

ects influenced hotel profitability, there were indirect indices that customers at least were favorably affected, and that employees were harder working and more stable.

A related point is in order regarding program costs. Because of a more "compact" work force and fewer numbers of "new" trainees, overall payroll costs decreased during the tenure of Project One compared to the previous year. Further, actual program costs for this project were for materials and for reinforcers. The costs for bulletin boards and graph paper were negligible and, since the preferred reinforcer was a variety of trade stamps from a company that also was owned by the head of the hotel corporation, the cost for rewards also was quite low. The best estimate for the latter is less than \$1000 in trade stamps (adjusted to the 1980 dollar) for the first two projects combined. This amount is to be contrasted with the one-time-only cleaning estimate of \$25,000 of an outside cleaning firm, and with the fact that continued adherence to the behavior-management program assured inexpensive performance maintenance for years to come.

Finally, a comment regarding program generality is in order. Project One entailed both direct and systematic replication of program effects. Therein, the intervention procedure was shown to be effective both across different behaviors of the same individual, as well as uniformly across different individuals in the same setting. In this context, Projects Two and Three, while deficient with respect to several important internal validity considerations, clearly demonstrate program generality across populations, tasks, and settings. Accordingly, taken together, the three projects may be viewed as strong support for program external validity.

REFERENCES

- Gilbert, T. F. *Human competence: Engineering worthy performance*. New York: McGraw-Hill, 1978.
- Kazdin, A. E. *The token economy: A review and evaluation*. New York: Plenum Press, 1977.
- Locke, E. A., Cartledge, N., & Kwopeel, J. Motivational effects of knowledge of results: A goal-setting phenomenon? *Psychological Bulletin*, 1968, 70, 474-485.
- Luthans, F., & Kreitner, R. *Organizational behavior modification*. Glenview, Ill.: Scott-Foresman, 1975.
- Winer, B. J. *Statistical principles in experimental design*. New York: McGraw Hill, 1962.

BEHAVIOR MANAGEMENT OF CLIENT CONTACTS IN A REAL ESTATE BROKERAGE: GETTING AGENTS TO SELL MORE

D. Chris Anderson
Charles R. Crowell
Jeff Succi
Katheryn Dolezal Gilligan
Martin Wikoff

ABSTRACT. A Project intended to increase client-contacting behavior on the part of 16 real-estate sales persons was described. Both contacts with prospective (initials) and with established clients (followups) were targeted for change. During a 20-week baseline, agent self-reports were used as a basis for posting weekly charts of contact behaviors together with measured sales and listing performances. A conjunctive token-reinforcement procedure involving both contact behaviors was introduced during a 15-week intervention phase. For all agents as a group, a sustained increase in both behaviors was noted during this phase. Additional analyses revealed, however, that for low baseline performers, the intervention effect was only short-lived. During a subsequent three-week withdrawal stage, the increased behaviors from the previous phase reverted nearly to baseline levels, despite the continued intervention. In response to instructions that program withdrawal was imminent, contact behaviors further declined to below baseline levels during the following 4-week withdrawal stage when both posting and token procedures were actually discontinued. A terminal 6-week reversal phase was marked by a nearly full recovery for all agents of asymptotic intervention levels of contact behavior under a reversed conjunctive token reinforcement schedule. Evidence indicating a correlation between changes in contact behaviors and changes in sales was presented. Also, other company benefits presumably derived from the program were described. Finally, the outcomes of this study were discussed in terms of several important validity concerns.

The major purpose of this study was to extend the general methods and procedures of the preceding project to a sales rather than service-oriented industry. The problem chosen for this undertaking was that of developing

D. Chris Anderson, Charles R. Crowell, Jeff Succi, Katheryn Dolezal Gilligan, and Martin Wikoff are with the Department of Psychology, University of Notre Dame. Address all correspondence to Dr. D. Chris Anderson, Department of Psychology, University of Notre Dame, Notre Dame, IN 46556

and/or increasing, and then maintaining, behaviors on the part of real-estate brokerage agents that might eventuate for the company in a property sale and/or listing. In part, the impetus for this project was provided by our discussions with several brokers all of whom indicated that such an undertaking would, if successful, represent an outcome of major significance for the real-estate industry at large. For the most part, this optimistic conclusion was based upon their own experience with the enormous number of individuals, companies, and groups that endlessly advertise and promulgate "programs" that promise, but usually fail, to instill in agents greater sales efficiency.

The proliferation of these so-called "training" programs for real-estate agents prompted us to search their literature for any reasonable evidence that could be viewed as acceptable documentation for the effectiveness of their claims. Unfortunately, as can be inferred from the numerous complaints voiced by those brokers with whom we spoke, no evidence of the long-run effectiveness of any plan was available. This discouraging result led us to examine with care the details of several of these programs. Based upon this admittedly limited survey, several common problems were noted, any or all of which could obfuscate potential effectiveness. Among their problems, these programs were deficient in (1) specifying clearly what an agent should be doing on a daily basis in order to achieve desired company outcomes; (2) assisting the agent to develop a measurement system for daily activities; (3) providing useful feedback to agents regarding their efforts; and (4) utilization of effective procedures for strengthening and maintaining sales-relevant actions. In effect, most prototypical sales-effectiveness programs in this history can be categorized as "motivational" in the traditional sense of the term. That is, they rely heavily on the "charging up" or "arousing" techniques in the form of "pep talks," sales meetings, or even implied threats. And, in addition, most have as their major "selling" point, only anecdotal evidence suggesting possible short-term gains in effectiveness.

Even if these programs were to be more fully evaluated, however, there are problems in many real estate organizations that likely attenuate the effects of any effort to increase agent effectiveness. In economically stable periods, this business attracts great numbers of agent applicants on the promise of quick and consistently large monetary benefits. The industry itself seems to have perpetuated this notion through brokers (and others) who attempt to generate funds by establishing agent "licensing-training" schools. These agencies often advertise widely for applicants on the promise of a lucrative profession, and charge high "tuition" fees for preparing applicants to take the state licensing examination. Such brokers also will often use these classes as a resource to replenish their own dwindling sales forces as cur-

rent agents leave for various reasons. One highly undesirable byproduct of this agent-recruitment and training-fund-raising scheme may be the large number of low-productive persons that currently occupy agent positions in various brokerages. In general, these individuals do not generate enough sales to fully pay for the resources they expend, but nonetheless are able to "hang on" because of other income sources.

Hard times have fallen on the real estate industry of late largely because of precipitously inflated housing costs and unusually high interest rates. These economic factors are, of course, not under the control of the individual broker or agent, but recently have been responsible for a wholesale exodus of companies and agents from this vocation. Although many of these difficulties have beset this industry since the present project was conducted (January, 1978), many of the economic obstacles that were encountered then are quite similar to those of current conditions. As evidence in this connection, consider the conditions that prompted a specific broker to approach us and request development of a work-productivity program within his agency.

This company was the largest in its region in terms of number of affiliated sales agents (about 35 in all), but it ranked only seventh in sales and dollar volume out of about 15 active firms in the area. The data supplied by the local Multiple Listing Service (MLS) indicated that this agency accounted for only 6-7% of the total sales for the year preceding program inauguration (1976), a figure described as "typical" for this company. In order to increase market percentage, the broker had invested heavily in various training packages for his agents. These included the purchase of several extensive cassette "programs" of the aforementioned variety, and in addition a subscription for his agents to the "Tom Hopkins Sales Management" course. Further efforts included substantial office remodeling, enlargement of space, purchase of desks, phones, secretarial help, and so forth.

MLS figures showed that none of these efforts had resulted in significant increases in market percentage or in absolute dollar volume for the target brokerage. As a last attempt, before approaching us, the broker had hired as many agents as could qualify via state licensure on the assumption that overall dollar volume accordingly would increase. Thus, throughout the year prior to program inauguration, the sales force was increased by about 33% (exact figures not available). Unfortunately, while a slight increase in dollar volume may have resulted from the last endeavor, a concurrent elevation in the costs of maintaining this large cadre of relatively unseasoned and non-productive agents resulted in an actual decrease in profitability for the company. In addition, company profitability was affected by the fact that only a single million-dollar and two \$750,000 sales records were evident within

the previous year's sales force. Thus, the company can be described as "faltering" when we were approached. Also, it may be noted that 1977 was a year when housing costs jumped and interest rates rose to an unprecedented high of around 10%, thereby discouraging many prospective buyers.

Clearly, for brokerages that currently share some of these problems, any work-improvement program that can document an effective resolution likely will be of great interest. And, since many of the difficulties noted above permeate the industry as a whole, the present report of such an accomplishment well may be quite timely and useful. Those interested in behavior-management applications also may find this report interesting since it was addressed to a unique work population (as far as the literature is concerned), required novel procedural adaptations that may prove useful in related applications, and since it contained various methodological refinements (cf. the lead article of this series) not often present in other organizational behavior-management undertakings. In these respects, the present project had general purposes in common with a study recently reported by Luthans, Paul, and Baker (1981).

Method

Subjects

A sales manager (trained to be a behavior manager) and a total of 35 agents served as participants at various times throughout the study. At the outset, there were 27 full-time and 8 part-time agents. However, 9 full-time persons resigned within 2 weeks following announcement of the program, and two others left within the next 13 weeks. Of these various subjects, 16 participated throughout all stages of the program, and thus constitute the sample reported on below (data for the others are available upon request). Females and males were equally represented in the final sample. Mean age was 35 (range, 22-64), and average educational level was 1.5 years of college (range, 10th grade-college graduate). All had at least one-year of selling experience at this brokerage (average experience = 2.5 years, range = 1.5 yrs). All were Caucasian, had lived in the community at least three years, and gave every appearance of being similar in characteristics to other major brokerage agent "pools" in the area.

Apparatus and Materials

The primary materials involved various charts, forms that were used to collect information, record keeping portfolios, and separate office space to store the data, house the behavior manager and post the charts. The charts

were regular sheets of 8-1/2 x 11 inch (21.6 x 27.9 cm) graph paper, and most of the portfolios were standard loose-leaf notebooks. The major form that was used was a so-called "smile sheet" that requested "fill-in" information from agents on clients that they contacted. This information included name, address, phone number, nature and date of contact, action taken by agent, and several items relevant to client financial status, current property holdings, and so forth. The back of this form requested information including the date(s), nature of the contact(s), action(s) taken, and so on. (Sample form is available upon request, given proprietary guarantees.)

Design

The design of the project conformed to a combined intrasubject-replication procedure including withdrawal and reversal components. Because the two primary measurements of behavior that were used depended upon agent self-report, the project could not begin with covert data collection. From the outset, then, agent data were formed into individual charts and impartially displayed (without comment) for 20 weeks (Baseline). A token reward system based on a conjunctive requirement involving two behaviors then was introduced for 15 weeks (Intervention) followed by, respectively, an announced 3-week period preceding program withdrawal (Anticipated withdrawal), and a 4-week period during which all program features were withdrawn (Withdrawal). Subsequently a 6-week period ensued wherein program procedures were reinstated but conjunctive token reinforcement requirements were reversed across the target behaviors (Reversal).

Procedure

The behavior manager was a former student of the first two authors and a college graduate in psychology (later replaced by a female college graduate in sociology, also formerly trained by the authors), and thereafter for the duration of the project would serve in the capacity of both positions until it was firmly underway. Since the behavior manager knew little about the real-estate profession, he not only took a "crash course" in relevant aspects of this vocation but also quickly developed resource persons from whom he could obtain answers to real-estate questions and other related helps.

Behavior designation. Considerable preparation was needed to discern which activities from the potential repertoire of behaviors of an agent should be targeted for change in order to bring about an overall increase in sales productivity. A major factor in the final choice was the overwhelming consensus in this industry that a strong, positive correlation likely existed be-

tween number of client contracts and sales volume). On the basis of this information, together with the past experiences of the broker (i.e., the company president) and several key agents, two kinds of agent contacts ultimately were chosen as the major dependent variables of this project: namely, (1) initial contacts (with prospective clients) concerning either property listings or sales of any kind, and (2) follow-up contacts (with established clients) of the same nature. Restrictions on these categories required all contacts, both initial and followup, to entail personal, face-to-face involvement with a client or prospect. This stipulation was made on the assumption that face-to-face contacts likely would be more highly correlated with subsequent sales (and listings) than less personal phone conversations or mailings. A special form, the "smile sheet," was developed to record the occurrence of these behaviors.

Reliability. Since the data-collection procedure relied exclusively upon self-report, a combined accuracy-reliability procedure was developed. This was accomplished through the development (and application) of a courtesy questionnaire that was incorporated within a folded, two page postcard. The superficial impression created by this questionnaire (based on preliminary testing) was that the brokerage and agent wished to obtain helpful information regarding the quality of agent-client contacts. The card assured each respondent of anonymity, was return-addressed and stamped, and was mailed to every client in response to a reported contact. (A sample card is available for inspection, given proprietary observances).

In reality, the primary reason for this questionnaire was not to obtain courtesy information. Of course, any valid information in this regard would have been used to improve customer-agent relationships. However, it was our judgment that no useful "courtesy" information was supplied by the questionnaire since virtually every return indicated uniformly positive agent demeanor and rapport, regardless of circumstance or person. We viewed this to be a reflection of a pervasive response bias by prospects to avoid difficulties through acquiescence. Instead, the information exclusively was used both to discern whether the agent actually had contacted the client as well as to determine the nature of that contact, (i.e., face-to-face or otherwise). Since only about 30% of the cards were returned during the initial eight weeks of usage, the behavior manager thereafter randomly sampled from the mailing list and followed up on selected clients with a personal phone call. Those called were reminded of the postcard and then were informed that the purpose of the call was to personally collect the requested "courtesy" information by phone. Again, the call served mainly to discern the authenticity of the agent's report. Since, based upon data collected from over 100

phone calls and postcards received, there was not a single instance of inaccuracy of agent report, no further mention of this information will be made. These data are taken as support for the accuracy and reliability of the results reported below.

Baseline. A dinner meeting was used to introduce the program to the agents. All were informed briefly about the financial problems facing the brokerage, of the numerous past unsuccessful efforts to assist agents to greater productivity, and of some of the rationale and successes that had characterized programs such as the one about to be introduced. All were requested to participate voluntarily on the promise that cooperative involvement for a trial period of six months would be followed by democratic polling of agents (in a similar meeting) to discern whether or not to continue further. Care was taken to avoid any mention or suggestion of a reinforcement procedure (to be introduced later). (The only program ingredients that were discussed were those in connection with a "feedback system" that critically depended upon (1) the consistent and accurate use by each agent of the "smile sheets," (2) keeping a schedule of weekly meetings with the behavior manager for purposes of recording information from the forms, and (3) posting of this information in the form of individual charts on the wall of the behavior manager's office. (These charts were clearly visible to the entire work force due to a full-length glass window that separated this office from the larger agent desk area.)

All were informed that individual company-relevant "performance charts" also would be posted immediately beneath respective behavior charts. These charts provided weekly information, by agent, on four relevant performance indices: namely, numbers of pending sales, actual sales, pending listings, and actual listings obtained. (In addition, monthly sales volume was collected but not posted for each agent). Finally, an attendance chart for biweekly sales meetings was posted on an opposite wall. This chart, introduced upon the insistence of the company president, was scored in terms of number of minutes attended for each meeting. All charts were coded anonymously at the request of the agents (voted upon at the initial dinner meeting). A vote also was taken from the agents regarding their willingness to participate.

While the latter vote was unanimous, 11 full time agents, as noted above, left the company shortly thereafter. Included among these were the two females that each had sold over \$750,000 in properties during the preceding year. The result of this exodus was a diminution in number of full-time agents to the 16 participants that remained throughout most of the program year. Although 12 additional full-time agents were recruited to the program over

the next year, only the complete data for these original 16 agents are reported below. (Data are available upon request for these 12 agents all of whom performed about the same throughout the project as those that are represented in the results.) The baseline period of recording and posting extended for 20 consecutive weeks.

Intervention. This phase, also inaugurated with a dinner meeting, entailed introduction of a token system that had been carefully evolved in connection with a detailed consideration of the data collected during baseline. The considerations of importance here included the calculation of correlation coefficients for the relation of each of the dependent variables with each of the four performance indices. Also, various ratios were determined depicting the average number of contacts per listing and per sale for collections of agents that exhibited relatively high, low, or intermediate client-contact rates. Correlation coefficients between initial contacts and sales, between initial contacts and listings (scores averaged over the initial 15 weeks in all cases), between personal followups and sales, between personal followups and listings, and between initial and followup contact behaviors all exceeded .61 (range .61-.87, $df = 15$, all $ps < .01$), and were quite high in absolute terms. While these coefficients could not supply the basis for definitive causal inference (cf., Cook & Campbell, 1979), they were consistent with the view that the behaviors chosen for change were relevant, (i.e., were important to the sales process). Of the two, initial contacts were viewed as the more relevant to desired brokerage outcomes and, as shown in Figure 1, were also the more infrequent.

The ratios of initial contacts to sales and to listings for the five high achievers, averaged respectively over program weeks 11-15, provided the basis for developing performance goals and cutoff values for the token system. High achievers averaged about six initial and 15 followup contacts per week during baseline weeks 11-15 and also maintained correspondingly good-to-outstanding sales and listings records during this period. Daily observations and evaluation of each of these salespersons suggested that achievement of these behavioral averages took less time than two full, 8-hour days per week. Thus, in order to increase the overall frequency of initial contacts without sacrificing an acceptable followup rate, a conjunctive-like system (cf., Morse, 1966) of token dispensements was devised and introduced at the intervention "kickoff" dinner.

This system required a minimum of 15 followup and six initial personal contacts within a designated "contract" period before credits could be earned

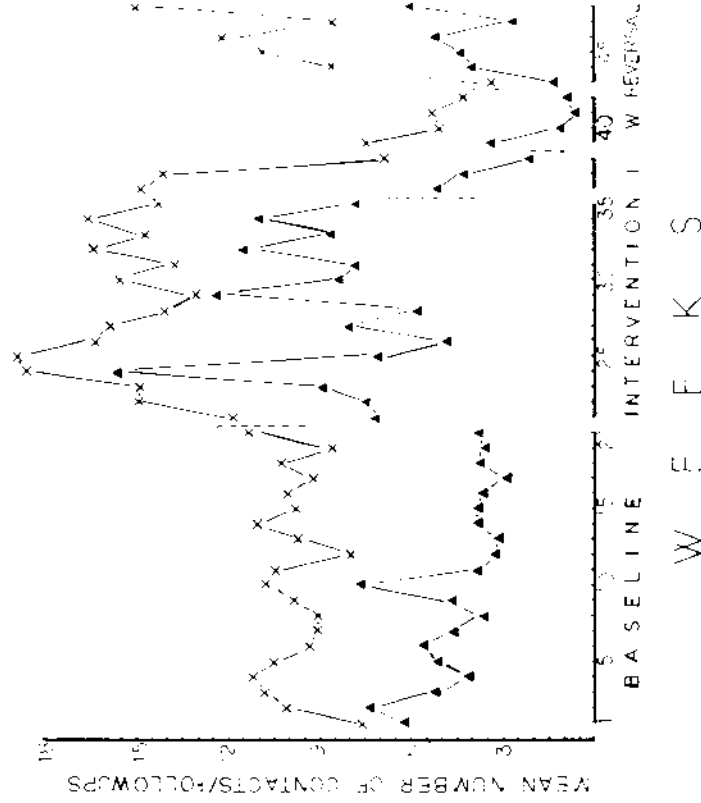


FIGURE 1. Number of initial (x) and followup (Δ) contacts, arranged by week for agents for the 20-baseline, 15-intervention, 3 pre-withdrawal (D), 4 withdrawal (W), and 6 reversal weeks.

for each additional initial contact. After this requirement was met in a period, a token would be given per initial contact up to a total of 16, and two credits for each thereafter. A "contract" period was one week, at the end of which the record of each agent was reset to zero and the accumulation of agent activities counting toward criterion levels was started anew. Credits were always awarded during the biweekly sales meetings, and could be accumulated and/or traded in for any of 60 items. These items ranged from 10 gallons of gas (11 points) to a registered slate pool table (1000 points). This list is available for inspection upon request (given proprietary assurances).

The actual cost to the company for each token was about \$0.35. This value was determined from an analysis of the various above-noted ratios that had

been calculated between personal contacts, listings, and sales in order to discern a conservative estimate of the worth (in likely sales dollars) of meeting the criterion levels of contact behavior. In part, this estimate was conservative because of the possibility that the intervention system might be accompanied by an attenuation in these ratios, (i.e., more activities but proportionately fewer sales or listings).

Anticipated withdrawal. The intervention lasted for 15 consecutive weeks. A dinner meeting then was used to announce that the full program, including feedback and reward systems, possibly was to be withdrawn three weeks hence. All were asked to continue recording contacts on their "smile sheets" during this "pre-withdrawal instruction" period in the event that the program might be reinstated sometime in the future.

Withdrawal. Another dinner meeting was used to announce actual program withdrawal. All again were requested to continue recording contacts on their "smile sheets," but the feedback and token systems were discontinued. This withdrawal period lasted four consecutive weeks.

Reversal. A sales meeting was used to discuss re-inauguration of the program. While all had voiced discontent over program withdrawal and enthusiasm at reestablishing the system, there also was strong consensus among the agents that the reward system for initial contacts should be changed to reinforce followup behaviors instead. Accordingly, an identical "conjunctive-like" credit-exchange system that entailed the reverse contingency from that used during intervention was introduced. Here, credits were given for every personal followup contact after six initial and 15 personal followups had been made. The contact period again was "refreshed" every week, and two credits could be earned for every followup in excess of 25 during each period. The end of the 6-week reversal phase marked the conclusion of our formal data collection procedures in this organization.

Results

Behavioral Measures

The number of initial and followup contacts, averaged by week for the 16 full-time, full-project participants, are shown in Figure 1 for the baseline, intervention, pre-withdrawal instruction (I), withdrawal (W), and reversal phases of this project.

Trends and levels for these measures changed across the various phases of the project. Following an initial increase, followup contacts showed a modest decline and then remained relatively stable and at a higher overall

level than initial contacts for the baseline phase. In contrast, initial contacts showed (except at Week 10) a gradual decline in mean rate throughout most of this same time frame.

Both measures markedly increased upon introduction of the token system (intervention), a trend that continued over the ensuing four-five weeks. These measures then decreased somewhat over a brief period, and finally followed a modest albeit variable upward trend thereafter over the terminal weeks of this intervention period. Prewithdrawal instruction had a marked attenuating influence on both activities in spite of the fact that the combined feedback reward intervention system remained in effect during this period. And, although there was a modest increase for each activity (not reliable) at the outset of withdrawal, this decrease continued over the initial two weeks. Finally, with the exception of Week 47, both activities showed a pronounced increase to near-intervention performance levels over the six-week reversal period.

The extent of direct replication of program effects across agents in this project is at least partly revealed by Figures 2 (initial contacts) and 3 (followups). For each type of contact separately, these graphs depict the mean number of behaviors for agents grouped or "blocked" according to the level of their initial contact performance during the first five weeks of baseline. The "high" (H) group included the three agents with the three highest scores, the "low" (L) group entailed the three agents with the lowest totals, and the "intermediate" (I) group involved the remaining 10 agents. The group or "blocking" effects that are depicted in Figures 2 and 3 show somewhat different patterns both across phases within a behavior type as well as across types.

In an effort to maximize the effect conclusion validity of these findings (cf. the lead article), various statistical analyses were applied to both sets of behavioral data. Included in these analyses, for purposes of evaluating the extent of direct replication, was the "blocking" or grouping factor described above.

Initial Contacts. Separate groups \times weeks ANOVAs were applied to the data of each phase for this variable. Table 1 summarizes the pattern of outcomes of these analyses, and shows, as the first major feature, that the group effects were reliable for all but the reversal period. A second feature of these analyses was the reliable groups \times weeks interactions only for the baseline and intervention phases. Followup analyses indicated that the interaction during baseline was due to a relatively more rapid decline in performance over weeks for the "high" as opposed to the other two groups. Performances were the same and quite low for all subgroups by the end of this baseline period.

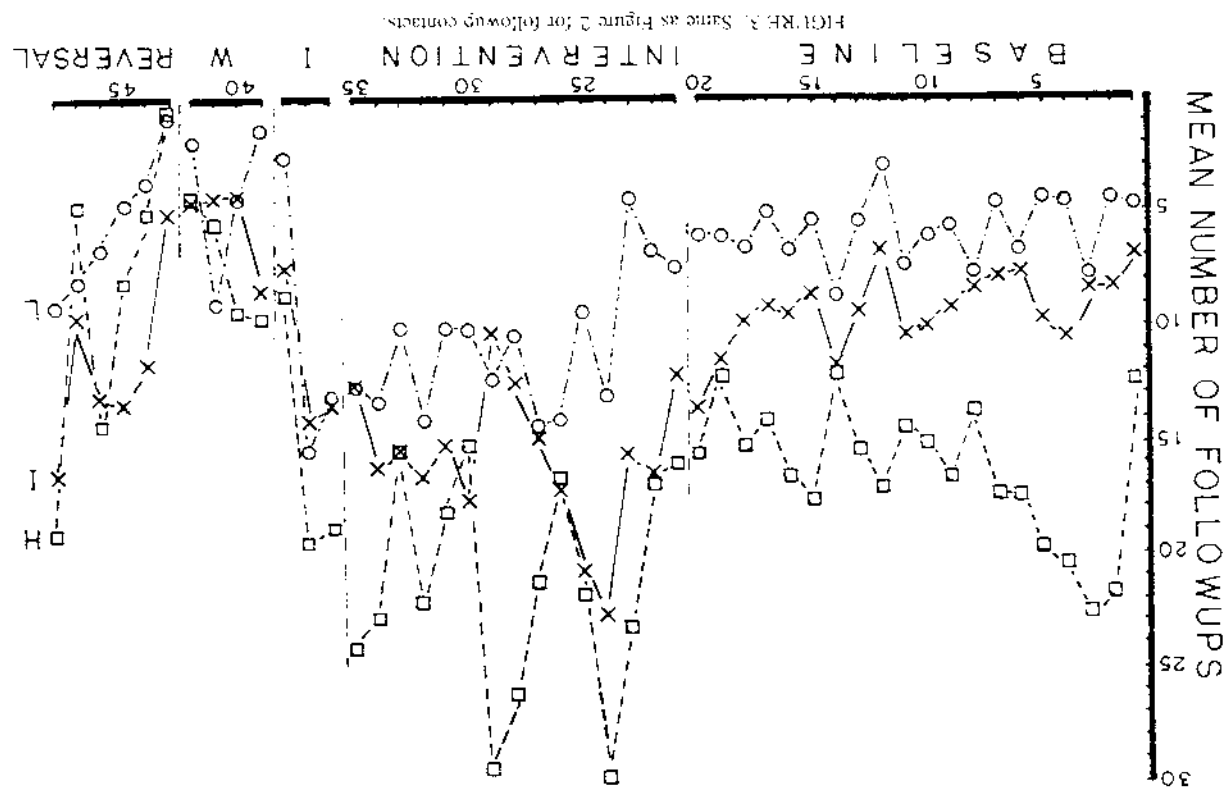
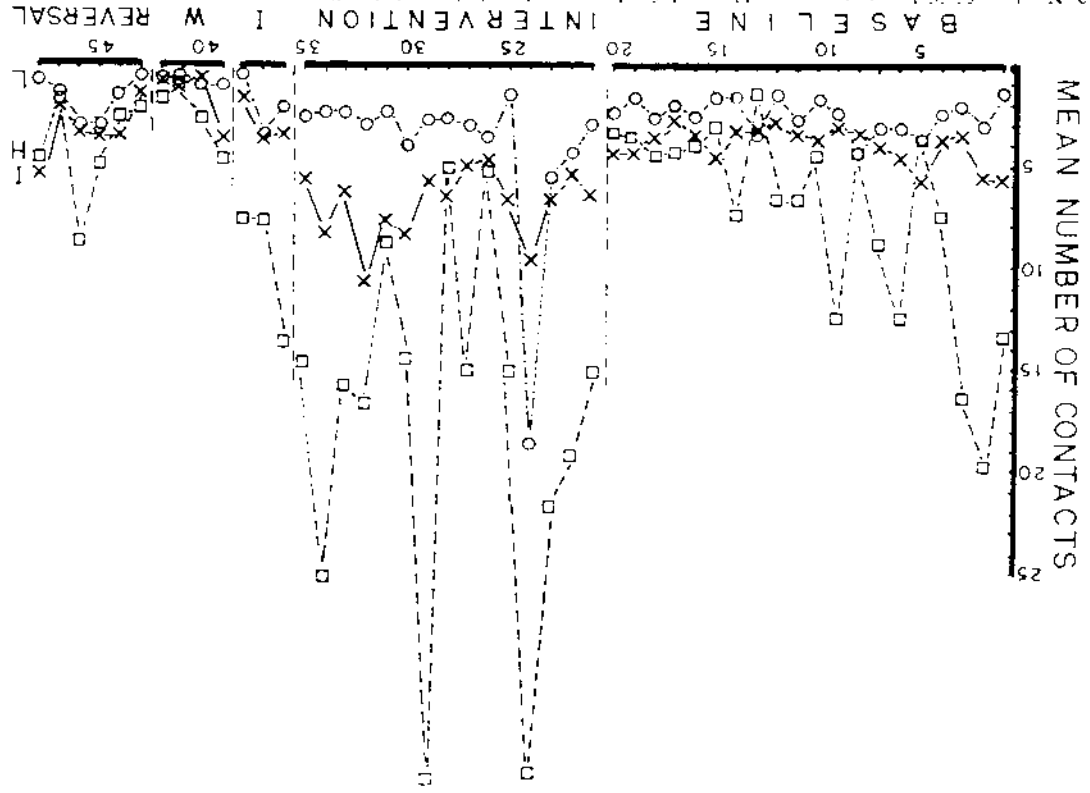


FIGURE 3. Same as Figure 2 for follow-up contacts.

FIGURE 2. Number of initial contacts, averaged by week for the agents that, during early baseline weeks, performed lowest (O), highest (X), or intermediate (X) to the latter two groups for the various project phases. Except for group designations, the legend is the same as Figure 1.



Relevant followup analyses indicated that the groups \times weeks interaction for the intervention period primarily was due to the complex pattern of performance changes for the "low" as opposed to the other two groups. All showed during intervention an initial phase-related increase in contacts over baseline values, followed by a decrease. However, in contrast to the "high" and "intermediate" groups, the "low" groups stabilized at a level during the latter weeks of intervention that was only slightly higher than their terminal baseline activity.

All groups showed marked and parallel activity declines across both the instruction and withdrawal periods, with performances at the end of withdrawal for each group being reliably below that for respective terminal baseline behavior levels. Finally, during reversal, all groups showed increases in behavior, but terminal levels were reliably higher than those at the end of baseline only for the "high" and "intermediate" groups.

Of the various ways to document statistically the across-phase activity changes that occurred, several groups \times weeks-within-phases ANOVAs were performed on the data. Two of these analyses were employed to assess the transition from baseline to intervention. The first entailed comparison of the terminal 15 weeks of the baseline with the entire 15-week intervention phase by means of a 3 (groups) \times 2 (phases) \times 15 (weeks) ANOVA. The second differed from the first in that only the 3-week periods immediately before and after the onset of intervention were analyzed. To statistically evaluate the effect of the transition from intervention to pre-withdrawal instruction, a third analysis identical to the second above was applied to the terminal three intervention weeks and the entire three weeks of pre-withdrawal instruction data. The transition effect from instruction to withdrawal per se was assessed by a fourth analysis consisting of 3 (groups) \times 2 (phases) \times 3 (weeks) ANOVA applied to the entire 3 weeks of pre withdrawal instruction and the initial three weeks of the withdrawal period. Finally, a fifth analysis evaluating the transition to the reversal phase was examined by a 3 (groups) \times 2 (phases) \times 4 (weeks) ANOVA applied to the full four weeks of withdrawal and the initial four weeks of the reversal phases.

The outcomes of these five analyses are listed in Table 2. While that pattern of effects for each of these analyses is complex, certain common features can be discerned. For instance, every analysis yielded a reliable phase effect, supporting observations that real changes took place at each across-phase transition point. Further, each produced a significant groups \times phases interaction effect, thereby documenting that these transition effects differed as a function of the blocking factor (i.e., the initial baseline performance level). Appropriate follow up analyses of these interactions indicated that these effects were due, in most cases, to the relatively greater impact of each

Baseline		F	df	p
G	10.2	2, 13		*
W	4.4	2, 237		*
G \times W	3.2	2, 217		*
Intervention				
G	39.13	2, 13		*
W	4.23	11, 126		*
G \times W	2.26	2, 109		*
Withdrawal				
G	9.26	2, 13		*
W	4.55	2, 26		*
G \times W	1.37	1, 26		—
Reversal				
G	7.77	2, 13		*
W	2.20	3, 31		—
G \times W	3.17	1, 30		—
Reversal				
G	2.5	2, 13		—
W	3.93	5, 65		—
G \times W	2.50	1, 65		—

TABLE 1. Groups (3) \times weeks ANOVAs of initial contact measures for each program phase. The symbols G, W, and G \times W represent, respectively, group and week main effects and the groups \times weeks interaction outcome.

subsequent phase upon the "high" and "intermediate" as opposed to "low" performers. That is, the former groups generally exhibited greater increases during intervention and reversal or more precipitous or greater decreases during pre-withdrawal and withdrawal periods than the latter group. Finally, several of these observed groups \times phase interactions varied with weeks

Phase	Intervention	15	15
Phase (1) vs. Phase (2)	1	3,137	3,113
	2	3,067	3,113
	3	3,129	3,133
	4	3,226	3,133
	1 x 1	3,226	3,113
	1 x 2	3,226	3,133
	1 x 3	3,226	3,133
	1 x 4	3,226	3,133
	1 x P	3,226	3,133
	1 x R	3,226	3,133
Phase (2) vs. Phase (3)	1	3,137	3,233
	2	3,058	3,233
	3	3,200	3,233
	4	3,226	3,233
	1 x 1	3,226	3,233
	1 x 2	3,226	3,233
	1 x 3	3,226	3,233
	1 x 4	3,226	3,233
	1 x P	3,226	3,233
	1 x R	3,226	3,233
Phase (3) vs. Phase (4)	1	3,137	3,233
	2	3,058	3,233
	3	3,200	3,233
	4	3,226	3,233
	1 x 1	3,226	3,233
	1 x 2	3,226	3,233
	1 x 3	3,226	3,233
	1 x 4	3,226	3,233
	1 x P	3,226	3,233
	1 x R	3,226	3,233
Phase (4) vs. Phase (5)	1	3,137	3,233
	2	3,058	3,233
	3	3,200	3,233
	4	3,226	3,233
	1 x 1	3,226	3,233
	1 x 2	3,226	3,233
	1 x 3	3,226	3,233
	1 x 4	3,226	3,233
	1 x P	3,226	3,233
	1 x R	3,226	3,233

TABLE 2. Phase transition analyses involving groups (3) x phases (2) x weeks-within phase ANOVAs. The respective phase wise comparisons entail, respectively, the last 15 baseline, Bsln (15), and all 15 intervention, Intv (15), weeks, the 3 weeks before, Bsln (3), and after the onset of intervention, Intv (3); The last 3, Intv (3), versus all pre-withdrawal, instruction weeks, Intv (3); The later versus the first 3 weeks of the withdrawal phase, Withdr (3); and all of the withdrawal, Withdr (4), versus the first 4 weeks of the reversal period, (Revs) (4), with the addition of a phase dimension. P, the symbols mean the same as Figure 1.

yielding significant triple interactions. Again, relevant followup analyses verified that these effects mostly were due to the dissipation over weeks of the two-way interactions of groups and phases just described.

Follow-up contacts. Tables 3 and 4 describe for the followup contact data the outcomes of the same respective sets of statistical analyses (summarized in Table 1 and 2) that were applied to the initial contact behaviors. The major differences between these outcomes and those reported for initial contacts were the respective absences in each of the latter analyses of any groups or groups x phases interaction effects. Indeed, as Table 3 shows, no effects emerged reliable for the separate analyses that were applied to the data for baseline-, intervention-, or withdrawal-only performances. Thus, the apparent group differences in followups during the baseline stage of Figure 3 were not significant. Moreover, only the weeks effect was significant for the instruction- and reversal-only phases. Thus, the major effects of interest for each of the across-phase transition analyses summarized in Table 4 were those level changes for each group attributable to phase-transitions.

Performance Indices

Numbers of pending sales (PS), sales closed (SC), new listings (NL), and listings closed (LIC) respectively were averaged by group (i.e., the high, low, and intermediate designations used above) and, as nearly as possible, by phase. However, since these data were available only on a monthly basis, it was necessary to combine the pre-withdrawal, withdrawal, and reversal phases to preclude the representation of only partial months. The resulting group means for each type of performance are shown by phase in Figure 4 as multilevel bars. The top of the striped portion of each bar corresponds to the performance of the "low" (L) group, whereas the tops of the open and closed portions correspond respectively, to "intermediate" (I) and "high" (H) groups performances. Mean monthly sales in each stage, beginning approximately two-1/2 months prior to baseline recording, also is shown for each group in Figure 5 (again collapsed over the last three phases).

The correlations of importance between the contact behaviors and these various performance indices can be discerned from a visual comparison of baseline and intervention periods in Figures 2 and 3 with the data of the initial two phases shown in Figure 4 and 5. In general, such comparisons reveal that subjects who evinced a high rate of initial contacts during baseline (i.e., the high group) not only continued to evince a relatively high rate of these same behaviors throughout the entire project, but also sold, listed, and

<u>Baseline</u>	<u>Z</u>	<u>df</u>	<u>p</u>
G	3.65	2, 12	—
W	< 1.0	10, 247	—
G x W	< 1.0	33, 247	—

<u>Intervention</u>	<u>Z</u>	<u>df</u>	<u>p</u>
G	< 1.0	2, 12	—
W	1.09	11, 192	—
G x W	1.00	26, 192	—

<u>Preval Instructions</u>	<u>Z</u>	<u>df</u>	<u>p</u>
G	< 1.0	2, 13	—
W	10.06	2, 26	—
G x W	< 1.0	3, 24	—

<u>Withdrawal</u>	<u>Z</u>	<u>df</u>	<u>p</u>
G	< 1.0	2, 13	—
W	< 1.0	3, 30	—
G x W	< 1.0	6, 33	—

<u>Reversal</u>	<u>Z</u>	<u>df</u>	<u>p</u>
G	< 1.0	2, 13	—
W	4.27	5, 55	—
G x W	< 1.0	10, 65	—

TABLE 3. The same analyses as for Table 1 applied to follow-up contacts. Legends are the same.

developed (i.e., had pending) more properties during the baseline and intervention phases as well. However, with the exception of the new-listings measure, this correlation was not well preserved during the combined terminal phases of the project, (i.e., the combined pre-withdrawal-instruction, withdrawal, and reversal conditions). Furthermore, all performance indices in Figure 4 show a gradual decline over phases, likely reflecting the general effects of extra-project factors, such as seasonal buying/selling patterns and

increasing interest rates, that are known to affect this industry. (In this connection, it can be noted that our intervention coincided with early fall, whereas withdrawal and reversal phases were toward later fall and early winter. Over this period, property transactions in this industry decline annually due to seasonal changes in the market).

Statistical analyses of these performance measures entailed appropriate

<u>Inst. (1) vs. Inst. (2)</u>	<u>Z</u>	<u>df</u>	<u>p</u>
G	1.15	2, 13	—
W	2.97	3, 30	—
G x W	1.0	10, 33	—
G x P	< 1.0	2, 13	—
G x W	< 1.0	3, 30	—
P x W	< 1.0	11, 33	—
G x P x W	< 1.0	26, 33	—

Inst. (1) vs. Inst. (2) ...
same pattern of effects as above

<u>Inst. (2) vs. Withdrawal (1)</u>	<u>Z</u>	<u>df</u>	<u>p</u>
G	< 1.0	2, 13	—
W	1.82	2, 12	—
G x P	7.33	2, 26	—
G x W	< 1.0	2, 13	—
P x W	3.26	3, 30	—
G x P x W	< 1.0	6, 33	—

<u>Inst. (2) vs. Reversal (1)</u>	<u>Z</u>	<u>df</u>	<u>p</u>
G	< 1.0	2, 13	—
W	7.05	1, 13	—
G x P	5.7	2, 26	—
G x W	< 1.0	2, 13	—
P x W	4.26	3, 30	—
G x P x W	< 1.0	6, 33	—

<u>Withdrawal (1) vs. Reversal (1)</u>	<u>Z</u>	<u>df</u>	<u>p</u>
G	< 1.0	2, 13	—
W	< 1.0	1, 13	—
G x P	1.02	3, 30	—
G x W	< 1.0	2, 13	—
P x W	< 1.0	6, 30	—
G x P x W	7.44	3, 30	—
G x P x W	1.02	6, 33	—

TABLE 4. The same analyses as for Table 3 applied to follow-up contacts. Legends are the same.

application of various forms of the groups \times phases \times weeks-within-phases ANOVA model used above. Space precludes a detailed consideration of all outcomes from these analyses. However, the two observations made above with respect to Figures 4 and 5 were more pronounced during baseline and intervention than during the combined terminal phases. Also, the decline of all measures across phases in Figure 4 was highly significant.

Of special interest was the pattern of outcomes for mean monthly sales (shown in Figure 5). For analysis, these data were blocked for each group into three comparable sets of four monthly periods each. The resulting blocks of four months corresponded approximately to the first 4 months of the baseline period (Block 1), the entire intervention (Block 2), and combined instruction-withdrawal-reversal phases (together with a single post-program month (labeled with the last W in Figure 5). A 3 (groups) \times 3 (blocks) \times 4 (months) ANOVA of these data yielded significant effects only for blocks, $F(2, 28) = 6.89, p < .01$, and the groups \times blocks interaction, $F(4, 28) = 2.74, p < .05$. Followup analyses revealed that, for all groups combined, the dollar volume sold was greatest for Block 2, compared to about equal but lesser volumes for Blocks 1 and 3. Moreover group ordering differed across blocks. For Blocks 1 and 2, the "high" group outsold both "lows" and "intermediates;" for Block 3, both the "high" and intermediate" groups outsold "lows" but not one another. Overall, then, mean dollars sold per agent markedly increased during the combined baseline-intervention phases, relative to preprogram levels, but then only moderately decreased during the tenure of the project. Additional followup analyses indicated that maximum sales occurred during the ninth month of the program, although overall sales were almost as high for the third and fifth program months. Finally, it is noteworthy that overall sales were reliably lower for all groups in the last 4-week period of Block 3 (i.e., post program) than for any other.

Organizational Outcomes

The statistics in this section were collected from the area MLS office. However, MLS data often were not processed, rarely seemed fully complete or organized, and never were available in the form discussed in this section. Further, their records often lagged far behind the actual real estate transactions that occurred in the area, in part because many firms were quite deficient in making reports. All of this precluded a "fine grain" and fully accurate determination of relative company performance for specific periods.

Nevertheless, according to MLS records, during the year preceding the behavior management program the brokerage hired 8% of the agents in the area and captured 6.7% of the local market. During the actual program year,

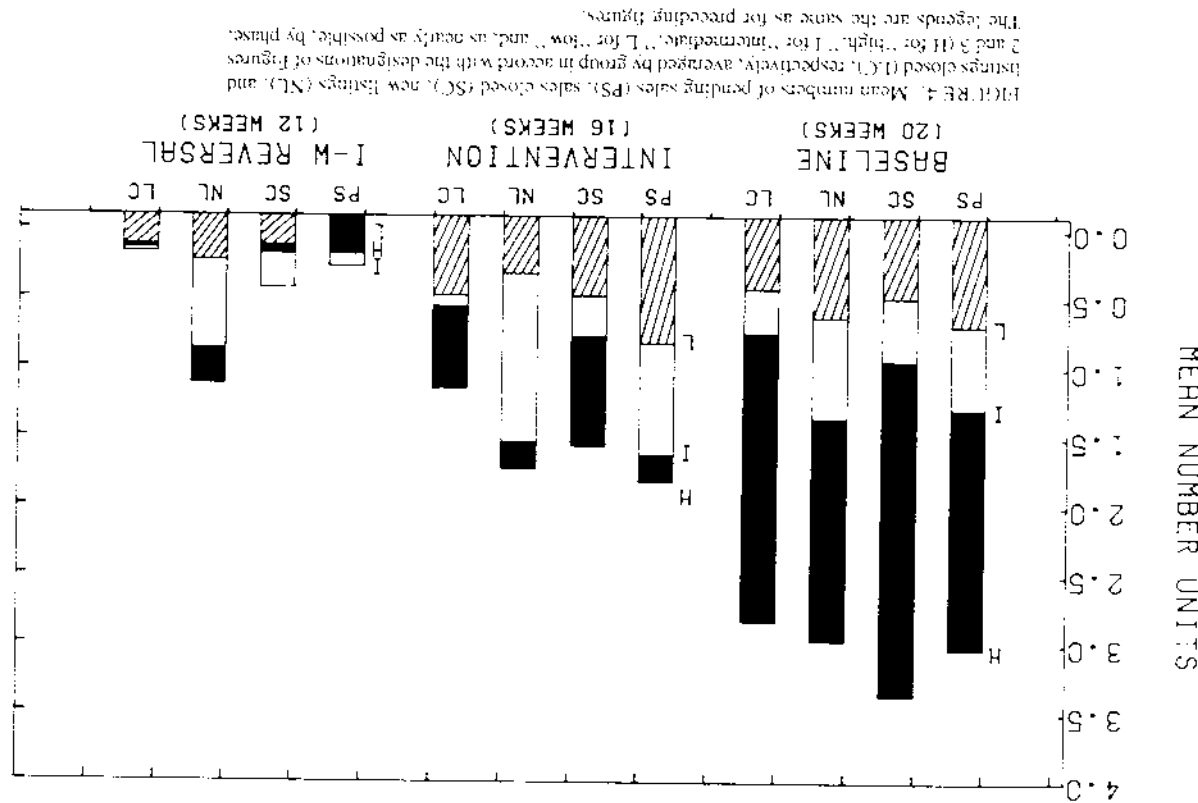


FIGURE 4. Mean numbers of pending sales (PS), sales closed (SC), new listings (NL), and listings closed (LC), respectively, averaged by group in accord with the designations of Figures 2 and 3 (H for "high," I for "intermediate," L for "low" and, as nearly as possible, by phase. The legends are the same as for preceding figures.

these figures changed to 5% of the agents and 12-13% of the market, respectively. In the three months following program termination, the company increased to 6% of the agents but declined to 3% of the area business.

In terms of dollar volume, the area business percentage translated to 9.3 million preprogram dollars of property sold versus a minimum of 13 million during the program year. Also, according to MLS figures agent income averaged over all brokerages during the preprogram year, was \$7,570 compared to a mean of \$6,927 for the present company. During the program, these figures changed respectively to \$6,400 for the average salesperson and a mean of \$14,000 for the present brokerage agents.

Although based upon incomplete information, the reasons for these changes in brokerage revenues and average agent income seem directly traceable to the data on comparative numbers of closing, monthly dollar volumes, and numbers of million-dollar salespersons in respective years. That is, MLS records show that the number of closings for the present brokerage equaled or exceeded the area averages based on all brokerages only during September and October of the preprogram year, but exceeded the average for all but the months of January and February of the program year. Similarly, total dollar volume per month accounted for by the company exceeded area brokerage averages only for July, September, and October of the preprogram year, but was ahead of respective averages for all but the preprogram months of January and February of the program year. In addition, percent million-dollar salespersons per company was 4% (one of 27) for the brokerage and 6% for the average MLS company during the preprogram year and was 31% (5 of 16) and 15%, respectively, during the program year.

Finally, it should be noted that the percent agent attendance for the entirety of sales-meeting within the brokerage rose from a preprogram average of 50% to a program average of 97%.

Discussion

The major findings of this study can be discussed in relation to the various types of validity concerns outlined in our lead article. First, with respect the question of internal validity, it can be noted that a marked correlation was evident in the results between changes in the behavioral measures (initial and followup contacts) and introduction or withdrawal of the intervention. As Figure 1 indicates, subjects as a whole exhibited marked improvements in both behaviors following introduction of the token reinforcement program during intervention and reversal phases. However, during pre-withdrawal and withdrawal stages, the previous behavioral gains were clearly reversed.

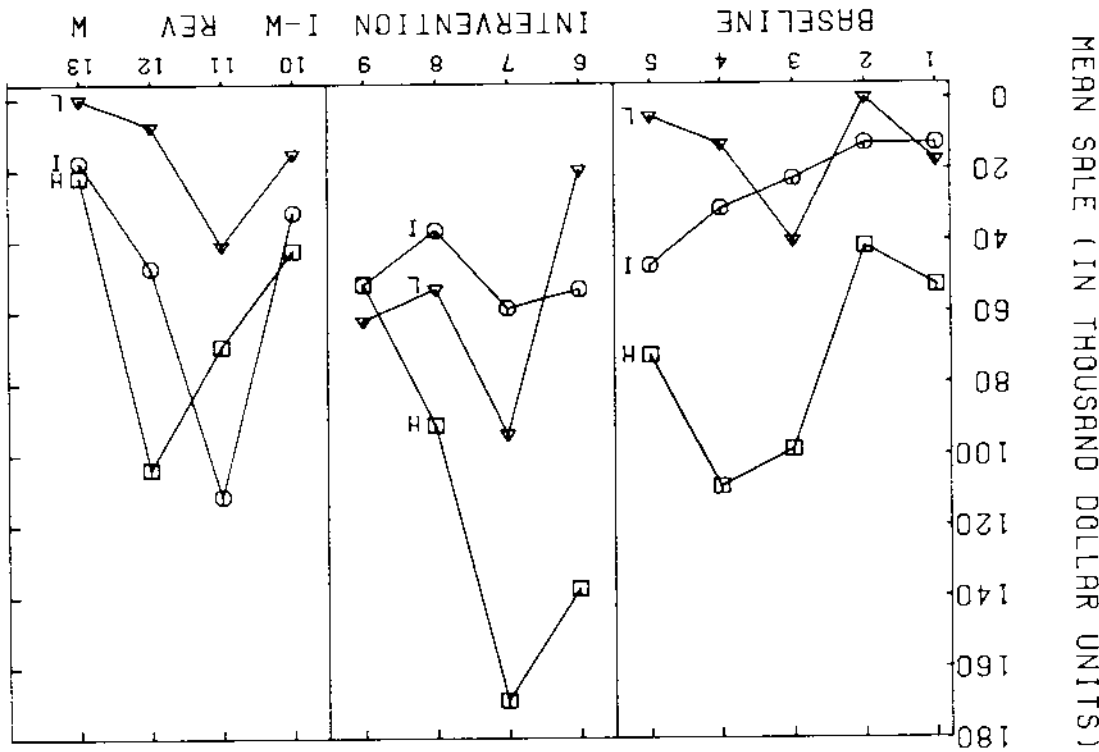


FIGURE 5. Mean monthly sales, beginning about 2½ months prior to baseline recording for the "high" (H), "intermediate" (I), and "low" (L) groups of Figures 2 and 3. Legends are the same.

These observations over all subjects are consistent, except as noted below, with those reflected in Figures 2 and 3 in terms of individual subgroup (high, intermediate, and low) actions. In general, as we noted in the lead article, a pattern of effects such as that obtained here can be viewed, in the context of a withdrawal design, as strong support for the conclusion that increased behaviors during intervention can be attributed to the treatment in effect therein (cf. Cook & Campbell, 1979).

However, a further question of importance for the interpretation of those findings concerns the extent of validity associated with the intervention itself. As noted in our beginning paper, two considerations are relevant here. One relates to the question of whether the manipulation was delivered as intended. In the present study, although there were no formal checks of this matter, there seem little doubt that such was the case. In general, with tangible reward systems such as we used, mere observation of token awards and exchanges are sufficient to establish this aspect of manipulation validity.

The other aspect of this validity concern relates to the question of which aspect(s) of the intervention was responsible for the observed behavior changes. In the present study, the treatment clearly was a multi-element package consisting at least of (1) visual and verbal feedback together with (2) token awards that were (3) performance contingent. Although a specific component analysis of these features was not conducted in the present case, certain inferences are possible regarding the relative contributions of certain elements. For one thing, it can be noted that baseline and intervention were similar in both having the feedback element present. Thus the changes following the introduction of intervention and/or reversal procedures cannot be attributed to this factor alone and must, therefore, have been due to the addition of the token system component.

Even so, however, it is still possible that feedback was effective, in and of itself. Unfortunately, it is difficult to get an accurate estimate of this effect in the present study. For the most part, this difficulty stems from the absence of pre-baseline measures of initial and follow-up contacts. Such measures were not obtained because we believed that the self-report system needed for this purpose itself supplied many of the ingredients that constituted the "feedback-only" procedure in effect during baseline.

But, the levels of contact behaviors observed during the withdrawal stage may be instructive here. Since only the self-report system was in effect at this stage, the procedures therein may be viewed as analogous to what would have employed in a pre-baseline without "feedback" (i.e., visual or verbal commentary). On the *assumption* that contact activities noted during withdrawal were not contaminated by the preceding phases, then the very

low levels noted there may be viewed as a "true" reflection of preprogram behavior, except for any effects of the reporting system itself. By this logic, the effects of feedback only could be estimated directly by comparison of baseline and withdrawal measures. An obvious conclusion from such a comparison would be that our feedback-only procedure was indeed effective on its own, although different estimates of this effectiveness would be obtained at the beginning and end of the baseline stage. Thus, it may be possible in the present study that the intervention effects were an additive combination of influences arising from both the feedback and token system.

With respect to the possible contribution of the performance contingency element of intervention, little can be said. Not only were tokens dependent upon performance in this stage, but this dependency involved a specific conjunctive requirement of the two behaviors. That the increased behaviors noted during this study were not peculiar to a specific conjunctive requirement can be inferred from the highly similar outcomes of intervention and reversal phases despite opposite conjunct criteria. Unfortunately, however, in the absence of a response-independent token procedure, no conclusions are evident regarding the general importance of the performance-contingency element. But, it should be noted that many existing studies support the view that response contingencies are important contributors to reinforcement effects (Skinner, 1969; although see Herrnstein, 1970).

Also, in connection with the issue of manipulation validity, it can be observed that the decline in initial contacts during the pre-withdrawal instruction period of this study poses some interpretive problems. During this stage, all of the previous intervention ingredients were still operative and combined with them was the "anticipation of withdrawal." The real interpretive problem here lies in the question of whether this instructional treatment functionally removed some important aspect of the intervention, such as "expectancy of reward" (Lawler & Suttle, 1973), or in fact added an inhibitory component not previously there, such as "frustration" (Amsel, 1972). In the former instance, we would be forced to conclude that yet additional features of the intervention, other than those specified above, are important to consider. However, in the latter event, it would be possible to argue that withdrawal itself may be viewed as a "package" treatment consisting of at least two components; namely, "physical" or "perceived" removal as well as "anticipated" or "psychological" removal of program features. In general, we find the latter possibility intriguing but rarely, if ever, addressed.

While the present study provides no definitive solution to the above problem, the finding of decreased performance during the pre-withdrawal stage upon which this difficulty is based raises an interesting issue related to "ef-

fect conclusion validity." This issue arises from the fact that it is possible to interpret this decline as a reflection of decreases only in reporting but not contact behaviors. That is, agents conceivably might have continued their "contacting" unabated even though, for whatever reason, "interest" in reporting was lost.

It seems that this possibility reflects generally upon the methodological adequacy of self-report measures such as we employed. Normally, typical "reliability" checks for self reports are designed to detect only those instances when a report was made in error, cases that may be termed "false positives." Conversely, however, it is possible that a subject will fail to report an instance of actual behavior, thereby resulting in a "false negative." Such occurrences cannot be detected without an external-observer-based recording system.

The possibility of "false negatives" in self-report data can influence effect-conclusion validity in two ways. On the one hand, it can result in an underestimation of behavior increases and, on the other, can lead to overestimation of behavior decreases. Several aspects of the present data suggest, at least indirectly, that "false negatives" were not a major factor in the present outcomes. One is that the operation of this factor to produce either spurious increases or decreases in contact behavior for this study should have been reflected in abrupt rather than gradual changes. The assumption here, of course, is that the behaviors involved in reporting, because of their lower "inertia" or effort requirements, would change more precipitously than contact activities. Secondly, the presence of "false negatives" in the data should have mitigated rather than supported the high correlations observed during baseline between contact behaviors and performance outcomes such as numbers of sales and listings. Also under such circumstances, it is unlikely that increases or decreases in contacts (i.e., changes in reporting behavior) would have been related to similar changes in sales and listings, such as found during intervention and subsequent phases. The existence of the latter relations in the present data therefore argue against a strict "false-negative" interpretation of these outcomes. Finally, it should be noted that the operation of a false-negative factor might be expected to be governed primarily by the prevailing reinforcement contingencies in effect. Thus, while one could interpret increased contacts during intervention merely as indication of the facilitative effects of the token reward program on reporting behavior, it would be hard to view the pre-withdrawal period as leading to a reduction in reporting given that the reinforcement system remained intact. But, if the decreases in contact behavior during this stage were "real" then there seems little basis for assuming that other apparent changes in contacts were not similarly genuine.

A question of further concern relates to the social validity of the present work improvement program. As noted in our introductory article, several considerations are relevant here. The first concerns identification of an adequate index of social functioning. In the present case, the performance measures relevant to sales and listings seem appropriate for two reasons. For one, these outcome measures were reasonably well correlated with our primary dependent variables, contact behaviors. For another, such indices are commonly employed in this industry to evaluate sales effectiveness.

A second consideration relates to the existence and nature of changes in the indices of social functioning during the project. Clearly, if a program is socially valid it must bring about changes that are beneficial to the organization. The organizational outcomes in this study as well as the improvements noted for sales and listings seem consistent with this criterion.

Finally, to demonstrate social validity convincingly it must be possible to show that any beneficial changes in indices of social functioning were at least correlated with the intervention period. Despite the probable existence of many extra-program influences with respect to sales and listings in this study, reasonable correlations of this nature were obtained for several performance indices.

It is of interest in this connection, however, to reflect on exactly how contact behaviors may have influenced sales and other performance indices in the present project. One possibility is that more initial contacts may have meant that more clients than during preprogram periods would be considering possible real-estate transactions with the company at any given time. But, periods of deliberation, of give-and-take negotiations, of filing for mortgage arrangements, and of participation in closing ceremonies (assuming the transaction proceeds with no obstacles) are inevitable no matter how many contacts are involved.

Viewed this way, it could be argued that the behaviors targeted for change in this project were designed to increase and then modestly prepare prospective "pools" of clients for such transactions, but not necessarily to change the proportion of clients that purchase or even to influence the actual decision-making behaviors of those so readied. By this analysis, then, an inept agent could have obtained more prospects by virtue of the present project, but well might have remained as awkward as ever in developing, preparing, or cultivating each for a sale. On this view, the present program may have been effective through increasing the absolute number of clients with whom each agent dealt. Assuming that the extant agent "hit rates" remained unmodified in spite of exposure to project contingencies, more business would be generated simply by virtue of the fact that an increased number of clients were contacted.

Finally, it is necessary to consider the external validity of the present program effects. The only evidence in this connection can be derived from the direct replication of intervention effects in the present study across in individuals. While the contact activity of all agents likely was causally influenced by the procedures of this study, some salespersons clearly were more affected than others. Agents that did not make many initial contacts during the early baseline weeks never achieved full program benefits throughout the study, even though all gave clear evidence during the early weeks of being affected by intervention reward procedure. It is possible to speculate here that the reward contingencies during intervention could not fully sustain this initial change in contact rate at levels sufficiently high for this group to come into full contact with the inherently rewarding facets of increased sales and listing performances supplied by the standard commission. Thus, although the intervention was demonstrably successful in maintaining behaviors for the intermediate and high groups, perhaps a highly specialized intervention procedure, (e.g., a changing-criterions reward contingency, more frequent and/or potent payoffs, etc.) may be needed for the maintenance of behavior change in subjects that exhibit especially low initial activity rates.

It is important to note here that the low performers of this project differed from similarly-defined low performers in the immediately preceding hotel project where we also employed token reinforcement procedures. Rather than showing only transient improvement, the initially low performers in that project more typically exhibited rapid increases to levels characteristic of respective intermediate groups where they remained stable thereafter. While many features distinguish that work population from the present, one of obvious importance emerges from a consideration of differences in the jobs themselves. When low performers have shown rapid and perseverative improvements, the tasks have been relatively structured and the behaviors targeted for change have been much more likely to fully account for task outcome variability. That is, the behaviors targeted for change very directly impacted against both complete and immediate task fulfillment. Thus, the activities entailed in cleaning a tub are in quite clear relationship to the desired performance goal of a clean bathroom in much the same sense as arranging and deploying materials into a prescribed pattern and feeding them into a machine are to the goal of rapid and flawless machine output. These relationships are not nearly so compact nor obvious in the present project.

First, client contacts account for but a portion of the factors that are operative for a sale or a listing. Second, the time lag between these activities and the performance goal can be several months, even years. These two fac-

tors likely mitigate any possible synergistic augmentation of reinforcement that might occur when close timing exists between the dispensation of performance-contingent rewards through the program and any benefits that arise naturally from task completion. That is, the "pride" that comes from turning out a clean bathroom or an acceptable machine output each day likely enhances the potency of any reward that is dispensed through the program for actions leading to said outputs. However, great temporal and spatial separation between sales-relevant behaviors and "natural" rewards invariably occurs for real-estate transactions, thereby perhaps obviating the possibility of any reward synergism. Therefore, if "low" performers need more "encouragement" than other agents in order to change their behavior, then it is possible that the absence of such synergism will especially reduce program effectiveness for them.

REFERENCES

- Amsel, A. Behavioral habituation, counter conditioning, and a general theory of persistence. In A. H. Black and W. F. Prokasy (Eds.), *Classical conditioning II: Current theory and research*. New York: Appleton-Century-Crofts, 1972.
- Cook, T. D., & Campbell, D. T. *Quasi-experimentation: Design & analysis issues for field settings*. Chicago: Rand McNally, 1979.
- Lawler, E. E., III, & Suttle, J. L. Expectancy theory and job performance. *Organizational behavior and human performance*, 1973, 9, 482-503.
- Lathans, F., Paul, R., & Baker, D. An experimental analysis of the impact of contingent reinforcement on salespersons' performance behavior. *Journal of Applied Psychology*, 1981, 66, 314-323.
- Morse, W. H. Intermittent reinforcement. In W. K. Hoing (Ed.), *Operant behavior: Areas of research and application*. New York: Appleton-Century-Crofts, 1966.
- Herrnstein, R. J. On the law of effect. *Journal of the Experimental Analysis of Behavior*, 1970, 13, 243-266.
- Skinner, B. F. *Contingencies of reinforcement*. New York: Appleton-Century-Crofts, 1969.