

UC Irvine

UC Irvine Previously Published Works

Title

On the distinction between density and crowding: some implications for future research.

Permalink

<https://escholarship.org/uc/item/2ws11480>

Journal

Psychological review, 79(3)

ISSN

0033-295X

Author

Stokols, D

Publication Date

1972-05-01

DOI

10.1037/h0032706

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at

<https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

ON THE DISTINCTION BETWEEN DENSITY AND CROWDING: SOME IMPLICATIONS FOR FUTURE RESEARCH¹

DANIEL STOKOLS²

University of North Carolina

A distinction is drawn between the physical condition, density, defined purely in terms of spatial parameters, and the experience of crowding, a motivational state aroused through the interaction of spatial, social, and personal factors, and directed toward the alleviation of perceived spatial restriction. The implications of this distinction for future research are discussed.

To date, there have been four basic lines of behavioral research which relate to the issue of crowding: (a) animal studies (Calhoun, 1962, 1966; Christian, Flyger, & Davis, 1960), (b) correlational surveys utilizing census tract data (Chombart de Lauwe, 1959; Mitchell, 1971; Schmitt, 1957, 1966; Winsborough, 1965), (c) experiments on the human use of space (Barker, 1965, 1968; Hall, 1959, 1966; Sommer, 1967, 1969), and (d) experimental studies directly concerned with the effects of crowding on human behavior (Freedman, 1970; Freedman, Klevansky, & Ehrlich, 1971; Griffit & Veitch, 1971; Hutt & Vaizey, 1966; Ittelson, Proshansky, & Rivlin, 1970).

Although previous empirical approaches provide some insights into the nature of crowding phenomena, there appears to be a certain confusion, reflected especially in research concerned with human crowding, regarding the meaning of the terms "density" and "crowding." Many writers have used these terms interchangeably, rather than distinguishing between the physical condition, density, involving spatial limitation, and the experiential state, crowding, in which the restrictive aspects of limited space are perceived by the individuals exposed to them. As a consequence of this confusion, there has been a general tendency to view crowding in terms of spatial considerations alone, and a failure to delineate those social and personal dimensions which may interact with spatial factors to mediate the experience of crowding.

According to the proposed distinction, density is viewed as a necessary antecedent, rather than a sufficient condition, for the experience of crowding. Any instance of spatial limitation involves potential inconveniences—the restriction of movement or the preclusion of privacy, for example. These potential constraints, however, are not necessarily salient to the individuals occupying an area of limited space. While the amount of space in a given area may appear limited to an outside observer, it will not inevitably seem inadequate to the occupants of the area, especially if their activities do not require a high degree of behavioral coordination, if their relationships with each other are cooperative and friendly, or if they have had much experience with living and working under conditions of limited space. Such circumstances, then, would operate to minimize the salience of spatial constraints.

In order for the restrictive aspects of spatial limitation to become salient and aversive, such that the individual's perception of them engenders the experience of crowding, certain social and personal factors must be present.³ Social interference, for example, in the form of task-coordination problems or competition with others, is likely to heighten the salience of spatial constraints. The restriction of movement, imposed by limited space, would become most apparent while engaging in tasks requiring the coordination of one's own activity with that of others; and the arousal of competitive feelings would eventuate in a tendency

¹ The preparation of this paper was supported by United States Public Health Service Grant 5-TO1 MH 07325. The author wishes to express his appreciation to John Schopler and John Thibaut for their critical readings of the manuscript. Thanks are also due to Nehemia Friedland for his comments on this paper.

² Requests for reprints should be sent to Daniel Stokols, Department of Psychology, University of North Carolina, Chapel Hill, North Carolina 27514.

³ To the extent that spatial limitation introduces noxious physical effects, such as heightened temperature and stuffiness, the relative importance of social and personal determinants of crowding decreases. Hence, under conditions of acute spatial limitation, density alone would be sufficient to induce the experience of crowding. The present discussion, however, focuses on situations in which the supply of space is not limited to the point that it impairs normal biological functioning, or promotes excessive physical discomfort.

to perceive the presence of others as threatening and intrusive, thereby generating a desire to expand and protect one's personal space. Similarly, the lack of prior experience with spatial limitation, as well as certain characterological traits (e.g., impatience, aggressiveness), would render an individual more susceptible to the experience of crowding.

Crowding, then, appears to arise through the juxtaposition of density with certain social and personal circumstances which sensitize the individual to the potential constraints of limited space. The perception of such constraints leads to a recognized disparity between the amount of space demanded, or considered to be adequate, by the individual, and the amount of space available to him. The experience of crowding, thus, can be characterized as a motivational state directed toward the alleviation of perceived restriction and infringement, through the augmentation of one's supply of space, or the adjustment of social and personal variables so as to minimize the inconveniences imposed by spatial limitation.

The particular form of one's response to crowding will be a function of the relative intensity of spatial, social, and personal factors, and the degree to which they can be modified. Where the limitation of space is extreme, and restraints against direct alteration of spatial variables are low, the prepotent mode of response to crowding will be a behavioral one. For instance, the individual can augment his supply of personal space by leaving the crowded situation. In situations where either normative or physical constraints inhibit overt behavioral adjustments of spatial variables, perceptual and cognitive modes of reducing the salience of restricted space will be more likely to occur. In such cases, the person may modify his standards of spatial adequacy, enhance the attractiveness of his task, or attempt to achieve a greater degree of coordination with others in the group, as a means of alleviating the sensation of crowding.

Although unsuccessful attempts to cope with crowding may be accompanied by behaviors symptomatic of general stress (e.g., discomfort, aggression, hormonal disequilibrium), crowding is distinguishable, nonetheless, from other stress syndromes by the fact that it involves a prevailing concern with spatial constraints and the motivation to eliminate them, or reduce their salience.

The suggested distinction between density and crowding has important implications for future research. Recent experiments have at-

tempted to manipulate crowding through variations in the size of the experimental room (Freedman, 1970; Freedman et al., 1971). Moreover, these studies have reported very few experimental effects on the dependent assessments of task performance and affective behavior. Though interpretation of negative results is tenuous, at best, the conceptualization of crowding, discussed above, suggests that the lack of experimental effects in previous investigations may be due to their failure to manipulate, or control for, personal and social sources of variance. Though the variation of experimental room size may well represent an effective manipulation of available space per subject, it does not appear to constitute an adequate manipulation of the determinants of crowding. Through the orthogonal manipulation of variables pertaining to social and personal dimensions, however, as well as those relating to the spatial component, it becomes possible to assess variance attributable to the former factors which, heretofore, has been subsumed under "error variance."

While previous investigations have focused on density as an independent variable, subsequent research must turn its attention to the experience of crowding as a measurable phenomenon. Such an approach would permit direct assessment of the spatial, social, and personal parameters of crowding, through the simultaneous manipulation of them. Moreover, the behavioral, perceptual, and cognitive consequences of perceived crowding could be assessed through the use of (a) behavioral measures pertaining to the augmentation of one's space, (b) subjective reports of restriction and discomfort, (c) observational indexes of tension (e.g., laughter, aggression, reduced eye contact), and (d) physiological indicators of strain. The utilization of such assessments would contribute to an elucidation of the crowding experience, as distinct from other motivational syndromes.

REFERENCES

- BARKER, R. G. Explorations in ecological psychology. *American Psychologist*, 1965, 20, 1-14.
- BARKER, R. G. *Ecological psychology*. Stanford: Stanford University Press, 1968.
- CALHOUN, J. B. Population density and social pathology. *Scientific American*, 1962, 206, 139-148.
- CALHOUN, J. B. The role of space in animal sociology. *Journal of Social Issues*, 1966, 22, 46-59.
- CHOMBART DE LAUWE, P. *Famille et habitation*. Paris: Editions du Centre National de la Recherche Scientifique, 1959.

- CHRISTIAN, J., FLYGER, V., & DAVIS, D. Factors in the mass mortality of a herd of sika deer *Cervus nippon*. *Chesapeake Science*, 1960, 1, 79-95.
- FREEDMAN, J. The effects of crowding on human behavior. Unpublished manuscript, Department of Psychology, Columbia University, 1970.
- FREEDMAN, J., KLEVANSKY, S., & EHRLICH, P. The effect of crowding on human task performance. *Journal of Applied Social Psychology*, 1971, 1, 7-25.
- GRIFFIT, 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.
- HALL, E. *The silent language*. Greenwich, Conn.: Premier Books, 1959.
- HALL, E. *The hidden dimension*. Garden City, N. Y.: Doubleday, 1966.
- HUTT, C., & VAIZEY, M. Differential effects of group density on social behavior. *Nature*, 1966, 209, 1371-1372.
- ITTELSON, W., PROSHANSKY, H., & RIVLIN, L. The environmental psychology of the psychiatric ward. In H. Proshansky, W. Ittelson, & L. Rivlin (Eds.), *Environmental psychology*. New York: Holt, Rinehart & Winston, 1970.
- MITCHELL, R. Some implications of high density housing. *American Sociological Review*, 1971, 36, 18-29.
- SCHMITT, R. C. Density, delinquency and crime in Honolulu. *Sociology and Social Research*, 1957, 41, 274-276.
- SCHMITT, R. C. Density, health, and social disorganization. *Journal of the American Institute of Planners*, 1966, 32, 38-40.
- SOMMER, R. Small group ecology. *Psychological Bulletin*, 1967, 67, 145-152.
- SOMMER, R. *Personal space—The behavioral basis of design*. Englewood Cliffs, N. J.: Prentice Hall, 1969.
- WINSBOROUGH, H. The social consequences of high population density. *Law and Contemporary Problems*, 1965, 30, 120-126.

(Received October 21, 1971)