OCCUPATIONAL STRESS AND HEALTH

CHAPTER 1

OCCUPATIONAL STRESS, SOCIAL SUPPORT AND HEALTH*

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Although the title of this conference is "Reducing Occupational Stress", the basic concern of those gathered here is not the reduction of stress per se in any or all of its different meanings. Rather our concern is to improve physical and mental health, and reducing occupational stress constitutes one means of improving health. Thus, our primary goal is actually to reduce the deleterious impact of occupational stress on health. It is important to keep this primary goal in mind for two reasons. First, many including Harold Bridger, would argue that experiencing certain types and degrees of stress can have beneficial rather than deleterious effects on physical and/or mental health. Second, as with any potential disease producer, the deleterious effects of stress can be alleviated not only by reducing the level of stress itself but also by bolstering the resistance of human beings to its disease producing effects. Thus, even in situations where we can not or will not reduce the level of occupational stress, we may still be able to mitigate the deleterious effects of stress on health.

While we must seek to reduce or eliminate noxious forms of occupational stress wherever possible, it is likely that a considerable amount of such stress will prove most irreducible. A multitude of factors constitute, or contribute to, what we label as occupational stress, and thus consequential residual amounts of stress are likely to remain even after concerted efforts at stress reduction. Further, the goal of reducing occupational stress and/or the means necessary to do so will often have to be weighed against competing goals and priorities.

Since, as discussed below, occupational stress is the product of an interaction between persons and their work environments, reducing stress entails modifying persons and/or work organizations--a difficult task especially if stress reduction may have to come at the expense of other individual or organizational goals or needs. The very modest success of efforts to reduce other health hazards such as cigarette smoking or many environmental hazards--the nature and effects of which are much better known than those of occupational stress--suggest the kinds of problems efforts at stress reduction may confront.

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Thus, I would like to discuss a potential social mechanism for mitigating the deleterious effects of occupational stress on health which has received increasing attention in recent years under the rubric of "social support". Though this concept is often treated very vaguely in the literature, people may be said to have social support if they have a relationship with one or more other persons which is characterized by relatively frequent interactions, strong and positive feelings, and especially perceived ability and willingness to lend emotional and/or instrumental assistance in times of need. The appeal of social support as a concept and mechanism for health improvement is reflected in its recently having been chosen as the central topic of invited addresses by two of America's leading social epidemiologists--Sidney Cobb (1976) and the late John Cassel (1976). However, it is also important to recognize that "social support" has been studied explicitly as a potential mitigator of the effects of stress on health for less than a decade, though a variety of work dating back to at least the beginning of this century is relevant to our current concerns. Thus, conceptual and empirical understanding of social support is still fragmentary. One goal of this paper is to highlight what we know and especially what we still need to learn about the nature of social support and its effects on relationship between stress and health.

A second goal is to discuss potential applications of our knowledge. Despite the relatively immature and fragmentary nature of our knowledge of social support, there are a variety of reasons for undertaking efforts to improve health by attempting to increase social support. Efforts to improve social support are probably desirable on other grounds than that of reducing the negative impact of stress on health; and such efforts involve relatively few risks or costs. We also have already the basic elements of a "technology" for enhancing social support in the current literature and practice of applied behavioral science. Thus, although as will be discussed below, we do not yet know with certainty whether, how and why social support ameliorates the effects of stress on health, we should still attempt to enhance social support in hopes of alleviating the disease-producing effects of stress.

Such efforts at application, however, must be closely integrated with further research in this area. The distinction between "basic" and "applied" research or science is really quite arbitrary, and efforts to maintain this distinction are generally harmful to both types of work. Actual field experiments are particularly essential to adequate scientific understanding of social support and its effects on stress and health. Conversely, until our knowledge base is much firmer, intelligent and effective efforts to improve health by increasing social support must include a research and evaluation component. Thus, application of scientific knowledge provides a critical test of its scientific adequacy, while scientific study of the efficacy and process of such application provides information essential to maintaining and improving the utility of future applications.

CONCEPTUALIZING THE PROBLEM

Before turning to results of our own and others' research it is necessary to clarify what we mean when we say social support mitigates (i.e., "buffers" or "conditions") the effect of occupational stress on health. Both common sense

and existing empirical evidence strongly suggest that supportive social relationships with superiors, colleagues, and/or subordinates at work should directly reduce levels of occupational stress for a variety of reasons. Supportive co-workers are less likely to create interpersonal pressures or tensions; and the experience of support satisfies important social or affiliative needs for most people and hence tends to make them feel more positively about themselves and their jobs. Thus, social support should reduce known occupational stresses such as role conflict and ambiguity, job dissatisfaction, and low occupational self-esteem; and available empirical evidence is quite consistent with this expectation. Its direct stress-reducing properties provide one strong reason for attempting to enhance social support. But our concern here is with a different, and more unique, type of effect of social support--its ability to "mitigate", "buffer", or "condition" relationships between occupational stress and health.

The idea here is that social support from persons outside the work setting as well as those within it can alter the relationship between occupational stress and health. Whereas in the absence of social support, physical and/or mental disorders should increase as occupational stress increases, as levels of social support rise, this relationship should diminish in strength, even perhaps disappearing under maximal social support. This hypothesis is graphically depicted in Figure 1.1. In multiple regression terms, the slope of the regression of disease on stress should be clearly positive when social support is absent or low but should diminish steadily as social support increases, perhaps declining to zero when support is high. This change in slopes constitutes a statistical interaction between stress and support in predicting levels of disease or ill health. It is this interaction, or the changing slopes of regression lines in Figure 1.1, which is the essence of the hypothesized "buffering" or "conditioning" effect of social support and this effect may occur regardless of whether social support has any direct effect on levels of stress and/or health.

Thus, although support from others at work tends to reduce occupational stress directly, it may, in addition, have this buffering effect. Further, even if social support has no direct impact on levels of occupational stress, as would generally be expected in the case of support from persons outside of work, it can still mitigate and perhaps even vitiate completely the deleterious impact of occupational stress on health. Our further discussion of research and application will focus entirely on this potential conditioning or buffering effect.

Cassel (1976) has suggested an analogy between this buffering effect of social support and other processes, ranging from immunization to proper nutrition, which increase people's resistance to disease-producing agents or phenomena. But how and why should social support increase "resistance" to the deleterious consequences of stress? Although we need more empirical research on this question, consideration of the basic nature of psychosocial stress suggests some answers. The term "stress" has been used in so many confusing and contradictory ways that Cassel (1976:108) concludes that "the simple-minded evocation of the word stress has done as much to retard research in this area as did the concepts of the miasmas at the time of the discovery of microorganisms." Nevertheless, an increasing number of researchers (McGrath,

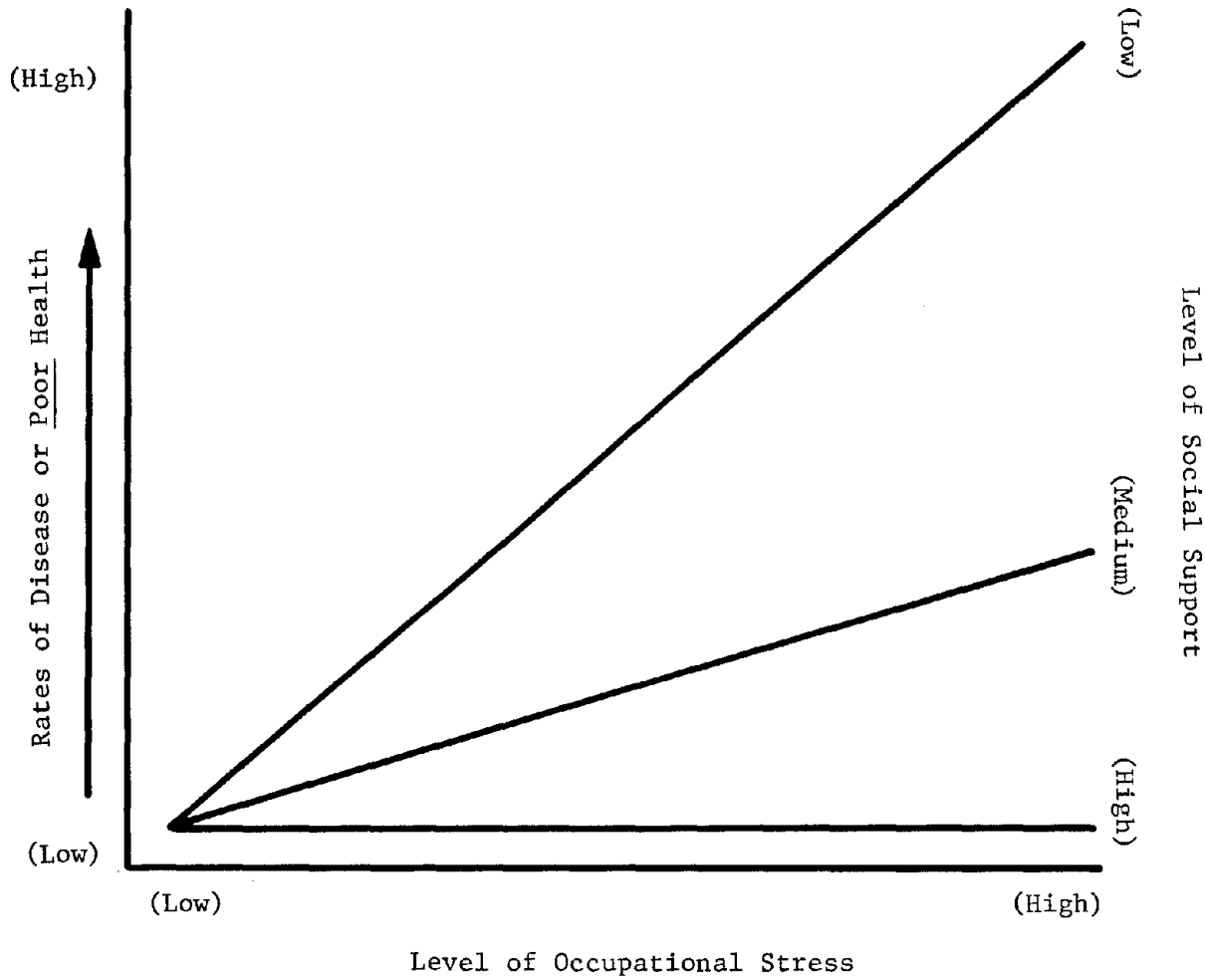

Figure 1.1

The "Conditioning" or "Buffering" (i.e. Interactive)Effect of Social Support on the Relationship Between Occupational Stress and Health

1970; Levine and Scott, 1970; French et al, 1974; Kagan and Levi, 1974) have converged on a similar conceptualization of the nature of stress as a phenomena or process. Figure 1.2 presents a paradigm of stress research (from House, 1974) which reflects this convergence.

This paradigm posits that "stress" is ultimately in the eye of the beholder and, in general terms, is perceived by people when they confront a situation in which their usual modes of behaving are insufficient and the consequences of not adapting are serious. These will be situations where the demands on people exceed their abilities or where they are unable to fulfill strong needs or values (cf. McGrath, 1970; French et al, 1974). Except perhaps for extreme situations such as disasters or concentration camps, no objective social or occupational situation will necessarily produce perceptions of stress or resultant physiological, psychological, or behavioral responses and outcomes in all people exposed to the situation. Rather, how people perceive a given situation depends on other individual or situational factors, labeled conditioning variables in Figure 1.2 of which social support is one. We have considerable evidence from social psychological experiments that the presence of other people alters initial perceptions of objective social stimuli (cf. Lazarus, 1966; Tajfel, 1968). Thus, social support could mitigate the effect of potentially stressful objective situations (such as a boring job, heavy workloads, unemployment, etc.) by causing people initially to perceive the situation as less threatening or stressful and hence leading them to manifest less of those psychological, physiological, or behavioral responses productive of disease (cf. Cassel, 1976; Kagan and Levi, 1974 for discussions of how psychosocial stress produces physiological, as well as psychological and behavioral, responses and outcomes).

Even if a situation is initially perceived as stressful, however, social support may still lessen or eliminate the tendency of this perceived stress to lead to responses productive of disease. Figure 1.2 indicates that once a situation is perceived as stressful a variety of responses are possible, some of which may serve to modify the objective social conditions (arrow labeled "coping") and/or the person's perception of it (arrow labeled "defense") so as to reduce or eliminate the perception of stress and hence to alleviate its impact on health. Cobb (1976:311) has suggested that these are the most important ways in which social support helps to buffer persons against stress.

In cross-sectional research such as that reported below, some of these kinds of effects will be reflected in a direct or zero-order relation between support and perceived stress, as well as in interactions of these two types of variables in predicting health outcomes. Longitudinal or experimental studies are crucial to documenting processes of coping and defense and the role of social support in them.

However, where efforts at coping and defense fail to reduce the perception of stress, social support may still alleviate the impact of such perceptions on other sets of physiological, psychological, or behavioral responses which are productive of more enduring health or disease outcomes. Without altering the perception of stress per se, social support may reduce the importance of this perception to the person and hence his/her degree of reaction to it. Below, for example, we note that support from spouses may mitigate the impact of

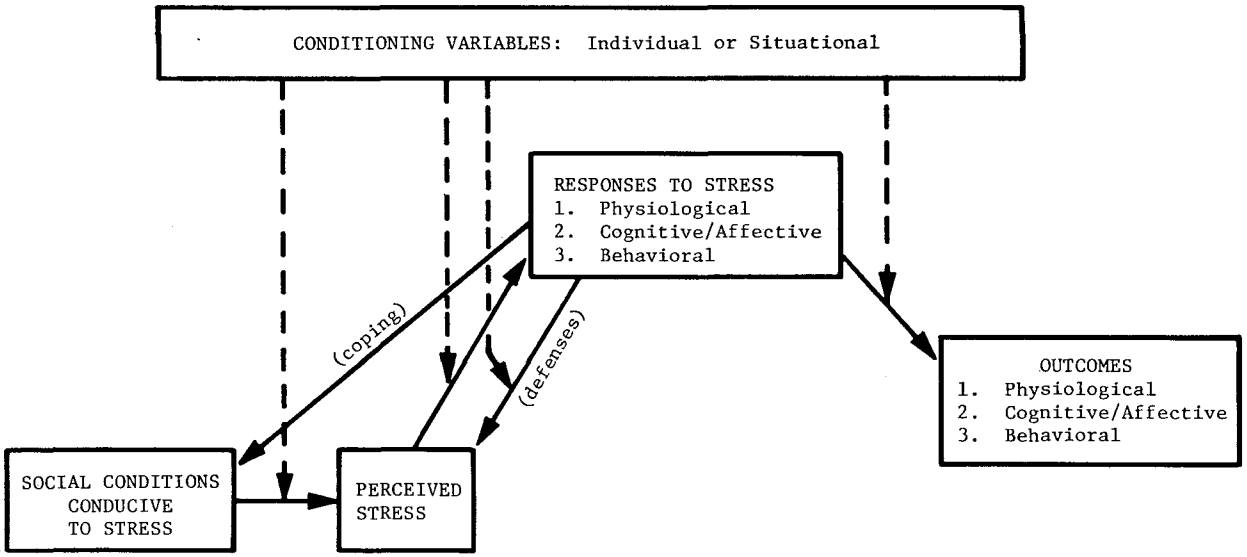

Figure 1.2 A Paradigm of Stress Research

NOTE: Solid arrows between boxes indicate presumed causal relationships among variables. Dotted arrows from the box labeled "conditioning variable" intersect solid arrows, indicating an interaction between the conditioning variables and the variables in the box at the beginning of the solid arrow in predicting variables in the box at the head of the solid arrow.

job dissatisfaction on health by helping the person to recognize that the job is not so important in the total context of life and that dissatisfactions with it may be compensated for by satisfactions and accomplishments outside of work. Support may also have some kind of general tranquilizing effect on the neuroendocrine system, making people less reactive to perceived stress. Findings of "social support effects" in studies of animals are suggestive of such a process (Cassel, 1976). Finally, supportive others may facilitate certain kinds of behaviors (e.g., exercise, personal hygiene, proper nutrition and rest) which may increase individuals' abilities to tolerate or resist psychosocial stress as well as physical, chemical, or biological threats to health.

This discussion of potential mechanisms through which social support may condition or buffer the effects of occupational stress on health has been necessarily rather speculative. There is at least some evidence for each of the kinds of mechanisms discussed here, but as noted below more and better empirical research, especially of a longitudinal and experimental nature, is essential before we will adequately understand how social support affects the relationship between occupational stress and health. Figure 1.2 provides one paradigm for such research and clearly indicates that support could intervene at several points in the chain which links potentially stressful objective social conditions to changes in health.

THE LIMITS OF EXISTING KNOWLEDGE

Although the idea that social support can mitigate the effect of occupational stress on health is plausible and appealing, our present theoretical and empirical knowledge is limited in many ways. Cassel (1976), Cobb (1976) and Kaplan et al (in press) have provided general reviews of data on both animals and humans suggesting that the presence of social support can mitigate or eliminate deleterious effects of a wide range of presumed indicators of social stress on an equally wide range of health outcomes. Although the variety and scope of this work is impressive in some ways, the body of knowledge which emerges remains quite fragmentary and unsystematic (cf. Pinneau, 1976). Neither the conceptual nor operational definitions of what constitutes support are comparable across studies, and in some cases the empirical measures of "support" include components which do not assess social support as it is conceived here (e.g., the study by Nuckolls highlighted in the reviews of Cobb and Cassel includes measures of "ego strength" and subjective social class in its measure of "social" support). Measures of stress and health in these studies are also highly varied and all each study shows is that the relationship between some indicator of health varies across levels of support. In sum, this literature suggests that social support can ameliorate the effects of stress on health, but it does not really answer a variety of questions of critical concern to those who would seek to apply knowledge of support as well as those concerned with further theoretical and research developments. What are the different sources and types of social support, and how do their effects differ? Is support equally relevant or effective with respect to all types of stress and/or all types of health outcomes? By what processes or mechanisms does social support mitigate effects of stress on health?

These same questions are almost equally unanswered in the more specific literature on the effect on social support in relation to occupational stress and health. Many studies find variables indicative of social support such as work group cohesion, interpersonal trust, or liking for supervisors associated with indicators of stress and/or health. For example, Seashore (1954) found that as work group cohesiveness increased, anxiety over work related matters decreased (see also Likert, 1961; Kahn et al., 1964). Although such associations argue for promoting such forms of support in order to reduce stress and increase health, they do not establish that social support mitigates the effect of job stress on physical or mental health.

More recent studies, however, do show that social support mitigates the relationship of occupational stress to health. In a study of coronary heart disease (CHD) risk factors among administrators, engineers and scientists, Caplan (1971) finds that among those who report poor relations with their subordinates (i.e. low social support), there is a positive relationship between role ambiguity and serum cortisol level, an indicator of physiological arousal tentatively linked to CHD. Similarly, a positive relationship exists between perceived workload and serum glucose, blood pressure, and smoking among those having poor relations with their supervisor, coworkers, and subordinates. However, among those having good relations with others at work (i.e., high social support), these types of work stress are not related to CHD risk factors. In a longitudinal study of the consequences of job loss and unemployment, perceived stress resulting from unemployment produced elevated cholesterol levels, increased incidents of illness and constant depression among men with low social support, while those with higher levels of social support were protected from these consequences (Gore, 1973).

However, Pinneau (1975, 1976) has questioned the adequacy of the evidence indicating that social support mitigates or buffers the effects of occupational stress on health. Further, in his own research using measures of support from which we derived those used in our own research, Pinneau finds little evidence that social support mitigates the effect of stress on "strain" (i.e., symptoms of physical and/or mental ill health). However, his analysis strategy makes the meaning of his results ambiguous at best, and is somewhat biased against social support effects. For example, he tests for interactive or buffering effects of social support "only where support is negatively related to strain and where stress is positively related to strain" in bivariate analyses (Pinneau, 1975:94). Our earlier discussion of Figure 1.1 indicated that there is no logical reason for such a requirement, one effect of which is to exclude from consideration a variety of cases where support may not be directly related to health, but still have substantial conditioning or buffering effects (as in our own results for wife support discussed below).

Pinneau correctly points up the fragmentary nature of existing evidence, but his conclusion seems unduly pessimistic. There is much to be done in differentiating among sources and types of social support, determining what types of stress-health relationships are most amenable to effects of support, and specifying the process by which support operates to produce its effects. On balance, however, existing evidence at least strongly suggests that social support can mitigate the effects of stress in general, and occupational stress in particular, on physical and mental health. The results of our own

research, to which we now turn, lend further support to this idea and begin to answer some of the unanswered questions about social support.

FURTHER EMPIRICAL DATA

We have been studying the relationship between occupational stress and health in the hourly workforce (N=2856) of a large tire, rubber, chemicals, and plastics manufacturing plant in a small northeastern city. The data reported here derive from self-administered questionnaires mailed to all workers, with response rates of 67.5% (N=1930) overall and 70% (N=1809) among white males--the group used in the present analyses. The small numbers and relatively poor response rate of black and female workers precluded all but simple descriptive analyses of these groups.

The measures of perceived stress, health, and social support used in the present analyses are all derived from questionnaire responses, though we are now attempting to replicate and extend these analyses using measures of health from medical examinations and tests on a subset of the population, observers' ratings of potentially stressful characteristics of major job types in the plant, and possibly more objective measures of support as well. Although the cross-sectional and self-report nature of the present data raises questions about their validity and causal ordering which are dealt with more extensively in previous reports (House, et al, 1976; Wells et al, 1977), all of the measures are as valid and reliable as such questionnaire measures can be, and we feel our results are most plausibly interpreted as indicating that social support mitigates the effect of stress on health. Let us stress that previous analyses not reported here have showed the present results to be unaffected by controls for age, smoking, and other potential confounding variables (cf. House et al, 1976).

We have examined how perceived social support from four different sources (supervisors, wives, co-workers, and friends and relatives) taken singly and together conditions the relationship between self-reported marked symptoms of five health outcomes (angina pectoris ulcers, itch and rash on skin, persistent cough and phlegm, and neurotic symptoms) and seven indicators of perceived occupational stress--job satisfaction and occupational self-esteem (lack of either is stressful), workload, role conflict, responsibility, conflict between job demands and non job concerns, and quality concern or worry over not being able to do one's work as well as one would like. These measures are fully presented in Wells et al, (1977) and their intercorrelations are shown in Table 1.1. Most notable here is the lack of correlation between social support and health except in the case of supervisor support, and the lack of correlation of support from wives and friends with the occupational stress measures as well. On the basis solely of these correlations, one might conclude that support from such persons is irrelevant to the problem of occupational stress and health--a quite erroneous conclusion in light of our further analyses.

For each of the 35 possible combinations of a stress variable and a health outcome, we have tested whether each of the four support measures as well as a combined measure of total support from all four sources conditions or buffers the stress-health relationship in the manner depicted in Figure 1.1. Concretely

Table 1.1

Intercorrelations of Perceived Stress, Health and Social Support Variables[1]

(Pearson r's)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Angina Pectoris	-															
2. Ulcers	.176	-														
3. Itching and Rash	.093	.109	-													
4. Cough and Phlegm	.183	.088	.065	-												
5. Neurosis	.257	.315	.126	.221	-											
6. Job Satisfaction	-	-.056	-.122	-.083	-.195	-										
7. Work Self-Esteem	-	-.072	-.088	-	-.121	.412	-									
8. Job vs. Non-Job Conflict	-	.082	.156	.053	.183	-.445	-.257	-								
9. Role Conflict	.050	.086	.104	.099	.167	-.212	-.140	.390	-							
10. Responsibility	.074	.054	.105	.067	.094	-.109	-	.332	.581	-						
11. Quality Concern	.067	.064	.134	.071	.149	-.348	-.185	.475	.640	.507	-					
12. Workload	-	-	.114	.070	.097	-.244	-	.231	.258	.307	.372	-				
13. Supervisor Support	-.041	-.059	-.102	-.046	-.072	.377	.231	-.233	-.223	-.129	-.388	-.123	-			
14. Coworker Support	-	-	-	-	-	.220	.117	-.102	-.102	-.035	-.112	-.080	.303	-		
15. Wife Support	-	-	-	-	-.060	.065	-	-	-	-	-	-	.106	.288	-	
16. Friend and Relative Support	-	-	-	-	-	.135	-	-	-	-	-	-	.164	.322	.618	-
17. Total Support	-	-.049	-.058	-.066	-.097	.364	.194	-171	-.186	-.106	-.286	-.103	.780	.625	.583	.637

[1]All coefficients are significant at the $p < .05$ level. Nonsignificant coefficients are omitted and indicated by a "-".

this involves testing whether a multiplicative product of the stress and support variables contributes significantly to predicting and explaining the health outcome, net of the additive effects. That is, we estimate equations of the following form:

$$\hat{Y} = a+b_1P+b_2S+b_3PS$$

where

$\hat{Y}$ = estimated proportion of persons with marked symptoms of each health outcome

P = Perceived stress variable; S = Perceived social support variable

PS = Product of PxS

Since our dependent health measures (Y) are all dichotomous, the parameters a, b_1, b_2, and b_3 in equation (1) can be interpreted as follows:

a = The intercept or the proportion of persons with marked symptoms at the lowest levels (i.e., 0) of both the stress and support variables.

b_1 = The slope (increase in proportion with marked symptoms for each rise of 1 unit in stress) of the regression of health on perceived stress when support is lowest (i.e., 0).

b_2 = The slope of the regression of health on support (or the change in the intercept of the regression of health on stress for each unit change in support).

b_3 = The change in the slope of the regression of health on stress for each unit change in support.

From equation (1) one can derive the slope of the regression of health (Y) on stress (P) at each level of support (S). Thus b_1 is the slope of this relationship when S=0; b_1+b_3 is the slope when S=1; b_1+2b_3 in the slope when S=2; etc.

The theoretical model depicted in Figure 1.1 is confirmed if the b_3 coefficient is significant and the size and sign of b_1 and b_3 are appropriate. Since low levels of job satisfaction and work self-esteem are stressful, we expect the b_1 coefficients for these variables to be significantly negative and b_3 to be significantly positive (and of a magnitude that would reduce the negative shape of the regression of health on stress as support increases, but ideally not reduce it significantly past 0). In contrast for each of our five measures of job pressures high scores indicate more stress, hence b_1 should be significantly positive and b_3 significantly negative.

For each source of support (total, supervisor, wife, co-worker, and friend and relative) we have estimated 35 versions of equation (1), one for each stress-health combination. Results for the 35 equations involving total

support are treated separately since they are clearly not independent of the 140 equations involving support from supervisors, wives, coworkers, and friends and relatives.

Our measure of total support reflects the cumulative amount of support perceived from all four sources and approximates the global support measures used in much previous research. Assuming the 35 tests involving total support are independent of each other, we would expect about three or four significant b_3 coefficients at the $p<.10$ level, and in only one or two of these cases should the signs and sizes of b_3 accord with the theoretically expected pattern. In fact, the b_3 coefficient is significant in nine of the 35 equations, and the signs and sizes of b_3 and b_1 accord with our expectation in all nine of these cases--quite striking evidence that social support can indeed ameliorate the effects of occupational stress on self-reported symptoms of physical and mental health. Table 1.2 presents the regression coefficients for these equations, along with predicted proportions of persons reporting marked symptoms of each health outcome at the highest and lowest levels of the stress variable within the highest versus lowest levels of support. The last two columns of the table show that under maximum levels of social support, marked symptoms of self-reported ill health increase only slightly, if at all, as stress increases. In contrast, the two columns just to the left of these show that when social support is minimal, marked symptoms of ill-health increase dramatically as stress increases.

It is noteworthy, however, that in almost every case where "total support" produced a conditioning effect, one of the four support measures composing it does also. Thus, the results for total support primarily reflect the impact of one or two particular sources of support, and it is critical to examine the results for each source of support as well--something which has seldom been done in studies using composite measures of support. Assuming the tests are independent of each other, we would expect the conditioning effects of social support to be significant (at the $p<.10$ level) in about 14 of the 140 equations involving the four separate sources (or in about three or four of the 35 equations involving each source), with only about four to six of these conforming fully to our expectations.

The 140 tests are, of course, not totally independent, since the variables involved are not all uncorrelated with each other. However, the only correlations large enough to introduce sizable dependencies (i.e., $>.40$) are those among the job pressures, between satisfaction and self-esteem, and between wife support and relative support. Tables 1.2, 1.3, and 1.4 indicate little tendency for such dependencies to affect the results. For example, wife support and friend and relative support are the two most highly correlated variables in Table 1.1, yet they significantly condition the same relationship in no case (cf. Table 1.4). Hence, 14 is not an unreasonable estimate of the number of significant conditioning effects to be expected by chance.

In fact, 24 of the 140 analyses yield statistically significant results, and 21 of these 24 accord with our predictions--four to five times as many as might occur by chance alone. Table 1.3 gives the same information for these 21 equations as Table 1.2 gave for those involving total support. Again the last four columns indicate that perceived stress bears little or no relation to the

Table 1.2

REGRESSION EQUATIONS OF SIGNIFICANT, PREDICTED CONDITIONING EFFECTS OF TOTAL SOCIAL SUPPORT ON RELATIONSHIPS BETWEEN PERCEIVED STRESS AND HEALTH

Health Outcome		Inter-cept	Stress	Support	Stress Support	Predicted Proportions with "Marked Symptoms"			
						Lowest Support		Highest Support	
Perceived Stress	Support Source	a	b_1	b_2	b_3	Lowest Stress	Highest Stress	Lowest Stress	Highest Stress
Angina Pectoris									
None	None	-	-	-	-	-	-	-	-
Ulcers									
Job Satisfaction	Total Support	.3178*	-.0253*	-.0069*	.0009+	.065	.318	.149	.042
Esteem	"	.4825*	-.0216*	-.0124*	.0007+	.094	.483	.102	(-.014)
Job-Nonjob Conflict	"	.0875+	.0286*	.0008	-.0009+	.088	.431	.120	.031
Role Conflict	"	.0656	.0322*	.0014	-.0010+	.066	.452	.122	.028
Workload	"	.0473	.0209+	.0032	-.0008+	.047	.298	.175	.042
Itch/Rash									
None	None	-	-	-	-	-	-	-	-
Cough/Phlegm									
Esteem	Total Support	.4124*	-.0141o	-.0132*	.0007o	.159	.412	(-.116)	.135
Neurosis									
Esteem	Total Support	.5592*	-.0237*	-.0125*	.0006+	.133	.559	.065	.059
Role Conflict		.0321	.0545*	.0017	-.0016*	.032	.686	.100	(-.014)
Responsibility		.1129+	.0291*	-.0009	-.0008o	.113	.462	.077	.042

* $p<.01$ + $p<.05$ o $p<.10$

Table 1.3

REGRESSION EQUATIONS OF SIGNIFICANT, PREDICTED CONDITIONING EFFECTS OF TOTAL SOCIAL SUPPORT ON RELATIONSHIPS BETWEEN PERCEIVED STRESS AND HEALTH

Health Outcome		Inter-cept	Stress	Support	Stress Support	Predicted Proportions with "Marked Symptoms"			
						Lowest Support		Highest Support	
Perceived Stress	Support Source	a	b_1	b_2	b_3	Lowest Stress	Highest Stress	Lowest Stress	Highest Stress
Angina Pectoris									
Job Satisfaction	Wife	.1211*	-.0088^{+}	-.0136*	.0018^{+}	.033	.121	.064	.026
Work Self-Esteem	Wife	.1412*	-.0051^{o}	-.0195^{+}	.0012^{+}	.049	.141	.064	.005
Ulcers									
Job Satisfaction	Supervisor	.2668*	-.0176^{+}	-.0104^{+}	.0012^{o}	.091	.267	.117	.080
Esteem	Supervisor	.4919*	-.0232*	-.0294*	.0018*	.074	.492	.128	(-.037)
Job-Nonjob Conflict	Supervisor	.0804*	.0261*	.0026	-.0078*	.080	.394	.127	.052
Job-Nonjob Conflict	Friend/Relative	.0924*	.0178*	.0037	-.0027^{o}	.092	.306	.115	.134
Role Conflict	Supervisor	.0781*	.0246*	.0021	-.0015^{+}	.078	.466	.208	.180
Workload	Coworker	.0302	.0160^{+}	.0169^{+}	-.0026^{+}	.030	.222	.132	.136
Workload	Friend/Relative	.0679^{o}	.0119^{+}	.0170	-.0032^{+}	.068	.211	.170	.082
Itch/Rash									
Job Satisfaction	Wife	.3829*	-.0340*	-.0216^{+}	.0032^{+}	.043	.383	.295	.232
Work Self-Esteem	Supervisor	.4705*	-.0168*	-.0238*	.0012^{+}	.168	.471	.042	.129
Cough/Phlegm									
Role Conflict	Supervisor	.0260	.0324*	.0051	-.0019*	.026	.415	.118	.096
Responsibility	Supervisor	.0537	.0235*	.0042	-.0016^{+}	.054	.336	.129	.066
Workload	Supervisor	.0007	.0233*	.0064	-.0014^{o}	.001	.280	.116	.093
Neurosis									
Job Satisfaction	Wife	.4277*	-.0421*	-.0274*	.0035*	.000	.428	.060	.236
Work Self-Esteem	Coworker	.4698*	-.0218*	-.0335^{+}	.0021^{+}	.077	.470	.103	.269
Role Conflict	Supervisor	.0166	.0438*	.0053^{o}	-.0024^{+}	.017	.542	.112	.119
Role Conflict	Wife	.0628^{+}	.0358*	.0007	-.0029^{+}	.063	.492	.068	.254
Quality Concern	Wife	.0578^{o}	.0294*	.0003	-.0023^{+}	.058	.411	.060	.220
Responsibility	Wife	.0774^{+}	.0267*	.0019	-.0028^{+}	.077	.398	.091	.176
Workload	Wife	.0006	.0287*	.0123	-.0033*	.001	.345	.087	.154

* $p<.01$ $^{+}$ $p<.05$ ^{o} $p<.10$

Table 1.4

SUMMARY OF SIGNIFICANT, PREDICTED CONDITIONING EFFECTS OF MEASURES OF SOCIAL SUPPORT ON RELATIONSHIPS BETWEEN PERCEIVED STRESS AND HEALTH

PERCEIVED STRESS	HEALTH OUTCOME				
	Angina Pectoris	Ulcers	Itching and Rash	Cough and Phlegm	Neurosis
Job Satisfaction	Wife	Supervisor Total	Wife		Wife
Work Self-Esteem	Wife	Supervisor Total	Supervisor	Total	Coworker Total
Job vs. Non-Job Conflict		Supervisor Friend and Relative Total			
Role Conflict		Supervisor Total	Supervisor		Supervisor Wife Total
Quality Concern					Wife
Responsibility				Supervisor	Wife Total
Workload		Coworker Friend and Relative Total		Supervisor	Wife

Note: Cell entries indicate measures of support which significantly condition each health-stress relationship in the predicted manner. The full regression equation for each of these effects appears in Tables 2 or 3.

health outcomes at the highest levels of support, but when social support is lowest self-reported symptoms of ill health rise sharply with stress. Although 21 significant results out of 140 is in many ways a modest figure, it is important to note that these 21 effects are scattered over 18 different stress-health relationships. That is, over half of all the 35 stress-health relationships we have examined are significantly conditioned in the expected way by at least one form of social support. These results become even more compelling when we consider their patterning in terms of sources of support and health outcomes involves. Table 1.4 summarizes the pattern of the results in Table 1.2 and 1.3. Each of the 35 cells of the table represents a particular relationship between stress and health; within each cell are noted those measures of social support which significantly condition or buffer (in the predicted way) the impact of that stress on that health outcome. Table 1.4 shows first, that, as we expected, support from the most "significant" others is more effective in ameliorating effects of occupational stress on health. Of the 21 significant predicted conditioning effects of the four separate sources of support, nine occur with supervisor support and eight with wife support while only two occur with co-worker support and two with friend and relative support. The potent effects of wives and supervisors and the weak effect of friends and relatives were as expected. However, the almost total lack of effect of co-worker support was somewhat surprising to us. The organization of work in this plant (e.g. many individual and machine-bound jobs, tight management control of work scheduling and processes, high-noise levels) may make it difficult for work group interaction and cohesion to develop and also make it unlikely that workers other than supervisors can do much to alleviate stress and/or its effects. The effects of co-worker support might be greater in occupations or industries which inherently require greater coordination and communication.

A second notable feature of Table 1.4 (also evident in Tables 1.2 and 1.3) is that support mitigates the effects of stress on ulcers and neurosis more than on other health outcomes. In fact, the results for other health outcomes are not substantially greater than what might occur by chance. Again this pattern is not unexpected in light of research which has especially emphasized the role of interpersonal processes in the etiology of ulcers (cf. Susser, 1967) and neurosis (Jaco, 1970). Support buffers the effects of stress on some diseases more than others.

THE PRACTICAL USES OF RESEARCH AND THE RESEARCH USES OF PRACTICE

Kurt Levin contended there is nothing so practical as a good theory. We would argue, conversely, that practical application constitutes the ultimate test of a theory and an excellent stimulus for further theoretical and research development. Theory and research tend to become sterile if not linked to applied concerns, just as practical applications tend to become ineffectual and even harmful if not guided by sound theory and research. Efforts to apply our knowledge of social supports require that we synthesize the most solid conclusions and implications of existing theory and research and also serve to identify a range of critical unanswered questions about the nature and effects of social support. Thus, although we are researchers rather than practitioners, we regard research and practice as mutually beneficial and interdependent.

Before turning to more specific issues of application let us consider two general issues which are sometimes neglected in recent discussions of social support. First let us re-emphasize that enhancing social support can and should in no way be considered a substitute for efforts at reducing occupational stress. Rather, social support should be viewed as a potential means of alleviating that occupational stress which we can not reduce. Theory and research on social support have said almost nothing about the effect that providing social support to stressed individuals has on the givers as well as the receivers of support. Although providing effective support to others may be rewarding in many ways, it also undoubtedly entails costs as well (e.g., emotional energy, time, sometimes tangible resources, etc.). Work organizations have no right to expect supervisors and co-workers, much less the spouses, friends, and relatives of workers, to buffer employees against stresses which the organization could reasonably reduce or prevent entirely. If the effects of stress are sufficiently deleterious that social support is necessary to alleviate these effects, then we ought to be willing to attempt to reduce that stress as much as possible, utilizing social support primarily to buffer people against stresses we can not reduce.

A second general concern is that proponents of the utility of social support not lose sight of the limitations of our current knowledge base. We are just beginning to assemble adequate evidence that social support is beneficial for health, and are still quite ignorant of how and why this is the case. Thus at present, efforts to enhance social support should be viewed as field experiments or intervention trials rather than as programs of proven utility for reducing stress and/or improving health. And research and evaluation must be inherent features of all such experiments and intervention.

With these caveats, however, we think there are good reasons for attempting to enhance social support in order to reduce stress and improve health. First although solid evidence of the buffering effect of social support is just beginning to accumulate, there is a broader data base indicating that increases in social support (e.g., from supervisors) would directly reduce certain kinds of occupational stress (e.g., role conflict) and hence improve health. Second, increases in social support or closely related phenomena are likely to contribute toward a variety of individual and/or organizational goals besides reducing stress or improving health (e.g., higher morale, lower absenteeism and turnover, and perhaps enhanced organizational effectiveness). Thus, efforts at enhancing social support or related phenomena (e.g., interpersonal skills) are justifiable on grounds other than reducing stress or improving health. In sum, the potential gains from enhancing social support are many and the potential risks and costs are few. Further, the literature of applied social science (from psychotherapy to organizational development) contains many techniques which might be directly used in, or adapted to, programs for enhancing social support. Thus, we can and should begin to experiment with social support as a mechanism for buffering people against the deleterious effects of occupational stress.

Does the research and theory discussed above offer any guidelines for such intervention? We leave for more knowledgeable applied behavioral scientists the issue of how to work directly with people to modify psychological attributes and behavior. Our goal is to suggest first what it will mean to

increase social support and second toward whom intervention efforts should be directed. Existing theory and data have important practical implications for both of these issues, while coming to grips with these practical issues reveals clear needs for further research, especially in conjunction with intervention efforts.

In our own and most other research social support has been measured in terms of respondents' perceptions that others like and trust them, are concerned about their welfare, and are likely to be of aid in times of stress or need. Thus, existing evidence suggests that one, and perhaps the critical, aspect of effective social support is establishing a perception of willingness and ability to empathize and help (especially in an emotional sense) with work-related problems; and applied efforts should probably give initial priority to this aspect of social support.

However, the social support literature is glaringly lacking in information about two closely related questions crucial to effective practical application: (1) how is this perception of emotional supportiveness established and (2) how does it operate to alleviate the impact of stress on health. Intervention programs can not alter directly, for example, workers' perceptions of the supportiveness of their supervisor. Rather efforts will be made to change those aspects of supervisory behavior in relation to subordinates which give rise to perceptions of support. At present we know almost nothing about what "objective" features of supervisors and their relations with subordinates give rise to perceptions of supervisor supportiveness, though we could learn much by intensively studying the differences in personality and behavior between supervisors who are and are not perceived as supportive. Fortunately, related literatures on group dynamics, therapeutic relationships and organizational development tell us a good deal about the properties of persons and relationships which contribute to social support. This is an issue, however, which deserves much greater attention in research on social support as well as in efforts at application.

In our discussion of Figure 1.2 above, we noted that social support may operate in several ways to mitigate effects of stress and health. Greater knowledge of what emotionally supportive others actually do that alleviates the effects of stress would greatly enhance the efficacy of intervention programs. It is usually easier to teach people relatively concrete techniques and behaviors, as opposed to a more general orientation of empathy and supportiveness, and such specific techniques and behaviors may be more directly effective in alleviating the effects of stress. If, for example, supportive spouses' encouragement of good habits of rest, exercise, nutrition, etc., are critical in buffering workers against stress, these habits and their benefits might be promoted more directly and/or by other mechanisms (though, as Cobb, 1976, suggests emotional support may facilitate adherence to such regimens). In short, we need to pay attention to both research and practice to how emotional supportiveness, the focus of most existing research on support, is expressed concretely, how it relates to more instrumental or tangible forms of support, and how, when, and why support is effective in buffering workers against the effects of stress.

Assuming we know what it means to enhance social support, toward whom should

such efforts be directed? Here existing research evidence provides clear and important guidelines which have not been adequately appreciated. It appears on the basis of our own data and that of others that social support derived from one significant other can be quite effective in mitigating the effects of stress on health; and, in fact, support from additional sources may have little or no additional benefits. Comparison of Tables 1.2 and 1.3 shows that a single source of support generally produces as much of an effect on a stress-health relationship as the measure of total support, and in most cases a high level of support from a single source almost completely mitigates the effect of stress on health. Similar efficacy of a single confidant or supporter has also been documented in other research (e.g., Brown et al., 1975), and many composite indices of support often give disproportionate weight to support from one significant other person (e.g., the wife in the work of Gore, 1973).

The potential practical importance of these findings ought not to be underestimated. The term social support has been used loosely, often connoting the effect of a broad network of relationships in organizations, communities, neighborhoods, and/or families. If social support from a large network of others were necessary to mitigate the effects of stress on health, the task of enhancing social support would be large and expensive. In fact, at least in the area of occupational stress and health, the data suggest that applied programs not only can be effective, but they are also most likely to be effective, if they concentrate their efforts on ensuring that each person has a supportive relationship with just one or two significant others. Although who those one or two others should be may vary from person to person and situation to situation, the existing data point toward work supervisors and spouses as particularly significant classes of others. A high level of support from one, and especially both, of these sources appears capable of buffering persons against a wide range of stresses and with respect to a wide range of health outcomes. Thus, these two types of others constitute obvious first targets of efforts to enhance social support.

The work supervisor is an especially appealing focus for intervention programs. Not only do supervisors appear capable of providing effective social support, they are also accessible to influence through existing organizational channels and applied behavioral science methods. In fact, many current programs of supervisory training emphasize goals related to social support, though for purposes other than reducing occupational stress and/or its impact on health. Thus, the effect of supervisory support on stress and health could readily be explored in field experiments which are either designed for this purpose or could be utilized for this purpose. If the results of such experiments are consistent with the evidence reviewed above from cross-sectional studies, supervisory support will be established as a viable and effective mechanism for mitigating the effects of occupational stress on health. As we obtain clearer research evidence on the effectiveness of co-workers as sources of support in various work contexts, application programs should, of course, be broadened to include them as well.

Efforts to enhance the supportiveness of spouses or comparable others outside of work involves more complex and difficult technical and ethical issues. To routinely expect that spouses will buffer workers against the deleterious effects of occupational stress is to displace onto the spouse and/or family

responsibilities which are more rightfully those of the organization and/or individual worker. In American society at least, family and marital relationships have too often been assumed to operate in the service of individual or organizational work achievement, with little attention paid to the deleterious effects that work organizations and involvements may have on the family. Efforts to reduce occupational stress would undoubtedly benefit families and marriages as well as individuals.

Nevertheless, research clearly suggests that spouses can be important sources of support in the face of occupational stress, and hence can not be ignored from an applied perspective. Certain types of potential occupational stress (e.g., shiftwork, mandatory overtime, intensive cyclical workloads and deadlines) may impinge directly on family functioning as well as on the individual worker. In such cases spouses and other family members may need support themselves as well as constituting sources of support for the worker; and groups of similarly situated or affected spouses, couples, or families might be formed both to support each other and to share and develop modes of providing support for affected workers. With more usual types of occupational stresses, such as those in our own research which affect the worker primarily and the family only indirectly, there is no clear and obvious route to enhancing the mutual supportiveness of spouses toward each other. Workers and spouses might be given options to participate in programs aimed specifically at enhancing their capacities for helping each other deal with work-related stresses, or such concerns might be more directly incorporated into other educational programs directed at improving marital and family relationships.

In sum, current evidence suggests that social support can not only contribute toward reducing occupational stress, it can also help to alleviate the deleterious health consequences of such stress which we will not or can not reduce. Amelioration of the effects of occupational stress, like any disease-inducing or promoting agent, involves some combination of reducing exposure to the agent and increasing resistance to its effects. Social support seems uniquely promising in the latter respect. We worry at times that society, organizations and individuals may, however, leap on a bandwagon for increasing social support without awareness of the substantial limitations of current knowledge, perhaps out of a desire to avoid the often more difficult problems of restructuring work organizations and environments in order to reduce occupational stress. Social support is not now, nor will it ever be, a panacea for all problems of occupational stress and health; but it deserves increasing attention in both research and practice as a major aspect of a comprehensive effort to improve occupational health, both mental and physical.

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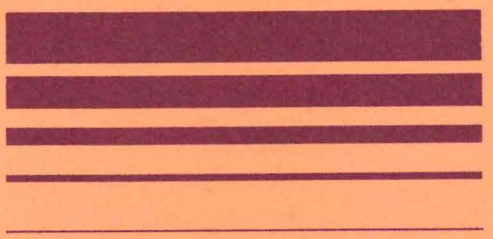

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