

Long-Term Effects of a Control-Relevant Intervention With the Institutionalized Aged

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Elderly nursing home residents who were tested as part of an intervention designed to increase feelings of choice and personal responsibility over daily events were reevaluated 18 months later. Nurses' ratings and health and mortality indicators suggest that the experimental treatment and/or the processes that it set in motion had sustained beneficial effects.

In a field study (Langer & Rodin, 1976), we assessed the effects of an intervention designed to encourage elderly nursing home residents to make a greater number of choices and to feel more control and responsibility for day-to-day events. The study was intended to determine whether the decline in health, alertness, and activity that generally occurs in the aged in nursing home settings could be slowed or reversed by choice and control manipulations that have been shown to have beneficial effects in other contexts (Lefcourt, 1973; Seligman, 1975; Zimbardo & Ruch, 1975). This also allowed us to extend the domain of the control conception by using a new population and a new set of response variables.

The hospital administrator gave a talk to residents in the experimental group emphasizing their responsibility for themselves, whereas the communication given to a second, comparison group stressed the staff's responsibility for them as patients. To bolster the communication, residents in the ex-

perimental group were given plants that were watered by the staff. In reality, the choices and potential for responsibility that we enumerated in the treatment condition were options that were already available; the administrator simply stated them clearly as possibilities. Thus the institutional readiness was already there, and the experimental induction was intended to bolster individual predispositions for increased choice and self-control.

The data indicated that residents in the responsibility-induced group became more active and reported feeling happier than the comparison group of residents, who were encouraged to feel that the staff would care for them and try to make them happy. Patients in the responsibility-induced group also showed a significant improvement in alertness and increased behavioral involvement in many different kinds of activities, such as movie attendance, active socializing with staff and friends, and contest participation. In addition to collecting these multiple questionnaire and behavioral measures at the

perimental group were offered plants to care for, whereas residents in the comparison

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time, we have now been able to collect long-term follow-up data on several variables, including mortality. As in Langer and Rodin (1976), our intent was to gather as many measures as were accessible for this population with the goal of increasing accuracy with increased heterogeneity of methodology (Campbell & Fiske, 1959).

Method

Subjects

There were 91 subjects given the original experimental treatment. The analyses in Langer and

Table 1
Number of Subjects in Test Samples

Condition	Responsibility induced	Comparison	Control
Received original induction	47	44	—
Included in Langer & Rodin (1976) analyses	24	28	—
In follow-up and included in Langer & Rodin (1976) analyses	14	12	—
Total in follow-up	20	14	9

Rodin (1976) were based on 52 of these subjects These were all the people for whom two nurses' ratings (for reliability assessment) were available Table 1 indicates which subjects are included in the follow-up analyses. Twenty-six of the 52 were still in the nursing home and were retested. Twelve had died, and 14 had been transferred to other facilities or had been discharged The differences between treatment conditions in mortality are considered in a subsequent section The groups did not differ in transfer or discharge rate Only 9 other persons from the original sample of 91 were available for retesting Since they had incomplete nurses' ratings in the first study, they are only included in follow-up analyses not involving change scores in nurses' evaluations Almost all of the participants now lived in different rooms, since the facility had completed a more modern addition 13 months after the experimental treatment.¹

We also evaluated a small control group of pa-

second period represented the 6 months that immediately preceded the follow-up On the basis of the medical data reported on the charts, he assigned the person an overall health score (1 = very good to 5 = poor) for each period. The physician's health ratings were independent of the nurses' evaluations, which did not appear on the medical charts that he used Like the nurses, he was unaware of the nature of the study and how his ratings would be used. Further, the physician was not employed by the nursing home when the original intervention occurred

Behavioral indices. After all the questionnaire measures had been taken, one of us (JR) gave a talk at the nursing home on psychology and aging This was advertised widely among the residents, and they were encouraged to come and ask questions. The number of people in each condition who attended and the frequency and type of questions they asked were recorded

Mortality A frequency count of deaths occurring during the 18-month period was made, and the cause of death was noted

Results

Nurses' Ratings

Since the interrater reliability coefficient between nurses who rated the same patient was high ($r = .76$), the ratings were averaged, and the resulting means were used for subsequent analysis.² First, a composite score was developed representing the total of the individual evaluative items. A one-way analysis of variance comparing the responsibility-induced ($M = 25.03$), comparison ($M =$

tients who had not participated in the first study due to a variety of scheduling problems. Five had previously lived on the same floor as subjects in the responsibility-induced condition, and 4 lived on the same floor as the comparison group. All were now living in the new wing. The average length of time in the nursing home was 3.9 years, which was not reliably different for the three groups.

Measures

Nurses' ratings. Two nurses on different shifts evaluated each patient along 9-point verbally anchored semantic differential scales for mood, awareness, sociability, mental attitude, and physical activity. Nurses were unaware of a relationship between prior experimental treatments and the purpose of these particular ratings.

Physician's ratings. A doctor on the nursing home staff evaluated the medical records of each patient for two periods. The first period represented the 6 months prior to the first study in 1974, and the

18.71), and no-treatment ($M = 17.60$) groups was significant, $F(2, 40) = 7.04, p < .01$. A

¹ All patients were given the option to move, and all did so. Those who wished to remain with their roommates were kept together, although people previously on the same floor were not all moved together to the same floor in the new wing. Interestingly, 33% of the patients in the responsibility-induced group, as compared to 21% in the comparison group, spontaneously requested to move even before they were given the choice.

² Two nurses on each floor rated all relevant patients on their floor, regardless of condition. Six nurses participated as raters. Since the patients no longer all lived together, residents formerly in the same group and thus rated by the same nurses were now rated by different nurses. Thus it is unlikely that the means for each treatment group were due to differences in the nurses who did the rating rather than to the patients themselves.

Scheffé test indicated that the responsibility-induced group was rated reliably higher than the comparison group, $F(1, 40) = 6.31, p < .05$.

The means for each individual item are presented in Table 2. On the average, the patients in the responsibility-induced group were judged to be significantly more actively interested in their environment, more sociable and self-initiating, and more vigorous than residents in the comparison group. The mean ratings also show the similarity between the comparison group given the "happiness" induction and the no-treatment group.

Composite scores for all the evaluative items were also available from the questionnaire, which the nurses completed prior to the original intervention and at the 3-week posttest. The means presented in Table 3 include all residents for whom these two scores and follow-up data were available ($n = 14$ for the responsibility-induced group, and $n = 12$ for the comparison group). Change scores between the preintervention means and the 18-month follow-up data indicate that the

Table 3
Mean Composite Nurses' Evaluation Scores Taken at Three Different Time Periods Relative to the Intervention

Time period	Responsibility-induced Comparison	
	Responsibility-induced	Comparison
Preintervention	402.38	442.93
Postintervention (3 weeks)	436.50	413.03
Follow-up (18 months)	352.33	262.00

Note. There were seven 10-point items on the scales used by Langer and Rodin (1976), making a total of 70 points possible. There were five items in the follow-up questionnaire, and the ratings were made on 9-point scales making a total of 45 possible points. The Langer and Rodin totals were multiplied by 9 and the follow-up totals by 14 to make the scores comparable.

marginally reliable differences in the same direction, $F(24) = 1.82, p < .10$.

Health Ratings

decline was significantly smaller for the responsibility-induced group ($M = 38.21$) than for the comparison condition ($M = 175.42$), $t(24) = 2.68, p < .02$. Change scores calculated between the 3-week postintervention ratings and the 18-month follow-up showed

Table 2
Mean Ratings for Residents 18 Months Following Experimental Interventions

Nurses' rating	Responsibility-induced (20) ^a	Comparison (14) ^b	No treatment control (9) ^c
Happy	4.35	3.68	3.28
Actively interested	5.15	3.96	3.95
Sociable	5.00	3.78	3.40
Self-initiating	5.15	3.90	4.18
Vigorous	4.75	3.39	3.33

Note. The difference between the responsibility-induced and comparison groups was reliable at $p < .05$ for all ratings but happy. Numbers in parentheses are ns.

^a Received experimental treatment in Langer and Rodin (1976).

^c Not previously tested.

Change scores were calculated between the preintervention (1974) and follow-up (1976) health evaluation ratings. Health ratings were retrospective, based on the medical records, so change scores could be calculated for all 43 follow-up subjects. There was no significant difference among the three groups in the preintervention health evaluations, $F(2, 40) = 1.77$. The responsibility-induced group showed a mean increase in general health of .55 on a 5-point scale, which was reliably greater than means for the comparison group ($M = -.29$) and the no-treatment group ($M = -.33$), $F(2, 40) = 3.73, p < .05$.

Mortality

The most striking data were obtained in death rate differences between the two treatment groups. Taking the 18 months prior to the original intervention as an arbitrary comparison period, we found that the average death rate during that period was 25% for the entire nursing home. In the subsequent 18-month period following the intervention,

Table 4
Mean Ratings Prior to Intervention Grouped by Subsequent Mortality Outcome

Variable	Responsibility induced		Comparison	
	Dead	Living	Dead	Living
Time institutionalized	2.40 (7)	2.70 (40)	2.80 (13)	2.20 (31)
Health ratings	3.57 (7)	3.85 (40)	3.69 (13)	3.64 (31)
Nurses' evaluations	36.20 (5)	44.79 (19)	31.69 (8)	47.39 (20)

Note. The numbers in parentheses represent the number of residents on whom each mean is based.

only 7 of the 47 subjects (15%) in the responsibility-induced group died, whereas 13 of 44 subjects (30%) in the comparison group had died. Using the arcsine transformation for frequencies, this difference is reliable ($z = 3.14, p < .01$).

Because these results were so startling, we assessed other factors that might have accounted for the differences. Unfortunately,

Behavioral Measures

There were no reliable differences among the three conditions in lecture attendance. Thirty-three percent of the responsibility-induced group attended, as compared to 30% of the comparison group and 20% of the no-treatment group. However, these groups did differ in the number and type of ques-

we simply cannot know everything about the equivalency of these subjects prior to the intervention. We do know that those who died did not differ reliably in the length of time that they had been institutionalized or in their overall health status when the study began. These means are presented in Table 4, which also presents the nurses' evaluations prior to the intervention. From these ratings it is clear that the nurses had given lower evaluations prior to the intervention to those patients who subsequently died than to those who were still living, $F(1, 48) = 7.73$, $p < .01$. The interaction between treatment group and the life-death variable was not significant, however.

The actual causes of death that appeared on the medical record varied greatly among individuals and did not appear to be systematic within conditions. For example, deaths in the responsibility-induced group were listed as due to factors such as cardiovascular disease, congestive heart failure, gastrointestinal bleeding, lymphoma, and cerebral hemorrhage. Similarly there were patients in the comparison group whose cause of death was also listed as congestive heart failure and cardiac arrest, as well as those dying from problems like gangrene foot and polynephritis.

that were asked, 10 came from residents in the responsibility-induced condition. The lecture and questions were taped, and subsequent content analysis by a coder who was blind to the experimental treatments indicated that 4 of the 10 questions had themes of autonomy and independence. For example, one female inquired whether intelligence really did decline with age, and if so, did that necessarily mean that older people should be taken care of? Another asked how to make her children feel less guilty about putting her in the nursing home. No questions from the comparison or no-treatment group dealt with these themes, but 2 of their 4 questions dealt with death. For example, one man asked whether senility could cause death. A woman who had obviously read the self-reported experiences of people who had a close brush with death asked whether this euphoric feeling was a universal experience or whether it differed as one got older. No one in the responsibility-induced group asked a death-relevant question.

Discussion

The intervention described by Langer and Rodin (1976) was stimulated, in part, by

our theoretical interest in control. We attempted to capture these theoretical concerns in a manipulation that suggested how elderly residents might increase choice and self-control in the nursing home. The manipulation did indeed produce strong effects that lasted as long as 18 months later. Compared to the staff-support comparison group, and to the no-treatment group where relevant, residents in the responsibility-induced condition showed higher health and activity patterns, mood and sociability which did not decline as greatly, and they had mortality rates that were lower. We would like to interpret these effects as suggesting that de-

the behavior of any individual resident could have interacted with changes occurring in his or her neighbors, who were also exposed to the same manipulation. However, we believed that at least some of the residents might discuss the administrator's communication if they saw themselves divided into different groups and that we would be unable to know whether and for whom this had occurred. Once having decided to assign by floor, we would also have chosen to have a third floor as a no-treatment control group. Although we simply lacked this option, data from the control group formed for the follow-up suggest that the responsibility group

cline can be slowed or, with a stronger intervention, perhaps can even be reversed by manipulations that provide an increased sense of effectance in the institutionalized elderly. Krantz (Note 1) and Schulz (1976) also recently found that experimental manipulations involving increased or diminished prediction and control have a significant impact on the elderly. Moreover, adjustment to relocation for older people appears more related to whether or not they have had a choice regarding the new setting than to specific features of the setting itself (Sherman, 1978).

Since the original intervention (Langer & Rodin, 1976) encouraged residents to create or utilize opportunities for control over ongoing daily events rather than over momentary, experimentally created tasks, it seemed reasonable to assume that the effects of this induction would continue after the study itself was completed. However, despite our intent in designing this particular set of interventions to extend the domain of the control conception, we have no real way of knowing without direct on-line observation exactly what the process was that generated the obtained improvements. As is often the case in any field study, we were unable to control some important features of the setting due to both ethical and practical constraints.

First, it would certainly have been more desirable to randomly assign residents to conditions within a floor rather than between floors. A manipulation aimed at changing

improved, rather than that the comparison group worsened, relative to "no-treatment" controls.

Second, the nurses could undoubtedly have made a great deal of difference in a variety of ways. Although they were unaware of the nature of the original intervention and did not attend the meeting where the communication was given, simply recording data about the residents and perhaps feeling observed themselves may have changed their awareness and behavior. In addition, once the patients began to change, the nurses must have responded favorably to improved behavior, sociability, and self-reliance. We can only take the administrator's word that he did not change his own behavior differentially toward the patients as a result of delivering the communications. The differences in nurses' ratings between conditions were maintained, however, even with changes in the nursing personnel, staff rotations, a move, and relocation of some residents to different floors. Nonetheless, it is striking to note that the nurses' evaluations of the patients and not the overall health ratings were more closely related to subsequent life and death. Either the psychological variables that the nurses were rating are better predictors of later mortality than medical symptom evaluations or the nurses' views of the residents are significant factors in their potential longevity. One clear area for further study is the patient-nurse interaction to assess if and how this factor is related to patient health.

Finally, it is especially true that this particular nursing home was open and primed to be responsive. When the options for increased patient involvement do not already exist, simple interventions of the sort used by Langer and Rodin (1976) may have to be elaborated over repeated trials and bolstered by changing the setting enough to allow the manipulations to have a sustainable outcome.

This is not an exhaustive list; it is simply provided to illustrate some of the most

stead fostered generalized feelings of increased competence in day-to-day decision making where it was potentially available. To the extent that a treatment is successful in providing these kinds of control, its termination could serve to make salient the loss of control and, as such, might lead to even greater debilitation than was first encountered.

plausible ways in which the results could have been obtained without being due to increased choice and responsibility per se. Whatever the actual mediating process, it seems clear that decline is not inevitable. Indeed, the strength of the data suggests the value of further investigation into the context-specific social-psychological factors that influence aging. In these studies, process measures must now be taken to assess how the manipulations actually produce their effects.

If the improvements are due to greater control, it must surely be the case that potential benefits are nonmonotonically related to increasing control. For example, one can conceive of circumstances in which a great amount of choice and responsibility would have negative effects for both the patients themselves and on the setting too. In addition, it should be clear that interventions that increase control-relevant features of one's life, including increased predictability, decision-making, and outcome control, should be those that are not withdrawn by the termination of the study. The long-term beneficial effects observed in the present study probably were obtained because the original treatment was not directed toward a single behavior or stimulus condition. They in-

Reference Note

1. Krantz, D Data presented at an invited discussion on *New directions in control research*. Presented at the annual meeting of the American Psychological Association, Washington, D.C., September 1976.

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