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Environmental Noise Level as a Determinant of Helping Behavior

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The results of research dealing with the effects of noise, on intrapersonal behavior suggest a variety of possible consequences for interpersonal functioning. The effects of various levels of noise on simple helping behavior were explored in a laboratory and a field setting for a total of 132 subjects. In both experiments, subjects exposed to 85-db. white noise were less likely than those in lower noise conditions to offer assistance to a person in need. The results were interpreted on the basis of prior research suggesting that noise-produced arousal leads to a restriction in attention deployment or cue utilization. Alternative accounts in terms of the effect of noise on mood and on drive level were also considered.

The effect of noise on intrapersonal behavior has long been of interest to general experimental and physiological psychologists, and the publication in recent years of a number of volumes on this topic (e.g., Broadbent, 1971; Kryter, 1970; Welch & Welch, 1970) attests to the significance that these issues are currently accorded. Public concern over "noise pollution," congressional legislation dealing with permissible noise exposure levels in industrial settings, and work such as that of Cameron, Robertson, and Zaks (1972), suggesting that noise may be associated with the incidence of chronic and acute illness, provide further impetus for research of this sort. Investigations of the interpersonal impact of ambient noise, however, are much less in evidence, though Glass and Singer (1972) have provided a nice bridge between these two complementary focuses, and there has been work on the relationship between noise and conformity (Dustin, 1968), aggression (Geen & O'Neal, 1969; Geen & Powers, 1971), and verbal disinhibition (Holmes & Holzman, 1966).

Earlier research by the authors on the psychosocial effects of ambient noise level (Canon & Mathews, Note 1) has provided indirect support for the hypothesis that high noise levels may lead to lessened attention to the incidental social cues that structure and guide significant aspects of interpersonal behavior. Since an individual's interpretation of same situation as one in which helping behavior is appropriate might well be based on such cues and would seem to be a necessary antecedent to assisting behaviors, the present study explored the effects of various levels of ambient noise on the likelihood of helping in a very simple situation.

Several interrelated lines of research (Broadbent, 1958, 1971; Easterbrook, 1959; Hockey, 1969) have produced data suggesting that arousal leads to a state of restricted attention or cue utilization in which attention is concentrated on salient features of the setting at the expense of its other aspects. As arousal-induced attention restriction increases, performance is either facilitated or hindered, depending upon the task relevancy of the salient or dominant cues within the situation. Recent studies dealing with vigilance, learning, and performance (e.g., Hamilton & Copeman, 1970; Hockey, 1970a, 1970b; O'Malley & Poplawsky, 1971) have, indeed, demonstrated that noise does decrease the detection of, and responsiveness to, peripheral or nonsalient events, while the perception of, and responsiveness to, central or salient events is not hindered.

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One implication of this effeet for interpersonal processes is that with noisy environments, individuals may become less aware of re!atively subtle cues produced in interpersonal interactions that more clearly define other's meaniugs, intentions, and bebavior. In addi tion, this approach suggests that the course of ongoing bebavior and/or interaction would be less flexible and less hKe!y to change to a new direetion, since individuals would be less attentive to events that are not directly related to ongoing activities. This implies that persons may become re!atively more single-minded in their actions, and in a situation that involves another in need of assistance, less like!y to interrupt present activities to perform he!ping acts.

Zimbardo (1969b), in a similar vein, has suggested that "sensory input overload" may lead to a state of deindividuation in which persons "treat others as if they were not human beings, as if they bad no personal identity" (p. 206). Implied here is a process akin to the one developed above concerniug responsiveness to peripheral cues, since one of the defining properties of a deindividuated state is that "the behavior must not be under discriminative stimulus contro!. It must be uuresponsive to features of the situation, the larget, the victim, or the states of self which normally evoke a given level of response or a competiug response" (Zimbardo, 1969b, p.259).

An application of Milgram's (1970) concept of overioad, developed in his treatment of the "urban experienee," also suggests consequences for social behavior that are similar to those derived above. However, two important distiuctions should be noted, since the earlier-discussed positions proposed a process that is not dependent upon learniug and that yie!ds a transitory state occurriug with little or no time lag in response to appropriate environmental factors. Implicit in Milgram's analysis is the notion of a continuing response resulting from temporally extensive experience with the precipitating stimulus conditions.

Two reeent studies provide indireet support for noise-produced deindividuation. In both investigations verbal behavior was "disinhibited" by the presence of relative!y high levels of noise. Stanton (1968) found that more "extreme" or taboo words were produced in a free-response situation under high-noise conditions. Holmes and Holzman (1966), after instructing subjeets to employ nonsense words at critica1 points while relatiug a personally embarrassing incident, reported agreater tendency of subjeets to lapse into the use of meaningful English with highnoise levels.

To test these implications, two studies were conducted in which subjects were presented with an opportunity to assist another person in a simple, nonemergency situation under various levels of ambient noise. Since the primary interest concemed the effeets of noise rather than the complex concept of altruism, the circurnstances involved a very uncomplicated and basic he!ping paradigm: The parties had no prior history of interaction, engaged in only the briefest of contacts with no expeetation of further involvement with . one another, and were alone at the time of the contrived incident. The laboratory experiment involved a book-dropping episode and three intensities of noise, while the field study used a similar occasion for he!ping and two noise leveis. Au additional manipulation in the latter study was designed to produce two levels of incidental cues indicating the degree to. which the accomplice was in need of assistance.

The attention-restriction position would predict a deerease in the tendency to help with an increase in noise leve!. Further, an interaction between noise leve! and the effect of the cues-for-helping manipulation wouid be expeeted. Tbat is, presence of these cues should be associated with a higher likelihood of assistance giving in the low-noise conditions but not in the high-noise settiug.

EXPERIMENT l: LABORATORY

Method

Procedure. Fifty-two male subjects reported for an experiment on mterpersoual percepliou. They were met at the door to the laboratory by the experimenter who indicated that they would have to wait for a few minutes before beginning the stndy. They were directed to a waitiug room where they fouud auother male "subjeet" (a confederate of the experimenter) seated m one of the two available chairs reading an arlide m one of the several journals he

held in his lap.. The confederate was in the chalr farthest from the door to the room, and thus the subjeet took the seat just adj=nt to that door. Alter only a moment, the expmmenter reappeared in the doorway and called the confederate to take bis tum in the experiment. As be arose, he awkwardly clasped to bis chest the two books, live
. joumais, and miscellaneous papers that bad beeu in bis lap, and as he crossed in front of the subject, the papers and journaJs slipped from his grasp and scattered on the floor. He moved without besitation to reeover the dropped materials that were spread over at least a 3 square foot (.9 m') area and proceeded out of the room.

The dependent variahle in the study was the presence or absence of helping bebavior on the part of the subject in front of wbom the materfaJs bad been dropped. A belping response was recorded only if the subjeet actually rose and assisted the confederate in retrieving the dropped materials.

The independent variable was the ambient noise leveI in the room durfng the period of the study. Three conditions were employed: (a) no artificially induced noise was present, and the natuIal level was 48 db. (C) '"5 db. (C)-no noise; (b) a white noise generator was used to produce an ambient level of broadband, wbfte noise at 65 db. (C)-low noise; (c) a broadhand, white noise IeveI of 85 db. (C)
was maintained-higb noise.

No explanation was given for the presence of the wbfte noise, and its source was not immedfately apparent, as the speakers employed were bfdden from view behind a curtained area adjacent to the subjeet and the confederate.

Since the confederates in both this and the second study could not be blind to the noise conditions, several precautions were taken to eJiminate the possibility of bias elfeets. Ten undergraduate nonpsychology majors were employed on a contract b~ to assist in the studies, and their participation representedonly one among a variety of dutfes. They were, of course, not told of the specffic bypotheses being tested or wbat variables were being manipulated and, moreover, were never given an overall picture of the strncture of the experiments untll all
data bad been coUeeted. Discussion of any aspect.
of their work with others in the group was explicitly probibited. Each assistant was given training and supervised rehearsal only for those limited aetivities that were bis particular responsibility and each aetually ran only a few subjects in each condition. Contaet between the confederate and the subjeet was kept to an absolute minirnuro, and in no cODdition was there any verbal interaction prior to the drop. The drop was bighly stmctured: The materials were always carri<d in the same initial order and bad to fall witbin a standard 3 square foot (.9 m') area unobtrnsively marked off dfrect1y in front of the subjeet if the trial was to be counted. The limited koowIedge of the design,' the brevfty and bfgbly restricted Dature of the confederate-subject contaet, the simplicity and routinizatioD of the activity involved, and the geDeral insigoificaoce of this work for the assistants were considered to he sufficient safeguards against the possibility of bias effects.

TABLE I

SUBJECTS' HELPING IN THE LABORATORY EXPERIMENT

Hcl.ing behavio,	No;'" lml		
	Ambi="	Low'	Higb'
Yes	13	10	7
No	5	5	12
% helpiDg	72.2	66.7	36.8

'48 db.
'65 db.
'SS db.

RESULTS

A one-way analysis of varianee and linear Irend analysis were performed on Ihe dichotomous data (help vs. not help; see Edwards, 1972, pp. 124--125, regarding the robustness of the *F* test when using binornial data).

The results of !he analysis of varianee indicated a marginally signiticant di!ferenee between mean helping rates for Ihe Ihree noise levels, $F(2, 49) = 2.878$, $.05 < P < .10$. However, when !he results were tested for a linear trend (see Myers, 1972, pp. 386-388, for coefficient determination for unequal-n treatment intervals), there was a significant linear relation between inereased noise levels (as measured in decibels) and deereased helping, linear $F(l, 49) = 6.63$, $P < .025$. (See Table 1.)

EXPERTMENT 2: FIELD STUDY

A seeond experiment was condueted in a field setting in which nonreactive measures eould be obtained and that migbt provide eonvergent eorroboration of the data that resulted from !he laboratory study. In addition, this study was designed to test the e!feet of noise level upon cue utilization. This provided an opportunity both to replicate the findings of !he laboratory study and to obtain data that would permit dearer determination of the value of the explanation in terms of reduced cue ntilization. The ahsenee or presenee of a cue designed to indicate the degree of legitimacy of the eonfederate's .need for assistanee was manipnlated by having the eonfederate wear a full-Iength arm east for halfof the staged incidents.

Method

Procedure. The responses of 80 male suhjeets to an oppmtunity to render assistance to another male in a natural setting were observed. The locale was a curving, tree-lined, low-traflic-density street in a student apartment residential area. Tbree persons were involved in cmying out the study: An ohserver was hidden in a recessed stairwe11 across the street from the scene of the incident, which was staged by the other two accomplices. The observer had a elear view of the street from approximately 60 yards (54 m) above and helow the incident site, and his duties were to give a "ready" signal when an appropriate suhjeet was approaching, to give a "go" signal when that subject reacbed a point 12 feet (3.6 m) from the incident site, and to record the subject's response to the contrived situation. An appropriate subject was defined as any male walking alone, that is, one who was neither preceded nor fo11owed by another person for a distance of 30 yards (27 m).

Asecond confederate was positioned with his back facing the sidewalk and leaning over inside the open rear door of aparked fom-door automobile. The incident was staged in front of a house with a large lawn flanked by an aparlment building on one side and a hedge on the other. Botb the apartment building and the hedge continued from each side of the house up to the sidewalk. Because of the slight curve of the street and the presenee of a series of trees in the plantiug strip betweeu street and sidewalk, an approaching pedestrian's view of the confedemte's activities was partially blocked. He could be seen bending over with his upper torso extending into the ear, but a clear view of just what he was doing was not availahle. The confederate busied himself at arrauging some books that were stacked high in a 24 X 6 X 12 inch (.6 X 1.5 X.3 m) cardboard box that was seated atop another similar sized box. On the signal from the observer indicating that the subject had reached a point 12 feet (3.6 m) from him, the coofederate picked up the boxes from the rear seat of the ear, withdrew from its doorway, turned, and begau walking toward the honse in the background. He did nothing to acknowledge the presenee of the approaching subject, who was by this time åpproximately 6 feet (1.3 m) from the confedmte as he croS5ed the sidewaIk. At this point, two of the books delicately balanced atop the overflowlng box spilled out, and as the confederate made a move to save them, several more fell, seatterIng over a wide area on the half of the sidewalk nearest tbe house. He paused for a brief moment, apparently puzzled over the dilemma In wbich he now found himself; that is, In order to retrieve the lost books, he would obviously have to go to the trouble of putting down somewhere the two apparently heavy boxes in his arms. At no thne did he glance toward tbe subjeet or In any way Indicate that he wished assistance. Following that brief pause, he either stopped and picked up the displaced books or, if the subject assisted him or asked if he could be of assistance, thanked him for his heIp and proceeded toward the honse.

The third assistant was stationed In the yard of the adjacent honse apparently worrying over a baIky gasoline-engined reel-power lawn mower. He was kneeling next to the mower, intently exarolnlng the throttle mechanism with his back to the sidewaIk and the activity going on there. At no time did he shift his attention from his work and appeared to be quite unaware of the presence of others and the book-droPplng Incident. His position was 25 feet (7.5 m) from the point of the drop and approximately 8 feet (2.4 m) to the right of the other confederate's direct path to the house.

In the low-noise condition the lawn mower was Inoperative, and the average ambient noise level was roughly 50 db. (C). To create a high-noise condition, the lawo mower was ruun!ng with its muffler removed, creatiug a noise level at the point of the drop of approxiroately 87 db. (C).

To manipulate- cues Indicatiug the legitimacy of the confederate's need for assistance, In one condition the confederate wore a east on his right arm that extended from his wrist to his shoulder with a right angle bend at the elbow. In the other condition, of course, he was not so encumbered.

Information regarding subjects' seif-reported mood or attention deployment was not obtained for experimental subjects because of the questionable validity of such responses. Given the very brief "treatment" period, the Incidental nature of the treatment from the subjects' point of view, and the lack of thne to cognitively structure the experience, any verbal report concerning the subject's mood or perception would have been of questionable value. Therefore, the only dependent variable measured was helping.

TABLE 2

SUBJECTS' HELPJNG IN THE FIELD EXPERIMENT

Condition	Helping behavi" y"	No % heloing	
No east			
Ambieot noise'	4	16	20
High noiseb	2	18	10
Cast			
Ambient noise'	16	4	80
High noiseb	3	17	15

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RESUL TS

A 2 X 2 (Noise X Cues) factoriai aualysis of variauce performed ou the dichotomous data (help or not help) resulted in highly significant results. As in the laboratory experiment, increased noise produced a significaut decrease in helping in that although 5°% of the sub)ects helped In the ambient

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noise condition, only 12.5% helped in the high-noise condition, F(I, 76) = 20.00, $P < .001$. (See Table 2.)

The cue-for-helping manipulation was also significant in that only 15% of the subjects helped the confederate when he was not wearing an arm east, while *47.5* % of the subjects provided assistance to the confederate when he was wearing the east, F(I,76) = 15.03, $P < .001$.

The Noise X Cue interaction was also highly significant as the presence or absence of the east on the confederate's arm was highly influential in determining the likelihoad of helping under ambient noise conditians (80% of the subjects helped the confederate wearing the east, while only *20ro* of the subjects helped the confederate not wearing the east), whereas the effect of differential cues was nonsignificant for the high-noise condition *(15* ro helping the confederate with the east, 10% helping the confederate without the east), F(I, 76) = 10.70, $P < .005$.

GENERAL DrscussION

The basic findings of these two investigators are consistent and straightforward. With increasing ambient noise levels, the likelihood of simple helping belravior decreases. An interaction was present in that the physical characteristic.s of the confederate, whieb provided visual cues regarding the legitimacy and degree of. his need *for* assistance, influenced the likelihood of his being helped in the low- but not in the high-noise conditions of the field study.

These results are consistent witIi the nation that high levels of ambient noise produce attenuation of attentian to peripheral cues, that is, those not related to central, ongoing activities and cancerns. This tendency for per
. ceptual "filtering to be more extensive and evidenee to be considered almost entirely from one source rather than anyother" (Broadbent, 1971, p. 16) with noise-induced arousal may weil have general social implications, since one of its consequences may be, as Zimbardo (1969b) has suggested, "that individuals may orient toward others in a less personal and individual fashion. The presence of high levels of noise and the attendant attention restric tian would be expected to curtail the directive inflnence on belravior that the cues presented by another person and his or her characteristics would have in the absence of highintensity noise.

An alternative expIanation in temIS of the aversive qualiiY of loud and noxious noise might be advanced. Here it would be argued, for example, that the lowered tendency to help was a function of the subjects' desire to escape quickIy from the immediate area of the unpleasantly noisy lawn mower, and thus subjects sinrply walked on past the dropped books and the fumbling confederate. However, sueb an account would be unable to deal with the similar results of the laboratory study. In this situation, there was no contingent relationship between the presenee or absence of a helping response and escape from the loud white noise. Subjects were led to believe that they were simply waiting to be called to participate in an experinrent, and failure to help could not be construed as hastening their exits from the waiting room. If anything, they might have assumed that the confederate was waiting for the same "experinrent" sueb that helping him and thereby speeding up his departure might reduce the time they would have to spend in the noise-filled waiting room. However, noise level was inversely related to helping just as it was in the field study. Thus, an aversion explanatian does not adequately account for the obtained results.

Fniany, it should be noted that two addi
tional interpretative frameworks might be seen as germane to these findings. One could, forexample, contend that high-intensity nOLSe infiuences mood or affective state as a consequence of its stressful nature. Subjective reports of annoyance or irritation with increasing noise exposure have ,been found by, among others, Stem, Gaupp, and Leonard (1970). Thus, in line with the contentian of Clore and Byme (1972) that personalaffective respouses mediate the expressian of interperwnal belraviors sueb as evaluations, approaeb-avoidance tendencies, and attraction, lowered tendencies to help might be anticipated with high-noise levels. However, whiIe numerous studies have demonstrated

that *positive* mood states are associated with inereased helping (Aderman, 1972; Berko. witz & Connor, 1966; Isen, 1970; Isen, Horn, & Rosenhan, 1973; Isen & Levin, 1972; Kazdin & Bryan, 1971; Moore, Underwood, & Rosenhan, 1973; Rosenhan, Underwood, & Moore, 1974), among those that have eompared controi and *negative* affeet eondi. tions, only Moore et al. have found dear-cut differenees in' helping. Thus, the viability of such an approach to the results of these studies is called into question in the ahsenee of research that might darify the specifie eonditions under which negative affeetive states will or will not influenee assistanee giving.

Alternatively, an interpretation might be advaneed in terms of the presumed drive properties of noise as an intense' stimulus that facilitates the oeeurrenee of responses that are dominant in a particular situation (Hull, 1952; Spenee, 1956). Geen and O'Neal (1969), for example, used preeisely !his ap. proach in a study which was interpreted as demonstrating that high noise levels, oper. ating as a souree of general arousa!, enhanee the likelihood of aggressive responses when they are assumed to be dominant in the sub. jeet's habit family hierarchy. Since in the present laboratory study, helping was. the response of 72% of the subjeets under ambient noise eonditions, and thus was highly likely in this situation, an inerease in helping with inereased noise level would be the straight. forward predietion from this paradigm. Just the opposite tendeney was found. However, it eould be maintained that such an analysis overlooks the eontention that a stimulus such as noise has both drive *and* cue properties (d. Hull, 1952). Cue properties might ralse some response other' than helping to a dominant position in the habit family hierarchy such that a noise.indueed inerease in drive level might eventuate in decreased helping.

Of course, this would be in direet opposition to the interpretation of the role of noise that Geen and O'N eal found to be successful in their study, but it is, nevertheless, a legiti. mate application of the social-Iearning posi. tion. One might speculate that leaving the field would be a likely response cued by the loud noise, and !his wouid, indeed, lead to the reduetion in helping observed in the field study. In the laboratory investigation, however, eseape from the noise was not possible, although some response(s) other than helping or escape could have been cued by the noise. Thus, an orientation of this sort is capable of providing a post hoe aeeount of the findings. However, the obvious diffieulties in developing specifie predietions with regard to a particular set of circumstanees from !his general orientation seem to argne against its being viewed as the preferred aeeount of the present results.

Two eautionary statements about the gen. eralization of the reported data should be kept in mind. First, the noise used in both studies was noneontingent, in that subjeets' behavior in no way affeeted the onset or offset of noise. Zimbardo (1969a) has reported a series of studies indicating that per. eeived choice or eontroi over stimulus events may signifieantly alter the influenee of various motivationai states. Seeond, the noise level was continuous rather than periodie or discontinuous. Glass and Singer (1972) and others reported that the effeet of noise on complex tasks varies depending upon its unpredictably eontinuous or diseontinuous presentation.

The present studies imply that the presenee of high levels of noise may be an important factor not onIy in helping behavior but in other social interaetion situations as well. The influenee of noise would seem to be especially important in cireumstanees in whieh indi. viduals' behavior must be direeted not only byevents or enes relevant to central activities but aIso by subtle and unreIated happenings.

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