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THE EFFECTS OF LIGHTING AND INTERPERSONAL DISTANCE ON COUNSELING INTERACTIONS**

ABSTRACT: This study investigated the effect of intensity of lighting and interpersonal distance in an analog counseling situation on an array of counseling variables: e.g., communication of empathy, duration of silence, duration of speech, number of interactions. Excerpts from initial sessions were randomly selected, rated, and analyzed. Results showed a significant interactive effect of lighting and distance on the communication of empathy. Both significant and non-significant results were discussed.

People have always been aware, to a certain extent, that their physical environment has a profound and often debilitating influence on their behavior as well as on their psychological states. There are, however, innumerable factors that play a part in the organization of social interactions, factors which are either so subtle or so complex that people rarely advert to them in a conscious way, or, if they do, have no way of assessing either their importance or their direction. A growing literature (Drew, 1971; Duncan, 1969; Proshansky, 1973 (in an issue of *Representative Research in Social Psychology* devoted exclusively to environmental psychology); Sommer, 1969) attests to current interest in this area which is often defined under the rubric of proxemics. Proxemicists and other social psychologists have begun in a somewhat systematic way to bring the strength and cogency of scientific inquiry

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to an examination of spatial and environmental influences on social behavior (e.g., Fretz, 1966; Haase & DiMattia, 1970; Haase & Tepper, 1972; Hall, 1960, 1963, 1966; Horowitz, 1965; Kelly, 1971; Little, 1968; Mehrabian, 1968, 1969; Mehrabian & Diamond, 1971; Proshansky, Ittleson, & Rivlin, 1970; Rapoport, 1969; Smith, 1972; Sommer, 1969). Reliable relationships have been found in these studies between an array of proxemic variables and interpersonal behavior.

The counseling situation can be viewed as a restricted and highly specialized sector of social interaction and, doubtless, the same lawfulness is operative within it as elsewhere. In view of this, an increasing number of studies, indicated above, have been made suggesting functional relationships between possible changes in the physical and interpersonal environments which can facilitate the exercise of certain therapeutic processes.

The present study was an examination of the influence of intensity of lighting on the communication of empathy by the counselor, as well as on several verbal measures: rapidity of speech, duration of speech, length of silence, number of interactions, and quantity of speech. Further, the influence of interpersonal distance and its interaction with lighting on the same criterion measures were also examined.

METHOD

Subjects

The sample chosen for this study consisted of 18 counselors-in-training in a master's degree program at the University of Moncton. They had all completed at least 100 hours of training in communicating and discriminating core conditions for effective counseling, following Robert Carkhuff's model. They interviewed 54 undergraduate students in this study. The 54 clients were randomly selected from a pool of 120 applicants who had been attracted to participate by campus advertisement and a modest monetary recompense. All the subjects, both counselors and clients, were Francophones from New Brunswick and Québec.

Design and Equipment

A 3 X 3 mixed factorial analysis of variance was used to test the effects on an array of criterion measures of two experimental variables. The variables, as indicated above, were interpersonal distance between seated interactants and the intensity of lighting in the counseling setting. The three distances were 30 inches, 50 inches, and 80 inches. Eighteen counselors were randomly assigned to the three levels of interpersonal distance — six counselors at each level. Measures were repeated for each of the 18 counselors across all three levels of lighting intensity, to wit: one footcandle, 32 footcandles, and 200 footcandles. (It may help the reader to visualize the various lighting intensities if we describe them as follows: 200 footcandles in the counseling rooms was comparable, in the authors' estimation, to a brilliantly lit sun porch; 32 footcandles was comparable to a moderate size room

lit only by a 60 watt bulb; one footcandle was comparable to a small room lit only by a dining candle.)

The apparatus consisted of (a) a Gossens Lunasix 3 lightmeter, (b) an Armaco "Variac" variable voltage transformer for controlling the intensity of lighting, (c) omnidirectional microphones and tape-recorders. All the apparatus, with the exception of the microphones, was installed in an adjacent control room and invisible to all the subjects.

Two rooms normally used by a student affairs center for counseling were used for the interviews. They were identical in every respect, even to the minutest detail. The windows were blocked out with opaque construction paper and completely draped so that variability in outdoor lighting would not (over a period of several weeks) affect the quality of indoor lighting. The chairs in which the interactants sat were placed at a 30 degree angle to the length of the room at each of the distances. Further, the chairs were placed with the left front legs in a line which bisected the room lengthwise to avoid obtrusive and distracting bumping of knees at the close distance.

Procedure and Instructional Set

Interviews of 20-minute duration were scheduled for each of the 54 clients who were randomly assigned to the nine distinct experimental conditions. In order to neutralize possible order effects arising from the counselors' entrance into three successive and variously lighted settings, the order in which the counselors functioned across the three levels of lighting was determined by the use of a table of random numbers.

Several minutes prior to the experimental interview, the client and the counselor were given separately their standardized set of instructions. The clients were asked, among other things, to speak, with the assurance of anonymity, on any issue of personal concern to them whether it be financial, academic, interpersonal, or political. All, both counselors and clients, were asked to refrain from altering in any way the appointments in the experimental rooms and a plausible rationale was given for the study: to wit: the counselors were told that client reactivity to the environmental setting was being studied. The clients, on the other hand, were told that counselor skills were being assessed. Both statements, of course, were true, although incomplete.

Data Analysis

The 54 interviews were all tape recorded in their entirety. Extracts, consisting of five dyadic elements in the order "client-counselor-client-counselor-client," were selected at random from each third of the interview and randomly re-recorded onto separate tapes for judges to rate according to Carkhuff's (1969, pp. 174-195) scales of communication assessment. Each interval of the scale between 1 and 5 was divided into tenths and the ratings were made accordingly, e.g., 2.6 or 3.4.

Judges were selected who were highly qualified in the Carkhuffian model for training counselors in the core conditions. Using the first

30 interview segments to be randomly drawn from the study to test interjudge reliability, the latter was found to be .90.

Veldman's (1967) program ANOVAR, a program for mixed analysis of variance, was used to analyze the experimental data. Since this program furnishes exact probabilities for each *F-ratio* (given the degrees of freedom), this information has been included in the tables and the text.

RESULTS

The analysis of the data indicated that there was an interactive effect between intensity of lighting and interpersonal distance ($p = .021$) showing that the communication of counselor empathy in the last third of the twenty minute interview was enhanced when lighting in the counseling room was minimal (one footcandle) and interpersonal distance was medium (50 inches). Results of this analysis are summarized in Table 1. Figure 1 clarifies the nature of this interaction.

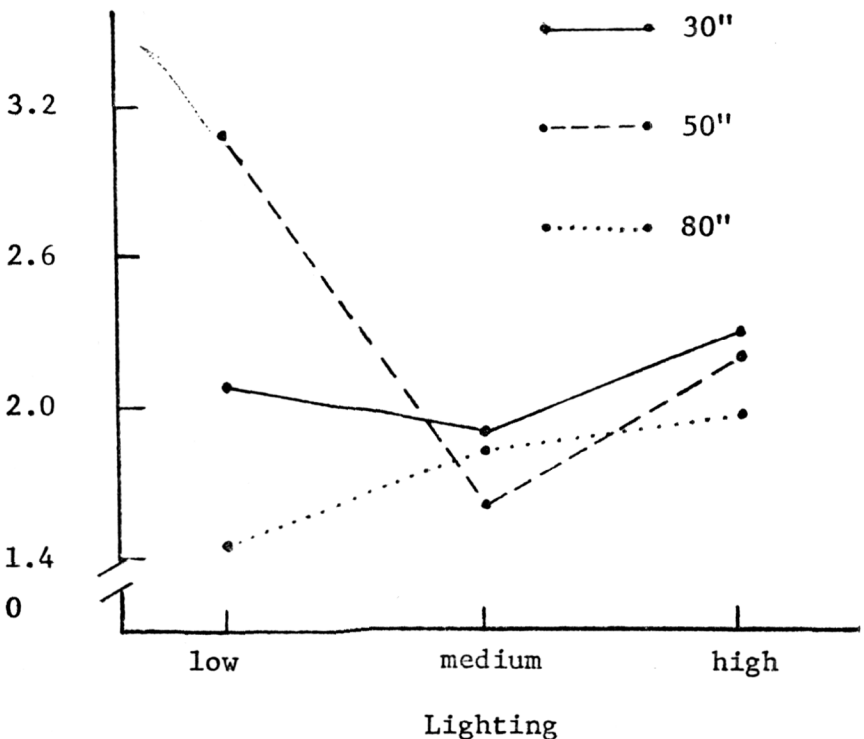


FIGURE 1

Effects of distance and lighting on duration of counselor speech. interview.

TABLE 1
ANALYSIS OF VARIANCE:
COMMUNICATION OF EMPATHY IN FINAL THIRD OF SESSION

Source of variation	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Total.....	53	.55		
<i>Between</i>	17	.50		
Distance (D).....	2	1.23	3.07	.08
Error.....	15	.40		
<i>Within</i>	36	.58		
Lighting (L).....	2	.93	2.15	.13
D X L.....	4	1.47	3.37	.02
Error.....	30	.43		

Other interesting results, not reaching conventional standards of statistical significance, were noted and are brought to the attention of the reader. Relative to the main effect of interpersonal distance, the communication of empathy during the first third of the interview was poorest at the far distance (80 inches) and highest at the medium distance (50 inches). This same effect revealed itself in the terminal third of the interview ($p = .075$).

Among the verbal measures several trends emerged clearly. An interactive effect was present in the duration of the counselor's speech over the entire interview. At a probability level of .10 the counselor was less voluble in the low-lighting and medium distance condition and in the intense lighting and far distance condition (see Table 2 and Figure 2).

TABLE 2
ANALYSIS OF VARIANCE:
DURATION OF COUNSELOR SPEECH

Source of variation	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Total.....	53	889.05		
<i>Between</i>	17	1472.91		
Distance (D).....	2	489.34	0.31	.76
Error.....	15	1604.05		
<i>Within</i>	36	613.33		
Lighting (L).....	2	627.47	1.16	.33
D X L.....	4	1156.86	2.14	.10
Error.....	30	539.92		

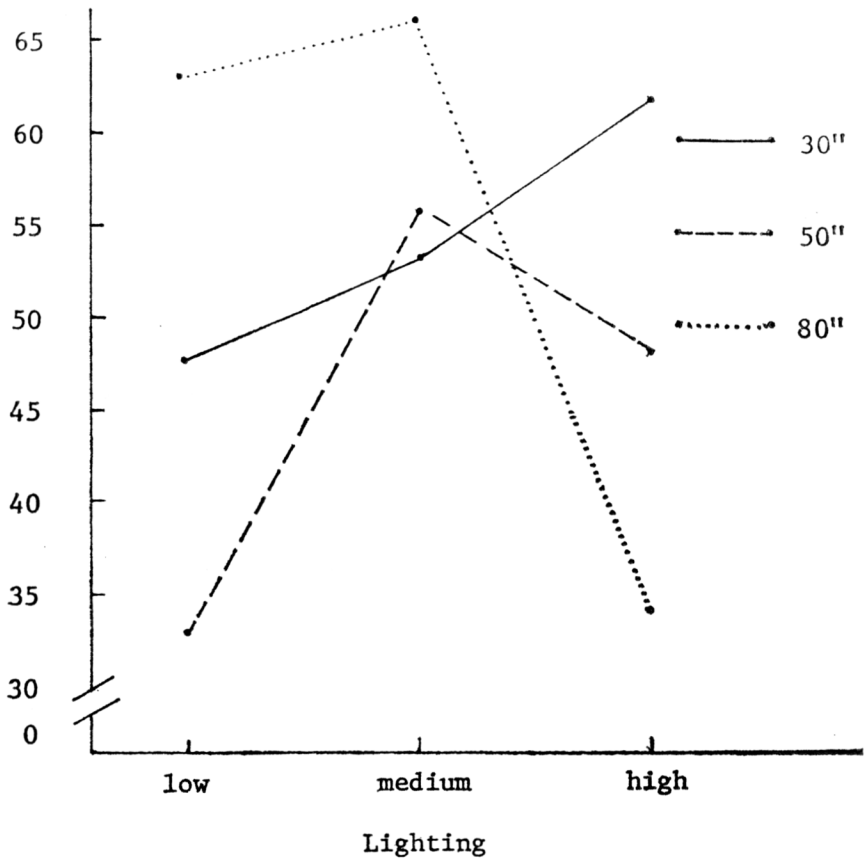


FIGURE 2
Effects of distance and lighting on duration of counselor speech.

TABLE 3
ANALYSIS OF VARIANCE:
DURATION OF SIMULTANEOUS COUNSELOR-CLIENT SILENCE

Source of variation	df	MS	F	p
Total.....	53	865.55		
<i>Between</i>	17	414.92		
Distance (D).....	2	921.78	2.64	.10
Error.....	15	347.34		
<i>Within</i>	36	1078.35		
Lighting (L).....	2	1566.81	1.40	.26
D X L.....	4	501.56	0.45	.78
Error.....	30	1122.70		

On the other hand, the duration of speech of the client was most elevated in the low-lighting and medium distance condition ($p = .158$). The total number of words articulated by the client was also highest when the lighting was very dim and the interpersonal distance was medium (50 inches). Further, at a probability level of .117 it was found that this last criterion measure was heightened by the main effect of medium distance. Conversely, there was less silence in the interviews in the low-lighting and medium-distance condition. The direct main effect of distance was significant at a .102 probability level (see Table 3 and Figure 3).

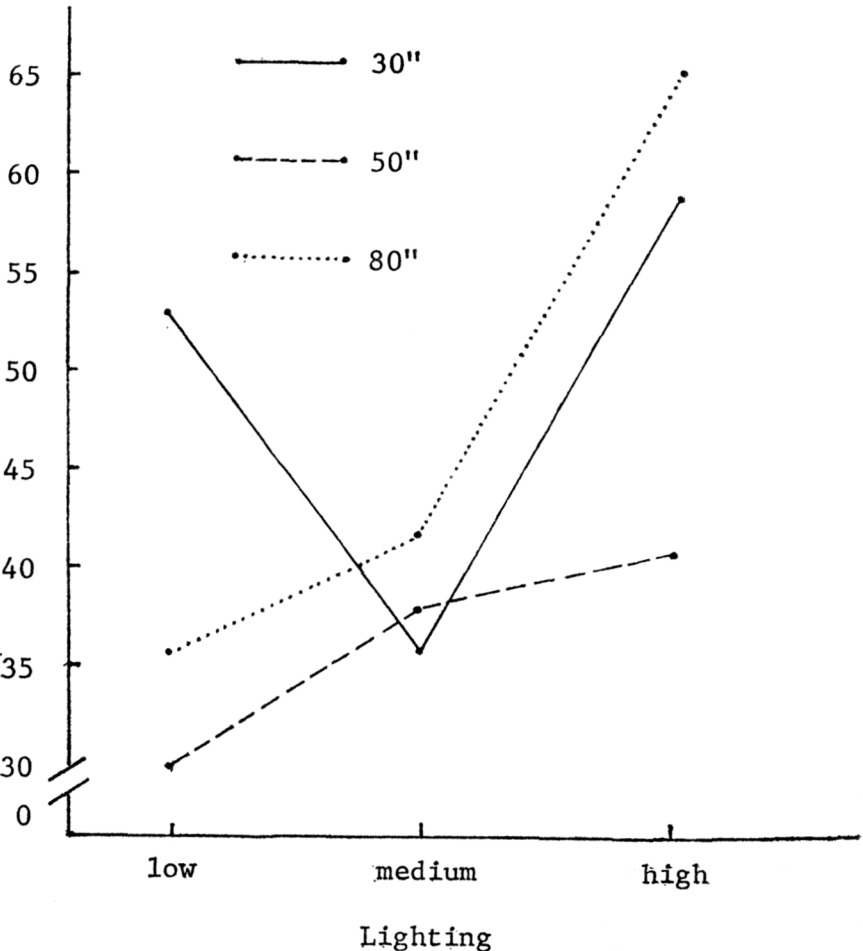


FIGURE 3
Effects of distance and lighting on duration of silence.

DISCUSSION

Communication of Empathy

It has been demonstrated that if one reduces, within limits, the size of the room in which one counsels, one will generally increase the amount of eye contact made by a client with his interviewer (Dumont, 1971). A large room, identical to a smaller room in all respects except physical dimensions, seems to be proxemically more sociofugal, fostering distractibility and diminishing interpersonal involvement. If one reduces the intensity of lighting in a setting, it would seem that the effect is comparable to reducing visual perspectives or to reducing the size of a room. That dimly lit lounges, parlors, or taverns are sought by those who wish high interpersonal involvement, if not intimacy, may be more than a cultural trait without a psychobiological basis. Sommer (1969) notes that clientele do not remain in restaurants, nightclubs, and other commercial establishments for as long if they are brightly lit than if they are dimly lit. He notes, further, that corners and nooks are preferred to wide open spaces by those seeking interpersonal involvement. Even granting that privacy-need may be a potent factor, this argument adds cogency, at least anecdotally, to the hypothesis that the dimly lit room as well as the smaller space is more sociopetal than the larger, more brightly illuminated space.

In this study it was found that in the terminal third of an analog counseling session, counselors communicated empathy at a significantly higher level ($p = .021$) when seated at a moderate distance (50 inches) from the client and when the lighting was dim (one candlepower) than in the more brightly lit conditions. If, indeed, the dimly lit ambience is more sociopetal than the brightly lit, it is not an unwarranted speculative leap to hypothesize that the same proxemic conditions that are sociopetal also facilitate the communication of empathy as well as other core conditions of effective counseling. Certainly empathic behavior is predicated on and further facilitates the "social" movement of two or more persons toward one another. This effect did not appear as strongly, however, in the earlier phases of the 20-minute counseling sessions. This is not surprising in that the experimental situation, particularly at one candlepower, was obtrusive and generated considerable tension. Further, empathy, it would seem, needs to be built on a minimal data base and a rapport that requires at least several minutes to establish.

Lastly, the communication of empathy was above a mean level of three on the Carkhuff scale only in the medium interpersonal distance condition of 50 inches (see Table 4). (The reason that the ratings as a whole were so low is that every intervention in the sample extracts was rated for empathy even though the counselor's main intent was to accent or focus or give a minimal encouragement to continue with no pretense to achieving interchangeability in the interaction.) The studies of numerous proxemicists (recently, Haase & Tepper, 1972; Kelly, 1971) demonstrated that interpersonal functioning, including the communication of empathy, are seriously impaired or enhanced by

TABLE 4
MEAN EMPATHY RATINGS

Distance	Lighting		
	1 footcandle	32 footcandles	200 footcandles
30 inches.....	2.2	2.0	2.4
50 inches.....	3.1	1.7	2.3
80 inches.....	1.6	2.0	2.0

any number of nonverbal and proxemic factors, notable among which is the physical distance between (in this case) client and counselor. This is confirmed by this study.

Verbal Measures

The student counselors were schooled according to a model of counseling which prizes, at least in the exploratory stages of the counseling relationship, a minimum of intervention. They were apparently able to achieve this best at the far (and safest) distance under intense lighting and at the medium (and usual) distance under minimal lighting (Figure 2), for the duration of counselor speech was lower ($p = .102$) in these two conditions than elsewhere. There are any number of reasons why this might be the case. One line of reasoning could be that the interviewers and the clients were strangers to one another and doubtless a degree of tension arose in the counselors simply by virtue of finding themselves with a stranger in an experimental context in which their performance was going to be scrutinized by experimenters who were members of staff. Kanfer (1959) and Manaugh, Weins, and Matarazzo (1970) show convincingly that anxiety and emotional states generally influence various verbal productivity measures. If the anxiety alluded to above interfered with counselor performance one might speculate that the two conditions in question were least "anxiogenic" and facilitated the counselors in reducing the number of their interventions. What is also of interest is that the same experimental condition (low lighting and medium distance) which was related to higher empathy levels was also related to lower intervention levels.

Among the other verbal measures, findings emerged that were consistent with those discussed above. The duration of the simultaneous silence of counselor and client was least in the low lighting, medium distance condition. Indeed, for the direct main effect of interpersonal distance the significance level was .102; it appeared that when counselor and client were seated 50 inches apart, a smooth uninterrupted flow of interactive speech was facilitated. The rapidity of speech of either the client or counselor as well as the number of verbal interactions seem to have been unaffected by the experimental variables.

However, the number of words uttered by the client was heightened in the medium distance condition ($p = .117$) and was highest in the low lighting condition. Correlatively, the number of words uttered by the counselor was lowest in the low lighting, medium distance condition ($p = .180$).

In conclusion it may be said that it appears that a dimly lit counseling locale in which the counselor seats himself at approximately 50 inches from his client is one which facilitates the expression of at least one, and perhaps the most important, of the core conditions for effective therapeutic process. This was found to be true in an initial session between strangers and within the first 15 to 18 minutes. In succeeding sessions, when habituation to the conditions would firmly set in, the facilitative effects of certain proxemic conditions would probably become more pronounced.

Although no one of the verbal measures reached conventionally acceptable levels of statistical significance, there appears to be a confluence of trends which cumulatively suggest that several important verbal measures are affected by the interaction of lighting and interpersonal distance.

All the above suggests to the authors that replicative studies should be made using the variables and the parameters (the entire counseling analog context) of this study. It would appear warranted to continue to examine the influence of lighting and interpersonal distance not only on the criteria used in this study but also on other aspects of therapeutic communication such as respect, authenticity, concreteness, confrontation, and so on. It might be useful, further, to investigate the effects of these conditions on nonverbal and paralinguistic behaviors which figure strongly in counseling interactions.

RESUME: On a étudié l'effet de l'intensité de la luminosité et de la distance interpersonnelle sur un certain nombre de variables dans une situation analogue à celle du counseling: e.g., la communication de l'empathie, la durée des silences, la durée de la conversation, le nombre des interactions. On a choisi au hasard des extraits tirés des sessions initiales, puis on les a cotés et analysés. Les résultats ont montré l'existence d'un effet significatif d'interaction de la luminosité et de la distance sur la communication de l'empathie. Tant les résultats significatifs que non significatifs ont été discutés.

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