About Here

In addition, a factor solution containing six factors was obtained using the criteria of eigenvalues larger than one in exploratory factor analysis. Factor 6, however, consisted of only one question. When forced to a five factor solution, 61% of the variance was explained by the five factors. Using the varimax solution, there were no cross-loadings with the loading criteria set at 0.5. Reliability coefficients (coefficient alpha) for the five factors ranged from a low of 0.57 to a high of 0.93. The five factor promax solution produced one cross-loading (Question 18). In addition, question 10 and question 25 were included with different factors. Reliability coefficients for the promax solution ranged from a low of 0.38 to a high of 0.92 (see Table 2).

Insert Table 2 About Here

Confirmatory factor analysis of each of the five models for this analysis resulted in statistically significant χ^2 (chi-square) measures of fit ($p \leq 0.01$) for each model (see Table 3). The two-factor model suggested by Kaiser (1995) and Kaiser's model with reverse coded questions produced a χ^2 of 857.03. The two-factor model suggested by exploratory analysis (see Figure 3) was a significantly poorer chi-square fit ($\Delta\chi^2=10.14$, $\Delta df=1$) than Kaiser's model.

Insert Figure 3 and Table 3 About Here

Although both five-factor solutions (see Figures 4 and 5) produced statistically significant χ^2 measures of fit, both also produced a significantly better fit than Kaiser's model (see Table 3). In addition, the model suggested by the promax rotation was a significantly better fit than the one suggested by the varimax rotation. Clearly Kaiser's model is not adequate. There is a better fit than the 2-factor model. None of the models tested, however, produced an adequate fit as measured by chi-square.

Insert Figures 4 and 5 About Here

Research Question 3 - Is the data produced by this instrument reliable?

Reliability estimates for the factors ranged from 0.38 for one of the promax factors to a 0.94 for one of the two-factor model factors. Coefficient alpha for the total test was 0.93. Thus it was concluded that reliability of data produced by the instrument was sufficient. However, some of the later factors in the five-factor models were questionnable.

Research Question 4 - Will the same model be produced across samples?

Because the number of responses was smaller than anticipated, the samples for cross-validation were also smaller. Consequently, it was not surprising that the same model was not produced by the original (n=77) and the holdout (n=72) samples. Both the two-factor and the five-factor results are displayed in the appendix.

Conclusions and Discussion

Questions 10, 14, and 16 were taken directly from the 'original' 100-item LBDQ and were reverse coded for scoring on it. Thus it was not surprising that these items required reverse coding. Nor was it surprising that an additional five questions also needed reverse coding. It was also evident that the two-factor solution was not adequate. However, no adequate solution using the 30-item LBDQ was found. While this problem may be partially accounted for by the use of individual questions in our confirmatory factor model, this problem may also be caused by the lack of appropriate questions. Most of the incomplete questionnaires returned contained comments concerning specific questions, such as "does not apply" or "does not fit our situation". Many completed questionnaires contained similar comments.

Although the two-factor model of the 30-item LBDQ produced adequate estimates of reliability, it should not be used without reverse coding. In addition, the number of constructs the instrument measures is debatable. Thus, we are very concerned with the validity of scores produced by this instrument. Because our number of responses was less than anticipated, we could not adequately address the issue of cross-validation.

The problems addressed in this study are compounded by the 30-Item questionnaire being published in a current leadership text. Instructors need to be aware of the problems with this

questionnaire. Not all forms are labeled as Form I, Form 2 or newest revision. Form XII, revised in 1962, is the only form we have discovered with a form number. Most are simply labeled LBDQ. Consequently without scrutinizing the actual questions on the LBDQ, the researcher cannot be sure what is being investigated.

The problems discussed in this study also suggest a need for further exploratory and confirmatory factor analysis. When Form XII of the LBDQ was developed, there were no leadership theories to use in developing models. Currently, there are multiple leadership theories and diversity among leaders. Thus, this instrument could be used and possibly modified to reflect new developments in the field with regard to leadership theory, leadership diversity, and leadership complexity. In addition, none of the versions of the LBDQ we examined indicated having dealt with gender or minority issues in the development or testing of the instrument - i.e. ensuring diversity in the norming pool, testing the instrument for gender or minority bias. Even in Clark & Clark's 1990 book on measures of leadership wherein the sorry state of leadership research and measures was depicted quite vividly, no mention was found of the need to be more sensitive to gender and diversity bias in the language, content, and administration of instruments used in leadership research and measurement. "Currently," write Posner and Kouzes, "the leadership field is in transition about the essential behaviors of leaders, moving from earlier versions of initiating consideration and structure (Fleishman, 1953) and transactional leaders to what Burns (1978) has referred to as transformational leadership. Still, the field lacks consensus around such issues as what leadership is, how it differs from management, and whether it can be measured or taught" (In Clark & Clark (Eds.), 1990, pp. 205-06). Now, while leadership definition and research are in transition with new instruments being developed and normed, is the

prime time for researchers to assure the norming pool and content of these instruments reflect fair representation of *school* leaders (rather than always being more representative of business and industry leaders) as well as fair representation of the diversity of today's school leaders (rather than continuing to be based on the majority characteristics of school leaders).

As a result of this exploratory study and the researchers' work with graduate students, we recommend:

(1) Development of better measurement instruments, more easily accessed by graduate students, for conducting school leadership research (using *school* leaders as norming subjects and including women and minorities as important players in leadership today).

(2) More careful monitoring of the use of the LBDQ in graduate studies to ensure its appropriateness in light of the study's purpose

(3) If a student uses the LBDQ, current estimates of the psychometric properties of the version used be established.

Many studies have confirmed the LBDQ's capacity to deal with the two-factors (people and organizational/task dimensions) of leadership, we question the justification of its popularity among graduate students conducting leadership studies considering the multitude of research needs related to a new paradigm of leadership and a diverse cadre of leaders. We concur with Witta and Daniel (1998) and would further urge instructors of educational research classes to stress the importance of assessing current reliability and validity estimates of the scores produced of any instrument used. And further, to emphasize that validity and reliability apply to scores produced at a given time with a given sample. While any researcher would like to have estimates established using a sample similar to the one the researcher is using, these estimates vary over

time and across samples.

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Appendix A

Table A-1

Two Factor Rotated Component Matrices Using Split Samples

Initial Sample Questions	Component 1	Component 2
Q25 Staff Know what Expected	0.847	
Q24 Friendly/Approach	0.811	
Q27 Sees memb work capac	0.81	
Q26 Staff Ease talk to	0.809	
Q28 Puts staff sugg operat	0.794	
Q20 Treat Staff Equals	0.788	
Q6 Easy Understand	0.786	
Q21 Ind Part Understood	0.775	
Q29 Sees staff work Coord	0.761	
Q12 Look out pers welfare staff	0.741	
Q22 Willing make changes	0.734	
Q8 Time to Listen	0.73	
Q14REC Refuse Exlain Actions	0.72	
Q1 Attitude Clear	0.718	
Q16REC Acts w/o consult staff	0.718	
Q4 Little things make Pleasant	0.685	
Q18MYREC Slow Accept Ideas	0.649	
Q10REC Keeps to self	0.647	0.546
Q23 Staff Follow Stand Rules	0.592	
Q11MYREC Work w/o Plan	0.589	
Q30 Staff approve prior proceed	0.576	
Q3 Try new Ideas	0.574	
Q15 Maintain Perf Stand	0.565	
Q2 Personal Favors		
Q19 Encourage Uniform Proced		
Q5MYREC Rules Iron Hand		0.778
Q9MYREC Speak Manner Not Question		0.644
Q13 Assign Staff Tasks		-0.566
Q7MYREC Criticize Poor Work		
Q17 Emphasize deadlines		

Note. Initial Sample Explains 51% Varianc (n=77)

Holdout Sample Questions	Component 1	Component 2
Q21 Ind Part Understood	0.809	
Q29 Sees staff work Coord	0.807	
Q25 Staff Know what Expected	0.766	
Q1 Attitude Clear	0.738	
Q27 Sees memb work capac	0.733	
Q20 Treat Staff Equals	0.716	
Q4 Little things make Pleasant	0.715	
Q8 Time to Listen	0.708	
Q24 Friendly/Approach	0.68	
Q15 Maintain Perf Stand	0.678	
Q30 Staff approve prior proceed	0.657	
Q12 Look out pers welfare staff	0.65	
Q6 Easy Understand	0.65	
Q26 Staff Ease talk to	0.615	
Q13 Assign Staff Tasks	0.595	
Q23 Staff Follow Stand Rules	0.582	
Q22 Willing make changes	0.578	
Q28 Puts staff sugg operat	0.575	
Q2 Personal Favors	0.566	
Q3 Try new Ideas	0.564	
Q19 Encourage Uniform Proced	0.561	
Q11MYREC Work w/o Plan		
Q9MYREC Speak Manner Not Question		0.706
Q7MYREC Criticize Poor Work		0.69
Q14REC Refuse Exlain Actions		0.629
Q10REC Keeps to self		0.612
Q18MYREC Slow Accept Ideas		0.554
Q5MYREC Rules Iron Hand		0.537
Q16REC Acts w/o consult staff	0.512	0.531
Q17 Emphasize deadlines		

Holdout Sample Explains 47% Variance (n=72)

Table A-2

Five Factor Rotated Component Matrix Using Split Samples

Initial Sample Questions	Component 1	2	3	4	5
Q18MYREC Slow Accept I	0.79				
Q16REC Acts w/o consult	0.79				
Q11MYREC Work w/o Pla	0.76				
Q14REC Refuse Exlain A	0.73				
Q28 Puts staff sugg opera	0.65				
Q30 Staff approve prior pr	0.65				
Q24 Friendly/Approach	0.62	0.54			
Q22 Willing make change	0.62				
Q10REC Keeps to self	0.58	0.51			
Q29 Sees staff work Coor	0.55				
Q21 Ind Part Understood	0.54				
Q4 Little things make Plea		0.78			
Q2 Personal Favors		0.73			
Q12 Look out pers welfare		0.70			
Q20 Treat Staff Equals		0.67			
Q26 Staff Ease talk to		0.63			
Q8 Time to Listen		0.56			
Q6 Easy Understand					
Q15 Maintain Perf Stand			0.76		
Q23 Staff Follow Stand Ru			0.74		
Q25 Staff Know what Exp			0.64		
Q17 Emphasize deadlines			0.63		
Q27 Sees memb work cap			0.54		
Q1 Attitude Clear			0.53		
Q9MYREC Speak Manner				0.81	
Q5MYREC Rules Iron Ha				0.70	
Q13 Assign Staff Tasks				(0.65)	
Q19 Encourage Uniform P					0.82
Q3 Try new Ideas					
Q7MYREC Criticize Poor					

Holdout Sample Questions	Component 1	2	3	4	5
Q1 Attitude Clear	0.73				
Q6 Easy Understand	0.72				
Q4 Little things make Pleasan	0.71				
Q2 Personal Favors	0.64				
Q24 Friendly/Approach	0.62				
Q10REC Keeps to self	0.59		0.57		
Q26 Staff Ease talk to	0.56				
Q8 Time to Listen	0.55				
Q21 Ind Part Understood					
Q3 Try new Ideas		0.76			
Q28 Puts staff sugg operat		0.67			
Q20 Treat Staff Equals		0.67			
Q12 Look out pers welfare st		0.66			
Q22 Willing make changes		0.56			
Q30 Staff approve prior proce					
Q7MYREC Criticize Poor Wo			0.78		
Q14REC Refuse Exlain Actio			0.67		
Q9MYREC Speak Manner N			0.62		
Q18MYREC Slow Accept Ide			0.56		
Q5MYREC Rules Iron Hand			0.52		
Q16REC Acts w/o consult sta			0.52		
Q27 Sees memb work capac				0.70	
Q25 Staff Know what Expect	0.53			0.60	
Q15 Maintain Perf Stand				0.59	
Q17 Emphasize deadlines				0.56	
Q13 Assign Staff Tasks				0.55	
Q29 Sees staff work Coord		0.51		0.54	
Q19 Encourage Uniform Proc					0.79
Q11MYREC Work w/o Plan					0.72
Q23 Staff Follow Stand Rules				0.54	0.56

Note. Initial Sample Explai s 66% Variance (n=77) Holdout Sampl e Explains 63% Variance (n=72)

Tables and Figures

Figure 1
30 Item LBDQ as reported in Kaiser

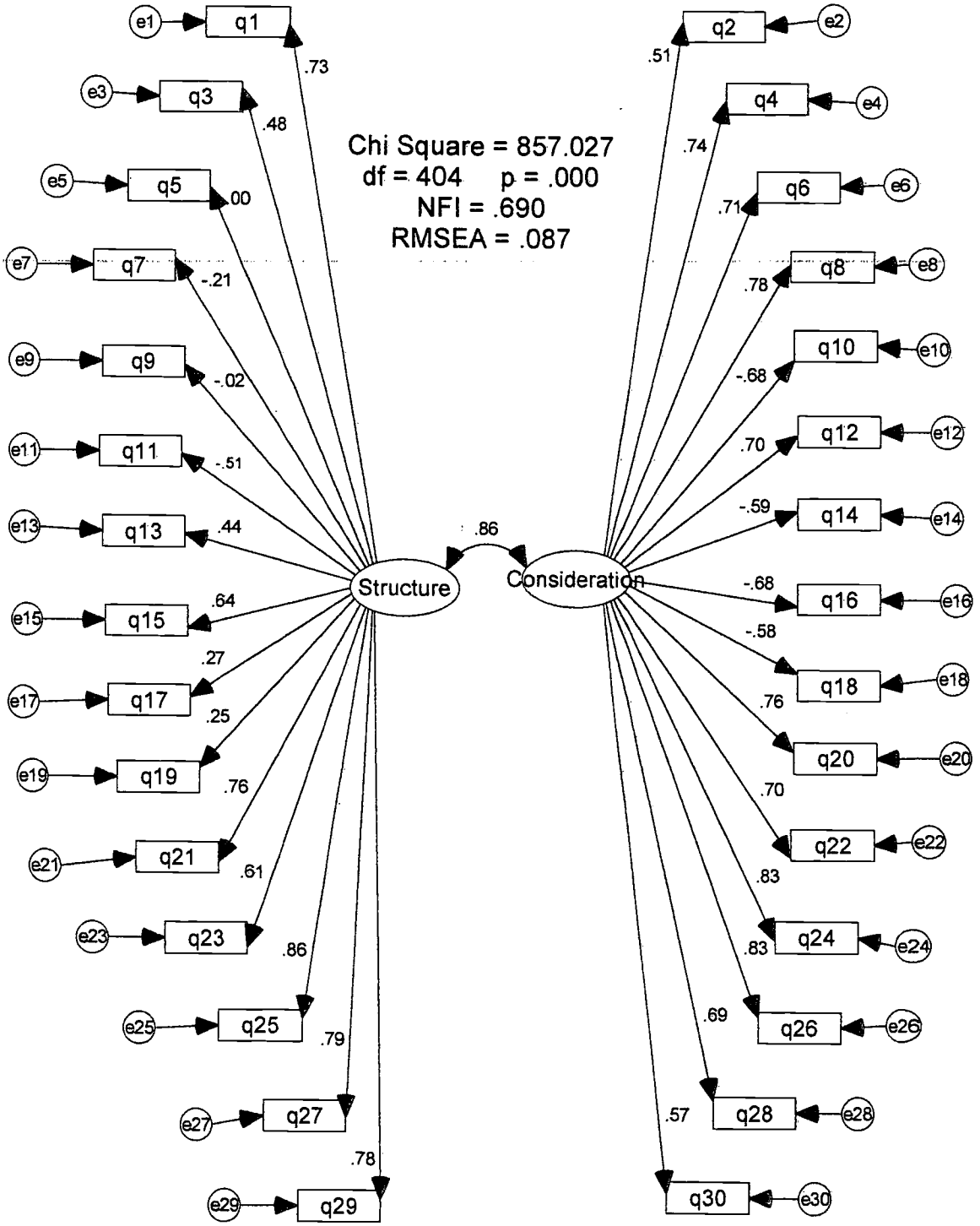

Figure 2
30 Item LBDQ as reported in Kaiser
(quest 5, 7, 9, 11, 10, 14, 16, 18 reverse code)

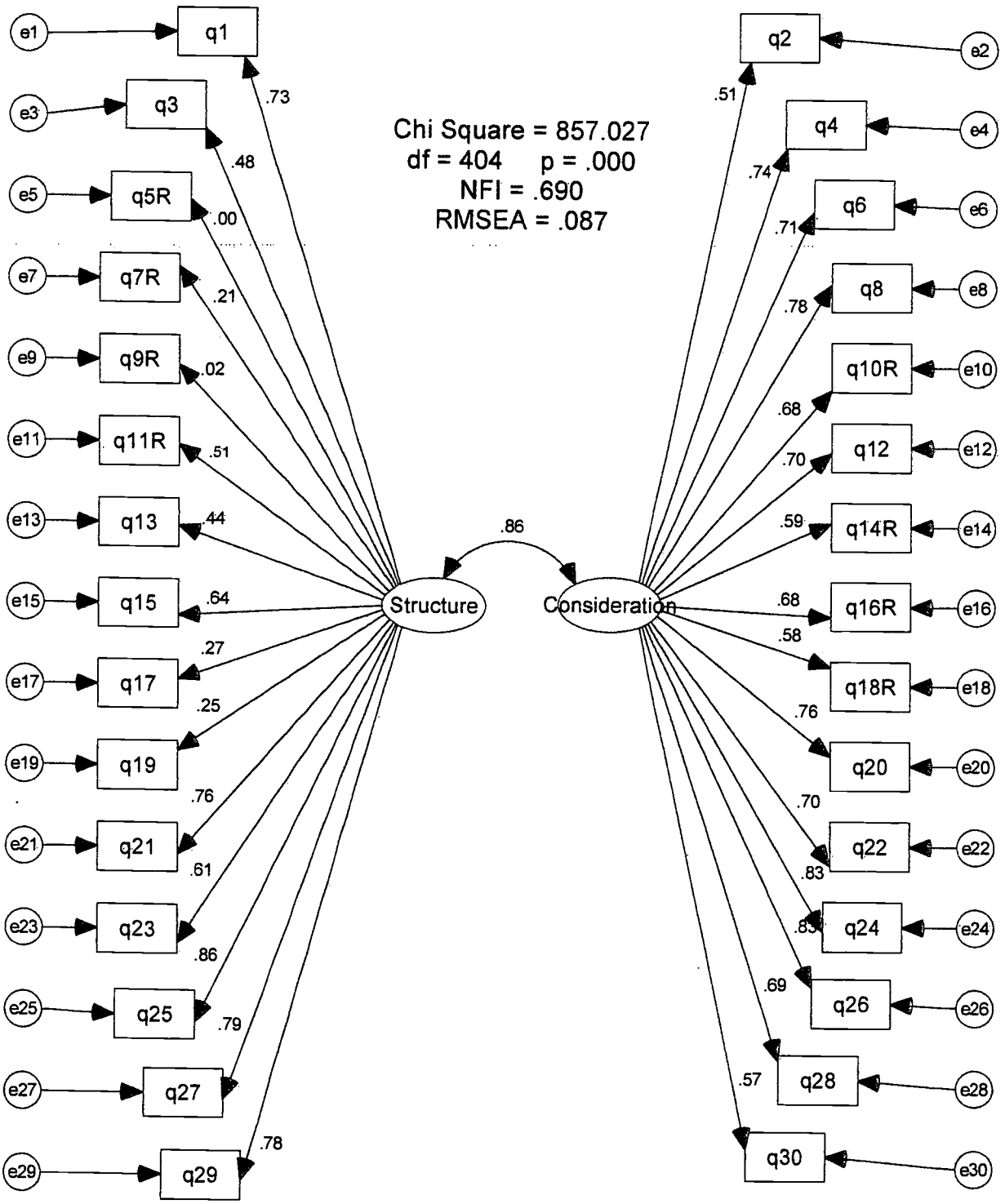

Figure 3
30 Item LBDQ with Questions 5, 7, 9, 10, 11, 14, 16, and 18 Reverse Coded

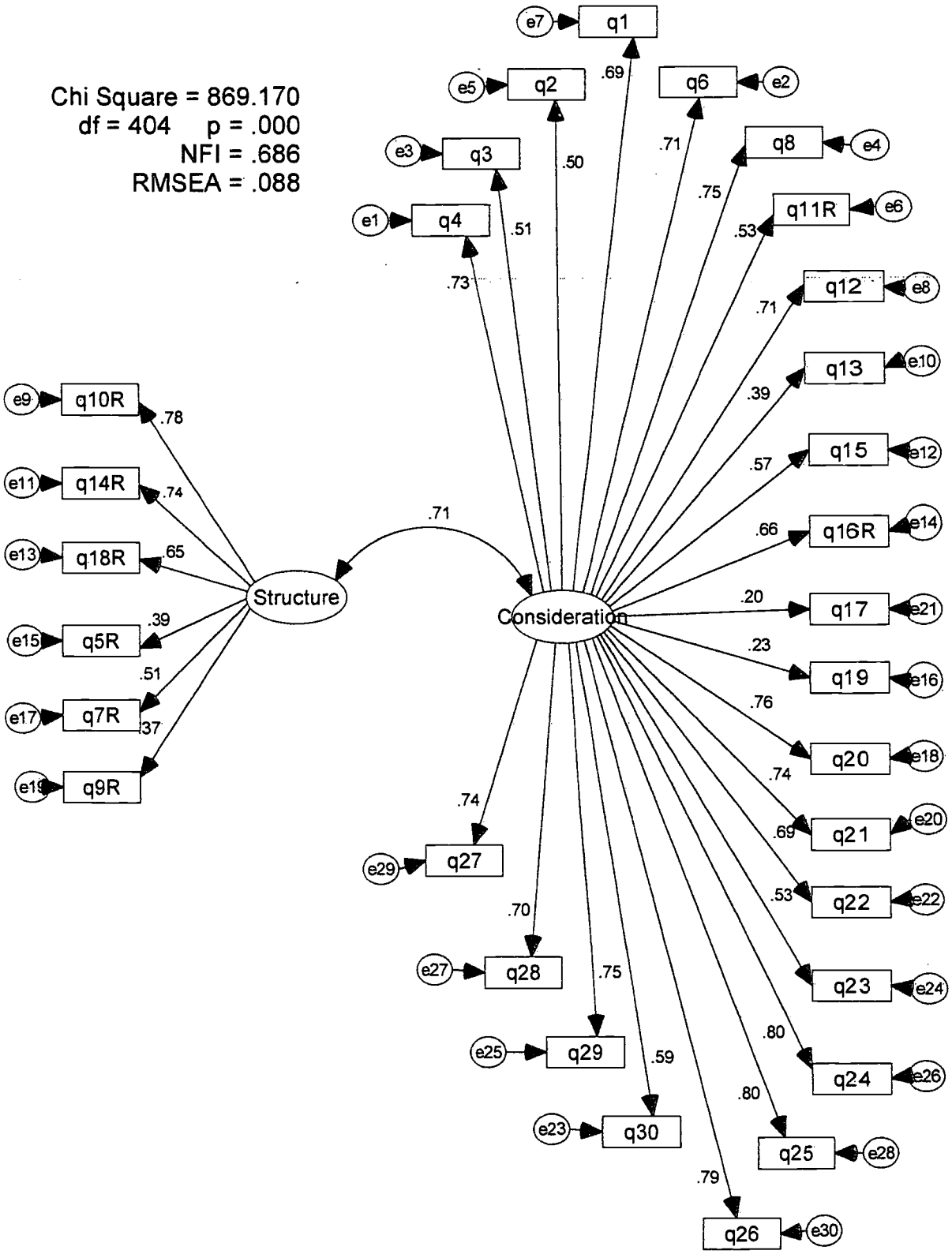

Figure 4
30 Item LBDQ using exploratory factor analysis with 5 Factors
(Varimax Solution)

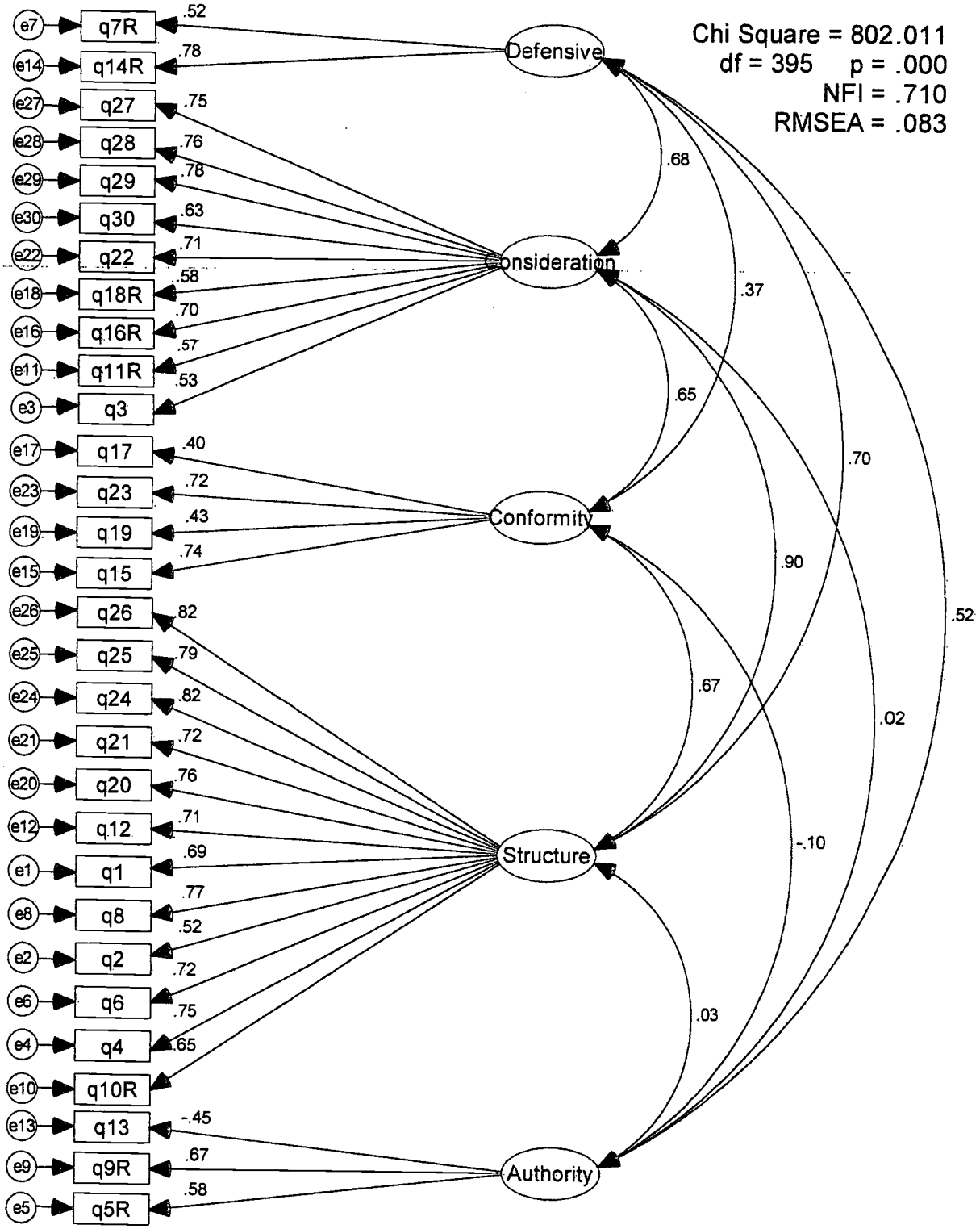

Figure 5
30 Item LBDQ using exploratory factor analysis with 5 Factors
(Promax Solution)

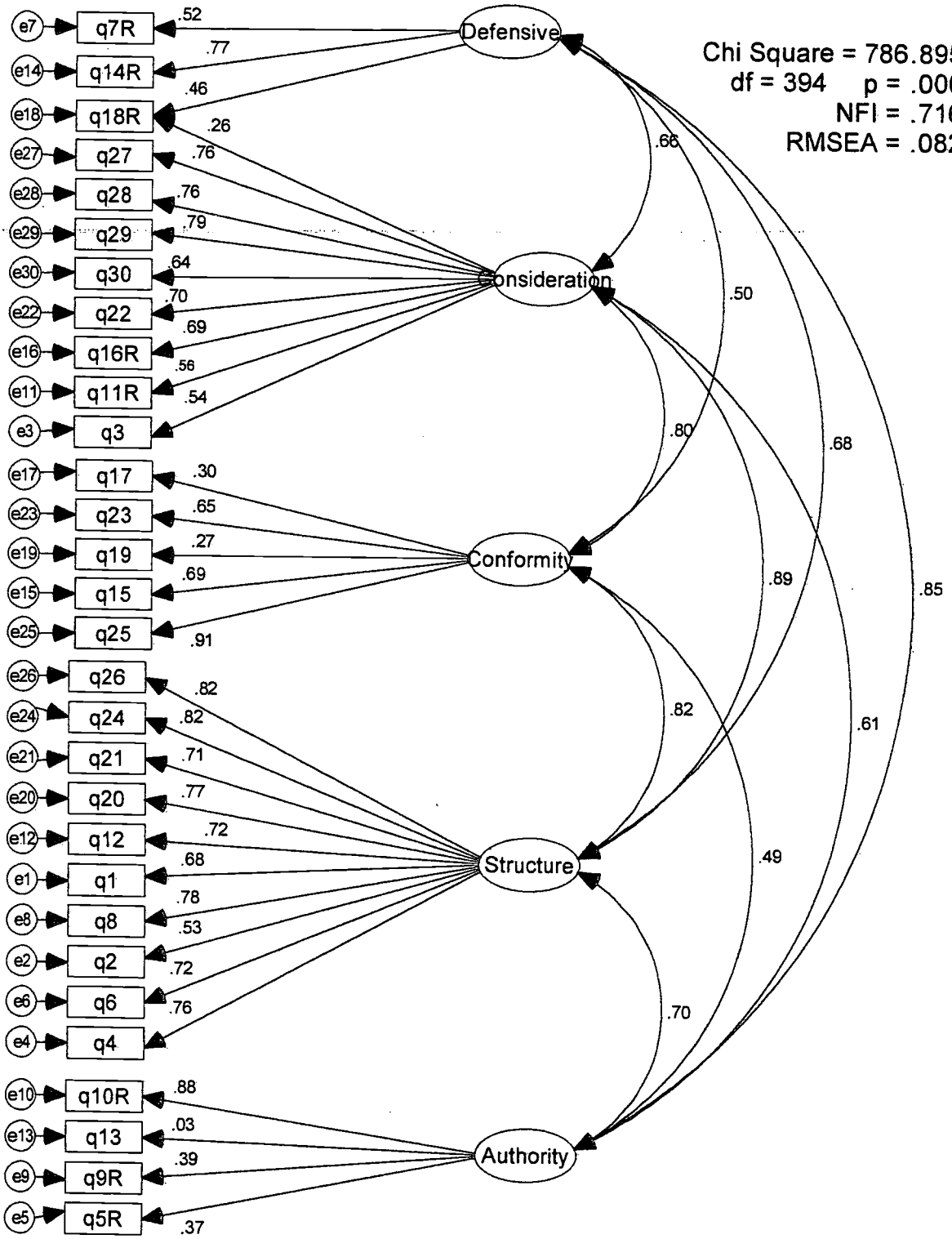

Table 1

Loadings for Two Factor Models of the LBDQ

Question	Varimax Rotation Without Recodes		Varimax Rotation With Recodes		Promax Rotation With Recodes	
	Consideration	Structure	Consideration	Structure	Consideration	Structure
Q25 Staff Know what Expected	0.813		0.813		0.846	
Q21 Ind Part Understood	0.811		0.811		0.888	
Q27 Sees memb work capac	0.782		0.782		0.836	
Q29 Sees staff work Coord	0.77		0.77		0.805	
Q1 Attitude Clear	0.74		0.74		0.795	
Q20 Treat Staff Equals	0.701		0.701		0.677	
Q12 Look out pers welfare staff	0.694		0.694		0.697	
Q6 Easy Understand	0.691		0.691		0.683	
Q24 Friendly/Approach	0.686		0.686		0.627	
Q26 Staff Ease talk to	0.667		0.667		0.595	
Q28 Puts staff sugg operat	0.666		0.666		0.646	
Q4 Little things make Pleasant	0.662		0.662		0.632	
Q8 Time to Listen	0.637		0.637		0.567	
Q15 Maintain Perf Stand	0.627		0.627		0.677	
Q23 Staff Follow Stand Rules	0.605		0.605		0.662	
Q13 Assign Staff Tasks	0.591		0.591		0.75	-0.556
Q30 Staff approve prior proceed	0.584		0.584		0.581	
Q22 Willing make changes	0.579		0.579		0.502	
Q16R Acts w/o Staff Consult	-0.547		0.547		<0.5	
Q3 Try new Ideas	0.525		0.525		0.543	
Q2 Personal Favors	<0.5		<0.5		<0.5	
Q11R Work w/o Plan	<0.5		<0.5		<0.5	
Q17 Emphasize deadlines	<0.5		<0.5		<0.5	
Q19 Encourage Uniform Proced	<0.5		<0.5		<0.5	
Q10R Keeps to self		0.686		0.686		0.649
Q5R Rules Iron Hand		0.662		0.662		0.765
Q9R Speaks not question manner		0.634		0.634		0.731
Q14R Refuse Explain Actions		0.608		0.608		0.571
Q7R Critizes Poor Work		0.586		0.586		0.619
Q18R Slow Accept New		0.583		0.583		0.546

Note. Two factor models explain 48.6% Varia

Table 2

Loadings for the Five Factor Models of the LBDQ

Question	Varimax Rotation					Promax Rotation				
	Structure a=0.93	Consideration a=0.89	Conformity a=0.63	Defensive a=0.58	Authority a=0.57	Structure a=0.92	Consideration a=0.89	Conformity a=0.71	Defensive a=0.58	Authority a=0.38
Q4 Little things make Pleasant	0.792					0.928				
Q2 Personal Favors	0.776					1.08				
Q12 Look out pers welfare staff	0.637					0.626				
Q20 Treat Staff Equals	0.62					0.544				
Q26 Staff Ease talk to	0.619					0.55				
Q6 Easy Understand	0.589					0.565				
Q8 Time to Listen	0.584					0.511				
Q24 Friendly/Approach	0.581					<0.5				
Q1 Attitude Clear	0.575					0.534				
Q21 Ind Part Understood	0.502					<0.5				
Q10R Keeps to self	<0.5									0.514
Q25 Staff Know what Expected	<0.5							<0.5		
Q28 Puts staff sugg operat		0.662					0.72			
Q11R Work w/o Plan		0.659					0.879			
Q30 Staff approve prior proceed		0.65					0.801			
Q29 Sees staff work Coord		0.616					0.611			
Q22 Willing make changes		0.609					0.663			
Q16R Acts w/o consult staff		0.588					0.596			
Q18R Slow Accept Ideas		0.557					0.607		0.504	
Q27 Sees memb work capac		0.537					<0.5			
Q3 Try new Ideas		0.533					0.644			
Q23 Staff Follow Stand Rules			0.703					0.734		
Q19 Encourage Uniform Proced			0.698					0.863		
Q15 Maintain Perf Stand			0.65					0.651		
Q17 Emphasize deadlines			0.596					0.643		
Q7R Criticize Poor Work				0.722					0.92	
Q14R Refuse Exlain Actions				0.515					0.54	
Q9R Speak Manner Not Questio					0.704					0.738
Q5R Rules Iron Hand					0.607					0.621
Q13 Assign Staff Tasks					-0.582					-0.596

Table 3

title

Model	χ^2	df	$\Delta\chi^2_{Kaiser}$	Δdf_{Kaiser}	$\Delta\chi^2_{Varimax}$	$\Delta df_{Varimax}$
Kaiser (1995)	859.03*	404				
Kaiser (1995) With Recodes	859.03*	404	0	0		
2-Factor Research	869.17*	404	10.14*	0		
5-Factor Varimax	802.01*	395	-57.02*	9		
5-Factor Promax	786.90*	394	-73.13*	10	-16.11*	1

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