DOCUMENT RESUME

ED 316 804 CG 022 355

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TITLE Occupational Stress and Health of Women LPN's and LSW's: Final Project Report. Working Paper No. 202.
INSTITUTION Wellesley Coll., Mass. Center for Research on Women.
SPONS AGENCY National Inst. for Occupational Safety and Health (DHHS/PHS), Cincinnati, OH.
PUB DATE 89
GRANT NIOSH-OHO1958
NOTE 68p.; For related papers, see CG 022 356-358.
AVAILABLE FROM Wellesley College Center for Research on Women, Wellesley, MA 02181 ($5.50).
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Employed Women; Family Relationship; *Females; Longitudinal Studies; Marriage; *Nurses; Physical Health; Role Conflict; Role Perception; *Social Workers; *Stress Variables

ABSTRACT

This study examined work and non-workplace sources of stress in the lives of women (N=403) currently employed as health-care providers. Female licensed practical nurses and social workers were sampled because they met the three criteria determined upon for the study; that is, they were all in high-stress occupations; women predominate in those professions; and these professions had readily identifiable populations which permitted drawing random samples. The aim of this longitudinal study was to assess the relationships between work-role quality, family-role occupancy, and family role quality on one hand and mental and physical health outcomes on the other hand. The results indicated that: (1) among female health-care providers, work-role quality was an important predictor of mental and physical health measures, particularly subjective well-being, physical health symptoms, and cardiovascular disease; (2) family role occupancy had few direct effects on psychological distress, well-being, or physical symptoms; (3) parent role and partner role quality had direct, but not interactive effects, with subjective well-being; (4) family role quality had both direct and interactive effects with psychological distress and physical health; (5) the subjects showed stability with respect to role occupancy, role quality, and health measures. Eight tables, and 16 figures are included. (ABL)

AUTHORS' NOTE

The authors wish to acknowledge the important contribution to the success of this project made by Grace K. Baruch, Co-Principal Investigator until her untimely death in October, 1988.

The final report for NIOSH grant #OH-1968, entitled "Occupational Stress among LPNs and SWs," is organized into five sections. In the first, we present an overview of the project and review the research aims. In the second, the sample for both the cross-sectional and the longitudinal analyses are described. The instruments are reviewed in the third section. The results are presented in the fourth. A summary of the findings is presented in the fifth section.

I. Overview

This study examines work and non-workplace sources of stress in the lives of women currently employed as health-care providers. The original sampling design called for 250 women in each of two health-care professions to be interviewed once a year for three years.. Our decision to sample within two populations -- licensed practical nurses and social workers -- was based on the following three criteria: (a) we wanted to sample women in high-stress occupations, and the health-care professions are considered highly stressful; (b) we wanted to sample professions in which women predominate; and (c) we wanted to sample professions that had readily identifiable populations so that we could draw random samples. Licensed practical nurses and social workers met all three criteria: they are in stressful occupations, they are predominantly female professions, and they are licensed in Massachusetts.

I.A. The Research Aims

The aim of this short-term longitudinal study was to assess among employed, female, social workers and licensed practical nurses, the relationships between work-role quality, family-role occupancy (i.e., partnership and parental status) and family-role quality on the one hand, and mental-and physical-health outcomes on the other.

More specifically, the four aims were:

1. To assess the contribution of work-role quality to mental and physical health.
2. To assess the contribution of partner-role and parent-role occupancy to the outcomes, net of work-role quality.
3. To assess the contribution of partner-role and parent-role quality to the outcomes, net of work-role quality.
4. To assess these relationships both cross-sectionally and longitudinally.

II. The Sample

In order to develop a sample most appropriate to the substantive and practical considerations of this project, the population to be sampled was restricted in several ways.

1. Age. The sample consists of women ages 25 - 55. The lower age reflects the minimum age at which social workers might reasonably be expected to have obtained their M.S.W. and have worked for at least a year. The upper age was set in order to avoid confounding physical illness with age. We reasoned that in a sample extending beyond 55 the effect of age on illness would be so great

that it would mask other factors. In addition, it seemed that employed women over 55, unlike younger women, tend to begin to be concerned with retirement issues.

2. Geographical location. All subjects live within an approximately 25-mile radius of Boston. For practical, logistical, and financial reasons, we defined our population as living within Route 495, a circumferential interstate highway that forms a semicircle around the city of Boston. The Route 495 boundary encompasses large cities, e.g., Boston; medium-sized cities, e.g., Framingham; suburban areas, e.g., Newton and Lincoln; and semi-rural areas, e.g., Acton. Geographical eligibility was determined by zip codes.The population of zip codes included those for any town whose center was within the Route 495 area. The zip-code information needed to determine eligibility was available from the licensure records.

II.A. The Decision to Stratify the Sample

The role-status variables of interest to the study are confounded in the population. For example, compared to white women 25 to 55 years of age, it is much rarer for black women to be currently married. Thus, in order to avoid the problem of disentangling such variables as race and occupation, or race and partnership status, the sample was stratified within occupation by race, partnership status, and parental status.

The success of our stratification is reflected in the low correlations among occupation, race, partnership status and parental status. For example, among social workers, the correlation between race and partnership status is .11; between race and parental status, the correlation is -.11. The comparable figures for the LPNs are .035 and -.06.

As we began the process of locating our sample, we ran into several unanticipated problems:

Race. We determined that fewer than 4% of the social workers listed in the registry are black and employed. Thus, using our random-sampling strategy, we would have been unable to complete our sampling design. To handle this unexpected problem, we conducted our own census of black social workers in the Boston area. We began by calling black social workers known to us and asking for names and phone numbers of other black social workers. These social workers were then called and asked, in turn, for additional names and phone numbers. We continued this process until the number of new names of registered social workers dropped off. With 93 calls, we identified 121 black employed social workers. We also identified 24 through the registry, for a total of 145 in our census. According to our estimates, based on State Division of Employment Security data, there are approximately 169 black registered social workers in our sampling area; thus we identified 86% of this population. The percent of black LPNs in the professional registry was large enough to allow us to locate our sample using our random sampling strategy. Therefore, it was not necessary to develop a census of black LPNs.

Low-frequency cells. Certain cells were especially difficult to fill because of their low frequency in the population. The rarest cell was partnered without children. Only among the white social workers were we able

to fill that cell. Given that the younger social workers in this cell may have only recently finished their professional training, the fact that they do not yet have children is not surprising. Also, women with more education tend to have their first child later than do women with less education. For LPNs, the partnered without children pattern was rare among both whites and blacks, perhaps because they finish their training well before the age for admission into the study and have already begun their families. In act, we were unable to find any black LPNs in that cell.

II.B. Additional Criteria for Inclusion into the Sample

Approximately one week after the recruitment letters were sent out, a telephone screening process was started. Interviewers called each potential subject and obtained additional information relevant to eligibility. Subjects who met the additional criteria were subsequently interviewed for the study. The major criteria were:

Current employment status. At the time of the telephone contact, a subject had to be currently employed at least half-time in her respective field or in a related field, and had to have been working continuously for at least a year in the occupation and for at least three months in her present job. LPNs who had obtained their RN and were employed as RNs were also excluded under this criterion. Failure to meet this criterion was the main reason for ineligibility. Of the social workers we contacted, 37.7% met this criteria; among LPN's the comparable figure was 42.2%.

Other employment criteria. Potential subjects were ineligible if they were primarily self-employed or if they worked rotating or night shifts. Of all the social workers who were ineligible, 74% were ineligible for work-related reasons. The comparable percent for LPN's was 87%.

Current non-workplace role status. Subjects had to have occupied the same non-workplace role (partnered, single, parent, not a parent) for at least 1 year.

II.C. Refusal Rates

01-year social workers. Recruitment letters were sent to 2288 female social workers living within our sampling area. We received notification that 6 were deceased and 48 had moved out of the area. Therefore, we had a final "population" of 2234 (roughly half of the social workers in the Boston area). Of the 2234, 364 (16.3%) were never reached, primarily because they moved and had left no forwarding address. Our refusal rate was 2.7 % of those contacted who met the eligibility criteria for the study.

01-year licensed practical nurses. Recruitment letters were sent to 2720 female LPN's living in our sampling area. We received notification that 28 were deceased and 47 had moved out of the area. Therefore, we had a final "population" of 2645 (roughly one third of the LPN's in the Boston area.) Unfortunately, the registry was very out of date; addresses were from 1983 or earlier. Of these 2645, 49.5% were never reached, primarily because they had

moved and left no forwarding address and/or did not have a phone and did not answer our letter requesting that they contact us. (If our recruitment letter was delivered and the screening interviewer was unable to locate a telephone number, two separate letters were sent providing the project's telephone number and requesting that the potential respondent either contact us or provide us with a phone number at which we could reach her. We also went door-to-door to locate LPN's, but abandoned this effort when it became clear that most LPN's had moved and that therefore the results of our efforts did not warrant the expense.) Of LPN's with a listed phone number, only 12.2% could not be contacted.

In sum, several factors explain the low-contact rate among the LPN's: (a) the LPN registry addresses are from 1983 or earlier, (b) LPN's are more likely to move than social workers, and (c) LPN's may be more likely than social workers not to have listed phones. Our refusal rate was 4 % of those LPN's that we contacted who met the eligibility criteria for the study.

The 02-year sample. The refusal rate for the 02 year was 2.7%; 3.2% for the LPNs and 2.4% for the SWs, an unusually low figure. In addition, 4 respondents (1%) moved out of the geographic area.

The 03-year sample. The refusal rate for the 03 year was 2.8%; 2.0% for the LPNs and 3.3% for the SWs. In addition, 3 respondents moved out of the area and 2 respondents died.

II.D. Description of the 01-Year Sample

The 01-year sample consists of 403 health-care providers: 248 social workers (204 white social workers and 44 black social workers), and 155 Licensed Practical Nurses (138 white LPN's and 17 black LPN's). The mean age of the sample was 39.5 years (SD = 7.4). Table One presents the distribution of the 01-year sample by occupation, race, partnership and parental status.

Insert Table One about here

Just over half were mothers; about half were partnered. On average, mothers had 2.56 children (the median was 2.0 children). At the time of the 01-year interview, they had, on average, 1.5 children living at home. On average, the women have been working in their respective occupations for 11 years (range was from 2 to 35 years), and at their current jobs for 6 years. They work on average 38 hours per week, and 80% work the same schedule on a regular basis. The mean individual income was $24,4000 (SD = $2,700). Among partnered women, the average annual household income was $42,300 (SD = $23,800).

II.E. The Longitudinal Sample

Of the 403 women in the C1 sample, fully 92% (371) were interviewed in all three years. Table Two shows the number of women in each cell in year 03.

Insert Table Two about here

We were surprised at the stability of the sample. For example, only 9% (n=30) of the women changed partnership status over the three years; only 7% (n=24) changed parental status. Given the age range of the sample, i.e., 25 to 55 years, we expected more change in both family-role statuses. Table Three presents data showing the status changes over the three-year period.

Insert Table Three about here

III. Instruments

This section is divided into two parts. In the first, we describe the major outcome and predictor variables, including reliability data for the reward and concern scales. In the second, we describe the confirmatory factor analyses of the reward and concern scales for the roles of paid employee, partner and parent.

III.A. The Major Outcome and Predictor Variables

To select the final outcome variables, zero-order correlation matrices were computed between the dependent variables and between the independent variables. These analyses led to several strategic decisions. For example, based on the high correlation (r = .80) between the scores on the anxiety and depression scales of the SCL-90-R, a frequency of symptoms measure (Derogatis, 1975), we combined the two scale scores to create a composite psychological symptoms score. Additional analyses led to the selection of two other outcome variables, namely, the Rand well-being score, and the physical symptoms scores. The important features of these three measures are described next.

Psychological distress. Psychological distress was assessed by the anxiety and depression subscales of the SCL-90-R. The SCL-90-R has high levels of both internal consistency and test-retest reliability. Coefficient alphas range between .77 and .90 for the primary symptom dimensions and test-retest coefficients range between .78 and .90 (Derogatis, 1983). In addition, norms are provided separately for men and for women and for non-clinical populations. Subjects indicated on 5-point scales (from 0 = not at all, to 4 = extremely) how often they were bothered by each of 10 symptoms of anxiety and 13 symptoms of depression.

Psychological well-being. Well-being was assessed by responses to a 14 - item scale developed by the Rand Corporation (Davies, Sherbourne, Peterson, & Ware, 1985). Cronbach alpha was .92 and the one-year test-retest reliability estimate was r = .63 (Veit & Ware, 1983). Subjects were asked to respond on 6-point scales (from 0 = not at all to 6 = extremely) to such items as, "How

often in the past month did you feel relaxed and free of tension?" "How often in the past month did you expect in the morning to have an interesting day?".

Physical symptoms. Our measure of physical symptoms is a 30-item measure of general physical symptoms. Respondents are asked to indicate both how frequently in the past year they have had each of these symptoms and the degree of discomfort caused by the symptom in the past year. By multiplying the frequency of occurrence by the degree of discomfort for each symptom, we derived a total score for physical symptoms. These scales were derived from measures developed by the Mind-Body Program at the Beth Israel Hospital, in consultation with Jane Lesser, an affiliate of that program, and have been used in several recent studies.

Blood pressure. During each interview, the interviewer took the respondent's blood pressure three times, once at the beginning, once in the middle, and once towards the end of the 2-hour interview. (The interviewers were certified each year by the American Red Cross to do blood-pressure readings.) We dropped the first reading and averaged the second and third readings. If the diastolic reading was greater than or equal to 104, or the systolic reading was greater than or equal to 160, the respondent was classified as hypertensive.

Serious illness. The respondents were asked to complete a checklist of major illnesses. They were asked to indicate which of the illnesses they had had in the previous 12 months, or since the last interview (which ever was most recent). They were instructed to report only those illnesses that had been diagnosed by a medical professional. Table Four shows the number of respondents who reported each illness in year 01, the number who reported each illness in year 02 who had not had this illness in year 01, and the number who reported each illness in year 03 who had not had this illness in year 01 or year 02.

Insert Table Four about here

Role quality. We conceptualize role quality as consisting of both positive aspects (rewards) and negative aspects (concerns) of a role. Role quality in the roles of worker, partner and mother was assessed by rewards and concerns scales constructed originally from data gathered during extensive interviews with 72 women, ages 35 to 55 (See Baruch & Barnett, 1986 for a full discussion).

For each role, subjects are instructed to think about their situation as it is right now and to indicate on a 4-point scale (1 = not at all to 4 = extremely) to what extent, if at all, each of the items is rewarding (or of concern). For example, for the role of paid worker, each employed subject was asked how rewarding she found "the job security" and how much of a concern "the job's not using your skills" was. For the role of mother, each woman with children was asked how rewarding she found "the love they show" and how much of a concern "the heavy demands and responsibilities" was. Each subject

received two scores for each social role: a reward score and a concern score. Role quality was operationalized as the difference between the reward and the concern scores (see Baruch & Barnett, 1986).

Reliability of rewards and concerns. In order to determine the reliability of the reward and concern scales, two procedures were employed. To determine test-retest reliability, a 10% subsample of the wave 1 subjects was reinterviewed between 1 and 3 months after their initial interview. In all cases, the same interviewer conducted both interviews. In addition, internal consistency was determined by calculating Cronbach alpha coefficients for each reward and concern score. The test-retest reliability coefficients and the alpha coefficients are all satisfactory as can be seen in Table Five. The range in Cronbach's Alpha was .88-.93 and the range in test-retest reliability coefficient was .70-.90.

Insert Table Five about here

III.B. Factor Analyses of the Rewards and Concerns Scales

In order to fully develop and confirm the factor structures of these scales, a two-stage analysis plan was implemented. First, the sample was divided into random halves, a "development" sample, and a "confirmatory" sample. Based on previous research and principle components analyses on the development sample, we specified factor structures for each of the six scales. These models were tested on the development sample using LISREL, and modified to improve the goodness of fit. After satisfying ourselves that further modifications would not significantly improve the model, we confirmed the final model using the other (i.e., the "confirmatory") half of the sample. Overall, the results were very positive, the models were all confirmed and the goodness-of-fit statistics were all acceptable. The results of the confirmatory factor analyses are summarized in Table Six and described in detail below.

Insert Table Six about here

Work rewards and work concerns. As can be seen, we identified six reward factors and five concern factors. The work-reward model (20-items) provided an adequate fit to the data, X^2 (155) = 276.46, p =.000 (Additional evidence of fit was provided by the high goodness-of-fit index (.884) as well as the small root mean square value of the residuals (.06).

The work-concern model (16-items), provided an adequate fit to the data X^2 (94) = 174.26, p = .000. (Additional evidence of fit was provided by the high goodness-of-fit index (.908), as well as the small root mean square value of the residuals (.06). Figures One and Two depict the item loadings, the standard errors, and the intercorrelations between the work-reward factors and the work-concern factors.

Insert Figures One and Two about here

Partner rewards and concerns. A three-factor (11-item) model of partner rewards was confirmed, which provided an adequate fit to the data, X^2 (41) = 94.64, $p < .001$. (Additional evidence of fit was provided by the high goodness-of-fit index (.875), as well as the small root mean square value of the residuals (.07).

A three-factor (11-item) model of partner concerns provided a good fit to the data, X^2 (41) = 64.45, $p < .01$. (Additional evidence of fit was provided by the high goodness-of-fit index (.907), as well as the small root mean square value of the residuals (.07). Figures Three and Four depict the item loadings, the standard errors and the intercorrelations between the partner-reward factors and the partner-concern factors.

Insert Figures Three and Four about here

Parent rewards and concerns. A four factor (13-item) model of parent rewards provided an excellent fit to the data, X^2 (59) = 89.10, $p < .01$. Additional evidence of fit was provided by the high goodness-of-fit index (.897), as well as the small root mean square value of the residuals (.05)

A three factor (11-item) model of parent concerns provided adequate fit to the data, X^2 (41) = 94.64, $p < .001$. (Additional evidence of fit was provided by the high goodness-of-fit index (.875), as well as the small root mean square value of the residuals.(.07). Figures Five and Six depict the item loadings, the standard errors and the intercorrelations between the parent-reward factors and the parent-concern factors.

Insert Figures Five and Six about here

IV. Results

This section is divided into three parts. Section Four A presents results from analyses of the 01 year cross-sectional data, Section Four B presents the findings from the longitudinal analyses of the relationship between occupational stress and psychological distress, and Section Four C presents the results from longitudinal analyses of the onset of cardiovascular diseases.

IV.A. Comparisons between the Two Occupational Groups

T-Tests. T-tests were conducted to compare the LPNs and social workers on the major independent and dependent variables of the study. The two samples were significantly different with respect to variables reflecting SES. They were, however, surprisingly similar with respect to other major variables, e.g., rewards and concerns, and the mental and physical-health measures. To illustrate, all SES indicators were higher for social workers. Compared to LPN's, they have completed more education, as have their partners, and they have higher salaries, and higher household incomes. In addition to these SES differences, social workers have been at their current job for a longer period of time, and work longer hours. Finally, among subjects with children, LPN's have more children and more children currently living at home.

Looking at the rewards and concerns scores in the three major social roles -- paid employee, partner, and mother -- we found no significant differences. LPN's reported more job concerns and child concerns than did social workers, however, their overall role-quality scores in these two domains were similar. With respect to the role of partner the samples were also more similar than different.

Turning to the outcome variables, there were no significant differences on the anxiety and depression scales of the SCL-90-R or on the Rand well-being scale. Differences did show up on indicators of both substance use and physical-health outcomes. For example, compared to social workers, LPN's are more obese, smoke more cigarettes per day, drink more caffeinated beverages per day, and drink more alcoholic beverages on the days when they drink at all. Finally, LPN's, compared to social workers, suffer more from general physical symptoms as well as from menstrual symptoms. They also report more major illnesses than do social workers.

IV.B. Cross-Sectional Analyses of Psychological Distress and Subjective Well-being

Work rewards and concerns. At present there is lack of agreement in the literature as to the importance of including uplifts (rewards) in addition to hassles (concerns) in models predicting mental-health states. On the basis of several studies, DeLongis, Coyne, Dakof, Folkman and Lazarus (1982) drew the counterintuitive conclusion that "there is at present little support for the notion that positive events in any form protect, enhance, restore or damage health"(p. 132). In contrast, our research model posits that rewards and concerns are equally important components of role quality, which is, in turn, a major predictor of mental-health states. Our findings bear directly on this issue.

To estimate the effects of work rewards and work concerns on distress and well-being, we first determined which of the work-reward and work-concern factors were associated with each of the two mental-health measures. (See Barnett & Marshall, 1989 for a full discussion.) Results indicated that overload at work was the only work-concern factor that remained significant in analyses in which all the work-concern factors were entered simultaneously. In contrast, five work-reward factors remained significant when all six were

entered simultaneously into a regression equation. The exception was satisfaction with salary. To estimate whether the association between overload and distress or well-being varied by the level of any of these rewards, appropriate interaction terms were computed.

With both well-being and psychological distress as the outcomes, helping others at work moderated the effects of overload. Under conditions of high overload, the effects on well-being were enhanced. Under conditions of high overload, the symptoms of distress were lowered. These relationships are shown in Figures Seven and Eight. Thus, not only do work-rewards have strong main effects, at least in the case of helping others, work rewards mitigate the negative effects of high overload.

Insert Figures Seven and Eight about here

With respect to the importance of rewards versus concerns, our findings indicate that to understand the relationship of work-role quality to mental health outcomes, it is crucial to assess both rewards and concerns, because they each have main effects and because the presence of certain rewards conditions the effects of work overload. Thus, employed women's mental health can be enhanced both by reducing work-concerns, especially overload at work, and by increasing work rewards, especially helping others at work.

These findings also suggest the possibility of gender differences in the aspects of work that are associated with stress-related mental-health outcomes for men and women. Perhaps main-stream research on the stress-illness relationship in men has not focused on helping others at the workplace as a moderator of stress, because it is only central to women, to people in the health-care professions, or was not considered important on an a priori basis. Future research is needed to determine which of the above possibilities is true.

Family-role occupancy. Among employed women, family-role occupancy has minimal direct effects on health measures, after controlling for the effects of age, race, SES and per capita income. More specifically, employed partnered women report higher well-being than employed single women. In contrast, parental status has no significant main effects on either of the mental-health measures.

The question of particular interest here concerns the effect of family-role occupancy on the relationship between the work factors and the mental-health measures. Our findings indicate distinctly different models for the relationships among these variables depending on whether well-being or psychological distress is the outcome.

With well-being as the outcome, family-role occupancy does not interact with the work-reward or work-concern factors. In other words, the benefits in well-being that accrue from holding jobs that are high in overload accrue to all employed women, regardless of partnership or parental status.

In contrast, with psychological distress as the outcome, the distress-enhancing or exacerbating effects of particular work factors are conditioned by family-role occupancy. The general finding is that employed women who occupy more roles, i.e., non-workplace roles, are less vulnerable to the negative effects of workplace stressors than are their counterparts with fewer roles. More specifically, compared to employed women with children, the psychological distress of employed women without children was more reactive to the presence or absence of decision authority at work. Similarly, compared to employed partnered women, the psychological distress of employed single women was more vulnerable to the presence or absence of rewards from helping others at work. These two interactions are shown in Figures Nine and Ten. With their mental-health eggs all in the workplace basket, employed women without family roles are more reactive to the quality of their work role than are their counterparts with non-workplace baskets. (For a full discussion of these findings, see Barnett and Marshall (1989), which is reproduced in Appendix A.)

Insert Figures Nine and Ten about here

Family-role quality. As expected, family-role quality has significant main effects on both measures of mental-health. Employed partnered women report high well-being and low distress if their relationships with their partners are positive and low well-being and high distress if those relationships are troubled. In parallel fashion, among employed mothers, well-being varies directly and distress varies inversely with the quality of their relationships with their children.

Again, the interesting question concerns the interactive effects of family-role quality on work rewards and concerns. With well-being as the health measure, there were no significant interactions. To illustrate, an employed woman with family roles enjoys a mental-health advantage from a rewarding job regardless of whether her relationships at home are positive or negative. It also follows that a good job will not ameliorate the negative effects on well-being of poor relationships at home. Conversely, positive relationships at home will not mitigate the well-being decrements associated with low-role quality at work. Thus, with respect to effects on well-being, the domains of work and family are independent of one another.

With psychological distress as the mental-health measure, there were no interactions with partner-role quality. However, we found a particularly important interaction with parent-role quality. Employed mothers with poor relationships with their children are protected from negative psychological-distress effects, provided they have challenging jobs.

IV.C. Multiple Roles, Spillover Effects and Psychological Distress

Our findings also bear on another currently important issue concerning the effects of multiple roles on women's mental health. Most research suggests that the more roles an incumbent (male or female) occupies, the better off they are with respect to their mental health. At the same time, there is

widespread concern that the roles of employee and mother are both so stressful that employed mothers are at great risk for stress-related mental illness.

To the extent that there are negative-spillover effects from work to family or vice versa, incumbents of multiple stressful roles could be at increased risk. Spillover effects occur when, for example, a negative experience in one role offsets the rewards associated with a second role, thereby resulting in a significant decrement to mental health. In general, spillover effects have received little research attention. Moreover, the attention that has been given to this topic has been given largely to negative-spillover effects. To illustrate, an employed mother who is concerned about overload at work brings that concern home where it mitigates the positive effect on her well-being of a positive relationship with her children. Positive-spillover effects, in contrast, have received almost no empirical attention. Positive-spillover effects would occur if, for example, a rewarding experience at work offset the negative effects on mental health of troubled relationships with children.

We were able to estimate both negative- and positive- spillover effects in our data. Interestingly, we found no evidence of negative-spillover effects. Apparently employed mothers leave their home-based woes at home and do not bring their work-based troubles back home with them. In contrast, we found convincing evidence of positive-spillover effects. Employed mothers with troubled relationships with their children are protected from the related negative mental-health effects provided they have rewarding jobs. In fact, the distress of employed mothers with troubled mother-child relationships and good jobs is no higher than of employed mothers with good mother-child relationships, as shown in Figure Eleven. (See Barnett & Marshall, 1989 for a full discussion of these data.)

Insert Figure Eleven

IV.D. Physical Symptoms

Work rewards and Concerns. Overall, women in the study saw themselves as basically healthy. More than half stated that they were in better health than other women their age, and only 11% said their health was poorer. Over half reported that in the past year they spent fewer than 3 days at home because they were sick.

Of the 30 physical symptoms on the symptom checklist, fatigue/exhaustion was the most common. It was considered a problem by 86% of the women interviewed, although only 14% reported considerable or extreme discomfort from it. Other frequently noted symptoms were headaches (79%), trouble sleeping (64%), stomach discomfort (62%), and back pain (61%).

Research on the relationship of work and family roles to physical symptoms has, until recently, been limited to the occupancy of roles rather than the quality of one's experience. (Verbrugge and Madans, 1985). In order to expand our understanding of these relationships, we examined the quality of

work roles as expressed by rewards and concerns. Initially, we estimated the effects of the ten work-reward and work-concern factors on physical symptoms. When these factors were entered into regression equations, two rewards and two concerns were significant.

As with psychological distress and well being, helping others at work was a work-reward factor that was significantly related to physical symptoms. The other significant reward factor associated with physical symptoms was satisfaction with salary. Also similar to our findings on psychological health was the relationship between concern about overload at work, In contrast to the results for distress and well being, work-hazard exposure was also significantly related to reports of physical symptoms.

To examine whether work-reward factors buffered concerns, we examined appropriate interaction terms. We found that the positive effects of helping others at work moderated the effects of overload. As can be seen in Figure Twelve, women who reported high overload had fewer physical symptoms in the presence of high rewards from helping others at work.

Insert Figure Twelve about here

Family-role occupancy. Controlling for whether or not the women in our sample had a partner made no difference in our basic findings. The work-reward factors of helping others and satisfaction with salary and the concerns of overload and work hazard exposure remained the significant main effects on physical symptoms. When the helping others x overload interaction was added to our model, it was also significant at $p<.05$. Thus, having a partner or not had no direct effect on reports of physical symptoms nor did it change the model. Interestingly, there were no significant interactions between partnership status and any of the work-reward or work-concern factors. In other words, the effects on physical symptoms of helping others at work, satisfaction with salary, overload, and hazard exposure were not influenced by the women's partnership status.

When parental status was added to the regressions, again no change occurred in the relationships between the work rewards and concerns (as above: helping others, satisfaction with salary, overload and hazard exposure were significant). Moreover, the buffering effect of helping others on overload was the same.

The one important addition to our understanding of the work-physical symptom relationship was the significant interactive effect of having children and satisfaction with salary. As can be seen in Figure Thirteen, satisfaction

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Insert Figure Thirteen about here

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with salary buffered the effect of having children on physical symptoms. Because children can represent a substantial financial concern, when employed women are satisfied with their salary (that is, perceive it sufficient to their needs), having children is no longer related to increased physical symptoms.

Partner-role quality. In order to examine partner-role quality, we identified the subsample of women who were partnered (n = 186). Not surprisingly, partner-role quality had a main effect. Thus, high partner-role quality, in addition to rewards and concerns of work, was related to low physical symptoms in working women. With respect to the work-reward and work-concern factors, satisfaction with salary, overload, and hazard exposure all had significant main effects. The effect of helping others, however, was moderated by partner-role quality. As can be seen in Figure Fourteen, the

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Insert Figure Fourteen about here

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presence of good partner-role quality enhanced the relationship between helping others at work and physical symptoms.

Finally, controlling for the quality of the partner experience, we again found that satisfaction with salary was a reward that buffered the effect of having children on physical symptoms. This result, discussed above for the total sample of working women, was replicated in this subsample of women who had partners.

Parent-role quality. The basic model of the work factors-physical symptoms relationship was replicated in the sample of women who were parents. Satisfaction with salary, overload, and work hazard were significantly related to physical symptoms, however, helping others was not.[1] Satisfaction with salary was associated with fewer symptoms; the two work-concern factors with increased physical difficulty. In addition, parent-role quality had a direct effect on reports of physical symptoms; parents with good parent-child relationships reported few symptoms, those with troubled relationships, reported many symptoms. However, controlling for quality of the parenting experience, rewards from helping others did not buffer the relationship between overload and poor outcomes.

IV.E. Longitudinal Analyses of Psychological Distress

Our approach to the longitudinal analyses warrants discussion. Most studies of longitudinal change use as their measure of change between-group differences in the predictors and outcomes, usually over two points in time. In essence with only two data points these studies estimate change in some outcome as a function of change between groups in a predictor. The limits of this approach are apparent. First, true change is always confounded with measurement error, i.e, much of the measured change may be due to lack of reliability in measurement of either the predictor, the outcome, or both. However, with only two data points it is impossible to determine how much of

the change is real rather than artifactual. Second, generalizations are often made to within individual change, yet the procedures deal only with between-subject change. Indeed, given these methods we have to date no real estimate of how much intra-individual change there is on many of the variables of interest to the stress-illness relationship. For example, over a three-year period, how much change is there in either role quality, or in any of the stress-related outcomes measures? The issue of the absolute amount of change is also confounded with another measurement issue. To the extent that researchers prefer to use measures with a high degree of test-retest reliability, these measures are not sensitive to change.

Our procedures for analyzing our longitudinal data address several of the above mentioned limitations of previous longitudinal studies. (Willett, 1988) First, we examine within-individual change over time. For each woman, we calculated regression coefficients to reflect her change over the three time points on each of the outcomes and each of the predictors. After determining that the observed changes were linear, we developed regression models to estimate the relationship between these coefficients. In this way, we can ask such questions as: How does change over time in work-role quality relate to change over time in psychological distress? Is the relationship between change in work-concerns and change in psychological distress affected by employed women's family-role occupancy and/or by changes in family-role quality? Second, because we have three data points we can have more confidence that the change we are measuring is real change, not error. The third data point allows us to estimate the goodness of fit between our predicted values on any variable and the observed values. With only two data points, only one line can be fit to the data, making such a determination impossible. In the analyses reported in this section, we have used these goodness-of-fit determinations to weight the data; giving more weight to those women whose change scores on psychological distress we were better able to predict[2].

The sample for the longitudinal analyses. For purposes of the longitudinal analyses, we included only women who had not changed role status over the three years of interviewing ($N = 305$). In other words, the women in the longitudinal analyses had to have been employed continually for the three years, and if they had been single or partnered at 01 were still single or partnered at 03, and if childfree at 01, were still childfree at 03. This condition was necessary since our analyses regress changes in the outcomes on changes in role-quality over time. A woman has to have been in a role for three years in order for her to have the necessary role-quality scores.

Table Seven shows the number of respondents in each role combination in the longitudinal sample used for these analyses.

Insert Table Seven about here

Absolute levels of change. An important finding of these analyses is the high degree of stability among employed adult women, ages 25 to 55, on all the major predictors and outcomes of the study. Thus, we are attempting to predict

small changes in psychological distress with predictors which change only slightly over the three year period.

Our measure of change in role-quality reflects the slope of the individual regression lines estimating the effects of time regressed on the three balance scores (i.e., work-role balance, partner-role balance, and parent-role balance). By definition, then, these change scores represent the amount of change in one year in the relevant balance score.

A balance score is derived by subtracting the concern score from the reward score for each role. The reward and concern scores range from 1 to 4. The range of change in balance scores is theoretically from -3 to +3. Thus, a change score reflecting one unit of change can be obtained in several ways, for example: (1) by a +1 or -1 change in rewards and 0 change in concerns; (2) by a +2 change in rewards and a +1 change in concerns; (3) or by a +1 or -1 change in concerns and 0 change in rewards. The distribution of absolute change scores indicated so little change that we will describe the levels of absolute change in terms of the percent of women who changed by one-half a unit of change rather than by one unit of change.

With respect to work-role quality, 4% showed no change over the three-year period. Forty-eight% showed some decline; 6% declined by one-half unit or more, whereas 42% declined by less than one-half unit. Forty-eight% increased; 7% increased by one-half unit or more, 41% by less than one-half unit.

For partner-role quality, 2% showed no change over time. Of the 59.5% that declined, 52.3% declined by less than one-half unit and 7.2% by one-half unit or more. Of the 39.5% who declined, 36.7% declined by less than one-half unit.

With respect to parent-role quality, 2% showed no change, 50%, some decline. Of these, 42.3% declined by less than one-half unit. Of the 48% that showed some increase, 44.8% increased by less than one-half unit.

The absolute amount of change in the mental-health measures was similarly small. For psychological distress, 5% showed no change, 50% showed an increase in symptoms. Of these, only 9.6% reported an increase equivalent to at least 1 point (on a 5-point scale) on 5 or more previously mentioned symptoms or 5 new symptoms. The remaining 40.4% showed a smaller increase. Of the 49% that showed some decrease in distress, 15% reported a decrease of at least 1 point on 5 or more symptoms. The remaining 34% showed smaller decreases.

With respect to subjective well-being, 6% showed no change, 50% showed some increase. Of these, 14.8% increased 1 point on 5 out of 14 items in one year, the remaining 35% increased by less than that amount. Of the 44 % who reported some decline, 15.9% declined by 1 point on 5 out of 14 items in one year. The remaining 34.3% declined by less than that amount.

Given the complexity of the longitudinal analyses, we focused our attention on only one mental-health measure: psychological distress.

Relationship between change in work-role quality and change in psychological distress over time. Change in work-role quality over time is

related significantly to change in psychological distress, F (2,282) = 3.31, p <.05, R^2 = .02. (The low R^2 reflects the small absolute levels of change in both work-role quality and in psychological distress, as discussed above.) For these analyses, we retained only SES as a control, eliminating age, race, and per capita income, since none of these three were associated with change in psychological distress.

Relationship between family-role occupancy and change in psychological distress. With work-role quality in the regression model, neither partner-role occupancy nor parent-role occupancy had main effects on change in psychological distress. We then estimated the interactive effects of family-role occupancy and change in work-role quality. The interactive-effects model with parent-role occupancy was significant, F (4, 280) = 2.62, p <.05, R^2 = .04. As shown in Figure Fifteen, the relationship between change in psychological distress and change in work-role quality is a function of an employed woman's parental status.

Insert Figure Fifteen about here

Change in psychological distress among employed mothers was unrelated to change in work-role quality. In contrast, among employed women who are not mothers, change in psychological distress was inversely related to change in work-role quality. These findings support the conclusion drawn from the cross-sectional data, i.e., the more roles an employed woman occupies, the less reactive her psychological distress is to the quality of her work role.

Interestingly, partnership status did not have the same effect. Indeed, we found neither main nor interactive effects of partnership status. Thus, change in work-role quality is associated with change in distress among employed women, regardless of whether they are single or partnered.

Relationship between change in family-role quality and change in psychological distress. With change in work-role quality in the equation, neither changes in parent-role nor in partner-role quality had significant main effects on changes in psychological distress. However, the interactive-effects regression model with the interaction term, change in work-role quality x change in parent-role quality was significant, F (4, 164) = 3.23, p <.05, R2 = .07. As can be seen in Figure Sixteen.

Insert Figure Sixteen about here

Change in work-role quality is associated with change in psychological distress only when parent-role quality improves over time. Improvements in work-role quality enhance the positive effects on distress associated with improvements in parent-role quality. However, under conditions of decreasing work-role quality, any gains in psychological distress associated with improving parent-role quality are eliminated.

No such interactions were found between change in partner-role quality and change in work-role quality.

IV.F. Onset of Cardiovascular Diseases

We used different methods to examine the relationship between job quality and the onset of cardiovascular diseases (CVD). We examined the factors related to the onset of cardiovascular diseases in years 02 and 03, among those women who did not have CVD year 01. (Table Four above lists the diagnoses included in CVD.)

Methods. Since the aim of these analyses was to predict which individuals will develop CVD, respondents who had cardiovascular disease in year 01 were omitted from the analyses; the remaining respondents were classified into those who developed CVD in years 02 or 03 and those who did not[3]. Because the outcome variable has only two values (0,1), we used logistic regression techniques. A total of 308 women did not have CVD in year 01, and provided information on major illnesses in all three years.

We conducted the analyses in the following four steps:

Step 1. We estimated models that included "predisposing variables", such as a history of high-blood pressure in either biological parent, race and age.

Step 2. We examined the predictive ability of certain health behaviors. Based on principle components analysis, we grouped these behaviors into two factors: (1) the use of caffeine, alcohol and cigarettes, (2) obesity and low activity.

Step 3. We examined the predictive ability of the various job rewards and concerns factors described above. Each concern factor was categorized into low concerns (an average score of 1 or 2 -- not at all a concern or somewhat a concern -- on each component item) and high concerns (an average score of 3 or 4 -- considerably or extremely a concern -- on each component item). Each reward factor was similarly categorized into low and high rewards.

Step 4. We examined the predictive ability of the interaction between each concern factor with each reward factor. As noted above, Karasek and colleagues have found that it is "high strain" jobs -- jobs high in demands and low in decision latitude -- that are most damaging.

Predisposing variables and the onset of CVD. Age was not related to the onset of CVD in this sample, perhaps because no one in the sample was over 55. The average age of respondents in these analyses was 39, the median age was 38; 25% of the respondents were between the ages of 44 and 55 in the first year of the study. Occupation and SES were similarly not related. Race was marginally related to onset (coefficient = 0.38, $p < 0.08$) -- black women were more likely to develop cardiovascular disease. A history of high-blood pressure in either biological parent was significantly related to the onset of cardiovascular disease (coefficient = 0.77, $p < 0.05$) -- women who had one or more biological parents with high-blood pressure were significantly more likely to develop cardiovascular disease. We examined the relationship

between onset and the interactions of age, race and parental history; we found no significant interactions. Race and parental-history variables were kept in subsequent steps of the analyses.

Health behaviors and the onset of CVD. Neither category of health behaviors was significantly related to the onset of cardiovascular disease, even for individuals with a parental history of high-blood pressure.

Work rewards and concerns and the onset of CVD. None of the work reward or concern factors had a direct relationship to the onset of CVD. We then turned to an examination of the interactions of specific rewards and concerns. Our findings confirm Karasek's model. Individuals in jobs with high overload ("demand" in Karasek's model) and low challenge (one component of Karasek's "decision latitude") were significantly more likely to develop CVD in years 02 or 03. (Karasek, 1982)

Table Eight shows the proportion of individuals, with and without a parental history of high-blood pressure, in such high-strain jobs or

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Insert Table Eight about here

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not in high-strain jobs, who developed CVD. As can be seen, respondents with a parental history of high-blood pressure and a high-strain job were almost twice as likely to develop CVD as individuals with a parental history and a job that was not high strain, and almost 4 times as likely to develop cardiovascular disease as individuals with no parental history of high-blood pressure (regardless of job strain). In addition, individuals in jobs with high overload and low decision authority (another component of Karasek's "decision latitude") were marginally more likely to develop CVD.

We found two other interactions not predicted by Karasek's model. Women who reported high levels of concern about deadend jobs and low challenge were significantly more likely to develop CVD, and women with high overload and low satisfaction with salary were marginally more likely to develop CVD.

Interestingly, we found no relationship between the interaction of overload and helping others and the onset of cardiovascular disease, in contrast to its importance to mental health. It is possible that the development of cardiovascular disease is not as reactive to helping others at work as is mental health. However, given the relatively few respondents who developed cardiovascular disease during the 3 years of this study, we would not rule out the possibility that in a larger sample, followed over a longer period of time, one might find that individuals whose jobs are high on demands and offer few rewards from helping others are more likely to develop CVD.

Given the potential significance of these findings to the literature on CVD and women, we intend to develop these analyses further.

V. Summary of Findings

The section is organized around the four research aims.

1. To assess the contribution of work-role quality to mental and physical health.

Among female health-care providers, work-role quality is an important predictor of mental- and physical-health measures, particularly, psychological distress, subjective well-being, physical-health symptoms, and cardiovascular disease. To fully understand the relationships between work-role quality and health measures, one has to take into account both the rewards and the concerns experienced at work and their interactions. To illustrate, the work-reward factor helping others at work has direct effects on all three health measures -- subjective well-being, psychological distress and physical symptoms. The absence of this reward was associated with relatively high levels of mental and physical distress. In addition, overload is the work-concern factor universally associated with mental- and physical-health measures. Women who report high concerns about overload report low well-being, high psychological distress, and more physical symptoms. Moreover, helping others at work moderated the effects of overload on all three health measures. However, helping others was not associated with the onset of CVD.

These findings provide only partial support for the Karasek job-strain model. Since Karasek did not include the reward of helping others as a buffer, a direct comparison of the two sets of findings is not possible.

2. To assess the contribution of partner-role and parent-role occupancy to the outcomes net of work-role quality.

With race, age, SES, per capita income and work-role quality taken into account, family-role occupancy has few direct effects on psychological distress, well-being, or physical symptoms. The significant association between partnership status and well-being is the exception; employed partnered women report higher subjective well-being than employed single women.

With psychological distress as the outcome, family-role occupancy buffers the stress-enhancing effect of high levels of particular work concerns and of low levels of particular work rewards. Thus, where employed women occupy family roles, the quality of their work-role has less effect on their level of psychological distress. In short, women with family-roles are less reactive, i.e., more resilient, to the presence or absence of particular work rewards and concerns. In contrast, with physical symptoms as the outcome, employed women with children are more reactive the presence or absence of rewards from satisfaction with salary than are women without children.

3. To assess the contribution of partner-role and parent-role quality to the outcomes, net of work-role quality.

The contribution of family-role quality, net of the control variables and work-role quality, differs for each of the health measures. With subjective well-being as the outcome, parent-role and partner-role quality have direct, but not interactive effects. With psychological distress and physical health as the outcomes, family-role quality has both direct and interactive effects. With psychological distress as the outcome, partner-role quality has direct effects only, parent-role quality has both direct and interactive effects. The significant interaction reflects positive-spillover effects from work to home: employed mothers with troubled mother-child relationships are protected from the distress-enhancing effects of those relationships, provided they are in rewarding jobs. With reports of physical symptoms as the outcome, parent-role and partner-role quality had direct effects. In addition, helping others enhanced the positive association between partner-role quality and physical symptoms.

4. To assess the above relationships to mental health longitudinally.

The major finding of interest was the stability of the sample with respect to role occupancy, role quality and health measures. Changes in work-role quality were related in the expected direction to changes in well-being and in psychological distress. In contrast, neither change in partnership status nor in parental status had direct effects on changes in either mental-health measure. However, parental status had a significant interactive effect on the relationship between changes in work-role quality and changes in psychological distress: change in psychological distress among employed women who are not mothers, compared to those who are mothers, is more vulnerable to change in work-role quality.

Footnotes

1. This finding may be due to the reduced sample size for these analyses.

2. The actual weight used was the inverse of the root mean square error from the within-individual regression of change over time in psychological distress.

3. Respondents who were hypertensive or who reported any of the cardiovascular diseases on the serious illness checklist in years 02 or 03, who also were not hypertensive in year 01 and had not reported any of these diseases in year 01, were scored 1 for onset of cardiovascular disease; all other respondents were scored 0.

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SOCIAL WORKERS
(248)

WHITE
(204)

Mother \ Partner	Yes	No
Yes	50	50
No	54	50

BLACK
(44)

Mother \ Partner	Yes	No
Yes	13	15
No	3	13

LICENSED PRACTICAL NURSES
(155)

WHITE
(138)

Mother \ Partner	Yes	No
Yes	51	37
No	18	32

BLACK
(17)

Mother \ Partner	Yes	No
Yes	8	5
No	0	4

TABLE 1

SAMPLE YEAR 01 (N = 403)

SOCIAL WORKERS
(230)

WHITE
(195)

KIDS \ Partner	Yes	No
Yes	69	43
No	40	43

BLACK
(35)

KIDS \ Partner	Yes	No
Yes	11	9
No	5	10

LICENSED PRACTICAL NURSES
(141)

WHITE
(127)

KIDS \ Partner	Yes	No
Yes	58	27
No	15	27

BLACK
(14)

KIDS \ Partner	Yes	No
Yes	7	5
No	0	2

TABLE 2

PARTNER AND KID STATUS FOR 371 SUBJECTS

INTERVIEWED ALL THREE YEARS

Table 3

Role-Status Changes[a]

Status in Year 01	No Change	Change in Year 02[b]	Change in Year 03	Changes in Years 02 & 03[c]
Parent	206	1	0	0
No Children	141	7	16	0
Partnered	179	4	1	0
Single	160	17	8	2
Employed	345	8	7	11

a $n = 371$

b Change into opposite role status, e.g., from "no children" to "parent" or from "partnered" to "single".

c Multiple changes, e.g., from "employed" to "not employed" to "employed".

Table 4

Onset of Serious Illnesses[a]

Diagnosis	Reported in Year 01	"Onset" in Year 02[b]	"Onset" in Year 03
Hayfever	80	24	13
Mononucleosis	4	2	0
Pneumonia	6	10	4
Asthma	19	6	8
Emphysema	0	0	1
Tuberculosis	2	0	0
Glaucoma	2	2	0
Deafness	7	0	3
Blindness	2	0	3
Hernia	1	1	0
Appendicitis	1	4	0
Gallstones	6	1	0
Hepatitis	4	1	0
Peptic Ulcer	8	2	0
Pancreatitis	1	0	0
Diabetes	5	1	1
Arthritis	30	18	7
Eczema	20	8	8
Drug Allergy	28	13	9
Shingles	2	1	1
Migraines	43	6	7
Coma	0	0	1

Table 4 continued

Diagnosis	Reported in Year 01	"Onset" in Year 02[b]	"Onset" in Year 03
Epilepsy	3	0	0
Fibroids of Uterus	34	14	6
Ovarian Cyst	21	5	6
Gonorrhea	1	1	0
Syphilis	0	1	0
Kidney Infection	7	3	3
Kidney Stone	4	1	2
Uremia	0	3	3
Goiter	3	3	0
Gout	0	2	0
Hyperthyroid	4	2	1
Colitis	5	3	1
Parkinson Disease	0	1	0
Muscular Dystrophy	0	1	0
Alcoholism	3	1	0
Drug Addiction	2	2	0
Tumor in Spinal Cord	0	1	0
Brain Infection	0	1	0
Multiple Sclerosis	1	0	0
Endometriosis	NA[c]	15	8
Vaginal Infection	NA	63	19
Bladder Infection	NA	35	8

Table 4 continued

Diagnosis	Rreported in Year 01	"Onset" in Year 02[b]	"Onset" in Year 03
CARDIOVASCULAR DIAGNOSES:			
Irregular Heart Beats	30	13	6
Anemia	35	10	12
High Blood Pressure[d]	37	11	12
Angina	2	0	1
Bloodclot in Blood Vessels	2	1	2
Bloodclot in Lung	1	0	0
Congenital Heart Defects	5	3	3
Heart Attack	0	0	1

Note. None of the respondents reported the following illnesses: Collapsed lung, hardening of the arteries, stroke, heart failure, bleeding in the brain, cirrhosis of the liver, cerebral palsy, cancer.

a n = 371

b "Onset" = not ill the year or years before.

c NA = not asked in Year 01.

d Includes respondents on medication or identified by our blood pressure readings.

Table 5

Reliability Data

Reward and Concern Scales	Chronbach's Alpha	Test-Retest[a]
Partner		
Reward	.93	.87
Concern	.88	.78
Balance		.90
Work		
Reward	.88	.87
Concern	.89	.81
Balance		.87
Parent		
Reward	.93	.82
Concern	.89	.70
Balance		.75

a 35 women were re-tested 2 months after wave 01 interview.

Table 6

Confirmatory Factor Analysis Models

Model	n[a]	x^{2b}	df	p-val	gfi[c]	agfi[d]	x^2/df
JOB							
Rewards	200	275.96	155	.000	.882	.548	1.78
Rewards	**203**	**276.46**	**155**	**.000**	**.884**	**.551**	**1.78**
Concerns	200	173.56	94	.000	.899	.674	1.85
Concerns	**204**	**174.26**	**94**	**.000**	**.908**	**.702**	**1.85**
KID							
Rewards	112	80.17	59	.035	.907	.736	1.36
Rewards	**114**	**89.10**	**59**	**.007**	**.897**	**.841**	**1.51**
Concerns	112	58.26	41	.039	.917	.781	1.42
Concerns	**115**	**91.35**	**41**	**.000**	**.874**	**.796**	**2.23**
PARTNER							
Rewards	90	76.98	41	.001	.876	.673	1.88
Rewards	**107**	**94.64**	**41**	**.000**	**.875**	**.798**	**2.31**
Concerns	90	63.33	41	.014	.885	.696	1.54
Concerns	107	64.45	41	.011	.907	.850	1.57

Confirmed models are entered in boldface.
a n_2 = sample size
b x^2 = chi-square goodness-of-fit statistic
c gfi = goodness-of-fit index
d agfi = goodness-of-fit index adjusted for degrees of freedom

SOCIAL WORKERS

(184)

WHITE

(157)

Mother \ Father	Yes	No
Yes	46	39
No	33	39

BLACK

(27)

Mother \ Father	Yes	No
Yes	8	8
No	2	9

LICENSED PRACTICAL NURSES

(121)

WHITE

(108)

Mother \ Father	Yes	No
Yes	46	26
No	11	25

BLACK

(13)

Mother \ Father	Yes	No
Yes	7	4
No	0	2

TABLE 7

LONGITUDINAL SAMPLE

($\underline{N}$ = 305)

Table 8

Onset of Cardiovascular Disease

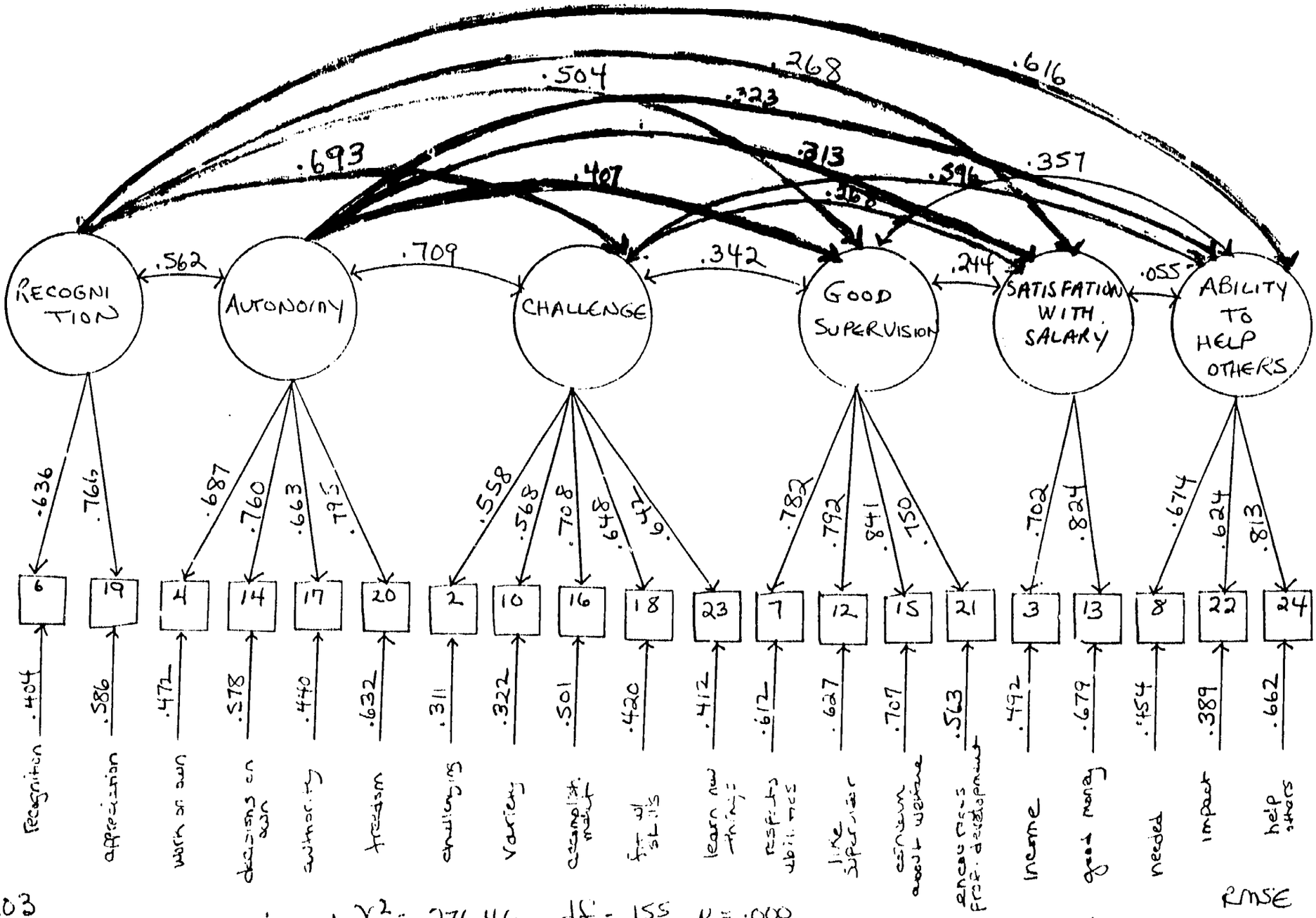
	One or More Biological Parents with High Blood Pressure[a]			
	Yes		No	
Onset of CVD	High Strain[b]	Not High Strain	High Strain	Not High Strain
No	13	131	5	70
Yes	6	28	0	7
Proportion	32%	18%	0%	9%

[a] 18 Respondents did not know if either parent had high blood pressure -- they are omitted from this Table.

[b] High Strain = high overload and low challenge.

FIGURE 1

JOB REWARDS MODEL



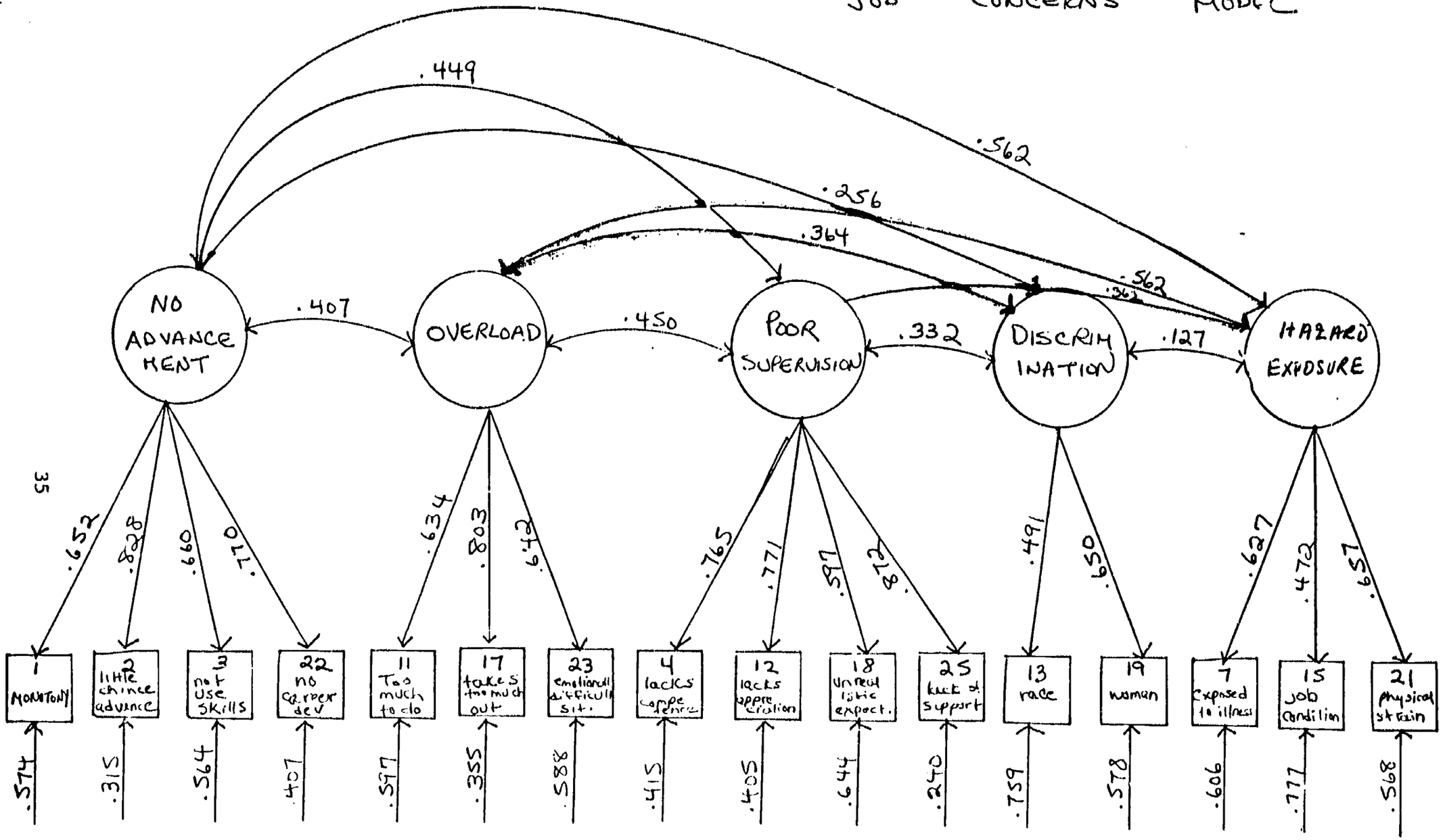
$\chi^2 = 276.46$, $df = 155$, $p = .000$

RMSE .058

AGFI .557

FIGURE 2

JOB CONCERNS MODEL



35

42

43

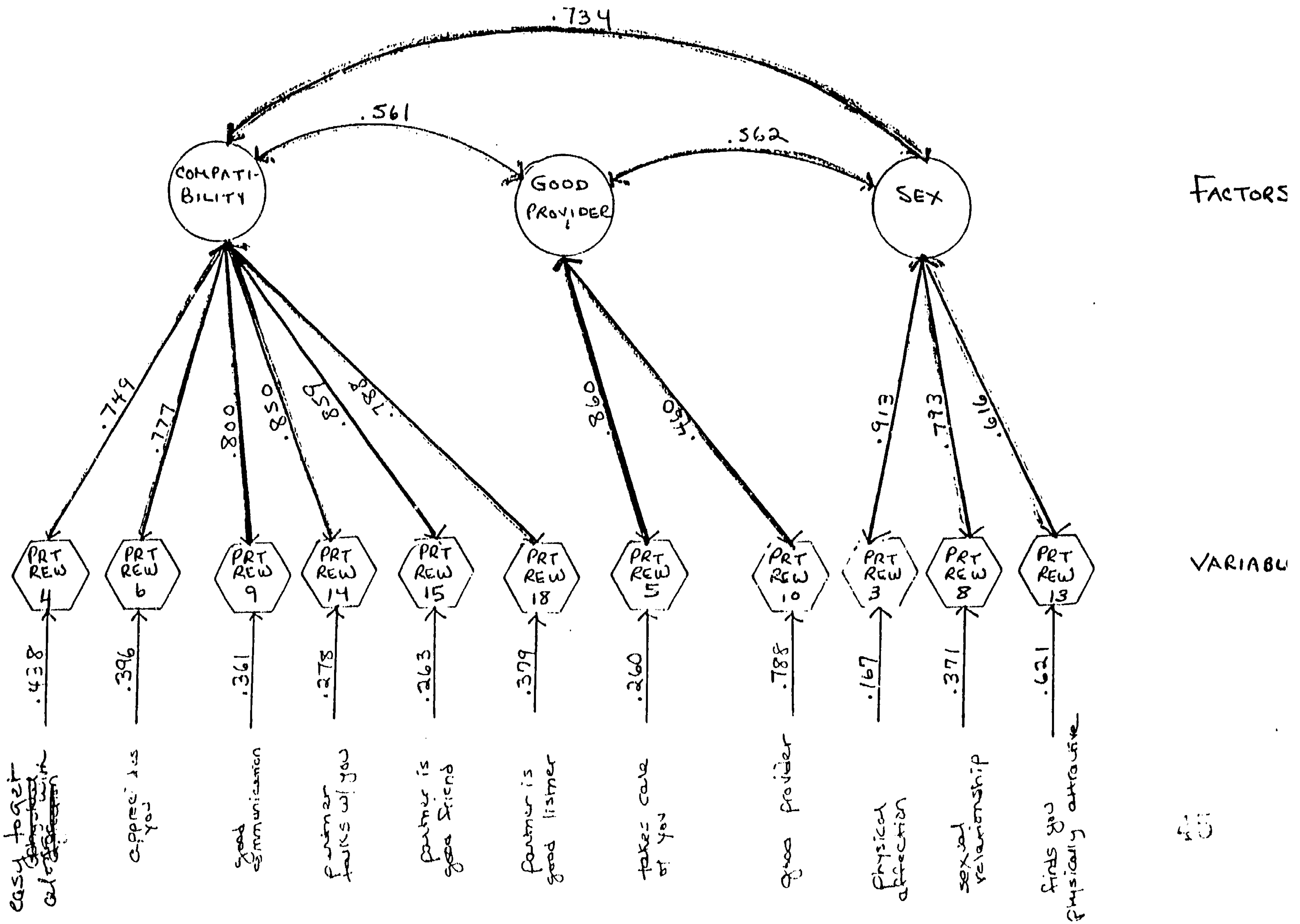
$\chi^2 = 174.26$, $df = 94$, $p = .000$

RMSE .0
AGFI .70.

.04

FIGURE 3

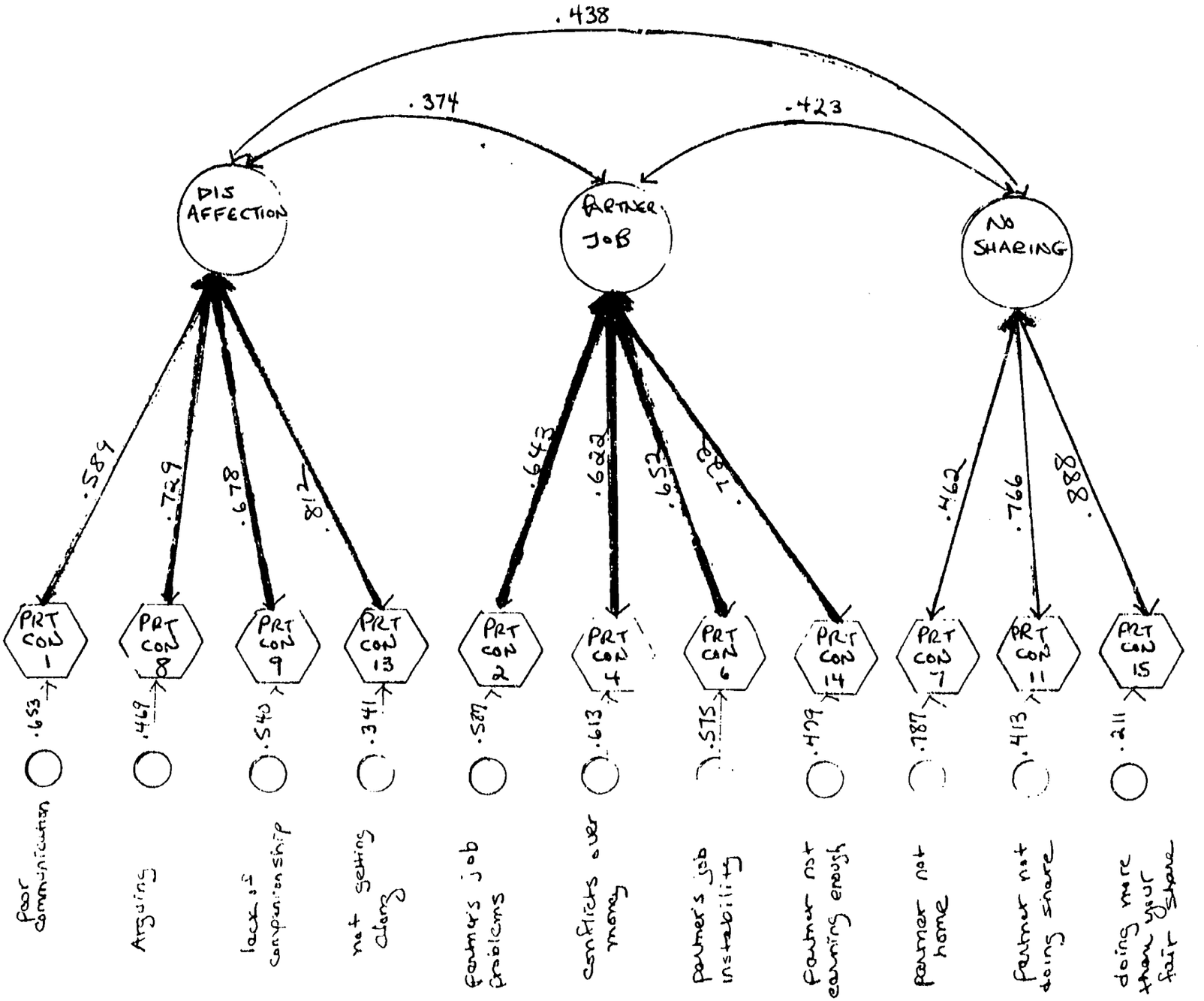
PARTNER REWARDS MODEL



N = 107 χ^2 = 94.64 df = 41, p = .000 RMSE = .0 AGFI = .

FIGURE 4

PARTNER CONCERNS MODEL



$n = 107$

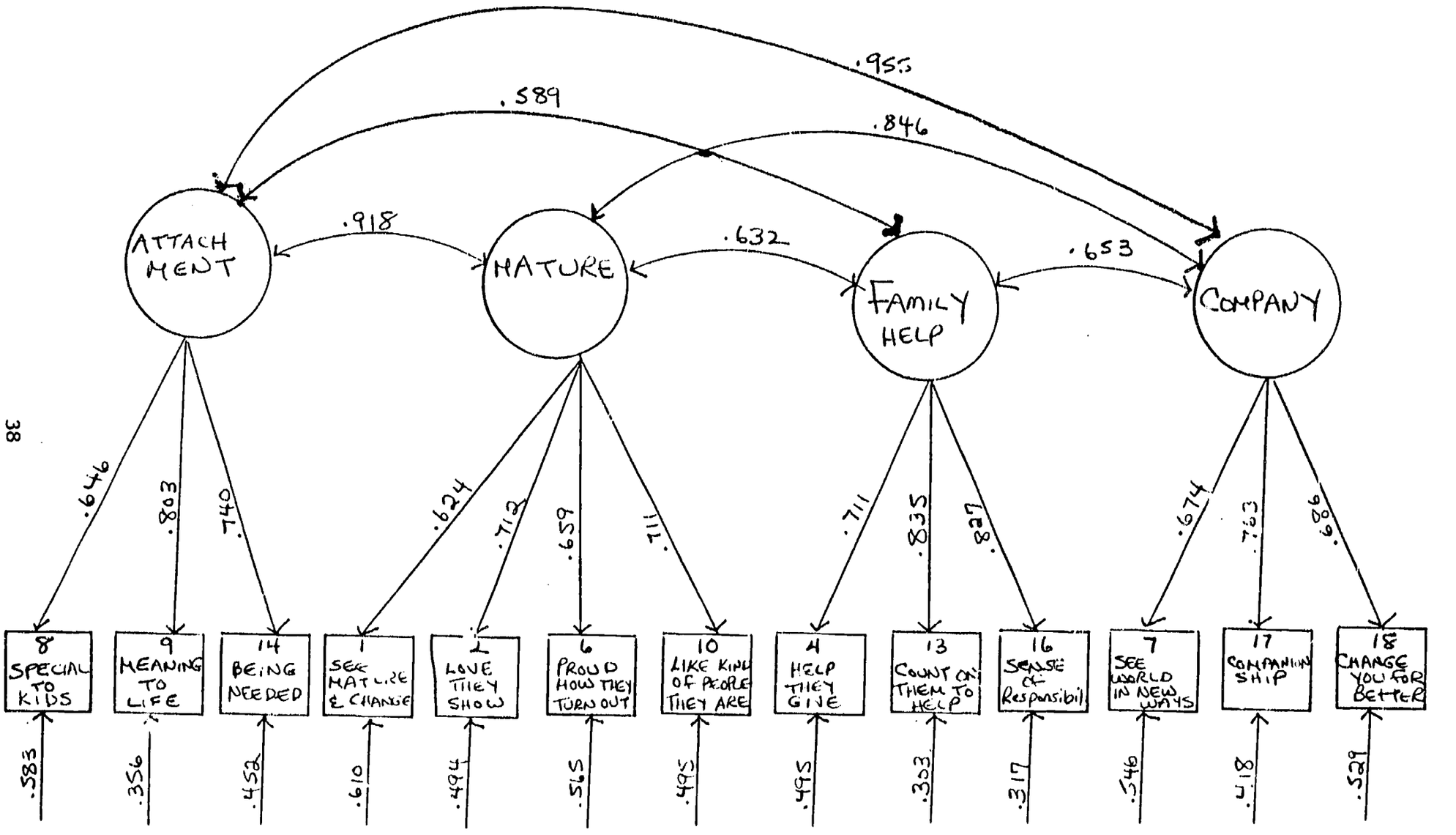
$\chi^2 = 64.45$, $df = 41$, $p = .01$

RMSE = .074

AGFI = .850

FIGURE 5

PARENT REWARDS MODEL



38

49

00. 40

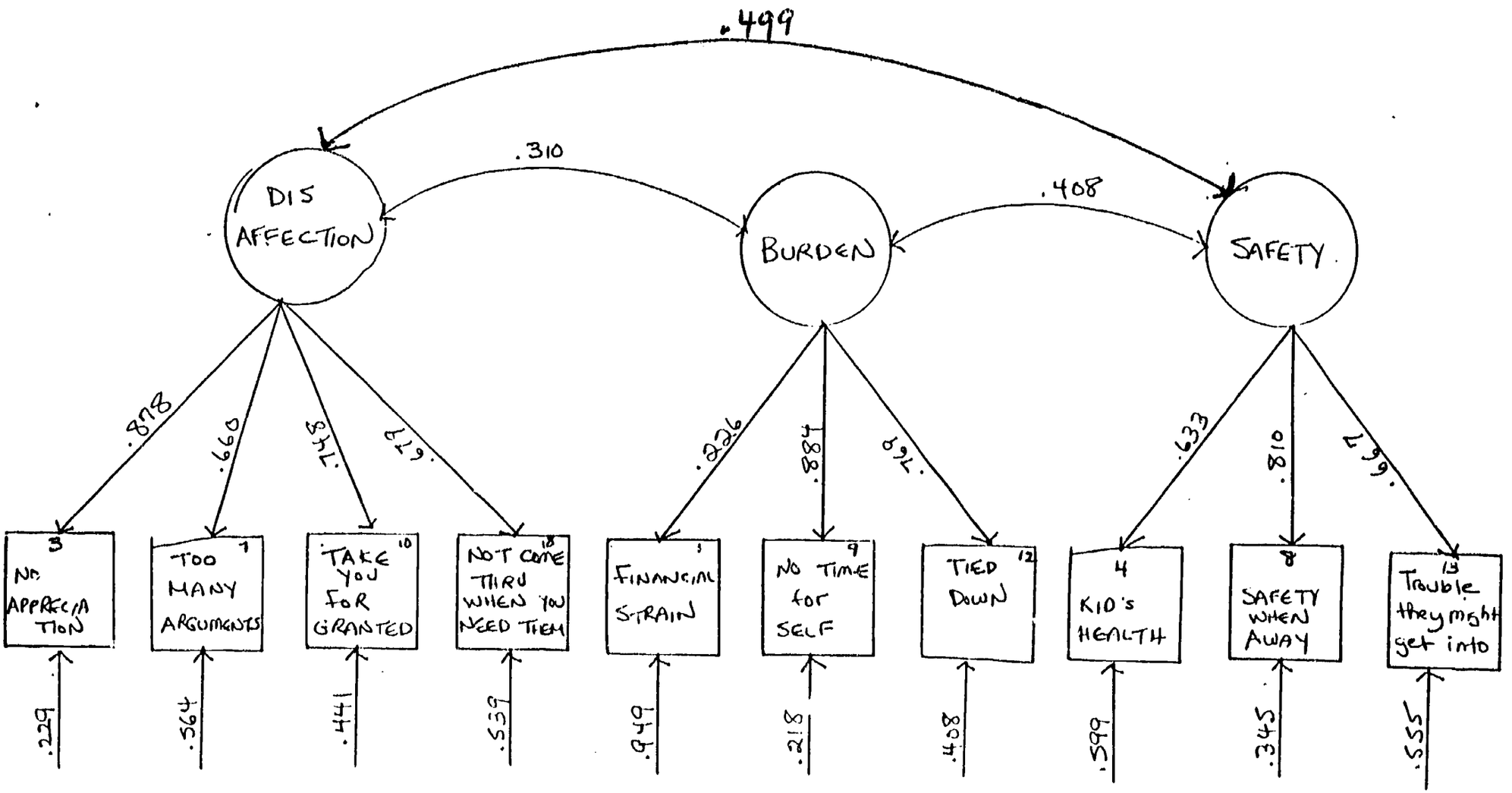
N 14

$\chi^2 = .89.10$, $df = 59$, $p = .007$

AGFI .841
RMSE .049

FIGURE 6

PARENT CONCERNS MODEL



$\chi^2 = 65.05$, $df = 32$, $p = .000$

RMSE .091
AGFI .825

FIGURE 7: INTERACTION OF OVERLOAD AND HELPING OTHERS AT WORK ON PSYCHOLOGICAL WELL-BEING

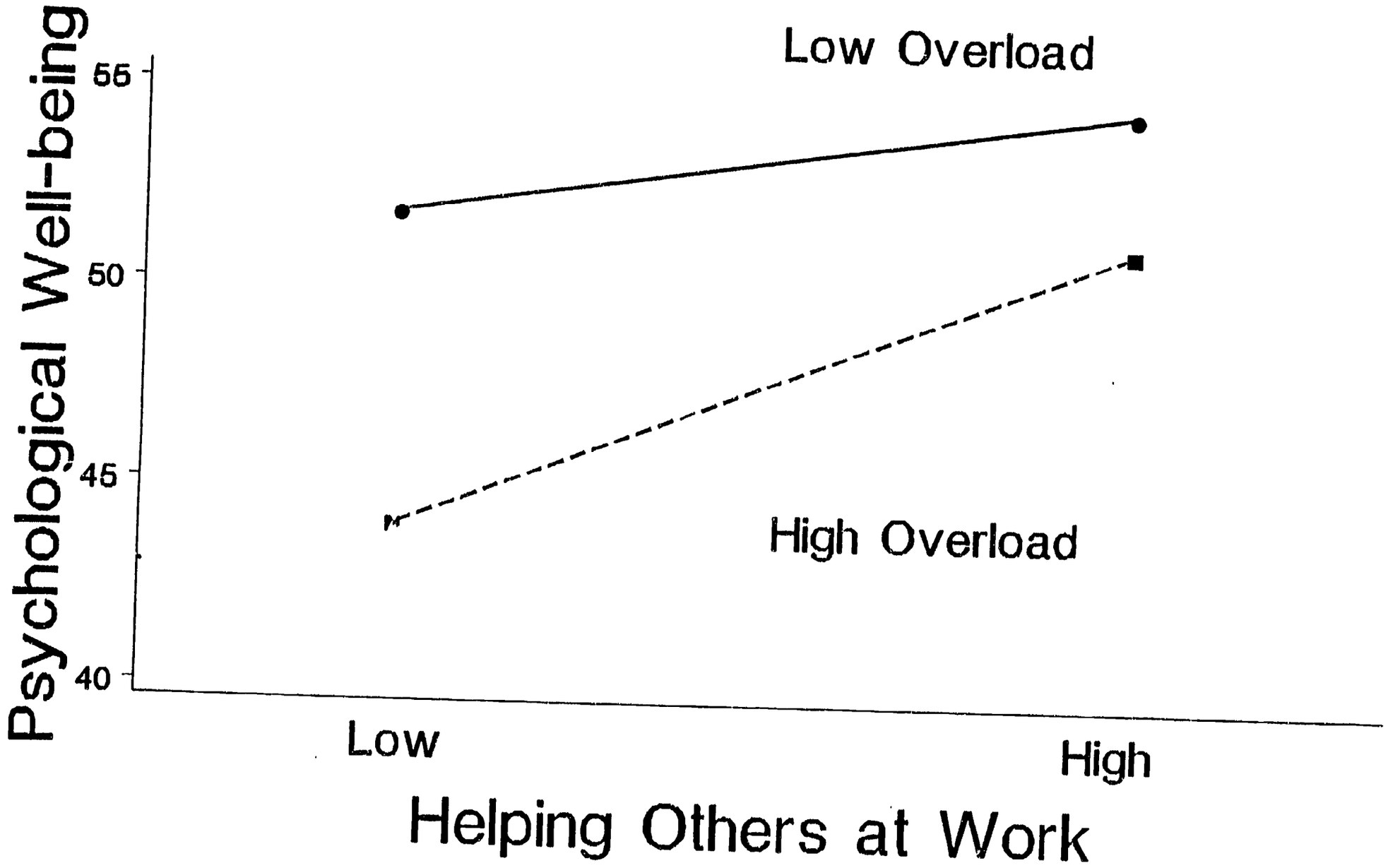


FIGURE 8: INTERACTION OF OVERLOAD AND HELPING OTHERS AT WORK ON PSYCHOLOGICAL DISTRESS

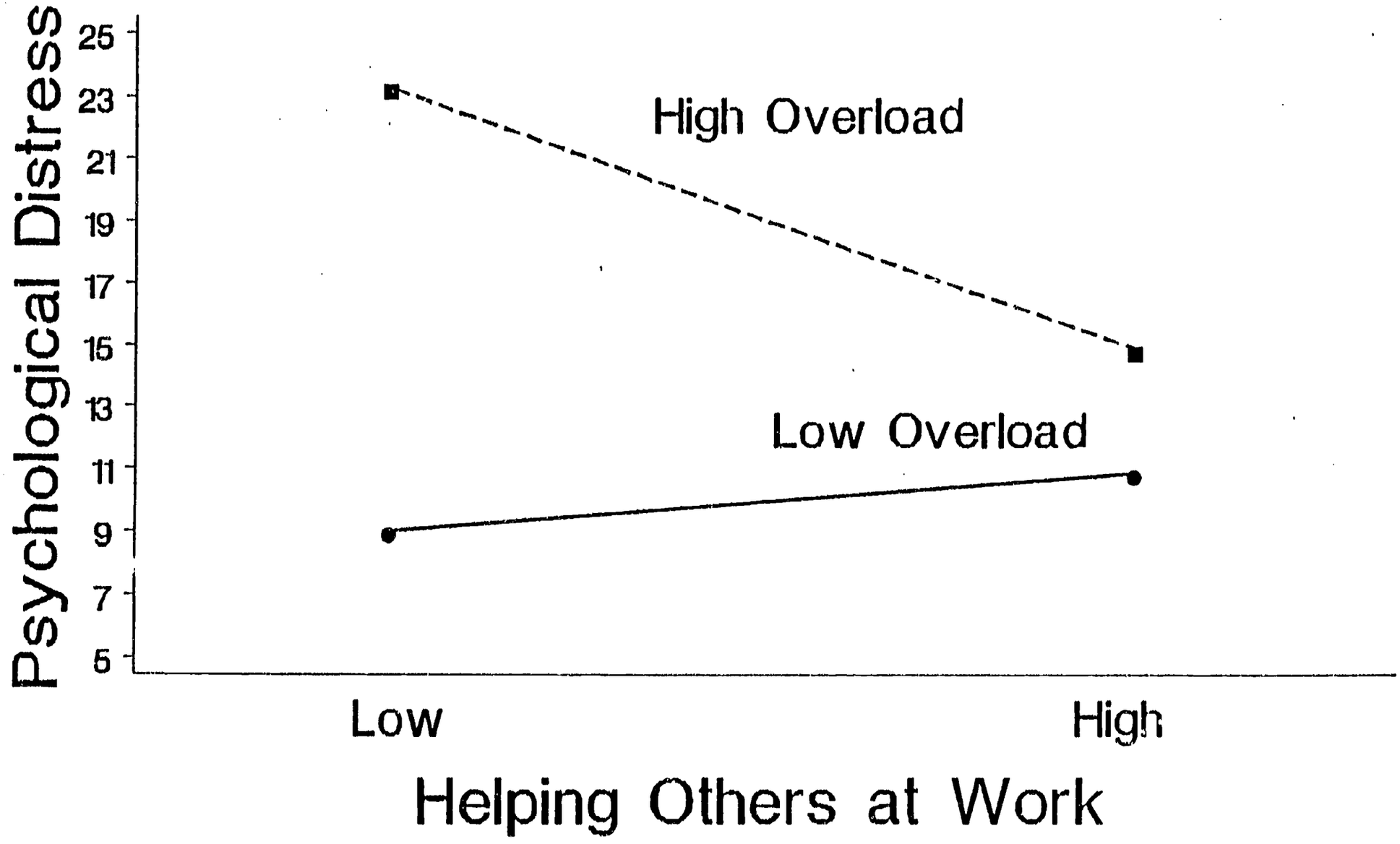


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FIGURE 9: INTERACTION OF PARENT-ROLE OCCUPANCY AND DECISION AUTHORITY AT WORK ON PSYCHOLOGICAL DISTRESS

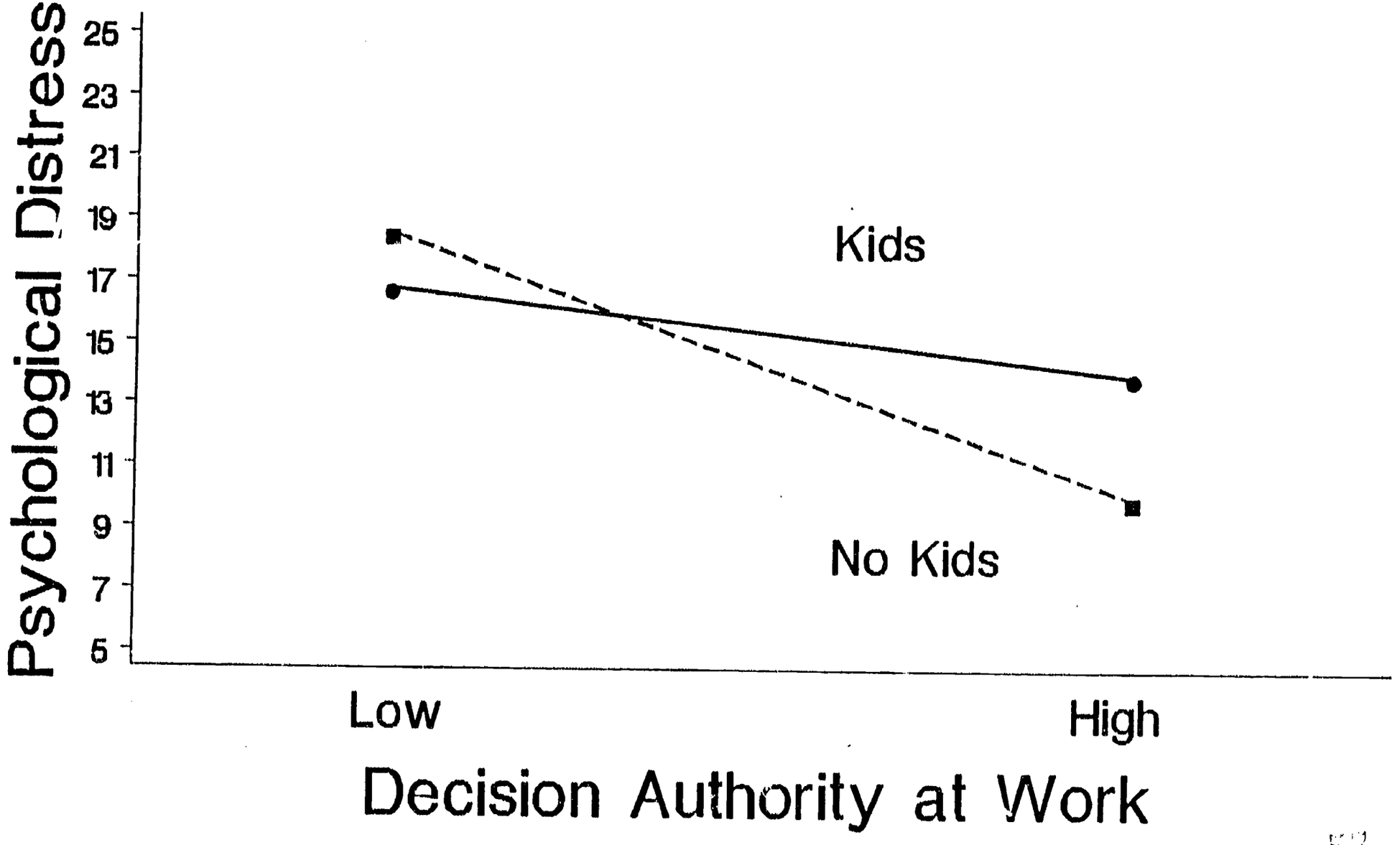


FIGURE 10: INTERACTION OF PARTNER-ROLE OCCUPANCY AND HELPING OTHERS AT WORK ON PSYCHOLOGICAL DISTRESS

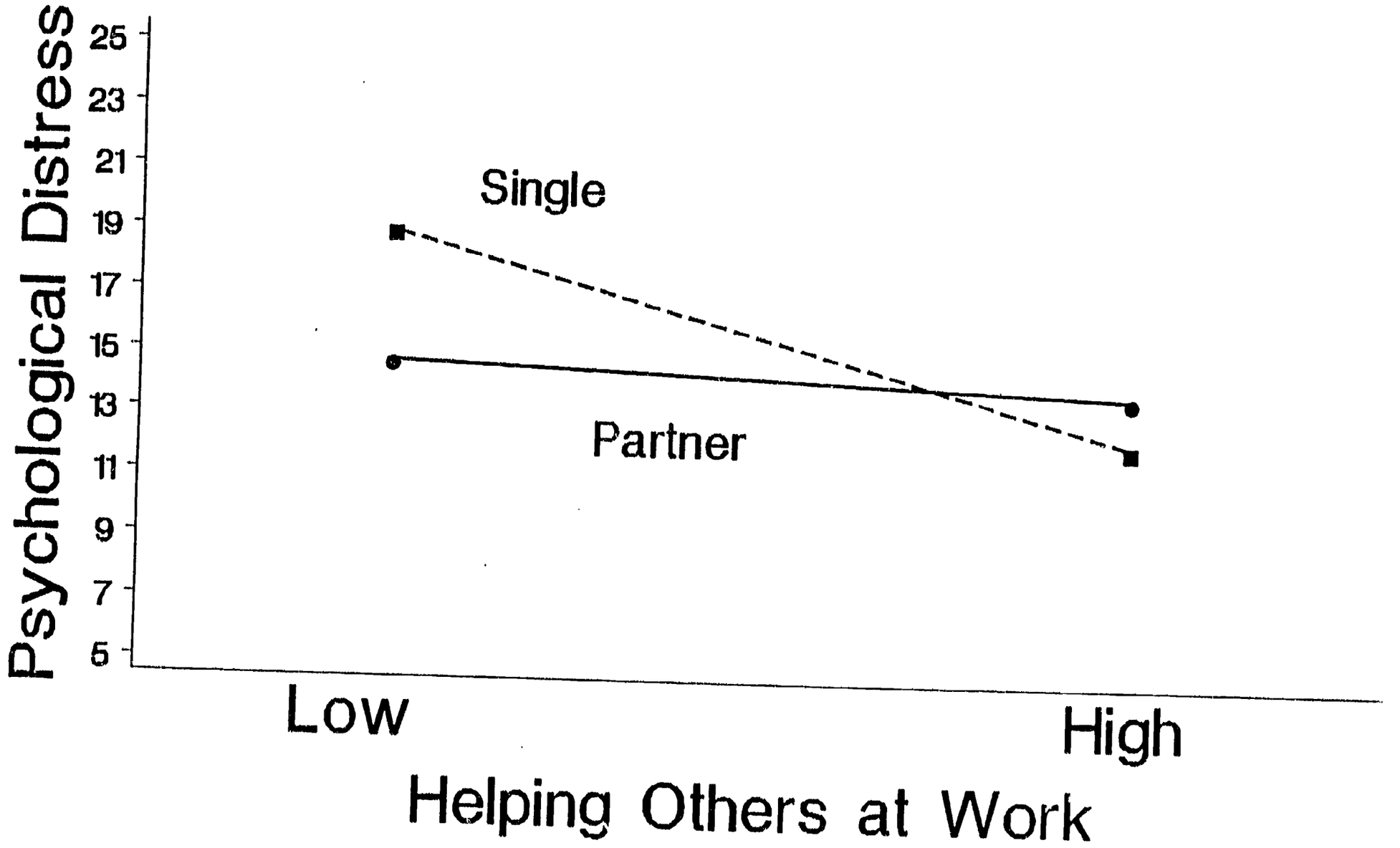


FIGURE 11: INTERACTION OF WORK REWARDS AND PARENT-ROLE QUALITY ON PSYCHOLOGICAL DISTRESS

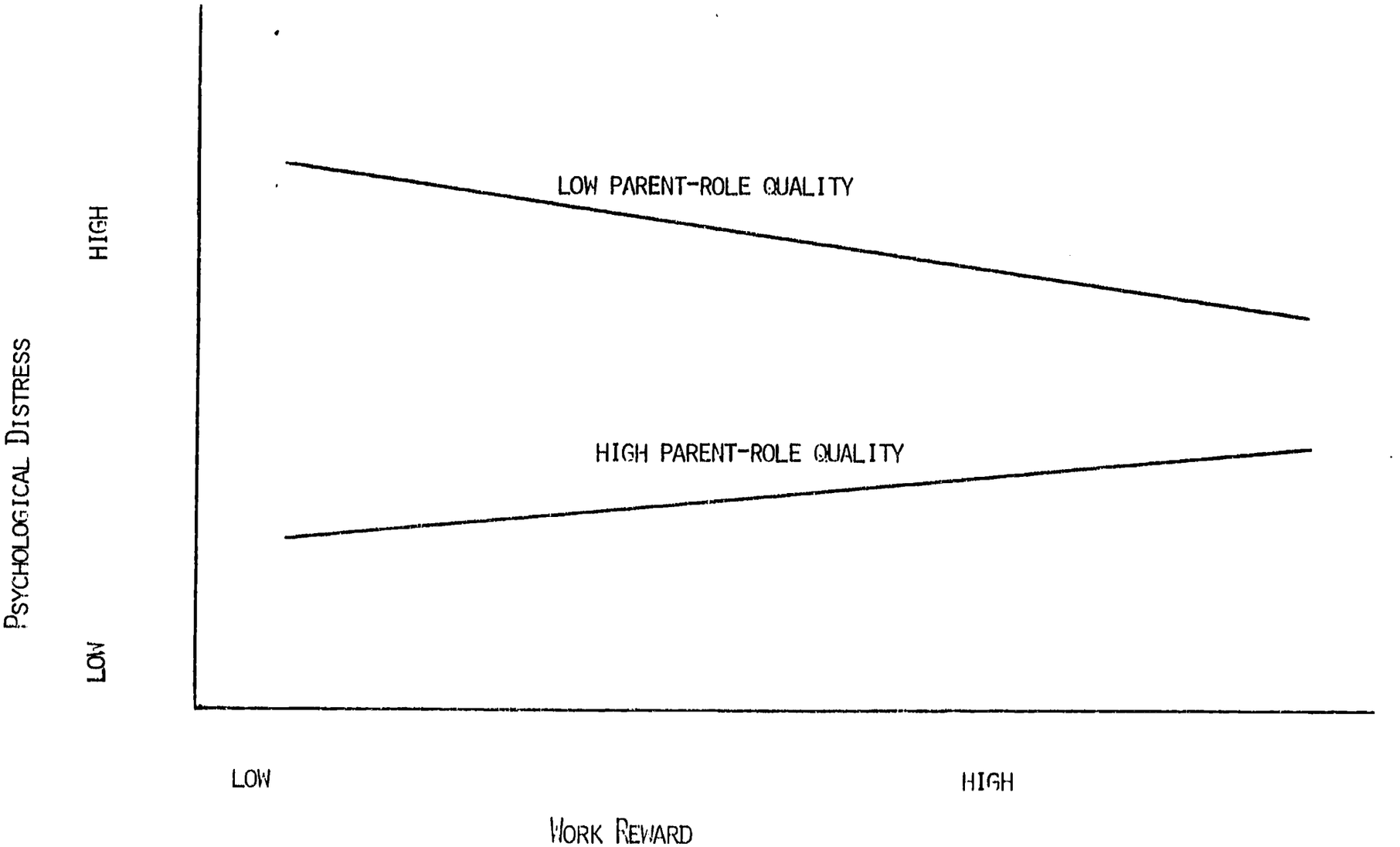


FIGURE 12: INTERACTION OF HELPING OTHERS AT WORK AND OVERLOAD ON PHYSICAL SYMPTOMS

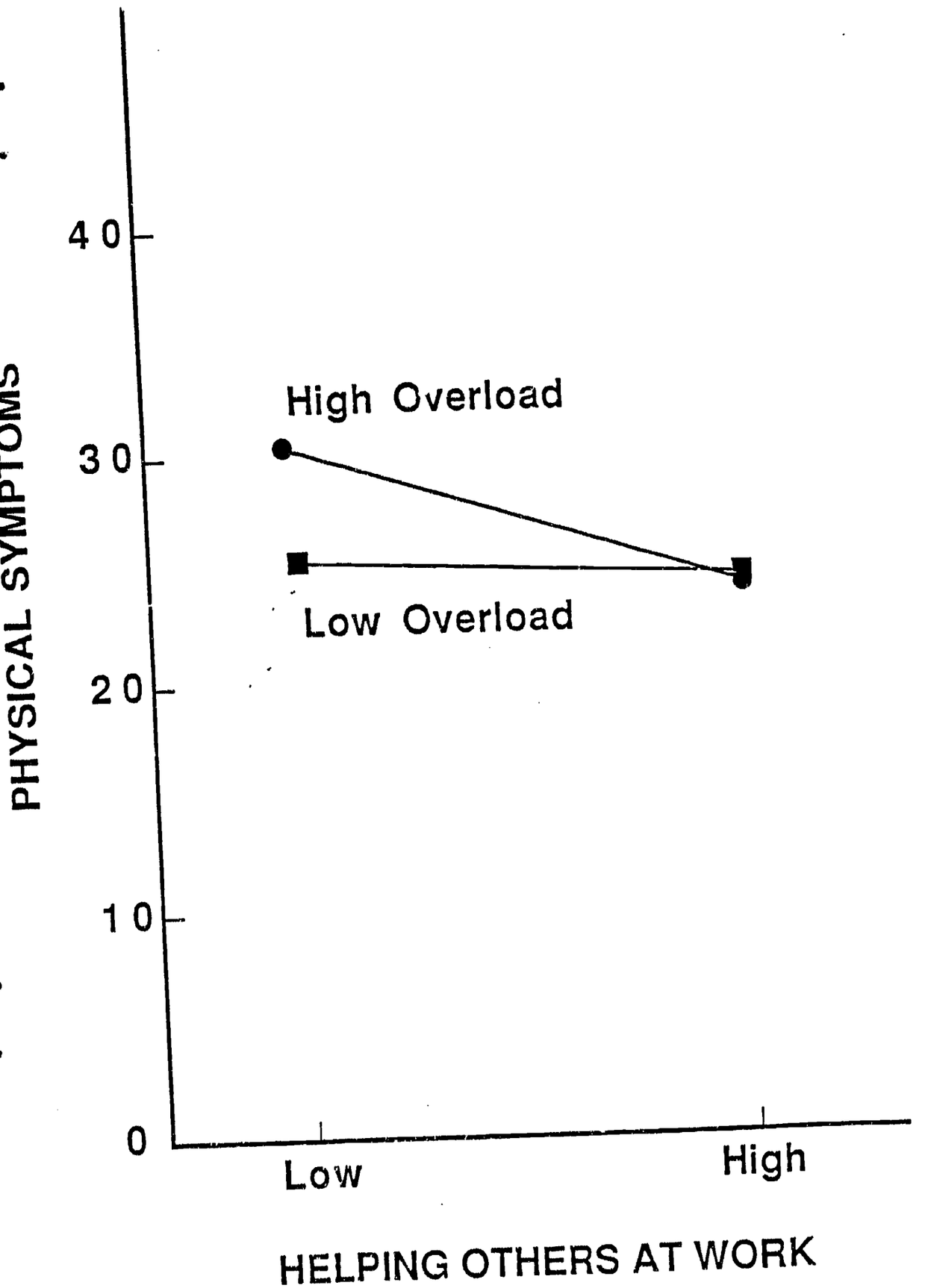


FIGURE 13: INTERACTION OF SATISFACTION WITH SALARY AND PARENTAL STATUS ON PHYSICAL SYMPTOMS

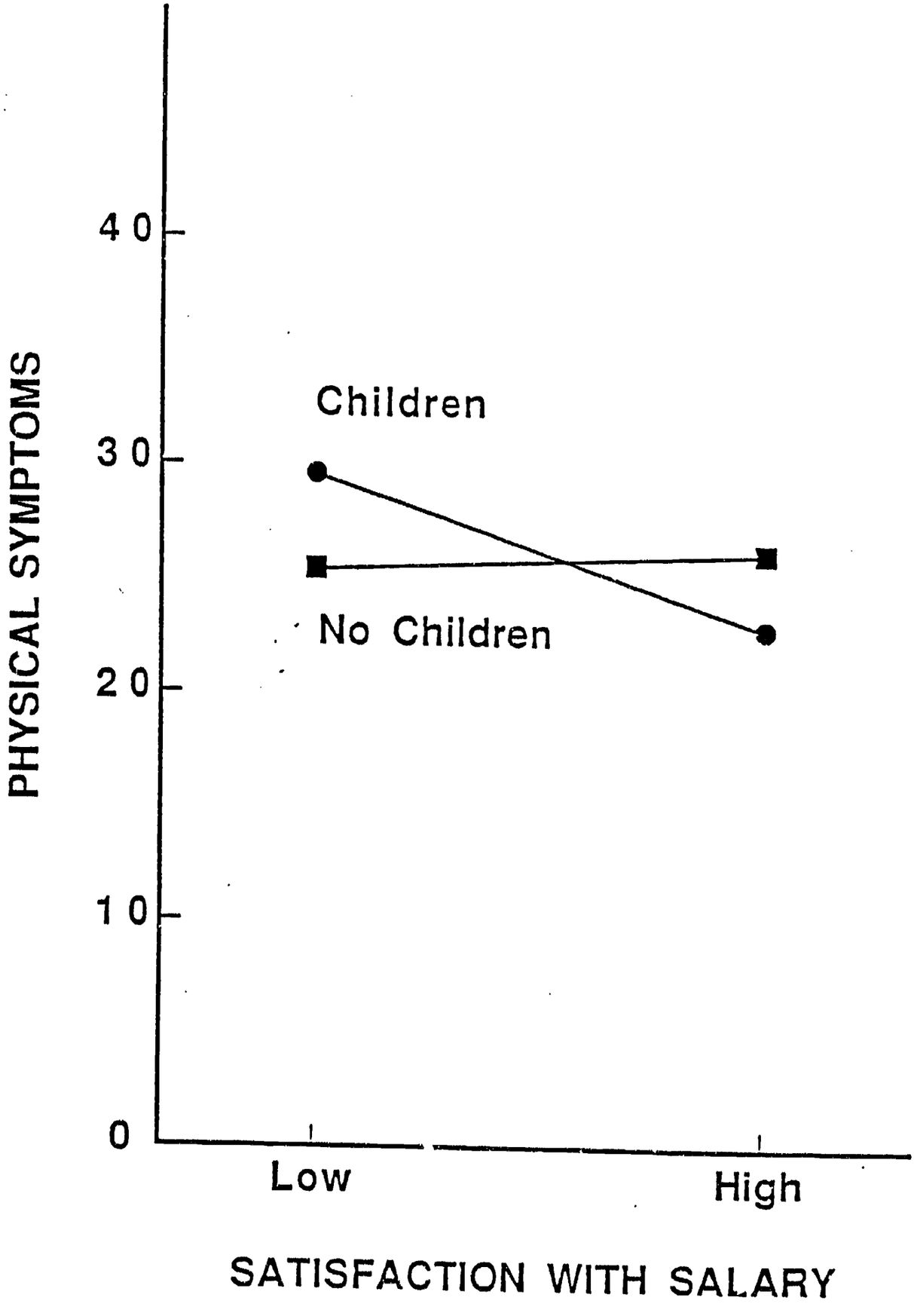


FIGURE 14: INTERACTION OF HELPING OTHERS AT WORK AND PARTNER-ROLE QUALITY ON PHYSICAL SYMPTOMS

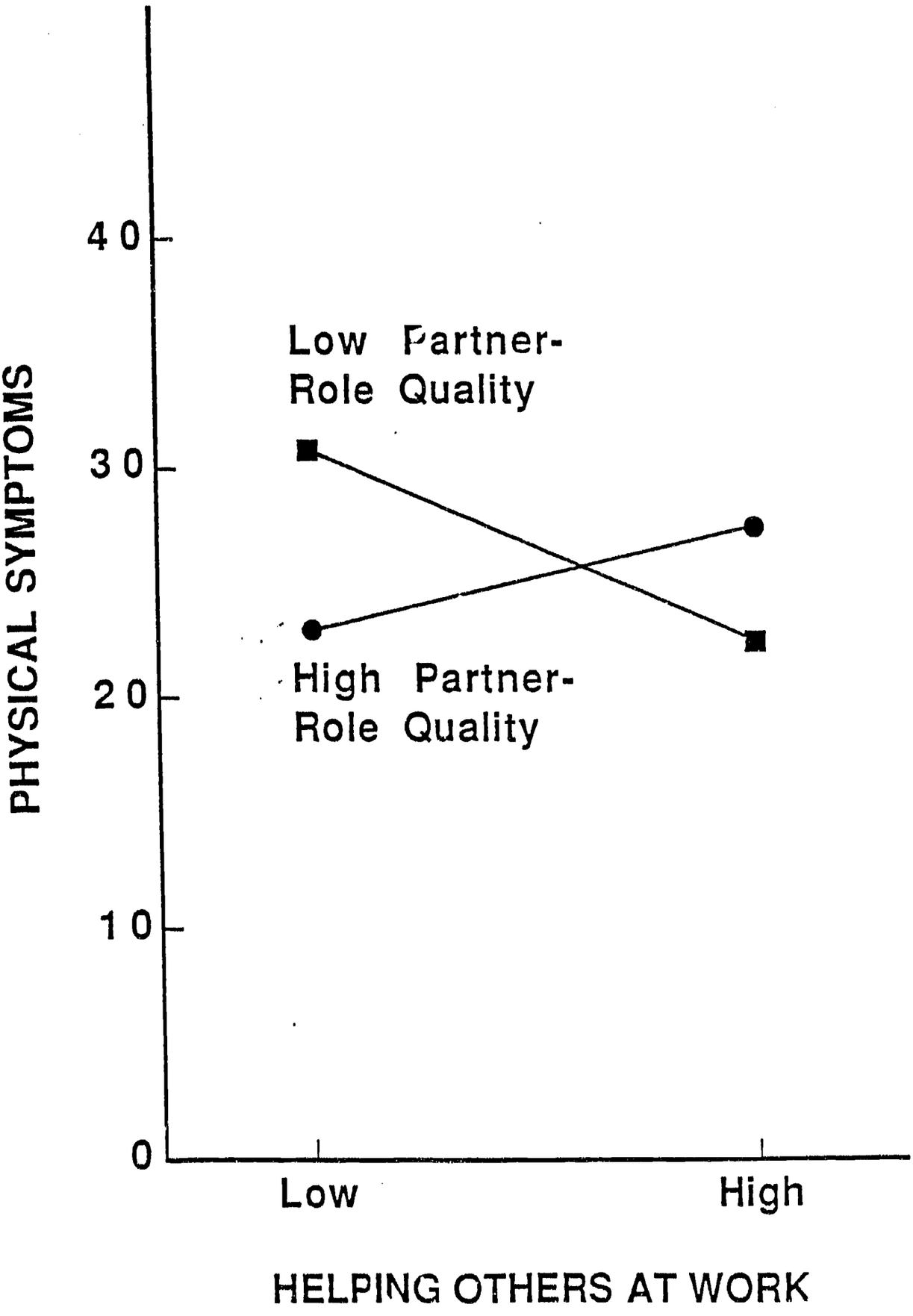


FIGURE 15: INTERACTION OF CHANGE IN WORK-ROLE QUALITY AND PARENTAL STATUS ON CHANGE IN PSYCHOLOGICAL DISTRESS

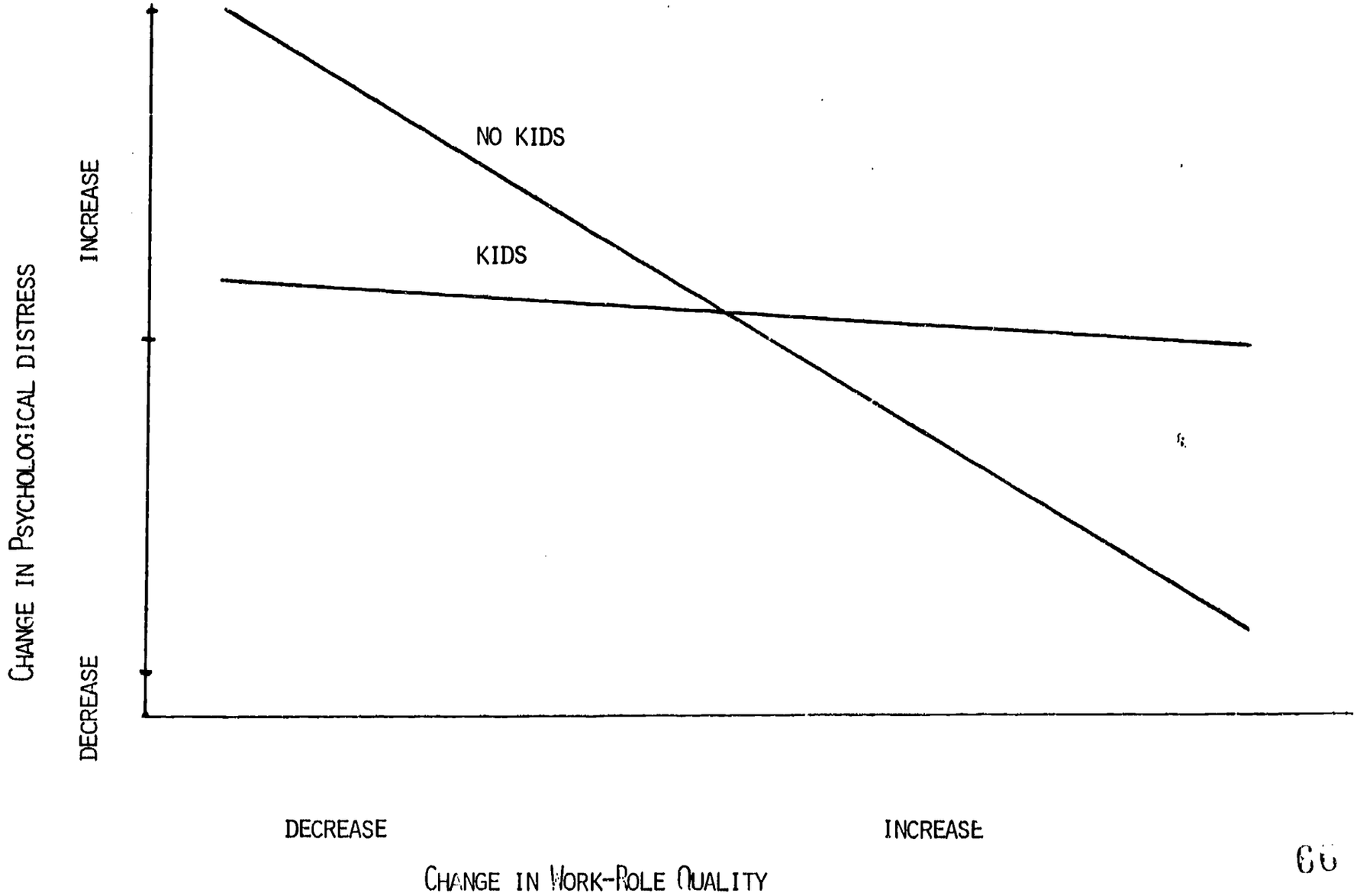
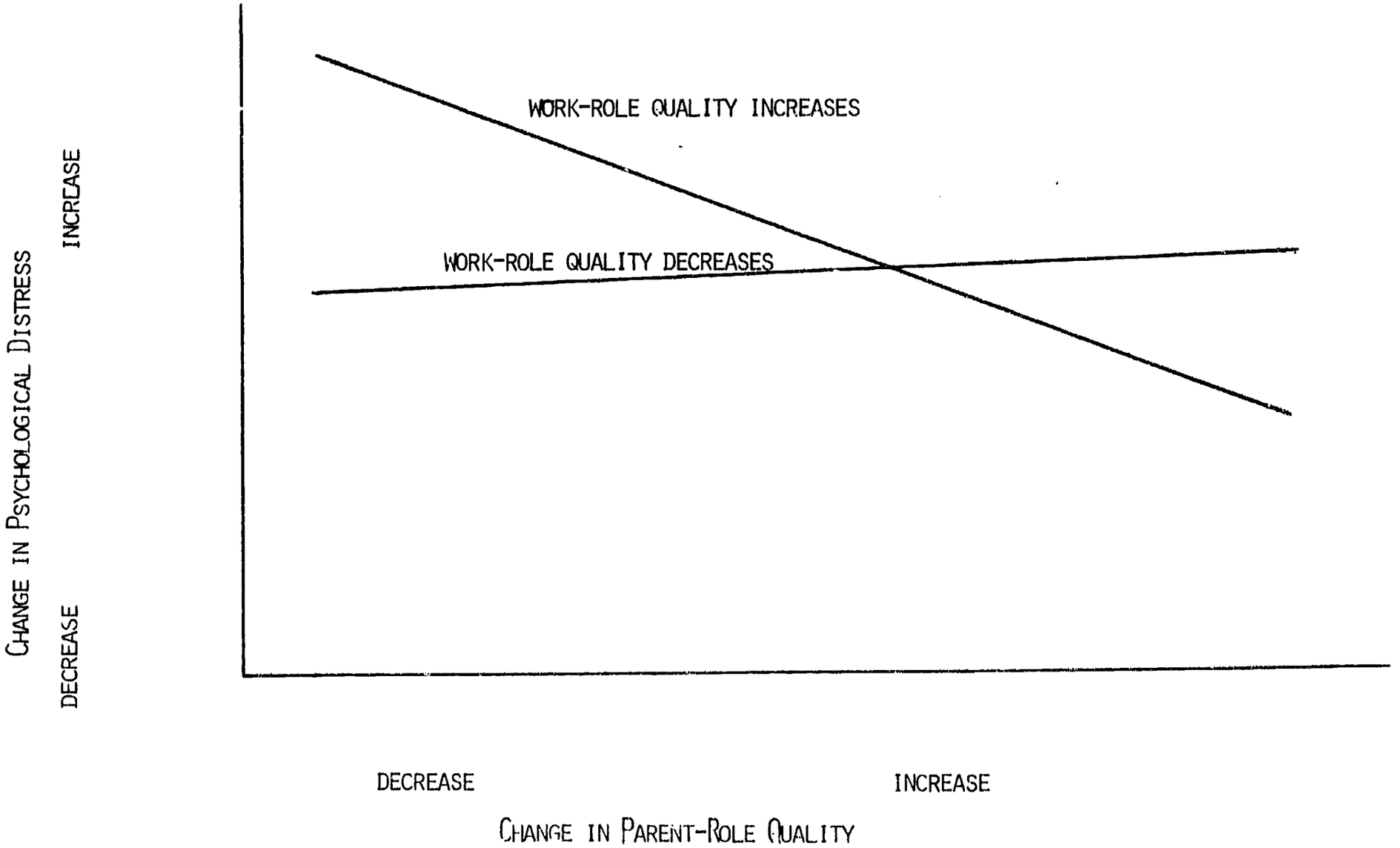


FIGURE 16: INTERACTION OF CHANGE IN PARENT- AND WORK-ROLE QUALITY ON CHANGE IN PSYCHOLOGICAL DISTRESS



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