DOCUMENT RESUME

ED 255 840 CG 018 172

AUTHOR	Skelton, J. A.
TITLE	Dormitory Social Climate and Student Health: A Structural Approach.
SPONS AGENCY	Dickinson Coll., Carlisle, Pa.
PUB DATE	Aug 84
NOTE	9p.; Paper presented at the Annual Convention of the American Psychological Association (92nd, Toronto, Ontario, Canada, August 24-28, 1984).
PUB TYPE	Reports - Research/Technical (143) -- Speeches/Conference Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Attribution Theory; *College Students; Dormitories; Group Experience; Higher Education; *Individual Power; Influences; Models; Perception; *Physical Health; *Self Evaluation (Individuals); *Social Support Groups
IDENTIFIERS	*Academic Pressure; *Dormitory Size

ABSTRACT

Although it is commonly held that environmental, social, and psychological factors influence health, specific causal models of these influences are rarely tested directly. Methods of structural analysis were applied to the problem of the relationships among variables thought to influence the health status of college students. Data were collected from 365 students on personal characteristics, physical features of their college residences, the perceived social climate of the residences, psychological distress, and health status. Canonical correlation analyses reduced the data to five indicators representing four factors: dormitory size, the degree of perceived influence and social support in the dormitory, and reports of academic pressure and physical symptoms. Four sets of structured equations, representing alternative causal models of the interrelationships among those variables, were tested for goodness-of-fit to the observed data. The first three models were based on the assumption of unidirectional causation. The best-fitting model was Model 4 which included a direct link from perceived influence to physical symptoms and an added reciprocal causal link between psychological distress and physical symptoms. Conclusions drawn about the relationships among the variables examined in Model 4 emphasized the important role played by perceptions of personal control in self-evaluations of health status. (Author/NRB)

DORMITORY SOCIAL CLIMATE AND STUDENT HEALTH:

A STRUCTURAL APPROACH

J. A. Skelton
Department of Psychology
Dickinson College
Carlisle, PA 17013

Presented at the 92nd Annual Convention of the
American Psychological Association
Toronto, Ontario, Canada
August 1984

The research reported here was supported by grants from the Dickinson College Faculty Committee on Research and Development. I should like to thank Janet Nathenson and Ruth Posnak for their assistance in data collection, Melinda Skelton for coding and data entry, Mary Powell, R. N., for permission to obtain College health records, and Pam Holley-Wilcox for valuable last-minute help with the data analyses.

ABSTRACT

Although it is commonly held that environmental, social, and psychological factors influence health, specific causal models of these influences are rarely tested directly. Data were collected from over 350 college students on personal characteristics, physical features of their college residences, the perceived social climate of the residences, psychological distress, and health status. Canonical correlation analyses reduced the data to five indicators representing four factors: Dormitory size, the degree of perceived influence and social support in the dormitory, and reports of academic pressure and physical symptoms. Four sets of structural equations, representing alternative causal models of the interrelationships among these variables, were tested for goodness-of-fit to the observed data. The best-fitting of the four included a direct link from perceived influence to physical symptoms and a reciprocal causal link between psychological distress and physical symptoms.

DORMITORY SOCIAL CLIMATE AND STUDENT HEALTH:
A STRUCTURAL APPROACH

J. A. Skelton
Department of Psychology
Dickinson College

It is by now a truism that variability in health status is at least as much influenced by psychological, social, and environmental factors as by pathogens. But truisms do little to illuminate models of these influences. Without testable causal models, it is difficult to know where to target health-promotive interventions. For example, it is of more than theoretical interest to know whether the physical environment has influences on health which are independent of people's perceptions of that environment, or instead, whether these effects are entirely mediated by psychosocial reactions to the environment. If the latter, then health promotions aimed solely at altering features of the physical environment cannot be expected to be successful, inasmuch as such interventions attack the problem at an inappropriate level.

Moos (e.g., 1979) has long advocated a systems or structural approach to understanding the interrelationships among environmental, social, and psychological factors, and their impact on health. He has proposed that features of the physical environment and the persons populating that environment jointly determine its social climate. Social climate, in turn, has been found to be related to a variety of psychological and health status variables (for a review, see Moos, 1979). For example, Moos and Van Dort (1979) found that the social climate of college dormitories was reliably related to students' reports of physical symptoms.

It is worth noting that, although Moos's theoretical framework is structural, the analytic methods used to test the framework are not. Instead, support for the structural model has been inferred from studies in which perhaps two factors of the structural model were observed. Moreover, the statistical methods used to test indicators of each factor are at risk of capitalizing on chance relationships. For example, in the study of social climate and health (Moos & Van Dort, 1979), a symptom risk scale was developed by examining dozens of simple, bivariate correlations among individual items of the University Residence Environment Scale (URES: Moos & Gerst, 1974) and a measure of the total number of physical symptoms reported by college dormitory residents. Clearly, an analytic approach using more refined methods is in order.

The present study represents an effort to apply methods of structural analysis to the problem of the relationships among variables thought to influence the health status of college students. Data were collected from over 350 students at a small liberal arts residential college in three cross-sectional waves during a three-semester period. The information obtained from students included demographic characteristics (sex, age, class year), physical features of their dormitories (total population, occupancy ratio, sex composition, number of roommates), ratings of dormitory social climate, self-reports of psychological distress (feelings of lack of support, dislike for college, academic pressure, shyness), and reports of health status (physical symptoms, medication usage, and health behavior). The data were then reduced via canonical correlation methods for use in structural equation analyses.

As a first step in developing structural models of the relationships among the reduced variable set, it was assumed that students' personal characteristics and physical features of dormitories are both temporally and logically prior to social climate, psychological distress, and health status, so the former were considered exogenous variables. In accordance with Moos's (1979) framework, social climate was considered a mediating endogenous variable which, in turn, affects psychological and health reactions. Preliminary data reduction suggested that only a few of the measures obtained of each theoretical factor were related, so model testing focused on the reduced variable set. Given the reduced data set, four structural models were tested. In Models 1 through 3, it was assumed that all causal links are unidirectional. The major differences among the models were (1)whether a direct link was posited between the measures of social climate (Model 1), or instead whether the direct link could be omitted (Models 2 and 3), and (2)whether the causal influence of physical features of dormitories was entirely mediated by social climate (Models 1 and 2), or instead whether physical features had a direct causal impact on psychological distress (Model 3). In Model 4, a reciprocal causal link was proposed between psychological distress and health status. Diagrams of each model are shown in Figure 1.

METHOD

Subjects

The subjects were 406 students at a small (Enrollment=1800), residential liberal arts college. They participated in three cross-sectional waves during the Spring 1982 (N=203), Fall 1982 (N=103), and Spring 1983 (N=100) semesters. Thirty-five students in the Spring 1982 wave also served in a retesting session about two months after their initial participation. About 50% of the participants were obtained through mail solicitations from a randomly-generated list of students. The remainder participated for course credit. Multivariate analyses of the three waves and two methods of subject recruitment revealed no significant differences among groups, so the data were collapsed for further analyses. Complete data for the variables analyzed in the present paper were obtained from 365 of the participants.

Instruments

1. Social Climate Measures -- Participants completed the 100-item University Residence Environment Scale (URES: Moos & Gerst, 1974). URES is scored into 10 subscales representing different dimensions of perceived social climate, including Support, Influence, Competition, Academic Achievement, etc. Subscale scores may range from 0 to 10. The Influence and Support subscales employed in the present analyses had two-month test-retest reliabilities of .49 and .74, respectively.

2. Psychological Distress Measures -- Participants rated 25 agree-disagree statements, developed specifically for this study, on five-point Likert scales. Factor analyses revealed the items tapped four dimensions of psychological distress; these dimensions were labeled Academic Pressure (e.g., "I have trouble handling the academic pressure here"), Social Support

(e.g., "I can rely on my friends here"), Dislike College (e.g., "I feel that college is worthless"), and Shyness (e.g., "I feel shy and self-conscious around others"). The three-item Academic Pressure scale, which is used in the analyses reported here, had an internal consistency coefficient (Cronbach alpha) of .77 and a two-month test-retest reliability coefficient of .66.

3. Health Status Measures -- Subjects completed the Pennebaker Inventory of Limbic Languidness (PILL: Pennebaker & Skelton, 1978), a 54-item self-report of common physical symptoms. They also completed self-reports of the number of prescription and nonprescription medications used and of the number of health related behaviors undertaken (e.g., "Went to Student Health Service"; "Missed class because of illness"). All health status measures were scored for frequencies of occurrence of one month or greater. PILL, which is used in the analyses reported here, has an internal consistency coefficient of .91, a two-week test-retest reliability of .77 (Skelton, 1980) and a two-month test-retest reliability of .59.

4. Demographic Measures -- Subjects reported their sex, class year, and residence on the URES cover sheet. They reported the number of roommates living with them in their dormitory on another sheet.

5. Physical Features of Dormitories -- Data on the total population, occupancy rate, and sex composition of each dormitory represented in the sample were obtained from the Campus Housing Office.

Data Reduction

Data were reduced for analysis in the following series of steps:

1. Variables having low test-retest reliabilities (e.g., ratings of the quality of personal relationships with roommates) were excluded.

2. Variables having no compelling theoretical relationship with Health Status (e.g., several URES subscales, the Dislike College and Shyness scales from the psychological distress items) were excluded.

3. The remaining variables were grouped into five non-overlapping sets representing Personal Characteristics, Physical Environment of Dormitories, Social Climate, Psychological Distress, and Health Status.

4. A series of canonical correlation analyses were performed among various pairings of the five sets. The variables chosen for the final analyses were those having high canonical variate loadings. At this stage, the Social Support scale derived from the psychological distress items was excluded because it loaded on a single canonical variate which was vitually isomorphic with the canonical variate for the URES Support subscale. Also at this stage, the entire Personal Characteristics set was excluded because (a)class year was isomorphic with dormitory population (i.e., older students live in smaller dormitories), and (b)sex was nearly isomorphic with sex composition (i.e., most female students live in dormitories with other women); thus, the Personal Characteristics set was largely redundant with the Physical Environment set.

5. The correlation matrix of the remaining variables was examined. Of the three variables in the Physical Environment set, only Dorm Size (total population of the dormitory) was related to the endogenous variables, so sex composition and occupancy ratio were dropped. Finally, only two Social Climate scales (Influence and Support), the Academic Pressure scale, and PILL (total physical symptom) scores were included for structural analysis. Two reasons dictated this choice. The first was practical: We wished to avoid imposing a latent variable measurement model on the endogenous variables. The second was theoretical: URES Influence may be viewed as a measure

of perceived control, a factor which has been consistently found to be related to symptom reporting (e.g., Pennebaker, Burnam, Schaeffer, & Harper, 1977); likewise, URES Support represents social support, another factor of recurring interest in the psychology of health (e.g., Suls, 1982). Moreover, Academic Pressure and Symptoms were moderately correlated ($r=.36$) and afforded an opportunity to test a reciprocal causal model.

RESULTS

The five-variable system, with Dorm Size as the exogenous variable, URES Influence and Support scores as mediating endogenous variables, and Academic Pressure and Symptom scores as outcome endogenous variables, was analyzed with the LISREL V program (Joreskog & Sorbom, 1981). As noted earlier (p. 2), four models were tested, with the first three based on the assumption of unidirectional causation (i.e., lower triangular Beta matrix). In all models, it was assumed that errors of measurement for the endogenous variables were correlated and that the exogenous variable, Dorm Size, was measured without error. Specifications for each structural system are shown below in equation form, and in diagrammatic form in Figure 1.

Model 1

Model 1 specified direct causal links from Dorm Size to URES Influence and Support, but no direct causal links from Dorm Size to Academic Pressure or Symptoms. This model also specified direct causal links from Influence to Support, from Influence to Symptoms, from Support to Academic Pressure, and from Pressure to Symptoms. Thus,

$$\begin{aligned}
\text{INFLUENCE} &= (\text{Gamma}_{11} \times \text{DORM SIZE}) + \text{error} \\
\text{SUPPORT} &= (\text{Gamma}_{21} \times \text{DORM SIZE}) + (\text{Beta}_{21} \times \text{INFLUENCE}) + \text{error} \\
\text{PRESSURE} &= (\text{Beta}_{32} \times \text{SUPPORT}) + \text{error} \\
\text{SYMPTOMS} &= (\text{Beta}_{41} \times \text{INFLUENCE}) + (\text{Beta}_{43} \times \text{PRESSURE}) + \text{error}
\end{aligned}$$

Model 2

Model 2 was similar to Model 1, except it eliminated the direct causal link from Influence to Support. Thus, the equations for Model 2 were the same for Model 1, except:

$$\text{SUPPORT} = (\text{Beta}_{21} \times \text{INFLUENCE}) + \text{error}$$

Model 3

Model 3 added a direct causal link from Dorm Size to Academic Pressure to the equations of Model 2. The equation for PRESSURE was, therefore:

$$\text{PRESSURE} = (\text{Gamma}_{31} \times \text{DORM SIZE}) + (\text{Beta}_{32} \times \text{SUPPORT}) + \text{error}$$

Model 4

Model 4 retained all the linkages of Model 3 and added a reciprocal link between Academic Pressure and Symptoms. The resulting equations were:

$$\begin{aligned}
\text{PRESSURE} = {} & (\text{Gamma}_{31} \times \text{DORM SIZE}) + (\text{Beta}_{32} \times \text{SUPPORT}) \\
& + (\text{Beta}_{34} \times \text{SYMPTOMS}) + \text{error}
\end{aligned}$$

Evaluation of the Models

Summary goodness-of-fit statistics for the four models are shown in Figure 1. If we consider only the Chi-Square statistics, Model 1 is to be preferred. However, the small number of degrees of freedom for all models, the values of the adjusted goodness-of-fit index (AGFI) and total coefficient of determination, and inspection of the strikingly nonlinear normalized residuals for Model 1 suggest that its fit to the observed data may be more apparent than real. As we inspect the results for each model, we observe small changes in Chi-Square values but large improvements in the AGFI (especially from Model 1 to Model 2 and from Model 2 to Model 3). Normalized residuals also become more linear as we progress through the models. Finally, we observe a change in the total variance accounted-for of nearly 5% as we move from Model 3 to Model 4, suggesting that the latter may offer the better solution. It should be noted, however, that in Models 2 through 4, we have probably committed a specification error by omitting the Influence - Support link.

The standardized parameter estimates for the equations of Model 4 are:

INFLUENCE=(-.450 x DORM SIZE) + .797
SUPPORT =(-.148 x DORM SIZE) + .978
PRESSURE =(0.043 x DORM SIZE) + (-.214 x SUPPORT) +(.144 x SYMPTOMS) + .868
SYMPTOMS =(-.168 x INFLUENCE) + (.214 x PRESSURE) + .866

DISCUSSION

We may draw the following conclusions about the relationships among the variables examined in Model 4. First, larger dormitories are associated with a decline in perceived influence over dormitory life and social support among residents. Many environmental psychologists (e.g., Baum & Valins, 1977) have observed that residents of larger dormitories, especially corridor-style dormitories, experience less control over their interactions with others and evolve fewer informal social relationships. It is interesting to note that, in the present sample of students, virtually all of the large dormitories on the campus are of the corridor style. Second, whereas dormitory size has a small direct effect on self-ratings of academic pressure (students perhaps feel greater interference with efforts to study in larger dorms), the primary influence of dorm size is mediated through a felt lack of support among co-residents. Study groups which might ameliorate feelings of pressure may be less likely to evolve in the larger residences, leading students to feel little support from their peers. Third, physical symptoms are both a cause and an effect of academic pressure. If a student reports high symptom frequencies, it is reasonable to expect that symptomatic experiences are interfering with his or her studies, thereby promoting feelings of academic pressure. But also note that the pressure-to-symptom link is stronger than the symptom-to-pressure link, suggesting that feelings of academic pressure may represent a loss of control experience for many students. Finally, a social climate characterized by a perceived lack of personal influence is also predictive of symptom-reporting, again underscoring the important role played by perceptions of personal control in self-evaluations of health status. In short, all the relationships identified by the structural model are consistent with existing theoretical models in environmental, social, and health psychology.

More generally, all four structural models provide support for Moos's (1979) conceptual framework. We see that the physical environment affects the perceived social climate of dormitories, which in turn affects psychological reactions and health. Note also the magnitudes of the standardized estimates: If it is hypothesized that Dorm Size is a more distal influence upon psychological reactions than is social climate, and that social climate is more distal to health than are psychological reactions, then we would expect coefficients for more proximal influences to be greater than those associated with more dital influences -- an expectation which is confirmed in the equations for Academic Pressure and Symptoms. Thus, we can feel greater confidence in classes of models which postulate an ordering of effects from the environmental level to the social to the individual, as do Models 1 through 4.

The models examined in the present analyses have been quite simple ones. Indeed, the variables examined here were chosen precisely because they were, on the basis of existing research, highly likely to fit the proposed models. The next step in the analysis of these data must be to investigate multiple-indicator, latent variable models of the environmental, social, psychological, and health factors represented here by only single measures. It is only by testing increasingly complex causal models that we may gain greater insight into the relationships among the factors implicated in student health and thereby gain the knowledge needed to permit effective promotive interventions.

REFERENCES

Baum, A. & Valins, S. 1977. Architecture and Social Behavior. Hillsdale, NJ: Lawrence Erlbaum Associates.

Joreskog, K. & Sorbom, D. 1981. LISREL V User's Guide. Chicago: National Educational Resources.

Moos, R. H. 1979. Evaluating Educational Environments. San Francisco: Jossey-Bass.

Moos, R. H. & Gerst, M. 1974. The University Residence Environment Scale Manual. Palo Alto, CA: Consulting Psychologists Press.

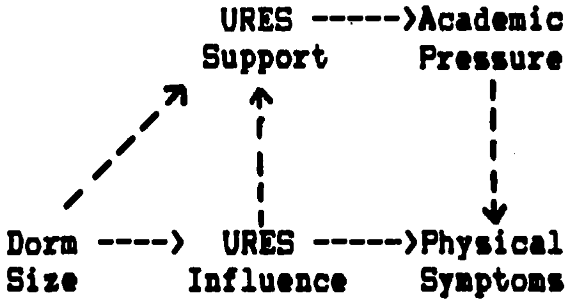
Moos, R. H. & Van Dort, B. 1979. Student physical symptoms and the social climate of college living groups. American Journal of Community Psychology, 7, 31-43.

Pennebaker, J. W., Burnam, M. A., Schaeffer, M. A., & Harper, D. 1977. Lack of control as a determinant of perceived physical symptoms. Journal of Personality and Social Psychology, 35, 167-174.

Pennebaker, J. W. & Skelton, J. A. 1978. Psychological parameters of physical symptoms. Personality and Social Psychology Bulletin, 4, 524-530.

Skelton, J. A. 1980. Symptomatic experience and judgements of the health-relevance of verbal stimuli. Presented at the annual convention of the American Psychological Association, Montreal.

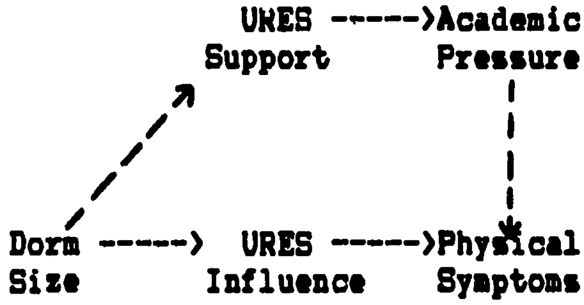
Suls, J. 1982. Social support, interpersonal relations, and health: Benefits and liabilities. In G. Sanders & J. Suls (Eds.), Social Psychology of Health and Illness. Hillsdale, NJ: Lawrence Erlbaum Associates.



Goodness-of-Fit Statistics

Chi-Square(4)=1.86, p>.50
Goodness-of-Fit Index=.315
Coeff. of Determination=.207

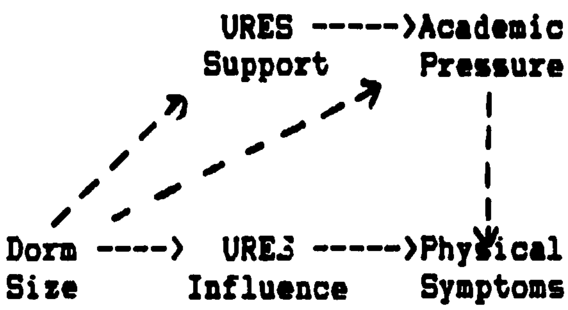
FIGURE 1A: Model 1



Goodness-of-Fit Statistics

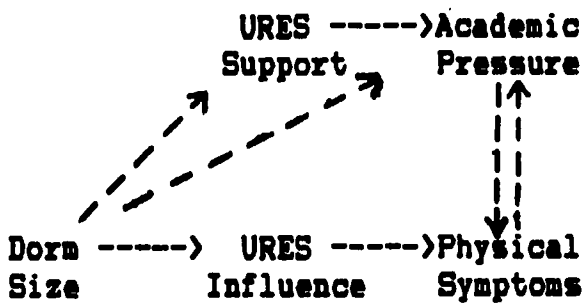
Chi-Square(5)=9.13, p=.10
Goodness-of-Fit Index=.414
Coeff. of Determination=.217

FIGURE 1B: Model 2



Goodness-of-Fit Statistics
Chi-Square(4)=7.99, p=.09
Goodness-of-Fit Index=.944
Coeff. of Determination=.219

FIGURE 1C: Model 3



Goodness-of-Fit Statistics
Chi-Square(3)=7.40, p=.06
Goodness-of-Fit Index=.954
Coeff. of Determination=.266

FIGURE 1D: Model 4

FIGURE 1: Four Structural Models of Environmental, Social, and Psychological Influences on Health.