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STRATEGIES FOR THE INVESTIGATION OF CROWDING[1]

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ABSTRACT

A variety of methods for systematically investigating crowding have merged. These include studies of humans and animals in both laboratory and field settings. Each of these approaches is viewed as having unique strengths and limitations. The potential of these varying research strategies is explored and the need for appropriate caution in generalizing from the results obtained is noted. A recent attempt to study real world crowding in a natural experiment is commented on in detail.

INTRODUCTION

Recently there has been a great deal of interest in the systematic study of the effects of crowding. Researchers have adopted a variety of approaches in the investigation of this phenomenon. Geographers have mapped concentrations of individuals in a variety of settings. Some sociologists have explored the relationship between population density and social pathology, while others have conducted interviews of residents of crowded areas. Some psychologists have studied the effects of density on such variables as task performance, physiology and social behavior. Others have concentrated on studying phenomena associated with personal space looking at nonverbal reactions to inappropriately close distances

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between interactants. Still other behavioral scientists have studied the effects of crowding on animal populations in both laboratory and field situations. It would seem necessary at this time to consider the strengths and limitations of some of these approaches, so that we may better learn what each can contribute to our understanding of how crowding affects human behavior. Finally, we would like to discuss another approach which we feel may further contribute to our understanding of the effects of crowding. Throughout this paper, we will be talking in general terms about the literature in each of these areas rather than referring to specific investigations. We would note that several reviews of the literature have recently appeared. Lawrence (9) and Freedman (6) have reviewed the literature on territoriality, while Evans and Howard (5) have reviewed the literature on personal space. Finally, Altman (2) has surveyed the literature in several of the aforementioned areas. In the main, these reviews have focused on substantive findings and have not considered the strengths and limitations of these disparate research strategies.

Animal Studies

Some of the most dramatic effects of crowding have been found in the animal literature. For example, severe breakdowns in social organization have been observed in experimentally crowded rodent populations. Under conditions of severe crowding, maternal behavior disintegrated, cannibalism occurred, and infant mortality was extremely high. Many male animals displayed heightened aggression and bizarre sexual behavior. The evidence suggests that continued crowding would have completely destroyed the colony. Other animal populations have been studied in the wild. Under conditions of high population density, adverse physiological reactions sometimes leading to dramatically heightened mortality rates have been observed. It should be noted that these animals had an adequate supply of food and were initially healthy. Thus, the adverse effects were clearly attributable to crowding. This research strategy has several obvious strengths. First, the severity of crowding which can be induced in experimental animal populations is much greater than can be created in human populations. Further, the relatively short life span of these animals enables the investigator to observe the effects of crowding not only throughout the entire life cycle, but even across generations. Finally, the ability to sacrifice animals at any point in time has enabled investigators to directly assess the physiological effects of crowding. On the other hand, it must be noted that this approach has some severe limitations. Generalization from animals to humans is always problematical. This concern is especially important when considering reactions to adverse environments. There is a substantial literature dealing with the cognitive mediation of the effects of stress on social behavior and

physiological responses. For example, the work of Lazarus and his colleagues points out the importance of cognition in the appraisal of and adaptation to stressful stimuli.[2] Further, the effectiveness of psychotherapy is largely based on our ability to change our reactions to our environment by changing the way in which we think. As a result of this cognitive ability we would expect that in contrast to animals, human beings should be much less adversely affected by environmental stressors such as crowding. Consequently, it may be even more important, in human populations, to look at the costs of continued adaptation rather than the direct effects of adverse environmental stimulation.

Correlational Approach

Let us turn then to some of the human costs resulting from living in crowded environments. A good deal of our knowledge of the effects of crowding on humans is based on the sociological literature which correlates degrees of population density with various indicators of social and physical pathology. These studies have looked at room density, dwelling unit density and neighborhood density and have linked high levels of these densities to such negative outcomes as increased crime, infant mortality, morbidity and problems of mental and physical health. These studies enable us to investigate the effects of real world urban crowding and suggest that crowded environments generally have adverse effects. There are, however, some problems with this research. First, the most crowded urban areas are usually inhabited by people who differ on a variety of dimensions from their less crowded counterparts. They are generally poorer and may be members of ethnic minority groups. They may suffer from malnutrition, have access to less adequate health care services, and have norms and expectations quite different from those of persons living in less densely populated areas. Thus, attempts to evaluate the effects of crowding may be confounded by the difficulty of assessing the contribution of each of these factors. Recent studies have utilized highly sophisticated statistical techniques in an attempt to deal with this problem. However, the success of these techniques is still in question. Issues such as the creation of appropriate indices of socioeconomic status and the choice of cutting points for measures of density have not yet been adequately resolved. For example, two recent studies (Galle, Gove and McPherson, 7; Ward, 12) have used exactly the same data to study the effects of density and social class in Chicago. Both studies found adverse effects in the more densely populated neighborhoods. However, one study seemed to demonstrate that crowding rather than social class was primarily responsible

[2]Lazarus, R.: *Psychological Stress and the Coping Process.* New York: McGraw Hill, 1966.

TABLE A
Summary of Laboratory Research

Study	*Subjects & Situation*	*Density & Other Independent Variables*	*Psychological Responses*		*Immediate Behavioral Reactions*	*Aftereffects*
			Stress, Crowding or Mood	*Liking and Other Responses*		
Aiello, Epstein, & Karlin (Note 2) (Study #1)	120 male & female students in same-sex gps of six (30 min).	*Spatial density* (lg or sm rm); *sex; trials* (5 blocks of 3 trials); *order of exposure.*	*Skin conductance* (index of arousal) higher in sm rm; increased over time).	--	--	--
(Study #2)	20 male & female students alone (30 min).	*Spatial density* (lg or sm rm); *sex; trials; order of exp.*	*Skin conductance* lower than in gps; interaction of density, trials, and order of exp.	--	--	--
Baum & Davis (1976)	80 male & female students in lab asked to place miniature figures in "rooms."	*Visual complexity* (high or low); *color* (light or dark); *situation* (cocktail party or waiting rm).	*Crowding:* higher in dark rm, esp with hi complexity in waiting rm.	*Rm size:* larger for light color, esp with hi complexity in waiting rm (Other effects.)	*Figure placement:* more in light rm.	--

respondents. What prople do and what people say they do is often at variance.

Psychological Experimentation

The next approach to be considered is psychological experimentation. Usually, these studies have involved short-term exposure (anywhere from five minutes to four hours) to very high densities in laboratory settings. Attempts to demonstrate that crowding is an aversive stimulus by measuring its effects on cognitive task performance have met with mixed success. In terms of social behavior, crowding does not seem to have simple effects. Usually, males and females respond differently to crowded settings. Men become more competitive and women more cooperative when crowded. On self-report measures of phenomenological reactions to crowding, people indicate that crowding is unpleasant. Measures of skin conductance seem to indicate that crowding produces arousal. While these studies manage to avoid some of the confounding factors which make the correlational studies difficult to interpret, they have several limitations of their own. Karlin and his colleagues have suggested elsewhere that the key problem here is the setting specific nature of crowding events (8).

Although the label, "crowding," has been applied to a very diverse set of phenomena, the majority of time that urban dwellers spend in crowded environments occurs in a small number of relatively discreet settings. The life of an urban dweller usually involves a fairly limited set of activities. Employed persons get up in the morning, travel on mass transit or in cars to work, stay at their work settings all day long (except for a lunch break), and then return home in the evening. During evenings and weekends they shop and make use of recreational facilities such as parks, restaurants and theatres. On occasions, they may participate in a demonstration or large meeting or otherwise be part of a crowd. We submit that the majority of situations which people label "crowded" occur in one of these contexts.

If it is true that people are crowded in these relatively discreet situations, there are some major implications for the understanding of real world crowding. If we are to understand how crowding affects people and how it may be ameliorated, it seems necessary to phrase such understanding in terms of these discreet contexts. For example, if we are to understand crowding in residences, we must concentrate our research on variables relevant to the study of this context. Crowding people with strangers for a short period of time and studying their task performance while in that setting will have little to tell us about the effects of residential crowding. Many laboratory studies, including our own, have asked such irrelevant questions.

In order for the applied researcher to create conceptual analogues to real world crowding, he must ask a series of questions before setting up his laboratory paradigm. First and foremost the researcher must ask, "What setting do I wish to study?" Here he may choose from among five prototypical settings: residential settings, work settings, mass transit settings, shops and restaurants and crowds. Second, he must ask, "What are the important events which evoke the label of crowding in that setting?" We believe that there are four major events. These are: congestion-resource scarcity, an inability to control and limit interaction with others, close physical proximity to others, and a very large number of interactants in a given setting. Next for the applied researcher whose interests concern the ability to generalize about the effects of crowding outside the laboratory context, the question of what variables are important in real world crowding must arise. This is not the case for the basic researcher who may be interested in the effects of overstimulation, spatial restriction or the presence of large numbers of people on other social psychological processes. One would not, for example, require the student of sensory deprivation to justify his paradigm by pointing to its real world analogue. However, the applied researcher must adequately conceptualize both his independent and dependent variables in light of what actually occurs. Moreover, he must make a distinction between logical possibilities and applied research priorities. While it might be interesting to know how the crowded subway rider feels about the person next to him, from an applied standpoint, it is probably more important to assess the effects of the ride on his subsequent interactions with family members at home. Similarly, in terms of effective interventions, real world considerations may be taken into account. If one possible intervention in terms of crowded subways is to provide much more space by building many additional subway cars, practical considerations render this a low probability occurrence. Alternate strategies such as exploring such social manipulations as traveling in the company of friends and thereby reducing the salience of the crowded environment may be a more profitable investment of such research efforts.

Laboratory studies of crowding to date have not, for the most part, had relevant applied considerations in mind. We have still to create appropriate laboratory analogues to real world situations in which people become crowded. Finally, let us consider a different sort of experimentation. Projective techniques have been used to ascertain reactions to crowding and certain elements of design. Usually, research subjects are asked to place objects representing people in scale model rooms in order to determine the point at which they judge the environment to be crowded. On the face of it, this approach would seem to have a great deal of merit for those concerned with design questions. This is especially true since data can be gathered with little time and effort. However, for a series

Desor (1972) (Study#1)	20 male & female students asked to place figures in miniature rms.	*Partitions* (3 types or none); *activity* (social or nonsocial); *standing vs sitting; sex.*	--	--	*Figure placement:* fewer with no partitions, with nonsocial (females only) and with seated figures.	--
(Study#2)	30 male & female students, same method.	*"Room" size.*	--	--	*Figure placement:* more as rm size increased. (Other effects).	--
(Study#3)	10 male & female students, same method.	*Doors* (2 or 6); *shape* of rm (square or rectangular); *activity* (social or nonsocial); *standing or seated; sex.*	--	--	*Figure placement:* more in 2-dr rect than 2-dr sq rms; more in 2-dr rect than 6-dr rect; fewer with nonsocial. (Other effects.)	--
Dooley (1974)	227 male students working on tasks in gps (40 min).	*Social density* (gps of 1, 3, or 6); *personal space* PS (approach dist close or far).	*Crowded, restricted:* higher with lg gps; higher with far PS.	*Perceived friendliness:* lower in lg gps; lower with far PS. (Other effects.)	*Perf of "marketing" task:* no effects of gp size; poorer with far PS.	*Proofreading* fewer lines in lg gps; more errors with far PS. *Volunteering for later discussions;* less with far PS.

(continued)

backgrounds with respect to socioeconomic status. They had equivalent educational backgrounds (all were college freshmen), were about equally healthy when they arrived at college, and had all been randomly assigned to living conditions. This provided an opportunity to study the effects of crowding from a longitudinal perspective in a manner uncontaminated by socioeconomic class and health factors which have usually differentiated persons who live in crowded urban conditions from those who do not.[3] At the same time, it provided some of the strengths of the experimental method and an opportunity to examine the processes by which people cope with conditions of crowded living.

METHOD

Subjects

A sample of 31 rooms (7 tripled male rooms, 7 tripled female rooms, 7 doubled male rooms and 10 doubled female rooms) was randomly selected from the available population. Potential subjects were offered an incentive of $25.00 each to contribute about 15 hours of their time during the course of the semester to the research project. All but one person so approached agreed readily to participate in the study. Subjects were told that the study would investigate patterns of adjustment of college freshmen to college and dormitory life.

Dependent Measures

The present research into long-term crowding was greatly influenced by Irwin Altman's model of contact regulation (2). The Altman model provided a guiding framework for our choice of dependent variables. Since the model is comprehensive, dealing with a wide range of variables, an attempt was made to collect information on as many of them as possible. Analyses have been completed on only those measures which directly relate to arousal or are clearly

[3]It is clear that in addition to experiencing restricted space and a scarcity of resources, tripled Ss lived in triadic as opposed to dyadic groups. These configurations have properties of their own, such as the presence of coalitions in the triads which would not be possible in two-person situations. One of our students is presently conducting a doctoral dissertation on the effects of group size as opposed to spatial factors in the present study. (M. Geller: The Behavioral Impact of Group Size and Available Space: An Analysis of Dyadic and Triadic Roommate Arrangements.)

Epstein & Karlin (1975)	84 male & female students in same-sex gps of 6 (measures taken after density manipulation was finished).	*Spatial density* (lg or sm rm); *sex.*	*Crowdedness, confinement, lack of privacy, competition for space:* higher in sm rm. (Other effects.)	*Evaluation of gps:* higher for women in sm rm. *Perceived similarity:* higher for women in sm rm & men in lg rm. *Group cohesiveness:* lowest for men in sm rm. (Other effects.)	--	*Task perf* No effects on complex tasks; better perf of simple tasks by people from sm rm. *Seating dispersion:* more women from sm rm chose peripheral seating than from lg rm *Prisoner's dilemma:* more competitive choices among men from sm rm, women from lg rm.
Evans (1975)	100 male & female students in mixed gps of 10 working on tasks (120 min)	*Spatial density* (lg or sm rm); *sex.*	*Crowded, stress, uncomfortable:* higher in sm rm *Heart rate, blood pressure* (indices of stress): higher after sm rm.	*Hostility:* greater in sm rm. *Rated adequacy of facilities:* lower in sm rm.	*Perf of matrix task:* poorer in sm rm *Perf of secondary task:* poorer in sm rm. *Other tasks:* no effect	*Persistence in tracing task* (partly impossible): greater after lg rm.

(continued)

TABLE 1

Feeling of room crowdedness by male and female doubles and triples*

	Doubles	Triples
Female	2.5	6.1
Male	3.2	5.1

*1 = not crowded; 7 = very crowded

TABLE 2

Satisfaction of doubled and tripled males and females*

	Doubles	Triples
Female	2.0	5.0
Male	2.3	4.0

*Lower scores are associated with greater satisfaction.

of crowding. Two questions were therefore asked tapping perceived crowding and satisfaction with living conditions. Subjects in tripled rooms perceived themselves as significantly more crowded than did persons living in double rooms ($F=67.9$, $df=1/58$, $p < .001$). Interestingly, while both men and women in tripled rooms differed significantly from their less crowded counterparts, the effect was stronger for women that it was for men ($F=6.0$, $df=1/58$, $p < .025$). Examination of reported satisfaction with living conditions reveals the same pattern. Tripled subjects were significantly less satisfied than were doubled subjects ($F=61.3$, $df=1/58$, $p < .001$). The effect is stronger for crowded women than it is for crowded men ($F=5.93$, $df=1/58$, $p < .025$).

Arousal

Two sets of measures were used to study arousal: cortisol levels and cognitive task performance. Cortisol levels did not show significant differences. However, tripled subjects showed an increase over time. Large individual differences in cortisol level as well as the small size of the sample may have prevented these differences from being clearer. Cognitive task performance, on the other hand, revealed clear indication of arousal over time. Subjects in double rooms showed improved performance over time on both

Freedman, Klevansky, & Ehrlich (1971) (Study#1)	126 male & female students in mixed or same-sex gps, working on tasks (3 60-min sessions).	*Spatial density* (lg or sm rm); *social density* (gps of 5 or 9); *sex.*	--	--	*Perf of 7 different tasks:* no effects.	--
(Study#2)	306 male & female students in same-sex gps of 7 to 9 working on tasks (2 60-min sessions).	*Spatial density* (lg or sm rm); *motivation* (bonus or no bonus for good performance); *sex.*	--	--	*Perf of 3 simple tasks:* no effects.	--
(Study#3)	180 women aged 25-60 in gps of 9 working on tasks (2 240-min sessions).	*Spatial density* (lg or sm rm).	--	--	*Perf of 3 simple tasks:* no effects.	--
Freedman, Levy, Buchanan, & Price (1972) (Study#1)	136 males & female students in same-sex gps of 4 working on tasks (240 min).	*Spatial density* (lg or sm rm); *sex.*	--	--	*Compet in prisoner's dilemma:* higher for males in sm rm than in lg rm; lower for females in sm rm than in lg rm.	--

(continued)

TABLE 5

Physical and psychological problems reported on the Cornell Medical Index by male and female doubles and triples*

	Doubles	Triples
Female	1.93	1.89
Male	1.93	1.95

*The lower the score, the greater the reported problems.

TABLE 6

Stability of double and triple rooms

	Double	Triple
Broke up	1	9
Stayed together	16	5

TABLE 7

Stability of female and male triples

	Female	Male
Broke up	7	2
Stayed together	0	5

DISCUSSION

These results would seem to indicate that there are a number of differences in the effects of the environment on students

living in tripled rather than in doubled room arrangements.[4] Tripled as opposed to doubled subjects saw themselves as more crowded and were less satisfied than doubled students. They seemed to be more aroused. However, when considering the effects of crowding on health and the stability of living arrangements, it is the crowded women who are most negatively affected. It should be noted that the same pattern emerged on the manipulation checks where the effects were stronger for women. While the data on arousal were consistent with results obtained in the laboratory, it would seem that on the face of it, the sex effects have been reversed.

The most obvious difference between this study and the laboratory studies is that this study concerns long-term crowding, while only short-term crowding was studied in the laboratory. In addition, since crowding is stressful, the key mechanism in question is a process of adaptation to stress. Coping mechanisms which work well in relation to short-term situations may prove to be extremely maladaptive in long-term situations. This idea is not new; Selye's

[4]The study of residential crowding in the Rutgers dormitory was concluded in early 1975. Since that time, the study by M. Geller, mentioned in Footnote 3, has been completed, and a follow-up study by L. Rosen is in progress. These studies have indicated several things. First, the study by Geller indicated that the stress of the triadic living arrangement was due, in large measure, to the coalitional properties of the three-person group. It should also be noted that A. Baum (personal communication) has found that the negative effects of crowded tripled dormitory living seem to be most pronounced for students who are excluded from a coalition between the other two roommates.

The study by Rosen, which was a two-year follow-up on the subjects of the original dormitory population, indicated that three-person female groups were more satisfied with college life than were any other groups after their freshman year. The data analysis for Rosen's study has not yet been completed, and it is not clear why tripled women subsequently showed better adjustment to college life than did persons in any of the other groups. The effect does not seem to be an instance of regression to the mean. We are considering three major possibilities to account for this finding. First, it may be due to the presence of helpful social networks that were formed in the first year. Second, the adverse experience in the first year may have taught these women coping skills which they later used. Third, since the clearest differences in Rosen's study emerged on self-report measures, the data may be due to social judgment considerations. Since tripled women were most negatively affected in their freshman year, the contrasted improvement brought about by the change in living conditions may have seemed more striking to them than to members of other groups.

TABLE 8

Proportions of students in room

	Male	Female
In room	19	32
Out of room	16	9

notion that the very process of adaptation to stress may lead to further costs resulting from the efforts to adapt is the classic formulation of this notion. In the laboratory, it has been seen that short-term crowding leads to increased interdependence among women and solitary activity among men. These patterns have been previously identified as a "positive" reaction among women and a "negative" reaction among men. In part, these labels reflect particular values and measures used to study the effects of crowding in the laboratory. For example, crowded women were more cohesive, viewed each other as more similar, and encouraged each other to share their distress (4). It was assumed that these behaviors were "good." In fact, they represent a particular style in coping with stress, i.e., increased interdependence. This affiliative style is typical of women and is also used by them in the long-term situation. It seems quite possible that it is this very process of high levels of interaction and interdependence among women which produced the strong negative effects of crowding on the tripled women. A variety of measures in the present investigation support the view that women employ this high interaction, interdependent style in long-term living situations, while men do not. This is most clearly seen when one examines which subjects spent the most time in their rooms and, hence, with each other. The procedure of questionnaire distribution permitted verification of the notion that women spent more time in their rooms than did men. Questionnaires were delivered to subjects in their rooms. If the subject was not in his or her room, the questionnaire was stamped with a notation requesting him to place it in a locked box on the front desk in the dormitory. In this way, it was possible to ascertain who were in their rooms and who were not. These data clearly indicate that women were in their rooms more often than men ($X^2=4.83$, $df=1$, $p < .05$).

In addition, subjects were asked to keep a room-use log for one week's time. On this log, subjects indicated the activities that were conducted in the room and noted the time of the day that they entered and left the room. As can be seen in Table 9, women tended to spend more time each day in their rooms than did men

McClelland (1974)	164 males & female students in mixed-sex gps of 6, working on tasks (90 min).	*Spatial density* (lg or sm rm); *necessity for interaction; previous acquaintance* (moderate or none); *sex*	*Crowding:* higher in sm rm; higher with hi interaction. *Upset & task dissatisfaction:* no differences for unacq; for acq, highest for hi interaction, sm rm & lo interaction lg rm. (Other effects.)	*Perceived interference:* higher with hi interaction. *Dislike others:* for males, highest in low interaction, for females, lowest in sm rm, hi interaction (Other effects.)	*Perf of bibliography task:* lower for hi interaction; lower in sm rm; lowest in sm rm, hi interaction. *No. of others in diagram of rm:* lowest for females in lg rm, lo interaction.	*Proofreading:* poorest performance with hi interaction. *Stroop test;* no effects of rm size or interaction.
Poe (Note 16)	64 male students working in gps on tasks (150 min).	*Spatial density* (9 or 18 sq ft per person); *social density* (gps of 4 or 8); *trials.*	*Comfort:* higher in lg rm on 1st trial. *Anxiety, sadness:* in gps of 4 no differences; in gps of 8, higher in lg rm. *Neg. emotion:* in gps of 4, higher in sm rm; in gps of 8, higher in lg rm *Pos. emotion:* higher in gps of 4. (Other effects.)	*Liking:* increased over time; higher in sm rm. *Liking for gp:* increased over time; higher in gps of 4 on 3rd trial. *Participate again:* in gps of 4, higher in lg rm; in gps of 8, higher in lg rm. (Other effects.)	*Anagram task:* performance increased over time. *Mock jury:* for 5 cases, inconsistent effects (on 1st case, higher guilt in sm rm).	*Anagram task:* improved performance in gps of 8, poorer in gps of 4.

(continued)

CONCLUSION

In his discussion of scientific methods in the behavioral sciences, A. Kaplan (*The Conduct of Inquiry*. San Francisco: Freeman, 1964) describes an incident in which a policeman notices a drunken citizen stooped on all fours and scratching around on the sidewalk under a lamppost. When asked by the policeman what he is doing, the drunkard replies that he is searching for a lost house-key. The policeman asks him where he lives and he points to a dwelling some 50 yards down the block. The policeman asks him whether he remembers losing the key in the vicinity of the lamp-post. "Oh, no," replies the man, "I lost it in the front of my house." "Why, then," asks the policeman, "are you looking for it in front of the lamppost?" "Oh," replies the drunkard, "because that's where the light is." Perhaps there is a lesson in this tale for investigators studying the effects of the environment. On the one hand, simple causal models of the type which are usually amenable to controlled laboratory investigations may not adequately account for phenomena such as crowding. Altman's model of crowding is an example of an alternative to the simple causal model. His approach seems rooted in the systems theory tradition. Clearly, no single laboratory experiment could adequately test his model. Rather, many different investigations are needed to accumulate information which can be seen as consistent or inconsistent with his ideas.

But, in addition to the conceptual issues noted above, one must ask whether the laboratory, as we have been using it, is really the best place to study environment effects? Singer, et al. (11) have made this point in a recent article on commutation stress:

> As psychologists turn to considerations of their environment, it is all important that studies be done of the environment itself. Theoretical or laboratory work can provide theories, hunches, and a host of detailed studies concerning the effects of selected and isolated variables; but they cannot substitute for a study of its aspects of the work outside the laboratory to which they are addressed. It thus requires acts of faith and extrapolation to move from a laboratory phenomena to recommendations of real application. (p. 18)

There is something very curious about our tenacious hold upon traditional laboratory experimentation in order to feel secure in the knowledge we obtain. We submit that when it comes right down to it, the utility of research results for understanding real world phenomena requires an act of faith. In the case of well controlled laboratory experiments, this means on the one hand discounting such factors as demand characteristics and other such potential artifacts and on the other hand making the huge inductive leap between a study

manipulating a limited number of variables in an artificial laboratory and a more complex real world phenomenon. Alternatively, when one conducts field studies and cannot control extraneous environmental variables, a different act of faith is required. In the long run, both of these approaches will yield spurious results which will have to await newer and improved studies for a better, though still incorrect, approximation to knowledge.

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TABLE A *(continued)*

Study	*Subjects & Situation*	*Density & Other Independent Variables*	*Psychological Responses*		*Immediate Behavioral Reactions*	*Aftereffects*
			Stress, Crowding or Mood	*Liking and Other Responses*		
Stokols, Rall, Pinner & Schopler (1973)	512 male & female students in same-sex gps of 8 working on tasks (70 min).	*Spatial density* (lg or sm rm); *cooperative or competitive tasks; sex.*	*Crowding:* greater in sm rm; greater with compet task. *Comfort:* lower in sm rm. (Other effects.)	*Others' aggressiveness:* higher in coop task; higher for females in lg rm & males in sm rm. *Self-aggressiveness:* higher for males in sm rm & females in lg rm.	*Laughter:* more in sm rm; more in compet gps; more in sm rm with compet task & lg rm with coop task. *Hostile remarks:* more from males. *Task performance:* higher for males; no other effects. *Recall of names:* higher for males in lg rm & females in sm rm. (Other effects.)	--
Stokols & Resnick (Note 21) (Study#1)	108 male & female students in mixed gps of 6 in sm rm working on tasks	*Social climate* (evaluative or "get acquainted").	*Crowding:* no effects.	*Liking:* no effects.	--	*Chair distance* (in different rm): greater in eval gps.