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How Funny is Crowding Anyway? Effects of Room Size, Group Size, and the Introduction of Humor

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This study examines the impact of introducing humor passages under three levels of social density and two levels of spatial density. Results demonstrated that having subjects listen to humor effectively elevates mood levels under these experimental conditions. Compared to their counterparts under no humor conditions, subjects listening to humor passages felt more vigorous and less fatigued, experienced less irritation and annoyance, and reported greater involvement and interest in these sessions. Of particular note is the finding that the high spatial density environment produced a considerable enhancement in subjects' enjoyment of the humor. As expected, the combination of high social and high spatial density resulted in the greatest self-reported discomfort and stress. The presence of larger numbers of people resulted in higher levels of stress-related arousal (as measured by subjects' skin conductance levels), but high spatial density conditions produced the greatest number of negative consequences. Interestingly, female subjects under the close physical proximity conditions reported feeling less self-centered, less anxious, less regretful, and generally felt more positive toward other members of their group.

During the last decade and a half there has been a dramatic increase in the number of studies related to crowding and human behavior. While a fair proportion of this research has investigated the effects of crowding in residential environments (cf. Aiello & Baum, 1979), the majority of these studies have examined the consequences of short-term crowding involving the close physical proximity of others for relatively brief durations.

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The experience of crowding is a function of the excess stimulation and subsequent loss of personal control resulting from too many others (high social density) or too little space (high spatial density)—or the combination of these two factors. The existing research literature has documented that each of these types of density conditions *can* produce negative consequences for individuals who experience them (see Schmidt & Keating, 1979; Sundstrom, 1978; for reviews of this area). For example, in studies when social density was increased in a constant size environment for a limited period of time, participants of larger groups reported greater degrees of crowding, discomfort, and other forms of stress (e.g., Griffitt & Veitch, 1971; Nogami, 1976; Saegert, 1974). Interestingly, even the anticipation of greater social density has been found to lead to greater crowding stress (e.g., Baum & Koman, 1976). Under conditions of high spatial density, greater physiological stress-related arousal has been demonstrated in a considerable number of studies (e.g., Aiello, DeRisi, Epstein, & Karlin, 1977; Aiello, Epstein, & Karlin, 1975; Aiello, Nicosia, & Thompson, 1979). While the effect of high density on task performance is somewhat less clear, it does appear that complex task performance may be impaired *under* some high spatial density conditions (e.g., Paulus, Annis, Seta, Schkade, & Matthews, 1976; Worchel & Teddlie, 1976) as well as directly *following* exposure to these conditions (e.g., Aiello et al., 1977; Evans, 1975).

One purpose of the present study was to assess the differential and the combined effects of social and spatial density conditions on the social and physiological responses as well as on the affective state and task performance of individuals under these conditions. This study was also designed, however, to determine the impact of providing a pleasant distraction to subjects under these density conditions. It was expected that the presentation of humor passages would elevate the mood and relieve some of the strain of the subjects in all of the experimental conditions. Support for this expectation is provided by two separate lines of research, one dealing with the use of distractors under high density conditions and the other pertaining to the social facilitation of humor appreciation.

Worchel and Teddlie (1976) proposed a two-factor theory of crowding that identifies violations of personal space as the spatial variable associated with crowding. They postulated that individuals may not experience crowding if the source of the arousal is misattributed to an alternative source for the arousal (rather than the close physical proximity of others). They found that pictures on the walls of conditions involving groups seated at a close interpersonal distance reduced the experience of crowding and enhanced interpersonal attraction and task performance. More relevant to the present study, Worchel, Esteron, and Yohai (1977, as cited in Worchel, 1978) had subjects watch arousing aggression, arousing humor, and

nonarousing movies in groups seated at very close interpersonal distances, reasoning that misattribution would occur only when the alternative stimuli (to the crowded environment) offered a plausible explanation for arousal. Subjects under the close proximity condition, who watched the two arousing films, reported being less crowded. Would the presentation of humor passages under the high density conditions in the present study similarly lead to lower levels of crowding stress and increased task performance?

Chapman (1975) has suggested that humor, in triggering laughter, can ameliorate excessive socially induced arousal and alleviate some forms of motivational arousal in a socially acceptable manner. Stokols, Rall, Pinner, and Schopler (1973), for example, found that subjects tended to laugh more when they were in close physical proximity and these authors maintained that laughing served as a coping response to the stress of the crowded situation.

One question being asked in the present study is whether or not the introduction of humor can relieve the crowding stress and discomfort experienced by those under high spatial and social density conditions. A second question of interest is whether or not high spatial or social density conditions might enhance an individual's enjoyment of humor. Chapman (1973) and Chapman and Chapman (1974), for example, have reported that children's humorous laughter, smiling, and judgments of funniness were highest when in the presence of others who were listening to the same humorous material and who were also smiling and laughing. In the only study with bearing on the present research Prerost (1977) reports that high spatial density had an inhibitory effect on the appreciation of humor (printed jokes in a booklet) while high social density produced a facilitating effect on humor appreciation. Because of the difference in the humor stimuli to be employed, the social and spatial density conditions that will be created, and the age of the subjects to be observed, it was uncertain whether these same patterns would hold in the present study.

METHOD

Overview of the Experiment

Subjects in three different sized groups were placed in either a small or a moderate-sized room. Half of the subjects additionally were presented with a humor distractor. Skin conductance data was recorded for each subject at 15 second intervals prior to and during the experimental session. Upon completion of the session, subjects completed several post-experimental questionnaires.

Subjects

One hundred and thirty-two female undergraduates enrolled in various psychology classes at Rutgers University served as the subjects for the present study and received course credit for their participation. Fifty-two of these students were designated as "target" subjects, those from whom all data would be gathered, and 80 of the undergraduates were designated "stimulus" subjects, those whose presence in the sessions would be utilized to establish the three social density conditions of this experiment.

Procedure

When subjects arrived individually for the experiment, they were given consent forms to fill out. The target subject was taken to a "resting room" where she was instructed to remove her watch and jewelry, and to pin on a badge numbered "one." The palmer surface of the third finger of the subject's non-preferred hand was rubbed with acetone. Zinc electrodes coated with a zinc-sulfate sodium chloride in "unibase" mixture were fastened to the subject's finger. These electrodes measured the subject's skin conductance level throughout the experiment.

During the next 10 minutes, the subject was instructed to rest on a cot and to relax as much as possible. She was instructed to keep the hand with the recording device rested on her thigh to insure accurate measurements, and to lie still, not to smoke, or stand up. She was also told that as soon as sufficient physiological data was recorded, the experimenter would return to take her to the next phase of the experiment. The experimenter then left the room and entered an adjacent room where skin conductance level (SCL) was recorded at 15 second intervals for 10 minutes. The lowest SCL obtained during this resting period was used as the subject's baseline or lowest response level.

During the time when resting SCL data were being gathered, the stimulus subjects were prepared for the experiment. The number of stimulus subjects changed according to condition: there was one stimulus subject for the two person group condition and five stimulus subjects for the six person group conditions. These persons differed from the target subjects in that they were not asked to rest on a cot and they were asked to participate for two sessions of the experiment.

Upon arrival, the stimulus subjects were: (1) instructed to sit in one of the marked chairs widely spaced throughout the hallway; (2) told not to talk; (3) given badges numbered two through six; and (4) given consent forms to complete. All stimulus subjects were then instructed to remove any watches and jewelry and electrodes were attached following the same procedure as had been used with the target subjects. The stimulus subjects then took seats

in the hall outside the recording room and were instructed again not to talk. The target subject was taken from the "resting room" and was told to have a seat in the hall with the other subjects. All persons were then taken to one of the two recording rooms: (1) the moderate-size rom, a 15.85' × 9.75' room in which the target subject sat in the middle chair of one row of three chairs, seven feet from the person opposite her and four feet from each of the two persons adjacent to her; or the (2) small room, 4' × 4', in which the target subject was seated in the middle chair of one row of three chairs (which were so close together that each person's shoulders touched those of the person next to her and her knees touched the knees of the person opposite her). Table 1 indicates the number of square feet per person in the various density level conditions. The same wooden chairs were used in both rooms and were arranged in two rows of three chairs each. Additionally, one wall of both rooms was lined with a rectangular one-way mirror through which the target subject was monitored by a video camera.

In both room size conditions, the subjects were seated in numbered chairs that corresponded to the number of their badge, with the target subject always being number one and thus always sitting in the middle chair in the one row of three chairs. All the persons in the room were told that this was "an experiment investigating the effects of the environment on physiological responses." In order to obtain accurate skin conductance measurements, all persons were instructed to rest the hand with the recording device on their thigh, not to talk, smoke, or stand up.

Humor passages were presented to a random sample of the groups in the experiment. The subjects were told to respond as naturally as they could. Five humor passages had been selected on the basis of pretested ratings of funniness and familiarity by female undergraduates at the same university. The passages, which were presented to subjects via earphones, were samples from albums of popular comedians. (Bill Cosby, "The Glazed Donut Monster," "Mothers Enunciate," The FCC and Mothers," My Father Confused Me, 1977; *Saturday Night Live,* "Fluckers," *Saturday Night*

TABLE 1
Number of Square Feet Per Person
Under Three Social Density Conditions

Number of Persons In Group	Room Size	
	Small	Moderate
1	16	154.54
2	8	77.27
6	2.67	25.76

Live, 1976; George Carlin, "Let's Make a Deal," AM/FM). The five passages combined lasted 13 minutes. Regardless of humor or no humor condition, all persons were told that when sufficient physiological data were collected, the experimenter would return to take them from this room to begin the next phase of the experiment. The experimenter then left the room and entered an adjacent room where SCL was recorded for all persons at 15 second intervals for 15 minutes. The target subject was also monitored via videotape throughout this portion of the study. In the humor condition, the cassette tape was set up such that one minute prior to, and one minute after the humor passage was blank. Thus, all groups remained in the recording room for a total of 15 minutes. Room temperature and humidity were recorded both upon placement and removal of the persons in the recording room. All were then given the Mood Adjective Checklist (Nowlis, 1965) while in the recording room so as to obtain their immediate feelings related to their experience.

After completing the Mood Adjective Checklist, subjects were taken out of the recording room individually. Stimulus subjects were brought to a seat out in the hall where they could not be seen by the target subject, and the target subject was taken to a separate room to fill out a post-experimental questionnaire (PEQ). The target subject was first asked to think of three adjectives that described the recording room, and three adjectives describing her feelings in the recording room. The PEQ that was then administered, assessed the subject's perception of the recording room, the experimental environment, the attraction to her group member(s), and self-reported somatic symptoms of stress. In the humor condition, the subject was additionally asked to answer a recall measure on the humor passages and reactions to the humor were assessed. Upon completion of the questionnaire, subjects were debriefed.

While the target subject was filling out the PEQ, the stimulus subjects were given filler questionnaires to answer. During this time, another target subject was placed in the "resting room" for 10 minutes following the same procedure as in the first session. In this manner, the stimulus subjects finished their questionnaires, were brought to seats outside the recording room, and the new target subject was taken from the resting room to join the others. The procedure for the remainder of the session was identical to that of the first session, all persons were taken into the exact same recording room. Stimulus subjects who had participated in a humor condition subsequently participated in a no humor condition during the second session, and those who had first participated in a no humor condition were then exposed to the humor condition. Thus, the stimulus subjects never sat in two sessions that were both humor or both no humor. After the second session and the completion of the Mood Adjective Checklist, all persons were taken out

individually and the stimulus subjects were asked to describe their feelings during the two experimental sessions. Finally, after completing this description, the stimulus subjects were debriefed.

RESULTS

Checks on the Density Manipulation

Data from the post-experimental questionnaire indicated that the density manipululations were effective. Two scales were created in order to assess the subjects' subjective reactions to the two density variables. The room reaction index dealt with reactions to the spatial density manipulation and represented the mean of the following items: characterization of the recording room as small, confined, characterization of others as too close to the subject, characterization of feelings in the recording room as cramped, room should be larger, and affected by the size of the room. The items were highly intercorrelated (r = .51, med. r = .51).

The affective density scale is related to the social density manipulation and represents the means of the items: whether the subject felt comfortable in the recording room, whether the subject was affected by the amount of space, the number of people, the distance between the subject and others. These items were also highly intercorrelated (r = .48, med. r = .50). The two scales that were created were also themselves moderately intercorrelated (r = .35).

Results from both scales indicated a significant main effect for room size. Subjects in the small room were more crowded and more uncomfortable. Table 2 indicates that they considered the recording room: more confined (F (1,39) = 7.09, $p<.02$, smaller, F (1,40) = 34.19, $p<.001$); it also made them feel more cramped (F (1,40) = 18.48, $p<.001$), and more uncomfortable about the distance between themselves and others (F (1,39) = 19.45, $p<.001$), than subjects in the larger room. As predicted, the six person groups in the small room were the most negatively affected ($p<.05$).

Electrodermal Responses

A 2 × 2 × 3 analysis of covariance was performed on the subjects' skin conductance level data, with subjects' lowest skin conductance level during resting, and the temperature and humidity of the recording room at the time of the session as the three covariates. Results for the analysis showed that with a greater number of persons, greater arousal was exhibited (F (2,23) = 6.08, $p<.01$).

TABLE 2
Mean Ratings of Items on Manipulation Checks for Density

Item	Room Size	
	Small	Moderate
Confined	2.33	4.18
Small	1.50	5.51
Cramped	2.38	4.87
Feelings Affected By Distance Between Self and Others	2.98	5.90

Note: 1 = Great Extent; 9 = Not At All

No significant main effects were found for room size, the humor distractor, or for interactions involving these variables.

Post-Experimental Questionnaire Data

A post-experimental questionnaire assessed reactions to the social and spatial density manipulations in addition to reactions to the humor stimuli.

Humor Distractor

Table 4 summarizes the mean familiarity and funniness ratings of the five humor passages. The five passages were rated as relatively unfamiliar ($\bar{x}$ = 7.09 and quite funny ($\bar{x}$ = 3.83). The fifth passage was rated as somewhat less funny than the other four ($\bar{x}$ = 6.63).

TABLE 3
Mean Reactions on Manipulation Checks for Density

Number of Persons In Group	Room Reaction Index		Affective Density Scale	
	Room Size		Room Size	
	Small	Moderate	Small	Moderate
1	2.6	5.4	4.1	5.2
2	2.9	4.7	3.9	4.2
6	1.9	5.9	2.5	5.7

Note: 1 = Very Affected; 9 = Not At All

TABLE 4
Mean Familiarity and Funniness Ratings for Humor Passages

Passage Number	Mean Familiarity	Mean Funniness
1	7.82	3.03
2	4.26	3.40
3	7.16	2.92
4	7.43	3.20
5	8.78	6.63
	7.09	3.83

Note: 1 = Very; 9 = Not At All

An analysis of variance was performed to determine whether subjects in the various density conditions differed in performance on a recall task related to the humor stimuli given after the experimental session. Results revealed that the groups did not differ in the number of questions correct, F (2,20), n.s. Out of a possible score of 10, the mean scores for the one person ($\bar{x}$ = 8.0), two person ($\bar{x}$ = 7.8), and six person ($\bar{x}$ = 8.5) groups were clearly very similar.

A third scale was created in order to assess subjective reports of irritability and included the means of the following items: whether the subject felt annoyed, angry, irritated, and bored. The items were highly intercorrelated (r = .47, med. r = .45). Analysis of variance indicated that subjects in the no humor groups ($\bar{x}$ = 6.29) felt more irritated than did the humor groups [($\bar{x}$ = 6.98), F (1,40) = 6.43, $p<.02$]. They felt more cramped, (F (1,40) = 3.83, $p<.06$), less involved (F (1,40) = 7.86, $p<.01$), and felt that their group members were less interested (F (1,24) = 8.64, $p<.01$), than subjects in the humor groups. Data on the Mood Adjective Checklist revealed that no humor groups felt more fatigued (F (1,39) = 8.69, $p<.01$), and less vigorous, (F (1,38) = 8.05, $p<.01$).

Subjects in the no humor condition, as compared with the humor condition, expressed a preference for the presence of a newspaper (F (1,40) = 7.64, $p<.01$), ($\bar{x}$ = 3.42 vs. $\bar{x}$ = 5.58) music (F (1,39) = 7.28, $p<.02$) ($\bar{x}$ = 1.42 vs. $\bar{x}$ = 2.68), a group discussion (F (1,40) = 14.67, $p<.001$) ($\bar{x}$ = 3.76 vs. $\bar{x}$ = 6.44), or a magazine (F (1,40) = 6.14, $p<.02$) ($\bar{x}$ = 2.36 vs. $\bar{x}$ = 3.77).

Although the no humor groups did rate their experience negatively, they rated the other members of their groups as more empathetic than did the humor groups (F (1,21) = 8.81, $p<.01$).

Room Size

Results obtained on reactions to the size of the room showed that, regardless of the number of persons per group, subjects' feelings were more affected by the room size. Subjects in the small room were more affected by the size of the room ($F(1,40) = 17.42$, $p < .001$), and were less satisfied with the distance between themselves and others ($F(1,39) = 19.45$, $p < .001$). They preferred that others sit further from them, having more space ($F(1,39) = 46.92$, $p < .001$). A significant interaction between people and room size additionally occurred, ($F(1,23) = 4.88$, $p < .04$). Table 5 shows that six persons in the small room expressed a greater feeling that group members were too close in comparison to other groups.

Persons in the small room, consistent with past research, additionally rated their group members as: more likeable ($F(1,24) = 3.78$, $p < .07$), good ($F(1,24) = 4.98$, $p < .04$), friendly ($F(1,24) = 5.52$, $p < .03$), and expressive ($F(1,24) = 7.03$, $p < .02$) than their counterparts in the larger room (see Table 6).

Analysis of the Mood Adjective Checklist responses revealed that subjects in the small room reported feeling less self-centered than subjects in the larger room ($F(1,40) = 3.5$, $p < .07$). They also felt less anxious, ($F(1,40) = 4.66$, $p < .04$), less (sad) regretful ($F(1,40) = 6.13$, $p < .02$), and more socially affectionate toward other members of their group ($F(1,39) = 8.35$, $p < .01$).

Two findings involving spatial density and humor are of particular interest. Firstly, when humor was presented to subjects in the smaller room, the size of the room strongly affected subjects' enjoyment of the humor, ($F(1,20) = 10.32$, $p < .005$); ($\bar{x}$ small = 3.1); ($\bar{x}$ mod. = 6.3). Secondly, these subjects hearing the humor passages in the small room (in very close physical proximity), reported feeling most confined ($F(1,39) = 5.94$, $p < .02$) (see Table 7).

TABLE 5
Extent Subjects Felt Group Member Was or Members Were Too Close

	Room Size	
Number of Persons In Group	Small	Moderate
2	5.0	6.7
6	3.5	8.4

Note: 1 = Great Extent; 9 = Not At All

TABLE 6
Mean Ratings of Group Members

	Room Size	
Factor	Small	Moderate
Likeable	1.70	2.73
Good	2.65	3.87
Unfriendly	7.30	5.67
Expressive	3.27	5.12

Note: 1 = Great Extent;
9 = Not At All

Another significant interaction indicated that those subjects most affected by room size were the six persons in the small room without humor ($\bar{x} = 1.3$, and those least affected by room size were the six persons in the large room with humor ($\bar{x} = 7.3$), and those alone in the large room without humor [($\bar{x} = 7.6$), $F(2,40) = 4.59$, $p < .02$)].

Number of Persons

Results obtained in the present study demonstrated that in comparison with six person groups, the two person groups decribed their group member as: less interested ($F(1,24) = 7.53$, $p < .02$) ($\bar{x}$s = 4.3 vs. 6.2), more passive ($F(1,24) = 4.2$, $p < .06$) ($\bar{x}$s = 5.0 vs. 3.7), and less expressive ($F(1,24) = 6.06$, $p < .03$) ($\bar{x}$s = 3.3 vs. 5.1). Furthermore, two person groups felt more skeptical in comparison with other groups ($F(2,40) = 3.30$, $p < .05$), and responded with less social affection than one or six person groups ($F(2,39) = 5.54$, $p < .01$).

A marginally significant effect was found when two persons were presented with humor. These subjects reported the most involvement in

TABLE 7
Extent Subjects Felt Confined

	Room Size	
	Small	Moderate
Humor	1.2	4.7
No Humor	3.5	3.6

Note: 1 = Great Extent;
9 = Not At All

listening to the humor ($\bar{x}$ = 8.0) in comparison with the one person groups who were least involved ($\bar{x}$ = 6.0), and the six person groups who were moderately involved [($\bar{x}$ = 7.17, F (2,20) = 2.80, $p < .09$]. Further, subjects who were least *satisfied* with the number of persons in their group were those with one other person in the large room ($\bar{x}$ = 5.3) along with six persons in the small room ($\bar{x}$ = 5.2); all other conditions reported being somewhat satisfied with the size of their group ($\bar{x}$s ranged from 2.2 – 3.6).

Those subjects who were most *affected* by the number of people in the group were the subjects in the six person groups in the small room ($\bar{x}$ = 2.8), the two person groups in the large room ($\bar{x}$ = 3.9), and the two person groups in the small room ($\bar{x}$ = 4.4); least affected were six person groups in the large room [($\bar{x}$ = 6.3), F (1,23) = 4.29, $p < .05$].

An interesting marginally significant humor by group size interaction was also found (F (2,37) = 2.86, $p < .08$). As the number of persons per group increased in the humor condition, subjects judged the left wall of the recording room as larger. This wall represented the distance between the subject and the person directly across from her. In contrast, in the no humor condition, with increasing number of persons in the group, subjects rated the left wall as smaller (see Table 8).

DISCUSSION

This study provided considerable evidence that for the conditions examined, the introduction of humor results in people feeling better during and after the experimental sessions. Subjects listening to humor passages, regardless of the density conditions to which they were exposed, reported having greater vigor, less fatigue, more interest, and more involvement, and felt less irritated and annoyed than individuals and groups who were not presented with the humor passages. Furthermore, those subjects not exposed to humor indirectly reflected their plight by reporting others in their

TABLE 8
Estimated Dimensions of Left Wall of Recording Room in Inches

	Condition	
Number of Persons In Group	Humor	No Humor
1	80.9	121.7
2	79.9	94.2
6	119.9	77.7

group to be more "empathetic" under these conditions and by expressing a greater preference for the availability of any number of distractors (e.g., music, magazines).

High spatial density was found to *enhance* subjects' enjoyment of the humor passages. Stokols et al. (1973) reported finding subjects in close physical proximity to laugh more, possibly as a coping response to the crowded situation. It is likely that in the present investigation listening to humor passages functioned as a releaser for these feelings of discomfort and therefore allowed individuals to appreciate the humor to an even greater extent than they otherwise would have. These findings do not correspond to Prerost's (1977) report that high spatial density had an inhibitory effect on appreciation of booklets of printed jokes and that high social density produced a facilitating effect on the judged "funniness" of these stimuli. In addition to differences in the humor stimuli used, the Prerost study also included primarily children and adolescents in his experiment and manipulated social and spatial density quite differently. We suspect that the less involving the humor stimuli (as might be the case for printed jokes), the less probable it would be that people will channel their discomfort with the environment (e.g., overly close proximity) into an appreciation of the humor presented.

As predicted, the combining of high social and high spatial densities resulted in the greatest self-reported discomfort and stress. Individuals in six-person groups under very close proximity conditions indicated that the other members of their groups were not only too close but also too numerous. They perceived the most intense lack of privacy and felt most angry about it. The subjects most negatively affected were those who were *not* provided with the humor passages. Clearly, the uncomfortable situation of too many others in too small a space is exacerbated when the presence of these others is so much more salient under conditions where the humor distraction is not available. An interesting example of this effect might be gleened from the tendency of individuals to perceive the room size as *smaller* with greater numbers of people when they were *not* provided with humor but to perceive the room size as *larger* with greater numbers of people when they *were* exposed to the humor.

Regardless of the number of persons in a group in this study, subjects' feelings were more affected by the high spatial density conditions. Subjects reported feeling more crowded, cramped, confined, and uncomfortable in the smaller room. They were dissatisfied with a host of aspects of the environment, not the least of which was the distance between themselves and others. Even the positive effect produced by the humor was unable to overcome the strong impact of the small room and the consequent inadequate availability of space. Interestingly, subjects under the high spatial density condition who were exposed to the humor distractor reported feeling *most*

crowded and confined. This result taken together with the lack of any task performance enhancement in the high spatial density condition means that no support whatsoever is available from this study for Worchel and Teddlie's (1976) proposed two-factor theory of crowding. According to this model, listening to arousing humor passages *should* have provided "the alternative plausible explanation for arousal" that would have led subjects to misattribute their arousal from the high spatial density conditions and consequently, to report feeling less crowded and to do better on the recall task. Neither of these events occurred.

Consistent with previous research (e.g., Stokols et al., 1973), female subjects under high spatial density conditions were more positive toward their fellow group members (e.g., rated them as good, friendly, likeable) than their less crowded counterparts. In addition though, this investigation found that they also felt less self-centered, anxious, and sad, and that they felt more socially affectionate toward the other members of their group. An important bond had obviously been established within these female groups as a function of social processes deriving from their method of dealing with the stressful environment they encountered.

The results obtained from the social density manipulation are considerably less straightforward. While *higher* levels of social density were associated with *higher* levels of stress-related (physiological) arousal, self-report data and other measures did not follow a similar pattern. Rather, the intermediate social density level (the subject with one other person in her group) was responded to most negatively. These two-persons groups reported being least satisfied with the number in their group and very affected by it, particularly when they were in the larger room. They also had a tendency to become more involved in listening to the humor passages, possibly as an available escape from the all-too-salient other group member, who is perceived to be less interested and expressive and is responded to with a very low level of social affection. It is possible that we might draw loosely from a notion such as the diffusion of responsibility in larger groups to speculate that with only one other in her group, a subject may feel greater pressure for establishing the norms in that group (e.g., how to behave "appropriately") and consequently feel less secure and positive under these circumstances. Future research will be needed to unravel this interesting, unexpected set of findings.

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REFERENCES

Aiello, J. R., & Baum, A. (Eds.) *Residential crowding and design.* New York: Plenum, 1979.

Aiello, J. R., DeRisi, D., Epstein, Y. M., & Karlin, R. A. Crowding and the role of interpersonal distance preference. *Sociometry,* 1977, *40,* 271-282.

Aiello, J. R., Epstein, Y. M., & Karlin, R. A. Effects of crowding on electrodermal activity. *Sociological Symposium,* 1975, *14,* 43-57.

Aiello, J. R., Nicosia, G., & Thompson, D. E. Physiological, social, and behavioral consequences of crowding on children and adolescents. *Child Development,* 1979, *50,* 195-202.

Baum, A., & Koman, S. Differential response to anticipated crowding: Psychological effects of social and spatial density. *Journal of Personality and Social Psychology,* 1976, *34,* 526-536.

Chapman, A. J. Social facilitation of laughter in children. *Journal of Experimental Social Psychology,* 1973, *9,* 528-541.

Chapman, A. J. Humorous laughter in children. *Journal of Personality and Social Psychology,* 1975, *31,* 42-49.

Chapman, A. J., & Chapman, W. A. Responsiveness to humor: Its dependency upon a companion's humorous smiling and laughter. *The Journal of Psychology,* 1974, *88,* 245-252.

Evans, G. W. *Behavioral and physiological consequences of crowding in humans.* Unpublished doctoral dissertation, University of Massachusetts, Amherst, 1975.

Griffitt, W., & Veitch, R. Hot and crowded: Influences of population density and temperature on interpersonal affective behavior. *Journal of Personality and Social Psychology,* 1971, *17,* 92-98.

Nogami, G. Y. Crowding: Effects of group size, room size or density? *Journal of Applied Social Psychology,* 1976, *6,* 105-125.

Nowlis, V. Research with the mood adjective check list. In S. S. Tompkins & C. E. Izard (Eds.), *Affect, cognition, and personality.* N.Y.: Springer Publishing Co., 1965.

Paulis, P. B., Annis, A. B., Seta, J. J., Schkade, J. K., & Matthews, R. W. Density does affect task performance. *Journal of Personality and Social Psychology,* 1976, *34,* 248-253.

Prerost, F. J. Environmental conditions affecting the humour response: Developmental trends. In A. J. Chapman & H. C. Foot (Eds.), *It's a funny thing, humour.* Oxford, England: Pergamon Press, 1977.

Saegert, S. C. *Effects of spatial and social density on arousal, mood, and social orientation.* Unpublished doctoral dissertation, University of Michigan, 1974.

Schmidt, D. E., & Keating, J. P. Human crowding and personal control: An integration of the research. *Psychological Bulletin,* 1979, *86,* 680-700.

Stokols, D., Rall, M., Pinner, B., & Schopler, J. Physical, social, and personal determinants of the perception of crowding. *Environment and Behavior,* 1973, *5,* 87-117.

Sundstrom, E. Crowding as a sequential process: Review of research on the effects of population density on humans. In A. Baum & Y. M. Epstein (Eds.), *Human response to crowding.* Hillsdale, N.J.: Lawrence Erlbaum Associates, 1978.

Worchel, S. Reducing crowding without increasing space: Some applications of an attributional theory of crowding. *Journal of Population,* 1978, *1,* 216-230.

Worchel, S., Esteron, C., & Yohai, S. Misattribution and crowding: The effects of arousing and nonarousing films on the experience of crowding. Unpublished manuscript, University of Virginia, 1977.

Worchel, S., & Teddlie, C. The experience of crowding: A two-factor theory. *Journal of Personality and Social Psychology,* 1976, *34,* 30-40.

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