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MODELING LEADERSHIP DIMENSIONS OF NURSING STUDENTS:

SOME PROBLEMS OF MEASUREMENT

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Abstract: The purpose of this study was to determine if students enrolled in their last quarter of Associate Degree Nursing and Bachelor of Science in Nursing Programs **exhibit** specific patterns of leadership attributes and to determine if values of selected demographic variables account for observed differences in leadership attributes. The Leadership Opinion Questionnaire dimensioned on consideration and structure was used for analyzing leadership style. Validity of the scales was tested with factor analytic techniques. Inter-item consistency and split-half reliabilities were computed for the total questionnaire and for the two **subscales**. Measurement problems with the questionnaire were found. Factor analysis.

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revealed an ill-conditioned matrix and every reliability coefficient, both corrected and uncorrected for anchor points, was negative indicating that estimates of measurement errors in the data exceeded information. Thus the questionnaire, when coded as recommended by **Fleishman**, was unsuitable for measuring leadership opinions of nursing students. Future research focused on detailed description of the measurement properties of the Leadership Opinion Questionnaire with students enrolled in various health occupations programs is recommended.

New graduates of nursing programs leading to registered nursing **licensure** generally will be staff nurses in health care facilities and are likely to face realities of overwork, high patient acuity levels, and inadequate staffing. Furthermore, many new graduates may become subordinate to individuals not having well developed leadership abilities. Thus, ineffective supervisory leadership styles--with respect to dimensions of interpersonal relationships and organizational demands--and pressures from new employment responsibilities, may contribute to stress and burnout. A partial solution to this dilemma may arise from expanding management content within present nursing curricula by emphasizing additional material from interpersonal relationships (consideration) and organizational goal attainment (structure). In short, it is important to teach nursing students to be able to work with people to get things done for the organization. Utilizing appropriate instruments, it also is important to be able to measure attitudes of future nurses as they assume supervisory leadership roles,

Background for the Study

Developing effective leadership styles in nursing students is vitally important for alleviating complications of compounded stress and burnout. Duxbury, Armstrong, Drew, and Henly (1984) utilized the Leadership Opinion Questionnaire (LOQ) as one of three instruments for quantifying relationships among head nurse leadership styles, staff nurse burnout, and job satisfaction. That study was concerned with staff nurses in Neonatal Intensive Care Units. Head nurse structure alone was not found to be related to staff nurse burnout, except when coupled with consideration. A head nurse high in consideration could be high in structure and still operate in a positive fashion. These findings of this study supported the belief that leader structure and consideration affect behavior and attitudes of staff nurses. Leaders of management programs have also found the LOQ to be helpful as an instructional aid by providing trainees some insight into their own patterns of leadership as a feedback mechanism at an early stage in a course (Fleishman, 1969) .

Many nursing programs, the greatest majority at the baccalaureate level, offer a management course during the last quarter prior to the preceptorship. The purpose of including principles of management in undergraduate nursing programs is two fold: (a) to foster the development of leadership styles, and (b) to develop perception of self as a leader; thus, the rationale for investigating leadership attributes of student nurses in this study.

Purpose

Initially, the specific objectives for the study, formulated as research questions were:

1. Do nursing students in Associate Degree Nursing (ADN) and Bachelor of Science in Nursing (BSN) programs exhibit specific patterns of leadership

attributes ?

2. Do values of selected demographic variables account for observed differences in leadership attributes?

From these questions, a background problem arose concerning how best to measure leadership attitudes. With that problem, the purpose shifted to one of solving the measurement problem associated with use of the LOQ with nursing students

Method

Subjects

Terminal students in two nursing programs in demographically similar (adjacent) communities volunteered as subjects. There were 40 university BSN students and 13 junior college ADN students. All students signed consent forms under policy established by the educational institutions involved. Anonymity was protected through use of a numbering scheme. Demographic characteristics of the nursing sample included: (a) both male and female, (b) both married and single, (c) previously and not previously employed with job titles of nursing assistant and registered nurse, (d) age ranging between 21 and 31 years, and (e) grade point averages between 2.30 and 3.90. Only 4 students had a previous college course in either nursing management or leadership.

Instrument

The LOQ was utilized as a method for modeling leadership perceptions in nursing students. It is purported to be a valid measurement scale used for analyzing leadership style and dimensioned on structure and consideration (Fleishman and Harris, cited in Duxbury, et al., 1984). Both dimensions are relevant to managerial effectiveness. Consideration was defined as the ability to maintain mutual trust, respect, warmth, and introspect into the feelings of

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subordinates. An individual with a high score on the consideration scale was presumed able to establish communication and rapport with subordinates. On the other hand, a low score was believed to indicate an impersonal manager within group settings. Structures was defined by **Fleishman** (1969) as the extent by which individuals design and define their roles and the roles of those around them. The primary drive in the structure mode was proposed to be goal attainment for organizational purposes.

DeJulio, Larsen, **Dever**, and **Paulman** (1981) suggested use of ". . . the LOQ . . . where feedback concerning personal attitudes toward leadership may be of particular benefit to persons entering into occupations requiring managerial and leadership role functions." Prospective nurses would seem to require managerial and leadership skills; therefore, it was natural to select the LOQ as an appropriate instrument for this situation.

Student responses on selected items as recommended by **Fleishman** were recoded for scaling into the two **Fleishman** scales: structure and consideration. The validity of those scales for the nursing students in this sample was tested with factor analytic techniques. Inter-item consistency and split-half (odd-even) reliabilities were computed for all 40 items and for the consideration and structure **subscales**.

Had the tests materialized as expected, additional descriptive data would have been calculated for characterizing leadership attributes of nursing students. It was intended to profile students in the sample by breakdowns on selected demographic characteristics. However, measurement problems with the LOQ interfered with pursuing that goal.

Results and Discussion

The first problem occurred in defining constructs to establish construct

validity of the **LOQ subscales** for nursing students, Scaled according to **Felishman's** algorithm, the 40 items generated an ill-conditioned matrix for factor extraction using the SPSSX Factor Analysis Sub-Program. To determine the source(s) of singularity in **the** correlation matrix, 40 Regression analyses (by LOQ items) were performed producing R^2 's ranging between .66 and .98, with 17 higher than .90. The regressions involved, in turn, each LOQ item as a dependent variable regressed on the remaining 39 LOQ items.

Factor analysis was repeated deleting the variable with the largest R^2 , and again produced an ill-conditioned matrix due to a determinant **of** zero. In a second factor analysis a second LOQ item (with the second largest R^2) was deleted with similar results. This process was continued until 12 LOQ items with the largest R^2 's were deleted from the factor analytic models. Each of the 12 reduced matrices was ill-conditioned. It was obvious after 12 attempts (still with R^2 's greater than .93) that the LOQ was not functioning as expected with this sample and would **not** produce results comparable with other studies.

The inquiry shifted to an examination of reliabilities. **Fleishman's** LOQ, test-retest, and split-half (odd-even), reliability estimates for the standardizing sample of first line supervisors and Air Force **NCO's** ranged between .70 and .89 for the Consideration Scale and .67 and .88 for the Structure Scale (**Fleishman**, 1969). Present estimates computed for nursing students are reported in Table 1. Every reliability coefficient, uncorrected for anchor points (Wirier, 1971, p. 289) or corrected for anchor points, was a negative coefficient--a condition indicating that noise in the nursing **student's** data exceeds information.

The LOQ in this application was an unsuitable measure of opinions about leadership. The first line of inquiry about an instrument should focus on the

instruments reliability, for, if the instrument is unreliable, no additional inquiry should be taken.

Under acceptable conditions, the reliability of an instrument will be a number close to 1.0. Were the reliability exactly 1.0 the instrument would be providing 100% information and no noise (error). Were the reliability 0.0, the instrument would be providing no information and all noise. The reader should understand that in this context, noise implies random or chance responses to the questionnaire items.

Table 1

Reliability Data for Nursing Students on the
Leadership Opinion Questionnaire

Measures	Bet Peo MS	Within MS	Bet Mess MS	Resid MS	Reliability Uncorr	Reliability Corr
40 Items Total	1.2001	1.7441	12.6717	1.5340	-.4504	-.277'3
20 Items Struct	1.3939	1.7929	12.8705	1.5799	-.2862	-.1334
20 Items Conaider	0.9276	1.7285	13.0961	1.5098	-.8634	-.6276
Odd-Even Total	24.0018	76.9245	570.9057	67.4249	-2.2049	-1.8092
Odd-Even Struct	13.9394	19.6887	68.1604	18.7565	-.4124	-.3456
Odd-Even Consider	9.2765	26.9906	244.5377	22.8070	-1.9096	-1.4586

¹Reliabilities are both uncorrected, and corrected, for anchor points.

By the mathematical nature of the reliability calculations it can be shown

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for these data that the LOQ reflects dominantly noise. Not a single computed reliability exceeded 0.0, the point at which essentially no information is generated and noise predominates. But, the equation provides for computing in the numerator the amount by which information exceeds noise: mean square between people minus mean square within people, if uncorrected for anchor points; or, mean square between people minus mean square residuals, if corrected for anchor points. Both the mean square within people and the mean square residuals are estimates of error; one chooses between the two on the basis of differences observed between **the anchor** points. If anchor points are not significant, the best reliability is the uncorrected for anchor points value; if anchor points are significant, the best reliability is the corrected value.

The conceptual identity of the anchor points changes with the reliability situation. Anchor points are the items in the inter-item consistency calculations; anchor points are the odd and even totals in the split-halves reliability calculations.

Even though the LOQ has been empirically validated with managerial and supervisory personnel in a variety of environments such as industrial, business, and hospital (**Fleishman**, 1973; Kerr, Schriesheim, Murphy, **Stogdill**, 1974; Korman, 1966; **Schriesheim** & Kerr, 1974, 1977), few published reports exist concerning its validation for student-leader populations. Nevertheless, **Fleishman's** LOQ manual presents college norms.

Two studies by **Capelle** and **Florestano** cited in **Duxbury et al.** , 1984) were concerned with performance on the LOQ of student leaders and non-leaders from "Who's Who Among Students in American Colleges" and Omicron Delta Kappa (an honorary male leadership fraternity). **Capelle** found significant

differences between male college leaders and non-leaders on both the consideration and structure scales. On the other hand, **Florestano** reported the structure scale differentiated former college leaders from non-leaders, but the consideration scale did not differentiate. Although both studies suggested that the LOQ showed promise for possible use with male college students, reliabilities of the LOQ with the research samples were not reported.

DeJulio, et al., (1984) analyzed **concurrent validity data concerning the use of the LOQ with male and female, college level, student leaders and non-leaders**. Of particular interest to them was whether the LOQ was sensitive to the more usual kinds of leadership observed on a university campus, such as leadership in resident advising, student government, dormitory **council**, and sorority and fraternity office. They stated that discrimination between such university student leaders and an unselected group of university students would greatly enhance the potential use of the LOQ in selecting paraprofessional student counselors. The results revealed that consideration was as influential as structure for distinguishing among the leader, non-leader groups. Accordingly, the LOQ was claimed to measure general leadership capacity in contexts other than business and industry. But, reliability data were not reported for use of the LOQ with the student groups.

Conclusions and Recommendations

Reports on the use of the LOQ for study of leadership styles of student nurses are limited. Nevertheless, the LOQ was used in the present study in an attempt to measure structure and consideration dimensions of leadership style of student nurses in their closing quarter of BSN and ADN Programs. This application was based on reports of successful use of the instrument in a variety of different organizational contexts: business, industry, educational

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(leadership), hospital, nursing, research and development, military and governmental. There are also reports of successful use with female groups at the college level (Adams & Hicks, 1978; DeJulio, et al., 1981).

Even though the LOQ has been applied to a number of research situations, the literature leaves open the possibility that there were problems with its application in some studies. Without explanation some researchers either modified (Duxbury, et al. , 1984) **the** items or used only a sample of the items on the two scales (Tucker, 1983) . Some authors (Baker, 1975; DeJulio, et al., 1981) did not report internal consistency reliabilities for the LOQ determined for their samples, perhaps because they assumed that the **Fleishman** reliabilities generalized to the populations studied, or because **the** reliabilities determined for the focal groups were so different from those reported by **Fleishman**. On the other hand, many researchers reported assumed appropriateness of the LOQ because of its **purported self-report format, its ability to discriminate between two leadership dimensions (consideration and structure) , its** acceptable **Fleishman** normalized reliabilities and validities, and its extensive application to normative data (Stun, Homer, & Boal, 1981). Analyses of student nurse data in the present study do not support application of the LOQ to that population. Although **Fleishman's** algorithms for scaling and aggregating item data were followed precisely, singularity of the correlation matrix prevented meaningful validation of the LOQ for measuring leadership attitudes of nursing students. Reliability analyses produced negative values for every computed reliability suggesting the LOQ to be an unsuitable measure of opinions about leadership for this nursing student sample.

Some previous research conducted by other authors who claim **the** LOQ to have potential for broad application in assessment and description of college

student leaders failed to substantiate its application with reliability and validity analysis for the populations studied. Some studies have demonstrated absence of sex bias with the LOQ, others have shown it discriminates between leaders and non-leaders, and still other studies have provided some evidence of its potential use in leader selection, placement or training of students. Thus, future investigations should be continued, but there is a need to examine reliability and validity properties of the instrument thoroughly for the groups measured.

It should not be inferred that the LOQ should not be used for measuring leadership attributes of **student** nurses. Rather, when used, one of the first analyses to be undertaken should be a reliability analysis. If reliability is acceptable, a determination of validity should follow. If both analyses are acceptable, the researcher should proceed with research plans involving the LOQ. If one or both analyses should be unacceptable, the researcher might consider beginning at the beginning, as are the present authors' plans with the present data. That means, beginning with a complete reevaluation of scaling and factor structure; perhaps even providing for a 3- or 4-factor solution.

Finally, **no** claim is being made that the LOQ would not facilitate professional growth and development of student nurses. Nor should research efforts based on the instrument be discontinued. Rather, research efforts should be continued with other student nurse groups and other student populations at secondary, postsecondary, and collegiate levels. If the measurement problems found in the present study are solved, feedback from LOQ could be utilized to assess student leadership behavior and as a training tool to assist and facilitate professional growth and development of emerging health occupations student leaders. If applied in this manner, group discussion on a

range of issues germane to successful leadership might be promoted.

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