# THE IMPACT OF SOCIAL SUPPORT ON HEALTH OUTCOMES IN THE SEATTLE LONGITUDINAL STUDY (SLS)

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Expanded text of a paper presented at the Annual meeting of the Gerontological Society of America's 47th Annual Scientific Meeting, November 20, 1994, Atlanta, Georgia.

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## ABSTRACT

This study examined the impact of structural and perceived support on health outcomes in a sample (N=238; 104 males; 134 females) of the Seattle Longitudinal Study participants. Medical history information was extracted from a Health Maintenance Organizations' medical records. Measures of structural and perceived support and independent variables which included behavioral assessments, life satisfaction measures, and measures of socioeconomic status were examined.

Structural path analysis was used to assess both an initial and final model. Latent variables were defined by means of confirmatory factor analysis. Linear structural path analyses were used to examine the relationship between social support and health outcome. In both the initial and final model structural and perceived social support failed to significantly predict health outcome. Age and SES were found to significantly predict health outcome for the initial study. Age and previous health were found to predict later health outcome for the full model.




## INTRODUCTION

"A friend, not an apple, a day will keep the doctor away." (Eisenberg, 1979).

The relationship of social support and health outcomes is a recent research topic; however, interpretations and operationalization of social support have varied from support actually received to perceived emotional concern, to quantity of support, in general, and to support as a particular type (i.e., marriage). Examining the relationship between social support and health outcomes clarifies how different interpretations of social support affect health outcome. This study examined the association between social relationships (operationalized in terms of quantity and perceived quality) and health outcomes and utilization for different age-cohorts across the life span.

There were three primary issues of interest in this study. Because previous research has often relied on one measure of social support, primarily, structural measures (Berkman, & Syme, 1979; Schoenbach, Kaplan, Freidman, Kleinbaum, 1986), one purpose of this study was to examine how structural and perceived social relationships influence health outcome. This study also attempted to assess the relationship between both measures of social support (structural and perceived).

Second, many studies have not included elderly people (House, Robbins, & Metzner, 1982; Welin, Tibblin, & Svardsudd, Tibblin, Ander-Peciva, Larsson, & Wilheilmsen, 1985). It is

important to understand how factors such as social relationship influence health in later years because the elderly are at highest risk for nearly all morbid and mortal events.

Finally, most of the previous studies have addressed only mortality as the outcome variable (Orth-Gomer & Johnson, 1987; Welin et al., 1985). This study examined the association of social support and morbidity.

## Hypotheses

1.) Measures of structural and perceived social support are hypothesized to be negatively correlated with frequency of medical utilization, number of episodes of diseases and illnesses, number of days in a hospital, and number of medications used.

2.) Perceived measures of support are hypothesized to be stronger predictors of health outcomes than structural measures.

## METHOD

### Subjects

The present study examined the effects of perceived and structural social support in two samples selected from the Seattle Longitudinal Study. The final sample was used to replicate findings from the initial sample. The initial sample consisted of 42 men and 56 females (N=98) subjects who had medical data from 1970-1984. The final sample consisted of 104 males and 134 females (N=238) with a mean age of 56.97 (range 36-



92 years) who had medical data from 1977-1991 at the time of testing. Both samples represented a wide variety of educational and income levels (Table 1). The initial sample had similar levels of education and income but were on average seven years younger than the final sample (Table 2).

The Seattle Longitudinal Study's sampling frame is a community dwelling population representing a wide range of occupational, educational, and economic backgrounds. The sample has reasonable representative characteristics of at least the upper 75% range of the socioeconomic spectrum (Schaie, 1989)(see Schaie, 1994 for a further discussion).

### Medical Data

Complete medical histories were available for participants because subjects in the SLS were recruited from a Seattle area Health Maintenance Organization (HMO). Medical technicians abstracted the medical data for each individual and organized it according to the diagnosis made by physicians at each clinic visit (Parham, Gribbin, Hertzog, & Schaie, 1975) (see Hertzog, Schaie, & Gribbin, 1978 for further discussion of medical data).

Within each diagnosis, the number of related medical usages and episodes of an illness for each year was recorded. Medical utilization refers to the number of visits to a physician or other health professional that a participant made, while episodes are the unique manifestations of a particular diagnosis in a seven year period of time. Comparable information is available

for hospital stays, home nursing visits, and outpatient surgeries.

The Life Complexity Inventory (LCI)

Various demographic and personal information were extracted from the LCI survey of background characteristics. (see Schaie, 1983, for greater detail). Information from the LCI included subjects age, occupation, family income, education, life and job satisfaction, smoking habits, and body mass index were calculated from height and weight. A body mass index (BMI) was developed by converting pounds to kilograms and inches to meters and calculating kilogram (kg.) divided by meters squared(m2).

Structural Social Support

The extent of social contact in an individuals immediate environment was measured by asking respondents how many neighbors they know well enough to visit with; the number of in-person social visits per week made; the number of hours each week individuals visited them; the number of confidants respondents knew well enough to confide in; the number of friends individuals reported; the number of church or synagogue visits a week; the number of children participants had, and whether respondents were married or not.



Perceived Social Support Measures

Moos and Moos (1986) constructed a 90-item true-and-false Family Environment Scale which measured 10 different dimensions. Schaie and Willis (1995) modified 8 of the original Moos and Moos (1987) sub-scales by selecting 5 items per scale and changing the response format to a Likert form.

## RESULTS

Two structural equation models were estimated to determine the measurement model and the structural path model.

Initial Model

It was first necessary to test the measurement model that specified which variables were designed to load on particular factors. The initial model tested that theoretical model of the direct effects of socioeconomic status, age, BMI, structural and perceived social support for 98 subjects on their health outcomes and health care utilization from 1970-1984. Twenty-seven variables were included in the initial model. Four were dropped because they did not explain a significant proportion of the variance of the model. These indicators included three measures of structural social support: number of hours spent in church or synagogue each week, number of siblings, and the number of grandchildren. A measure of whether an individual smoked or not was also found not to contribute to the model. Perceived social

support factored onto two latent variables. The initial measurement model is presented in Figure 1.

The factor loadings for the initial group are the results of a confirmatory factor analysis in which the manifest variables are allowed to load on a factor. Higher loadings indicate a closer relationship between the manifest variable and the underlying latent factor. Standardized loadings for the latent variables range from -.37 to .88 (Table 3).

This model contained direct paths of the independent latent variables to the dependent latent variables. Correlations among the exogenous variables were permitted to be free. The exogenous variables accounted for 14 percent of the endogenous latent variable health outcome.

The overall Chi-square test for this model was significant $X^2[178]=249.36$, $p<.0001$; RMSR=.081; GFI=.844; AGFI=.758. Structural and perceived social support were not found to significantly predict health outcome, nor was BMI, but age and SES did (Figure 2).

Final Model

The second model tested the same model in a larger sample. This sample differed from the initial sample in that subjects had medical data from 1977 to 1991 and that participant's medical history were assessed as two latent constructs; previous health outcome (1977-1984) and present health outcome (1984-1991). The final model assessed the direct effects of socioeconomic status, age, Body mass index, structural social support, perceived social



support, control, previous health outcome and health care utilization health outcomes and utilization for 238 individuals. Thirty variables were included in the initial model. Four indicators were dropped because they did not explain a significant proportion of the variance of the model. These indicators included three measures of structural social support: the number of hours spent in church or synagogue each week, the number of siblings, and the number of grandchildren. A measure of whether an individual smoked or not was also found not to contribute to the model (figure 3).

The factor loadings estimated by this model are of substantial magnitude and differ significantly ($p<.05$) from zero except for occupation and gender on SES (Table 4).

Correlations among the exogenous variables were permitted to be free. The latent variables accounted for 58% of the variance of health outcome and utilization.

The overall Chi-square test for this model was significant $X^2[232]353.23$, $p<.0001$; RMSR=.064; GFI=.899; AGFI=.848. Only age and previous health were found to significantly predict health outcome and utilization (Figure 4).

## DISCUSSION

Increased structural and perceived social supports were hypothesized to be correlated with measures of poor health outcome. Perceived social support for both the initial and final sample were found to be negatively correlated with health outcome

and utilization. However, the impact of structural social support was found to be negligible for the full model and negatively correlated for the initial model. None of the measures of social support were found to significantly predict negative health outcome.

There are three possible explanations for why neither structural or perceived measures of social support predicted health outcome. First, the findings from studies addressing the relationship between structural social support and health have not been consistent. Similar measures have been found to predict different outcomes in different studies (i.e the Tecumseh study, the Durham study and the Alameda study). Second, those who are the sickest may receive the least amount of support. Third, this study examined morbidity. One may argue then that the participants of this study tended to be healthy and that the relationship between social support and morbidity is weak. In addition, since both samples were relatively healthy, there may not have been enough variance among the health construct to detect an effect.

While social support was not related to health outcome, age, SES for the initial model and previous health for the final model were related to health outcome. Higher SES has repeatedly been shown to be associated with better health status (House, 1987). Diseases increase in probability of incidence with age (Minkler, 1985) and some health problems remain chronic conditions.



The second hypothesis was that perceived measures of social support were believed to be stronger predictors of health outcomes and utilization than structural measures. There was a lack of support for the hypothesis since neither measure was able to predict health outcome. The two structural path models were able to explain a portion of the health outcome variance. However, this portion of the model was not statistically significant. Perceived social support was found to be more correlated with health outcome than structural social support.

Comparisons of the Two Structural Path Models

There are two possible reasons why the relatively similar models were able to produce different fits of the data and account for differences in the variance of the endogenous variables. First, the final model included past health outcome. It is likely that if someone is suffering from a chronic illness they will continue to experience these chronic conditions at a later time. Second, the final model had an older sample; age is associated with increase health problems.

In conclusion, existing data provide little evidence of what underlies these links between social support and health. Understanding the social support-health relationship will occur if future studies focus on the ways by which support is linked to well-being instead of determining merely whether this link exists.

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Table 1:

Summary of Sociodemographic Indicators for the Initial Sample

| N=98 | Mean | Standard Deviations | Range |
|---|---|---|---|
| Age | 49.97 | 8.76 | 36-81 |
| Income | $29,090 | 3.44 | $2000-34,000 |
| Education | 14.31 | 2.27 | 11-20 |

Table 2:

Summary of Sociodemographic Indicators for the Final Sample

| N=238 | Mean | Standard Deviations | Range |
|---|---|---|---|
| Age | 56.97 | 11.44 | 36-92 |
| Income | $27,180 | 4.01 | $2000-34,000 |
| Education | 14.28 | 2.60 | 7-20 |

Table 3:

Standardized Factor Loading for Initial Model

| | SES | Age | BMI | Satisfaction | Structural | Perceived | Control | Prev. Health |
|---|---|---|---|---|---|---|---|---|
| Gender | -.60 | | | | | | | |
| Income | .50 | | | | | | | |
| Education | 1.00 | | | | | | | |
| Occupation | -.12 | | | | | | | |
| Age | | 1.00 | | | | | | |
| BMI | | | 1.00 | | | | | |
| Life Sat | | | | 1.00 | | | | |
| Work Sat | | | | 1.00 | | | | |
| Confid | | | | | 1.00 | | | |
| Friend | | | | | .18 | | | |
| Mar Stat | | | | | -.37 | | | |
| Visit | | | | | .17 | | | |
| Cohesion | | | | | | .88 | | |
| Express | | | | | | 1.00 | | |
| Achieve | | | | | | .57 | .62 | |
| Culture | | | | | | .80 | | |
| Recreat | | | | | | .86 | | |
| Organ | | | | | | | 1.00 | |
| Control | | | | | | | .81 | |
| Hospital | | | | | | | | .46 |
| Med.usage | | | | | | | | .59 |
| Episode | | | | | | | | 1.00 |
| Usage | | | | | | | | .60 |

Table 4:

Standardized Factor Loadings for Final Model

| | SES | Age | BMI | Satisfaction | Struct. | Perc. | Control | Prev Health | Pres Health |
|---|---|---|---|---|---|---|---|---|---|
| Gender | -.15 | | | | | | | | |
| Income | .32 | | | | | | | | |
| Education | .77 | | | | | | | | |
| Occupation | .56 | | | | | | | | |
| Age | | .97 | | | | | | | |
| BMI | | | 1.00 | | | | | | |
| Life Sat | | | | .61 | | | | | |
| Work Sat | | | | .37 | | | | | |
| Confid | | | | | .81 | | | | |
| Friend | | | | | -.06* | | | | |
| Mar Stat | | | | | -.31 | | | | |
| Visit | | | | | .11 | | | | |
| Cohesion | | | | | | .77 | | | |
| Express | | | | | | .86 | -.13 | | |
| Achieve | | | | | | .50 | .30 | | |
| Culture | | | | | | .75 | -.21 | | |
| Recreat | | | | | | .58 | | | |
| Organ | | | | | | | .71 | | |
| Control | | | | | | | .86 | | |
| P.Hospit | | | | | | | | .45 | |
| P.med usage | | | | | | | | .80 | |
| P.Episod | | | | | | | | .62 | |
| Hospital | | | | | | | | | .58 |
| med. usage | | | | | | | | | .82 |
| Episode | | | | | | | | | .97 |
| Usage | | | | | | | | | .41 |

* = p<.05

Figure 1: Initial Measurement Model

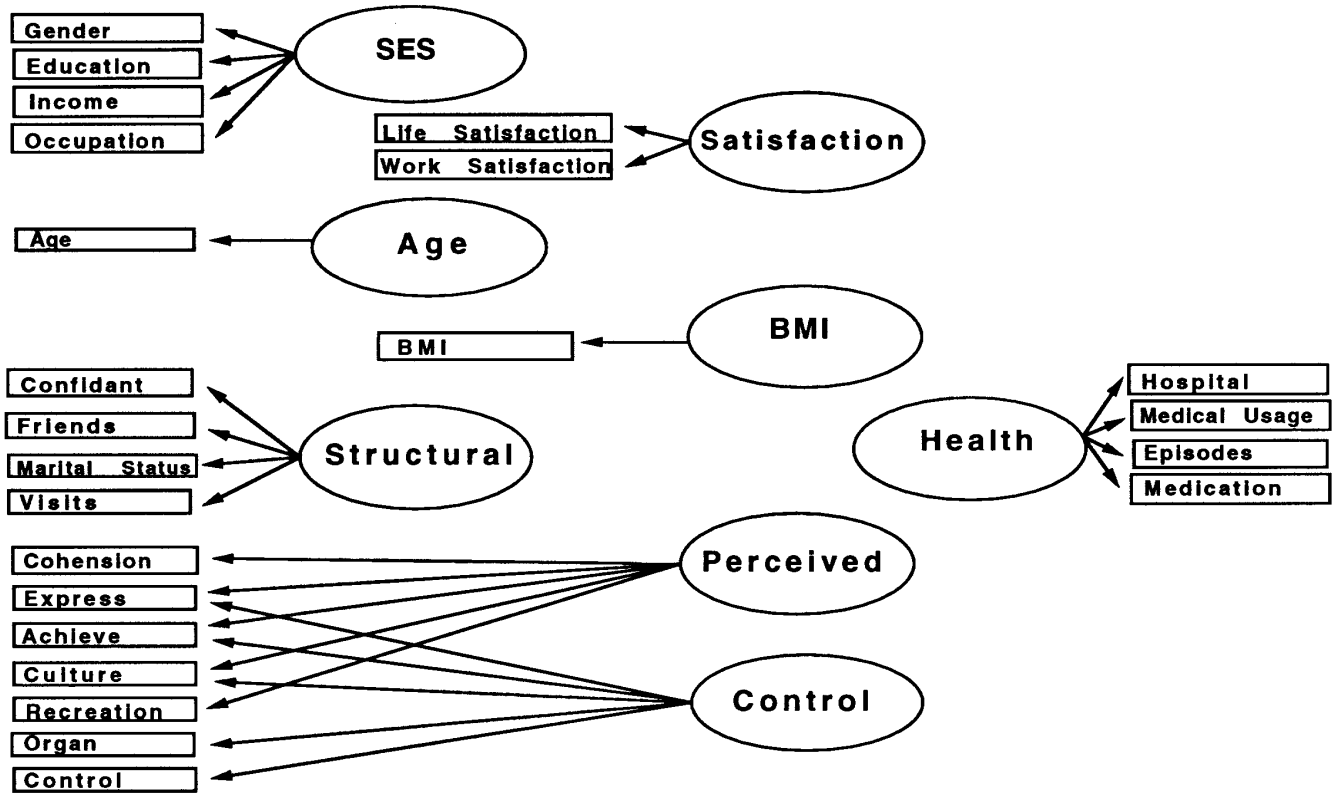

Figure 2: Initial Path Model

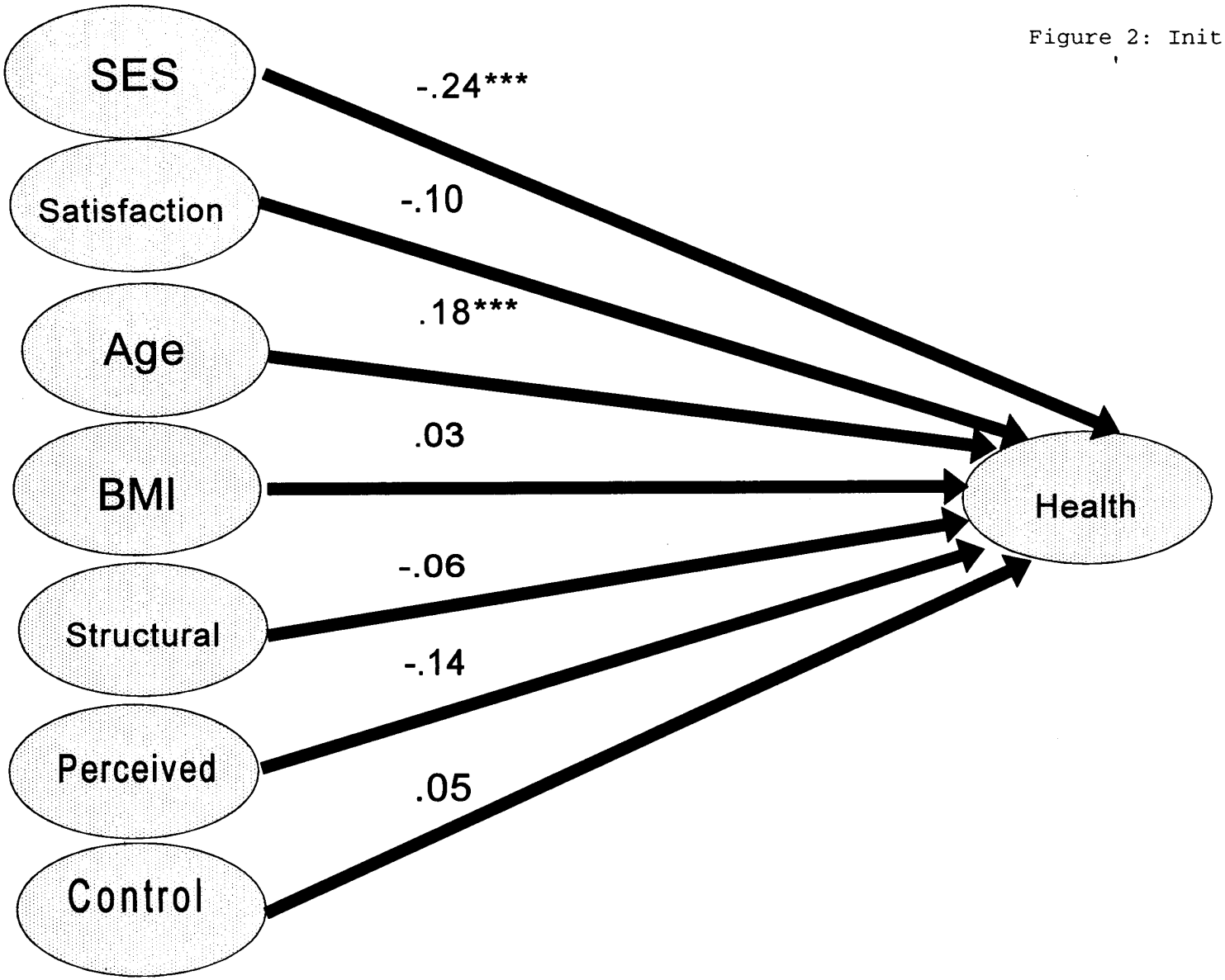

Figure 3: Final Measurement Model

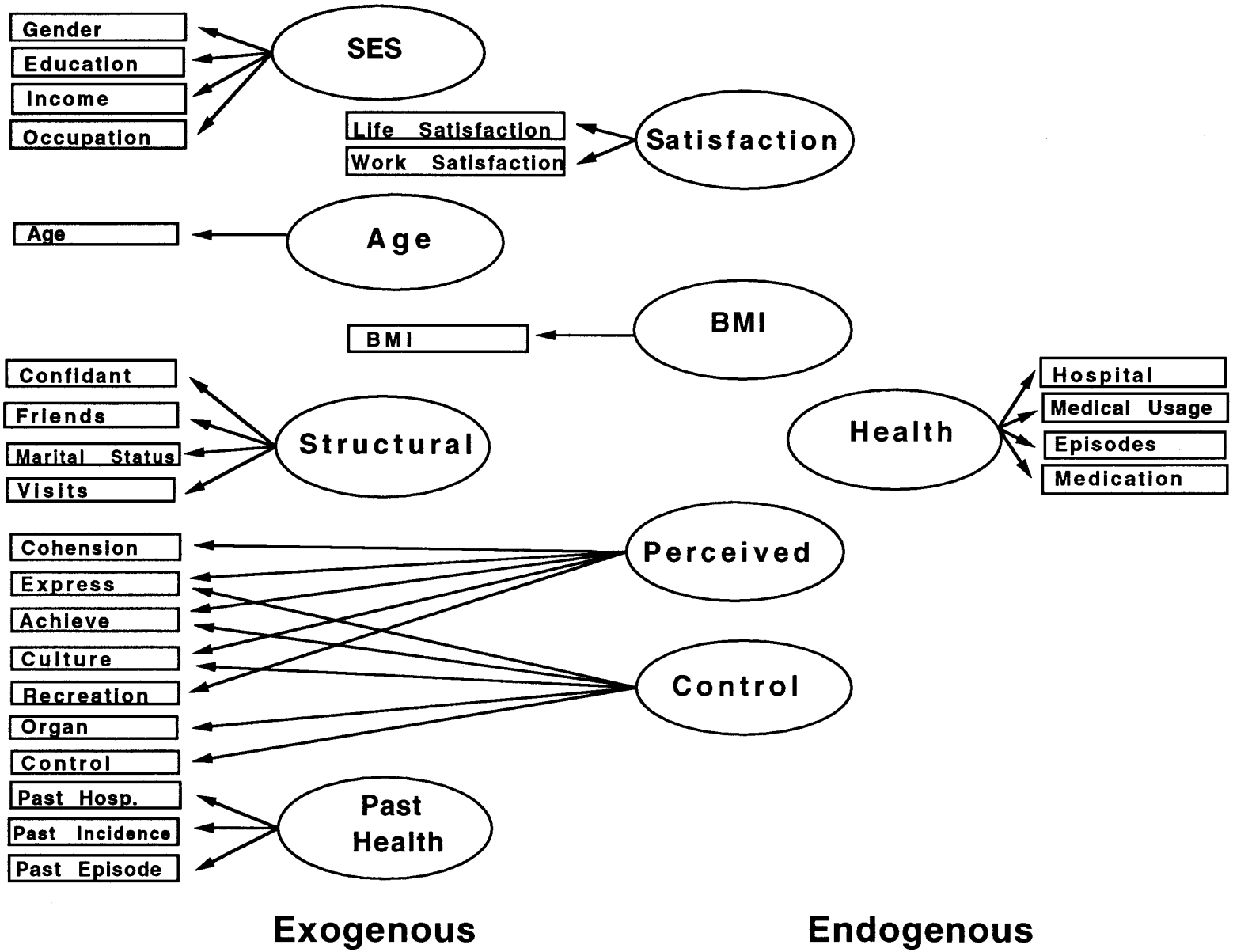

Figure 4: Final Path Model