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Effects of Resource Availability and Importance of Behavior on the Experience of Crowding

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According to the interference formulation, participants in a crowded setting will experience interference to the extent that behavioral goals conflict with environmental conditions. The importance of the behavioral goals directly affects not only the magnitude of the interference but also the mechanism by which people cope with interference. It was reasoned that important goals would induce a more active coping strategy in a crowded setting than in an uncrowded setting and would maintain task performance at the price of increasing crowding stress. When the behavioral goal is unimportant, decrements in task performance preclude a rise in stress. A laboratory study manipulated group size, in order to vary the availability of resources, and the importance of the task behavior. The predictions were confirmed, and partial confirmation was obtained for predictions involving the effects of the internal–external personality dimension. The meaning of the results is discussed in terms of other findings in the literature on crowding and the mediating role of the type of mechanism used to cope with interference.

A number of variables have been said to mediate between conditions of high physical density and the experiences of subjective crowding and crowding stress. The variables include excessive stimulation from social sources (Desor, 1972), excessive and unwanted social interactions (Valins & Baum, 1973), restricted behavioral choice (Proshansky, Ittelson, & Rivlin, 1972), decreased interaction distance (Worchel & Teddlie, 1976), and breakdowns in privacy-regulating mechanisms (Altman, 1975). In an attempt to subsume these mediating factors under a single generic variable, Schopler and Stockdale (1977) suggested that interference with goal-directed behavior sequences is the crucial mediator between density and the experience of crowding stress.

The behavioral interference formulation is a sequential model that views physical density as a necessary but not sufficient condition for the occurrence of crowding stress. When the presence of other people in large numbers or in close physical proximity leads to interference with goal-directed behavior, stress is experienced. The degree of stress experienced in a given setting is determined by several factors that affect the impact of interference produced in the setting. These include the anticipated duration of the interference, the importance of the vulnerable response sequences, and personality factors related to anticipated control. This framework accounts for interference in terms of the reward–cost ratio associated with particular behaviors in a given setting. The effect of density-induced interference is to increase the costs of enacting the desired behavioral sequences. This increased cost may be manifested in various forms, such as annoyance, embarrassment, anxiety, or increased effort for making appropriate responses. Implicit in this formulation is the assumption that crowding stress is jointly determined by the physical and social

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characteristics of the setting and the nature of the behavioral goals set by the actor. Interference is experienced to the extent that behavioral goals conflict with environmental conditions.

Schopler, McCallum, and Rusbult (Note 1) provided evidence for the relationship between behavioral interference and the subjective experience of crowding. Subjects in this study worked on a group decision task under conditions of either high or low density. This factor was crossed with a manipulation that imposed structure on the interactions of half of the groups. The imposition of structure reduced the potential for interference in the high-density setting by providing for the coordination and synchronization of responses among group members. Consistent with the interference model, subjects in the high-density conditions perceived less interference and reported less subjective crowding with the imposition of structure. Similar results have been reported by Baum and Koman (1976). These investigators manipulated anticipated group size and found that subjects expecting to meet with a large group felt less crowded when anticipating structured interactions than when no structure was expected.

The present experiment was designed to test the interference model prediction regarding the relationship between crowding stress and the importance to the actor of vulnerable response sequences. One direct way in which high-density settings produce interference with goal-directed behaviors is to place limitations on access to available resources. The term *resource* refers to those features of the physical/social environment that are necessary for the attainment of behavioral goals. In natural settings, resources may include doorways, seating, clear lines of vision or movement, physical or verbal access to others, adequate materials for task completion, and so forth. The designation of a given environmental feature as a *resource* requires specification of the particular behaviors enacted in the setting. Consequently, the setting features required as resources will vary not only from setting to setting but also across individuals within the same setting and across time for a given individual. Despite these potential variations, it is evident that conditions of resource scarcity should produce interference and consequent stress.[1] The first hypothesis of the present study was merely that individuals provided with inadequate resources to complete required tasks would report greater subjective crowding and crowding stress and would perform less well than individuals provided with sufficient resources. This hypothesis is consistent with many points of view, including the interference formulation. Predictions regarding the effects of resource availability and importance upon actual task performance and crowding stress, however, do stem directly from the interference formulation. These effects depend upon the strategy the participants select to cope with interference and their success in maintaining task performance. It is useful to distinguish two general coping strategies for dealing with interference in high-density settings. One strategy involves active intervention of the type required for coordination and synchronization of responses, whereas another involves passive withdrawal from interaction, altering behavioral goals, and lowering expectations (Thibaut & Kelley, 1959). Either of these general strategies may be successful in reducing the degree of conflict between behavioral goals and environmental conditions and may consequently reduce crowding stress. To the extent that the behavioral sequences to be enacted in a setting are important to the individual, however, passive withdrawal and lowered expectations should become less attractive as coping strategies. A second prediction was that given low importance, the scarce-resources condition would evidence a performance decrement relative to the adequate-resources condition. The average effect

[1] The availability of resources may be manipulated in an experimental paradigm by holding group size constant and varying resources or by holding resources constant and varying the number of people who must compete for them. Group size was manipulated in the present experiment. Because the functional importance of group size, in our experimental setting, was in relation to the availability of task resources, we have labeled the manipulation *resource availability* throughout the article, rather than *group size* or *density*.

of resource availability upon task performance predicted by Hypothesis 1 is therefore modified by the interaction contrasts described by Hypothesis 2.

The interference formulation predicts that crowding stress increases in magnitude with increases in the importance of vulnerable response sequences. This effect of course assumes that the conditions expected by Hypothesis 2 will pertain, that is, that raising the importance of the goal will induce an active coping strategy even in the face of high interference. Under these restricted conditions, variations in resource availability should have an effect when behavioral goals are important but not when behavioral goals are unimportant. Specifically, among individuals working for important goals, subjects given inadequate resources should experience more crowding stress than should subjects given adequate resources. In contrast, individuals working for unimportant goals should be less affected by variations in resource availability. The average effect of resource scarcity upon crowding stress predicted by Hypothesis 1 is therefore modified by the interaction contrasts described by Hypothesis 3.

In addition to variables associated with the setting characteristics and the nature of the participants' behavioral goals, the present experiment investigated the effect of a personality variable that is conceptually related to the interference analysis. Stockdale (1978) has emphasized the importance of the perception of environmental control in determining the degree of actual or anticipated interference experienced in high-density settings. To the extent that the potential for exerting control over the social environment (through coordination and synchronization of behaviors) is salient to participants, the negative effects of interference on subjective crowding and crowding stress should be mitigated. Individuals who typically anticipate a high degree of personal control in social situations should therefore experience fewer negative effects of density-induced interference. A scale designed to assess individual expectancy of internal or external control over the social environment (Schopler, Langmeyer, Stokols, & Reisman, 1973) was employed to locate subjects on this personality dimension. The fourth hypothesis was that within the scarce-resources (high interference) condition, individuals identified as externals should experience greater crowding and crowding stress than should internals. No internality–externality differences in subjective crowding and crowding stress were predicted within the adequate-resources condition because the existence of adequate resources should obviate the salience of control considerations. Such results would be consistent with the findings that externals report more subjective crowding under high-interference conditions and respond more favorably than do internals to manipulations designed to reduce interference experienced in high-density situations (Schopler, McCallum, & Rusbult, Note 1). These results parallel the findings of research that directly manipulated perceived control. For example, Glass and Singer (1972) found fewer behavioral effects and aftereffects of another environmental stressor (noise) when subjects believed they controlled the onset of the aversive stimulus, and Sherrod (1974) demonstrated that subjects who controlled when they could leave a crowded setting showed greater tolerance for frustration on a postcrowding task.

Because the interference formulation and many other conceptions of crowding speculate about the arousal and reduction of crowding stress, identification of an adequate measure of this kind of stress is of general importance. The obvious limitations of self-reports of stress, among other considerations, have led some investigators to seek physiological indices. Although it is by no means evident that a variable as complex as crowding stress will have a reliable physiological counterpart, the literature contains some suggestions, such as the Palmar Sweat Index (PSI; Johnson & Dabbs, 1967) or blood pressure (D'Atri, 1975). We undertook to explore the adequacy of PSI as a measure of crowding stress in the present study.

Method

Subjects

Seventy-two males and 72 females participated in the experiment in partial fulfillment of the re-

quirements for an introductory psychology course. Subjects were assigned to 16 same-sex six-person and 16 same-sex three-person groups. Four six-person and four three-person groups of each sex were randomly assigned to two importance conditions.

Procedure

The study employed four independent variables in a complete $2 \times 2 \times 2 \times 2$ factorial design: availability of resources (scarce or adequate), importance of behavior (high or low), locus of control (internal or external subject orientation), and sex of subject.

Upon arrival at the laboratory, subjects were escorted to a waiting room by one experimenter who was of the same sex as the subjects and were given numbered clipboards. (Two women and two men served as experimenters for the study.) The experimenter briefly described the procedure as a simulation of working conditions in a large business organization. The subjects were told that they would be asked to perform clerical work under controlled conditions so that factors affecting work quality and job satisfaction could be evaluated. Subjects wishing to terminate participation in the experiment without penalty were given the opportunity to do so at this point. The experimenter then administered the North Carolina Internal–External Scale (Schopler et al., 1973). Instead of categorizing individuals relative to the sample median, locus of control assignments were determined for each subject on the basis of the standardization mean (if his/her score was 72 or lower, the subject was assigned internal status, and if his/her score was 73 or higher, the subject was assigned external status).

In order to obtain a measure of physiological stress (the Palmar Sweat Index) without arousing subject suspicion as to its purpose, the experimenter requested the subjects' cooperation in helping another graduate student (the second experimenter present at the session) pretest for an experiment he/she was preparing to run. The second experimenter stated that he/she wanted to pilot test a measure of concentration called the "PCI" and explained that in order to assess the stability of the measure across various activity levels, several measures would be obtained throughout the experimental session. The PSI was obtained by painting a special chemical on the fingertip and transferring the print to a slide with a piece of transparent tape. After demonstrating the administration of the PSI on the primary experimenter, the second experimenter obtained a baseline palmar sweat measure from each subject.

The primary experimenter then accompanied the group to a mock office containing six (or three) chairs placed in a semicircle facing three standard four-drawer file cabinets. Subjects were instructed to occupy the chair that corresponded to their respective clipboard numbers. Availability of resources was manipulated by variations in the size of the group. The resources available for work on the task (such as physical space and equipment) remained constant across all conditions. The mock office itself measured 2.86 m by 4.11 m and contained the subjects' chairs as well as the three file cabinets placed against one wall and spaced 60 cm apart. While these resources were sufficient for three-person groups, they were insufficient when divided among the members of larger groups. That is, while members of smaller groups seldom experienced difficulty in obtaining access to the files, resources were insufficient and led to problems of interference and a greater need for coordination of behaviors in the larger groups.

The experimenter distributed a different list of names to each subject and explained the experimental task. The file cabinets contained a set of alphabetically ordered folders, and the subjects' task was to locate the file for each name on their lists and to record the home address listed for each of those names. Subjects were told that they would receive "credit" for names only if their records of each address corresponded exactly to that on the experimenter's master list. Subjects were also asked to complete the names in the order in which they appeared on the lists.

Subjects in the low-importance condition were instructed to work as quickly and as carefully as possible and were told that individuals were typically able to complete from 20 to 60 names during the experiment. The other half of the subjects, those in the high-importance condition, were told that in order to simulate piecework schedules they would be paid 15 cents for each name they located and correctly identified. These subjects were informed that typical earnings in the experiment ranged from $2 to $8, the average being about $5. The offer of monetary incentives contingent on high quality and quantity performance was intended to increase the relative importance of task-related behaviors.

After 5 minutes subjects' task work was interrupted to obtain a second PSI reading from each subject. Subjects then resumed work for an additional 5 minutes, after which the primary experimenter administered the experimental questionnaire. Subjects were then informed that the task work was completed, were escorted back to the waiting room, and were thoroughly debriefed. Subjects in the high-importance condition were paid $5 each for participation in the experiment (this amount was greater than that actually earned by any subject).

Dependent Variables

The experimental dependent variables comprised four separate conceptual groupings. The first group was designed to measure crowding stress and included ratings of subjects' reported stress, per-

sonal feelings, attitudes toward other group members, and intentions concerning task performance. The second set consisted of measures of subjective crowding, whereas the third and fourth sets consisted of single measures—task performance and Palmar Sweat Index, respectively. Items were also included to evaluate the effectiveness of the manipulations of availability of resources and importance of the behavior.

Nine items were included in the crowding stress group. Affective reactions were assessed by requiring the subjects to rate both their "normal" feelings and their feelings during the experiment on four pairs of 9-point semantic differentials (pleasant–unpleasant, cooperative–uncooperative, nervous–calm, friendly–unfriendly). These ratings were then converted to difference scores (experimental rating less normal rating) to facilitate statistical analyses. Subjects also rated the degree to which the experience of working in the experimental setting was stressful, the extent to which task work was distressing compared to the subject's experience during a typical day, the extent to which their expectations concerning task performance decreased during work on the task, the difficulty of coordination with other group members, and the extent to which others interfered with task work.

Subjective crowding was assessed by six 9-point bipolar scales. These items asked: "Is there (too much – too little) room for you to work on the task?" "To what extent do you feel (extremely crowded – extremely uncrowded) by the other group members?" "Is there (too much – too little) room for you to feel comfortable while working on the experimental task?" "Do you feel (extremely unconfined – extremely confined) physically while working on the task?" "Do working conditions in this room make task work (much harder – much easier)?" "To what extent is the experimental room (congested – uncongested)?"

Task performance was evaluated by simply counting the number of items correctly completed by each subject. A baseline and task-related PSI score was computed for each subject. Two raters ignorant of the experimental conditions scored the PSI measure by counting the number of open sweat pores within a standard 4-mm square area for both the baseline and the task-related measures. Scores of the two raters were reliable and yielded a correlation of .97.

Two 9-point bipolar scales assessed the effectiveness of the availability-of-resources manipulation and required that subjects estimate the extent to which they would have performed better had they been alone in the room and indicate whether there were too many people in the room.

Four 9-point bipolar scales assessed the effectiveness of the manipulation of the importance of the behavior. These measured liking for the task, importance of task performance, difficulty of the task, and amount of effort expended on task work.

Results

Manipulation Checks

Except where otherwise indicated, the individual responses on each dependent measure were averaged and the group mean employed as the unit of analysis, avoiding problems associated with possible response dependence within experimental groups. To assess the effectiveness of the availability-of-resources manipulation, a two-factor analysis of variance was performed on the measures associated with this factor. Subjects in the large groups were more likely than those in small groups to report that they would have performed better had they been alone in the room and that there were too many people in the room. The means on the ability-to-perform measure were 8.07 for the scarce-resources condition and 7.44 for the normal-resources condition, and the respective means for the number-of-people measure were 7.20 and 6.23, multivariate $F(2, 27) = 16.92$, $p < .001$. Thus it appears that the manipulation of availability of resources was successful.

The success of the importance-of-behavior manipulation was assessed by four items designed to measure subjects' reactions to the experimental task. Subjects in the high-importance condition reported greater liking for the task, stated that it was more important for them to perform well on the task, perceived task work as more difficult, and estimated that they had expended greater effort on task work than did subjects in the low-importance condition. A two-factor analysis of variance revealed that the difference between the two conditions on these measures was only marginally significant, multivariate $F(4, 25) = 2.31$, $p < .086$. Although the importance manipulation was judged satisfactory, the marginal significance of the mean differences should be recalled in evaluating the results of the experiment.

Tests of the Major Hypotheses

Initial analyses revealed that no significant effects were obtained with the nervous–calm and friendly–unfriendly measures, and these

Table 1
Mean Values of all Dependent Measures as a Function of Importance of Behavior and Resource Availability

Item	Importance of behavior			
	High		Low	
	Scarce resources	Adequate resources	Scarce resources	Adequate resources
Behavior				
Performance score	15.40	16.92	14.40	16.83
Crowding stress				
Unpleasant	1.71	.92	1.81	1.21
Uncooperative	.94	.21	.92	.42
Difficulty of coordinating with others	5.35	4.42	4.85	4.67
Stress	4.77	3.13	3.90	3.13
Distress	4.90	4.17	5.31	3.96
Others interfere	5.92	5.33	5.88	4.63
Lowered expectations	5.27	4.75	5.10	4.71
Subjective crowding				
No room to work	7.21	6.17	7.10	6.21
Crowded	6.96	6.08	6.96	6.00
No room to feel comfortable	6.90	5.92	6.77	5.92
Confined	6.27	5.67	6.13	5.54
Congested	6.81	5.71	6.79	5.75
Working conditions poor	7.58	6.50	7.67	6.33
Physiological reactions				
Task-related PSI score	58.39	53.33	51.52	55.46

Note. PSI = Palmar Sweat Index.

variables were not considered further. Although no experimental hypotheses were advanced with respect to sex of subject, the influence of this factor was examined in order to assess the universality of the experimental results. A three-factor analysis of variance was performed on each of the four sets of dependent variables. There were no significant multivariate main effects nor interactions associated with sex of subject, and this factor was not included in the remaining analyses.

The first experimental hypothesis predicted that scarce resources would produce greater subjective crowding, crowding stress, and task decrements than would adequate resources. A two-factor analysis of variance revealed a significant effect of resource availability on participants' subjective crowding, multivariate $F(6, 23) = 9.90$, $p < .001$; crowding stress, multivariate $F(7, 22) = 2.48$, $p < .05$; and task performance, $F(1, 28) = 8.66$, $p < .006$. Participants in the scarce-resources condition reported greater subjective crowding and greater crowding stress and performed less well on the experimental task than did participants in the adequate-resources condition. The resource-availability manipulation did not significantly affect participants' physiological reactions to the setting (as measured by the PSI score, covarying initial PSI levels). The significant effects, in essence, confirm that the resource-availability manipulation established the circumstances required to test the hypotheses involving importance. Induction of scarce resources by an increase in group size did create the required crowding and interference with actual task performance. The lack of an effect for PSI scores precluded consideration of this measure. We will return to this regrettable fact in the discussion.

Hypotheses 2 and 3, stated as planned comparisons, were tested by a series of simple effects analyses because standard analysis of variance does not provide the specific contrasts necessary to test the hypotheses. It is

necessary to examine the influence of variations in availability of resources within both the high-importance and the low-importance conditions. It will be recalled that the second hypothesis expected high, but not low, importance to maintain task performance in the face of scarce resources. Consistent with the experimental hypothesis, scarcity of resources significantly affected performance among low-importance subjects, $F(1, 28) = 6.57$, $p < .02$, but did not significantly influence performance in the high-importance condition, $F(1, 28) = 2.56$, $p < .12$. Average performance scores are shown in Table 1. It is apparent that subjects in the high-importance condition produced a uniformly high level of performance (these subjects averaged 16.16 completed items per session), whereas subjects in the low-importance condition responded to variations in availability of resources. Within the low-importance condition, scarce-resources subjects averaged 14.4 completed items, whereas adequate resources subjects averaged 16.8 items. When motivated by the potential for monetary gain, subjects overcame the interference created by scarce resources and performed at a high level of productivity. When task behaviors were of relatively low importance, however, variations in availability of resources produced commensurate decrements in task performance.

In accord with the interference formulation, Hypothesis 3 predicted that subjects' crowding stress would be adversely affected by scarcity of resources when the task behavior was of high importance to the subject but not when it was of low importance. In support of this prediction, the crowding stress measures were influenced by variations in availability of resources within the high-importance condition, multivariate $F(7, 22) = 2.40$, $p < .05$, but not in the low-importance condition, multivariate $F(7, 22) = 1.62$, $p < .18$. Mean responses on these dependent variables are presented in Table 1, where it can be seen that for the seven stress items, only two (*distress* and *others interfere*) do not show the predicted pattern. With hindsight, these two items appear to be deficient in tapping events that were not strictly task related.

Locus of Control

It was predicted that among scarce-resources subjects in the high- and low-importance conditions, the stress responses, subjective crowding, and physiological reactions of external subjects would be more negative than those of internal subjects. This hypothesis was tested by simple effects analyses and was by necessity performed using the individual rather than the group as the unit of analysis. It should be noted that the use of locus of control as an independent variable produced a nonorthogonal experimental design. The reader is referred to Appelbaum and Cramer (1974) for a description of the series of ignoring and eliminating procedures that were employed to produce accurate tests of significance.

Analysis of subjects' stress responses indicated that externals reported more negative affect than did internals in the high-importance scarce-resources condition, multivariate $F(7, 130) = 2.11$, $p < .05$, but within the low-importance scarce-resources condition, internality–externality did not have the predicted effect, multivariate $F(7, 130) = 1.15$, $p < .34$. As expected, internality–externality did not significantly influence affective responses within the adequate-resources condition.

A similar pattern of results was obtained for the measures of subjects' subjective crowding. Among scarce-resources subjects, externals consistently responded more negatively than did internals, but the effect for internality–externality within the high-importance scarce-resources condition is significant, multivariate $F(6, 131) = 2.33$, $p < .04$, whereas the internality–externality effect within the low-importance scarce-resources condition was not significant, multivariate $F(6, 131) = 0.21$, $p < .98$. Again, internality–externality had no significant effect on subjects' responses in the adequate-resources condition.

There were no locus-of-control main effects nor interactions on the measures of performance or physiological stress.

Discussion

The major focus of the present research was to evaluate the effects of varying the importance of the behaviors vulnerable to interference by others. We successfully induced crowding and interference through the creation of scarce resources by manipulating group size. Individuals working in the scarce-resources condition, compared to those working in the adequate-resources condition, reported more crowding and crowding stress and completed fewer items on the task. These effects are hardly remarkable, although they do underscore the reason why some experiments, for example, those of Freedman, Klevansky, & Ehrlich (1971), find no performance decrements with high density, whereas other experiments, such as ours or that of Heller, Groff, & Solomon (1977), do find performance decrements. The difference appears to reside in whether or not the crowding manipulation and the particular task used intersect to produce scarce task resources and interference. Freedman, Klevansky, and Ehrlich used problem-solving tasks and manipulated room size, a combination that was selected explicitly to minimize task interference by unhinging high density from scarce resources. In our experiment and that of Heller, Groff, and Solomon, a performance task was combined with the heightening of density by increasing group size. This combination produces task interference and performance decrements.

Based on the interference model (Schopler & Stockdale, 1977), it was predicted that the aversive impact of interference would be greater when behaviors encountering interference are important to the actor. The second and third hypotheses expected efforts to maintain task performance, when the goal was important and despite scarce resources, by an active coping strategy that also produced increased stress. The data confirmed these predictions for task performance and for stress. Subjects responded more negatively to scarce resources on the stress measures only when they were provided with incentives to perform well on the task. In accord with the interference analysis, subjects who were highly motivated to complete goal-directed behavior sequences experienced more psychological costs than did less motivated subjects when these behaviors encountered interference from the physical/social environment. These results suggest that in understanding the impact of high-density settings, specifying the nature and importance of behaviors enacted in these settings is as necessary as specifying the nature of the settings themselves.

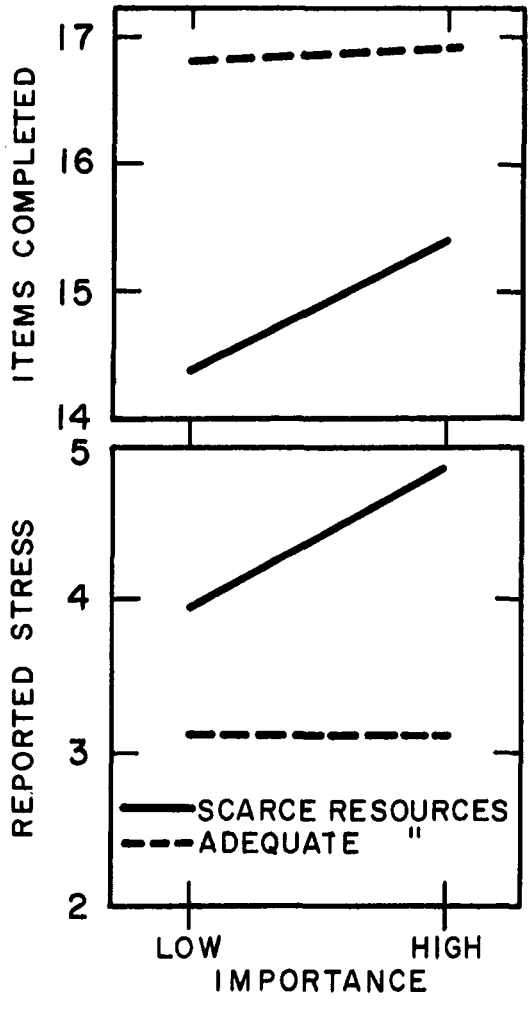

Figure 1. Mean number of items completed and reported stress as a function of resource availability and level of importance.

Further evidence of the relationship between reported stress and the interference produced by high-density settings is revealed in a comparison of the pattern of responses

to the stress item, in the stress group, with the pattern of performance scores (see Figure 1). When no external incentive was provided, scarce resources produced a performance decrement but did not result in greater reported stress. When the importance of task performance was raised, however, scarce resources no longer resulted in a significant performance decrement but did produce significantly greater reported stress. It appears that subjects in the high-importance scarce-resources condition were able to maintain their relatively high level of performance only at the expense of experiencing greater subjective stress. These psychological costs seem to be the price subjects paid for their attempts to maintain high performance under unfavorable environmental conditions. The observed relationship between performance and reported stress in the scarce-resources condition may also indicate that reduced task output functions as a coping mechanism. When behavioral goals and environmental conditions conflict, modifying or eliminating those behaviors that encounter interference may be an effective strategy for low-incentive subjects in reducing the stressfulness of the situation. The extrinsic rewards offered in the high-importance condition, however, encourage these subjects to maintain those behaviors in spite of the interference.

The importance of the behavior and the scarcity of task resources may also be the critical features determining when crowding and sex of subject interact with respect to affective feelings. Increases in density have raised positive feelings for women while lowering them for men, both when the measures are taken in the crowded situation (Freedman, Levy, Buchanan, & Price, 1972; Ross, Layton, Erickson, & Schopler, 1973) and when they are taken after the participants have left the crowded situation (Epstein & Karlin, 1975). Affective ratings are included in our crowding stress group. It will be recalled that we found no interactions with sex of subject on these measures. We would suggest that the sex interaction effect will not occur when the mechanism used to cope with interference does not lower crowding stress. The cohesion and cooperativeness that characterizes groups of women, according to Epstein and Karlin, will probably not survive the combination of scarce resources and high importance.

Although it was predicted that externals would respond more negatively to the scarce resources present in the large group under both high and low importance, this effect was observed only in the high-importance condition. A possible explanation of this result is suggested by reference to our previous discussion regarding the most likely coping strategies in the high- and low-importance conditions. A passive withdrawal strategy, resulting in reduced performance, may seem equally attractive to internals and externals when incentive is low. The high-importance condition favors internals because it requires a more active strategy aimed at coordinating and synchronizing responses to keep performance high. Thus, individual differences in expectancies for control over the social environment produce differing affective responses when the desirable coping strategy requires active intervention.

No significant effects were obtained for the physiological measure of stress. One of the problems with attempting physiological measures in crowding studies is the disrupting and distracting influence of the measurement process itself. The PSI was selected for use because it allowed subjects the necessary mobility and could be administered relatively quickly. To further reduce the disruptions inherent in taking the measure, the PSI was administered only twice. The data, which reflect generally higher scores on the initial administration, suggest that a longer baseline period with several administrations would have been desirable. The longer baseline period would allow subjects an opportunity to adapt to the measurement procedure itself and might have resulted in a greater sensitivity to the experimental manipulations. However, the nonsignificant results for the PSI must also lead us to entertain the possibility that physiological stress does not in actuality adhere to the pattern obtained for self-reported stress and negative affect. This seems plausible in view of the relatively brief

duration of the experimental session. In any case, we feel that the development of a sensitive and easily administered measure of physiological stress would add much to a literature that has relied heavily on self-report measures.

The results of this study have been interpreted in support of the interference model of crowding. This model locates the aversive impact of high-density settings in the increased costs of enacting behaviors when environmental conditions are in opposition to the actor's behavioral goals. Aversive psychological consequences were shown to be a joint function of the degree of density-related interference and the importance to the actor of his or her goal-directed behaviors. The relationship between density and actual task performance was also qualified by the importance of the task-related behaviors. When highly motivated individuals are successful in maintaining high levels of performance under high-density conditions, the increased costs of enacting the necessary behaviors are reflected in their negative affective responses to the situation.

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