Journal of Organizational Behavior Management™

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Monographic Separates from the *Journal of Organizational Behavior Management*™

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Intervening to Improve the Safety of Occupational Driving: A Behavior-Change Model and Review of Empirical Evidence, by Timothy D. Ludwig, PhD, and E. Scott Geller, PhD (edited by Thomas C. Mawhinney, PhD) (Vol. 19, No. 4, 2000). *Examine the behind-the-wheel behaviors of delivery people and discover interventions to improve driver safety!*

Organizational Behavior Management and Developmental Disabilities Services: Accomplishments and Future Directions, edited by Dennis H. Reid, PhD (Vol. 18, No. 2/3, 1999). *"Provides readers with an up-to-date review of related OBM research and effective OBM strategies. . . . It could be the cornerstone that guides future research for OBM."* (*Carolyn W. Green, EdD, Educational Administrator, Rosewood School, Western Carolina Center, Morganton, North Carolina*)

Organizational Culture, Rule-Governed Behavior, and Organizational Behavior Management: Theoretical Foundations and Implications for Research and Practice, edited by Thomas C. Mawhinney, PhD (Vol. 12, No. 2, 1993). *"Can help OBM researchers and managers more precisely analyze complex work environments to develop more comprehensive yet highly focused interventions to improve individual and organizational effectiveness."* (*The Business Library Newsletter*)

Pay for Performance: History, Controversy, and Evidence, edited by Thomas C. Mawhinney, PhD, and Bill L. Hopkins, PhD (Vol. 12, No. 1, 1992). *"Provides a comprehensive examination for performance theories and a fresh look at how they can be used successfully in OBM. It provides a wealth of background information and research to enhance managers' understanding of this controversial issue."* (*Abstracts of Public Administration, Development, and Environment (APADE)*)

Promoting Excellence Through Performance Management, edited by William K. Redmon, PhD, and Alyce Dickinson, PhD (Vol. 11, No. 1, 1990). *"Consultants can glean information about managing client relations and implementing effective intervention. . . . A quick and easy read as well as a valuable addition to the library of anyone who studies and/or practices in the field of organizational consulting."* (*Personnel Psychology*)

Organizational Behavior Management and Statistical Process Control: Theory, Technology, and Research, edited by Thomas C. Mawhinney, PhD (Vol. 9, No. 1, 1988). *"This compilation of articles addressing various dimensions of statistical process control, behavior analysis, and organizational behavior management is an excellent primer for the three areas, as well as a provocative presentation of comparisons among them. . . . Informative, varied in tone, and well-structured."* (*Personnel Psychology*)

Job Stress: From Theory to Suggestion, edited by John M. Ivancevich, DBA, MBA, and Daniel C. Ganster, PhD (Vol. 8, No. 2, 1987). *"Readable, usable, and of immense value . . . Should be required reading for every personnel professional or individual involved in the field of human resources."* (*Personnel Psychology*)

Computers, People, and Productivity, edited by Lee W. Frederiksen, PhD, and Anne W. Riley, PhD (Vol. 6, No. 3/4, 1985). *"Provides a valuable insight into the development of theory on organizations and computers."* (*Social Science Computer Review*)

Improving Staff Effectiveness in Human Service Settings: Organizational Behavior Management Approaches, edited by Lee W. Frederiksen, PhD, and Anne W. Riley, PhD (Vol. 5, No. 3/4, 1984). *"Methodologically, the studies are state-of-the-art. A worthwhile book. Human service professionals who are unfamiliar with OBM will find enough here to whet their appetites to read more of the OBM literature."* (*Personnel Psychology*)

OBM in Multiple Business Environments: New Applications for Organizational Behavior Management, edited by Brandon L. Hall, PhD (Vol. 4, No. 1, 1983). *Valuable insights that have applied significance for the management of behavior in various business settings.*

Current Topics in Organizational Behavior Management, edited by Phillip Duncan, PhD (Vol. 3, No. 3, 1982). *"Interesting and informative. Recommended as a useful aid in promoting discussion on key issues among social scientists and managers alike."* (*Journal of Occupational Behaviour*)

Indexing, Abstracting & Website/Internet Coverage

Journal of Organizational Behavior Management

This section provides you with a list of major indexing & abstracting services and other tools for bibliographic access. That is to say, each service began covering this periodical during the year noted in the right column. Most Websites which are listed below have indicated that they will either post, disseminate, compile, archive, cite or alert their own Website users with research-based content from this work. (This list is as current as the copyright date of this publication.)

Abstracting, Website/Indexing Coverage . . . . . Year When Coverage Began

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- ***ABI/INFORM Global. Contents of this publication are indexed and abstracted in the ABI/INFORM Global database, available on ProQuest Information & Learning@www.proquest.com <http://www.proquest.com>*** **1981**
- ***ABI/INFORM Research. Contents of this publication are indexed and abstracted in the ABI/INFORM Research database, available on ProQuest Information & Learning@www.proquest.com <http://www.proquest.com>*** **1981**
- ***Academic Abstracts/CD-ROM*** **1993**
- ***Academic Search: Database of 2,000 selected academic serials, updated monthly: EBSCO Publishing*** **1996**
- ***Academic Search Elite (EBSCO)*** **2001**
- ***Biostatistica*** **1992**
- ***Business & Company Profile ASAP on CD-ROM <http://www.galegroup.com>*** **2001**
- ***Business ASAP*** **2001**
- ***Business ASAP–International <http://www.galegroup.com>*** **1981**

(continued)

- *Business International and Company ProFile ASAP <http://www.galegroup.com>* **1996**
- *Business Source: Keyword access to abstracts for over 530 business-related journals, and selected newspapers in the business field; updated monthly; EBSCO Publishing* **1996**
- *Business Source Corporate: Coverage of nearly 3,350 quality magazines and journals; designed to meet the diverse information needs of corporations; EBSCO Publishing <http://www.epnet.com/corporate/bsourcecorp.asp>* **1993**
- *Business Source Elite: Coverage of scholarly business, management and economics journals; EBSCO Publishing <http://www.epnet.com/academic/bussourceelite.asp>* **1993**
- *Business Source Premier: Coverage of scholarly journals and business periodicals covering management, economics, finance, accounting, international business, and much more; EBSCO Publishing <http://www.epnet.com/academic/bussourceprem.asp>* **1993**
- *Corporate ResourceNet: Coverage ranging from general to trade publications including top management journals: EBSCO Publishing <http://www.epnet.com/corporate/crn.asp>* **1993**
- *Criminal Justice Abstracts* . . . . . *
- *Current Contents/Social & Behavioral Sciences <http://www.isinet.com>* **1995**
- *EBSCOhost Electronic Journals Service (EJS) <http://ejournals.ebsco.com>* **2001**
- *Elsevier Scopus <http://www.info.scopus.com>* **2002**
- *EMBASE.com (The Power of EMBASE + MEDLINE Combined) <http://www.embase.com>* **2003**
- *EMBASE/Excerpta Medica Secondary Publishing Division. Included in newsletters, review journals, major reference works, magazines & abstract journals <http://www.elsevier.nl>* **2003**
- *Entrepreneurship Research Engine <http://research.kauffman.org>* **2004**
- *e-psyche, LLC <http://www.e-psyche.net>* **2001**
- *Ergonomics Abstracts* **1993**
- *ERIC Database (Education Resource Information Center) <http://www.eric.ed.gov>* **2005**
- *Excerpta Medica . . . See EMBASE* **2003**
- *General BusinessFile ASAP <http://www.galegroup.com>* **1994**
- *General Business File ASAP–International <http://www.galegroup.com>* **1981**
- *General Reference Center GOLD on InfoTrac Web* **2001**

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- *General Reference Center INTERNATIONAL <http://www.galegroup.com>* **2001**
- *Google <http://www.google.com>* **2004**
- *Google Scholar <http://scholar.google.com>* **2004**
- *Haworth Document Delivery Center <http://www.HaworthPress.com/journals/dds.asp>* **1977**
- *Human Resources Abstracts (HRA)* **1982**
- *IBZ International Bibliography of Periodical Literature <http://www.saur.de>* **1995**
- *Index Guide to College Journals (core list compiled by integrating 48 indexes frequently used to support undergraduate programs in small to medium sized libraries)* **1999**
- *InfoTrac Custom <http://www.galegroup.com>* **2001**
- *InfoTrac OneFile <http://www.galegroup.com>* **1981**
- *Internationale Bibliographie der geistes- und sozialwissenschaftlichen Zeitschriftenliteratur . . . See IBZ <http://www.saur.de>* **1995**
- *ISI Web of Science <http://www.isinet.com>* **1991**
- *Journal Citation Reports/Social Sciences Edition (ISI) <http://www.isinet.com>* **2005**
- *"LABORDOC" Library-Periodicals Section "Abstracts Section" <http://www.ilo.org>* **2001**
- *LexisNexis Academic Universe <http://www.lexisnexis.com/>* **2005**
- *Links@Ovid (via CrossRef targeted DOI links) <http://www.ovid.com>* **2005**
- *Magazines for Libraries (Katz) . . . (see 2003 edition)* **2003**
- *Management & Marketing Abstracts <http://www.pira.co.uk/>* . . . **1991**
- *Management News* **1992**
- *MasterFILE: Updated database from EBSCO Publishing* **1993**
- *MasterFILE Elite: Coverage of nearly 1,200 periodicals covering general reference, business, health, education, general science, multi-cultural issues and much more: EBSCO Publishing <http://www.epnet.com/government/mfelite.asp>* **1993**

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- *MasterFILE Premier: Coverage of more than 1,950 periodicals covering general reference, business, health, education, general science, multi-cultural issues and much more; EBSCO Publishing <http://www.epnet.com/government/mfpremier.asp>* **1993**
- *MasterFILE Select: Coverage of nearly 770 periodicals covering general reference, business, health, education, general science, multi-cultural issues and much more; EBSCO Publishing <http://www.epnet.com/government/mfselect.asp>* **1993**
- *OCLC ArticleFirst <http://www.oclc.org/services/databases/>* **1994**
- *OCLC ContentsFirst <http://www.oclc.org/services/databases/>* . . **1994**
- *Operations Research/Management Science* **1994**
- *Ovid Linksolver (OpenURL link resolver via CrossRef targeted DOI links) <http://www.linksolver.com>* **2005**
- *Personnel Management Abstracts* **1984**
- *ProQuest 5000. Contents of this publication are indexed and abstracted in the ProQuest 5000 database (includes only abstracts . . . not full text), available on ProQuest Information & Learning@www.proquest.com <http://www.proquest.com>* **1981**
- *Psychological Abstracts (PsycINFO) <http://www.apa.org>* **1978**
- *Referativnyi Zhurnal (Abstracts Journal of the All-Russian Institute of Scientific and Technical Information–in Russian) <http://www.viniti.ru>* **2003**
- *RESEARCH ALERT/ISI Alerting Services <http://www.isinet.com>* **1995**
- *Sage Public Administration Abstracts (SPAA)* . . . . . *****
- *ScienceDirect Navigator (Elsevier) <http://www.info.sciencedirect.com>* **2002**
- *Scopus (Elsevier) <http://www.info.scopus.com/>* **2002**
- *Sexual Diversity Studies: Gay, Lesbian, Bisexual & Transgender Abstracts (Formerly Gay & Lesbian Abstracts) provides comprehensive & in-depth coverage of the world's GLBT literature compiled by NISC & published on the Internet & CD-ROM <http://www.nisc.com>* **1994**
- *Social Sciences Citation Index (ISI) <http://www.isinet.com>* **1991**
- *Social Scisearch <http://www.isinet.com>* **1995**
- *SwetsWise <http://www.swets.com>* **2001**
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- individual articles/chapters in any Haworth publication are also available through the Haworth Document Delivery Service (HDDS).

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To develop, enhance and support the growth and vitality of Organizational Behavior Management through research, education, practice, and collaboration.

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CONTENTS

Two methods of assessing preference for stimuli (i.e., potential reinforcers) were compared for adult administrative assistant employees. During Phase 1, a survey method and a verbal choice method of assessing preference for 6 stimuli were administered. During Phase 2, a coupon system was used to determine which categories of stimuli actually functioned as reinforcers for each of the four participants.

Comparisons between the preference assessment methods were then conducted based on the results of the reinforcer assessment. Results showed that the survey method was more accurate than the choice method.

KEYWORDS. Reinforcer assessment, reinforcer identification, stimulus preference assessment, survey, verbal choice

Appointment coordinators at a mid-western medical clinic were to provide exceptional telephone customer service. This included using a standard greeting, speaking in an appropriate tone of voice during the conversation, and using a standard closing to end the call. An analysis suggested performance deficiencies resulted from weak antecedents, poor knowledge and skills, and weak performance contingencies. An intervention package consisting of task clarification, goal setting, feedback, and performance contingent consequences was designed to improve customer service behaviors of four participating appointment coordinators. An ABAB reversal design was used, and overall performances of all four participants increased during intervention phases. This study indicates that a multi-component intervention may be an effective strategy to increase telephone customer service behavior in medical clinic settings.

KEYWORDS. Customer service, task clarification, goal setting, feedback, performance contingent consequences

This paper describes and experimentally demonstrates the main tenets of an operant theory of leadership. Leadership is characterized in the current paper as involving problem solving operant behavior (Cerutti, 1989; Skinner, 1969) in a social context (Skinner, 1953). The theory was assessed under two experimental analogs modeled from generic formal organizational bureaucratic leader-follower role relations. Under a minimal leadership contingency (MLC) leaders and followers in N = 4 dyads interacted via button pressing and trigger pulling responses, respectively, and they received feedback on counters located on response panels in their separate rooms. Under the MLC every leader button press added a point worth money to one of the follower's counters but the leader received no points worth money based on follower responses. A leadership contingency (LC) was identical to the MLC except that for every 19th follower trigger pull the leader received a point worth money. As anticipated, high rates of leader-follower interaction evolved in all dyads under the LC and appreciably

lower rates occurred under the MLC as leader button pressing extinguished under the MLC with repeated exposures to the two contingencies presented in ABABAB fashion. Results were discussed in terms of the theory and data as they may be related to assessment and maintenance of leader-follower interactions and performance in OBM lab and field experiments.

KEYWORDS. Operant theory, superior-subordinate dyads, operant behavior, leadership, effective leadership, mutual reinforcement, follower performance, leadership contingencies

ANNOUNCEMENTS

Journal of Organizational Behavior Management

Guidelines for Publication Sections

Manuscripts submitted to the journal may be reviewed for possible publication within one of the following journal sections. Authors submitting manuscripts to the journal must specify which of the below categories their submission best fits into for purposes of review and potential publication. Articles appearing in these sections reflect various research and practical aims and the review process for each section reflects these aims.

Research Articles

The *Journal of Organizational Behavior Management*'s primary mission is to publish articles that promote scientific research in OBM. Scientific research methods and procedures permit researchers to identify and change selected independent variables expected to produce changes in dependent variables related to the performance of people in organizations and attribute changes in performance to the independent variable(s) by

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effectively controlling for potentially confounding variables. For example, eliminating confounding variables as potential causes of performance changes other than the independent variable(s) manipulated requires use of a comparison group, ABAB reversal and/or multiple baseline experimental designs. In addition to effective use of experimental designs, *Research Articles* should include evidence regarding the means by which integrity of each independent variable was assessed and must include evidence regarding the means by which each dependent variable was assessed and achieved. Therefore, papers that might qualify as *Research Articles* will undergo a full peer-review by as many as 5 scholars to ensure that they qualify as properly controlled studies of meaningful organizational applications. Controlled experimental analog-based assessments and examinations of behavioral processes that might lead to understanding of or account for relative success of organizational interventions under field conditions will also qualify as *Research Articles*. For example, the relative effects of differing levels of feedback frequency on individual or group performance, that might be impossible to assess in the field, might well be functionally related to performance within a work simulation or laboratory analog of an organizational task and its context. Experimentally sound replications and extensions of previous work are also acceptable as *Research Articles*. *Research Articles* are expected to range from 20 to 40 double-spaced pages, not including figures.

Checklist for reviewers:

- Clear description of problem and research literature
- Clear description of experimental methods
- Appropriate experimental design (e.g., Multiple baseline, reversal or other "single subject" design; appropriate group design)
- Clear demonstration of effect
- Reliability of dependent variable; integrity of independent variables is a strength
- Clear discussion of results

Research Reports

Submissions for *Research Reports* require less detailed descriptions of background, methodology, or findings than *Research Articles*. *Research Reports* provide contributors with an outlet for interesting, scholarly, and potentially important contributions to the empirical foundations of OBM that, at the moment, simply cannot satisfy the criteria for full-length *Research Articles*. Authors should adhere to a limit of 200 typed lines with the main text area (not including the title page, abstract, or references) with up to 3 tables or figures. The research report will be the primary outlet for the dataset published, so the author must agree not to publish an extended version of the Report in another journal. *Research Reports* will undergo expedited peer review to assess applied significance, clarity of presentation, and reasonable data collection and analysis. Reviewers will not hold *Research Report* submissions to the same standards of experimental rigor required for *Research Articles*.

Research Reports describing follow-up data to a previously published project will also be considered for publication. In this case, authors should submit a report-length treatment of the project wherein they briefly review and cite the originally published work (which could have been published in any peer-reviewed journal, not only in *JOBM*), clearly describe the procedures used to produce maintenance, and clearly describe and discuss the maintenance effects. When preparing a follow-up *Research Report,* authors should not resubmit originally published data in the same format as they were published. They can, however, report the mean levels of performance as reported in the original work, for purposes of comparison with the follow-up data.

If the efficacy of an OBM principle appears to be supported by otherwise reliable data in spite of experimental shortcomings such as a lack of an independent variable's integrity, high-face validity of the variables might, nevertheless, be sufficient to support publication of the data. Pilot studies and studies that do not provide the full complement of controls required of *Research Articles* but still do provide insights important to OBM researchers and practitioners may be published as *Research Reports*.

Checklist for reviewers:

- 200-line main text area (not including title page, abstract, or references)
- Concise description of problem and brief overview of research literature, demonstrating applied significance
- Demonstration of effect (can be attained through a believable size of effect using an AB design, for example) worth examining in more controlled experiments
- Clear description of experimental methods
- Reliability of dependent variable
- Clear discussion of results
- Not held to the same rigorous standards as are *Research Articles*

Reports from the Field

Data-based case studies that describe the application of OBM principles in organizational settings are valuable to the ongoing development of the field and, for this reason, some of these will be published in a *Reports from the Field* section of the *Journal*. In many instances OBM researchers and practitioners cannot use field experimental intervention designs required to qualify their study as a *Research Article*. At the same time, OBM researchers and practitioners may systematically implement OBM interventions that can be described in detail and, in some cases, partial or complete data regarding performance changes associated with the interventions may be collected and presented. Papers reviewed for potential publication in the *Reports from the Field* section will (1) provide an adequate background on the applied problem encountered, (2) describe the behavioral and practical considerations addressed to develop the reported intervention solution, (3) describe the application program in sufficient detail that a person trained in OBM techniques could effectively replicate the procedures and data collection processes the authors used, and (4) include an evaluation of the OBM solution including cost-benefit analyses and social validity data if available. Authors are also encouraged to offer advice to readers regard-

ing how their work might be changed to satisfy requirements of a *Research Article* by other OBM researchers that might replicate the intervention within a field experimental design.

Authors should adhere to a limit of 300 typed lines for the main text area (not including the title page, abstract, or references) with up to 3 tables or figures. *Reports from the Field* will be the primary outlet for the dataset published so the author should not publish an extended version of the Report in another journal. *Reports from the Field* will undergo expedited peer review to assess the contribution of the manuscript to OBM and clarity of presentation. Articles that claim proprietary OBM processes and thereby do not provide sufficient detail for replication will not be accepted as *Reports from the Field*.

Checklist for reviewers:

- 300-line main text area (not including title page, abstract, or references)
- Adequate background on the applied problem
- Description of the behavioral and practical considerations addressed to develop the reported intervention solution
- Description of the solution in sufficient detail that a person trained in OBM techniques could effectively replicate the procedures and data collection processes the authors used
- Experimental designs and dependent variable reliability are preferable but not necessary
- Evaluation of the OBM solution including cost-benefit analyses and social validity data if available

Discussion Articles

Manuscripts that develop foundations of behavior analysis or critically review a particular area of research in OBM may be accepted as *Discussion Articles*. *Discussion Articles* will undergo full peer review by up to 5 scholars. They will evaluate the merit of arguments made in the article and judge the usefulness of the perspective developed in the

manuscript with respect to whether it is likely to advance research and/or practice of OBM. The *Journal*'s Editors and/or members of the editorial board often solicit meaningful commentary on *Discussion Articles*.

Comment Articles

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RESEARCH ARTICLES

A Comparison Between Survey and Verbal Choice Methods of Identifying Potential Reinforcers Among Employees

David A. Wilder
Kelly Therrien
Byron Wine

ABSTRACT. Two methods of assessing preference for stimuli (i.e., potential reinforcers) were compared for adult administrative assistant employees. During Phase 1, a survey method and a verbal choice method of assessing preference for 6 stimuli were administered. During Phase 2, a coupon system was used to determine which categories of stimuli actually functioned as reinforcers for each of the four participants. Comparisons between the preference assessment methods were then conducted

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based on the results of the reinforcer assessment. Results showed that the survey method was more accurate than the choice method.

KEYWORDS. Reinforcer assessment, reinforcer identification, stimulus preference assessment, survey, verbal choice

Reinforcer identification can be important for the development of effective performance management interventions. Interventions which employ items that function as reinforcers are likely to be more effective than interventions which do not. In addition, although generalized conditioned reinforcers such as money may serve as effective reinforcers for all employees and therefore eliminate the need to assess preference, it is not always possible to deliver money contingent upon improved performance in organizations. Further, items other than money may sometimes be delivered to create a more personal approach to managing employee performance.

The main method, by which preference for stimuli has been identified in organizational behavior management (OBM), is the reinforcer survey (Daniels, 1989). Daniels describes the reinforcer survey as a helpful tool, because "if you (simply) ask people to tell you about their interests and hobbies, they may not remember them all at that time or may not think you would be interested in some of the things they do" (p. 58). The typical reinforcer survey consists of a questionnaire that asks what an employee likes to do or would like to receive for a job well done and includes likert scale response options (e.g., 0 = none at all to 4 = very much). Although it may be widely assumed that the reinforcer survey is an adequate method of identifying potential reinforcers, no research has examined the accuracy of reinforcer surveys among employees. It is possible that other methods of assessing preference for items and activities may be more accurate.

In fact, recent research on reinforcer surveys in applied behavior analysis has suggested that they are not a very accurate method of identifying preference for items and activities in some populations. For example, Northup, George, Jones, Broussard, and Vollmer (1996) compared three methods of stimulus preference assessment (SPA) (i.e., survey, verbal choice, and pictorial choice) in typically developing (i.e., verbally competent) children with attention deficit/hyperactivity disorder (ADHD) in order to evaluate the accuracy of self-report information and identify an accurate method of reinforcer identification. More specifically, Northup et al. first conducted the three methods of preference assessment with four 6 to 9 year-old kids to determine relative preference of 5 categories of stimuli for each child. Next, they conducted a reinforcer assessment to determine which categories of items/activities identified by the preference assessment methods actually functioned as reinforcers. During the reinforcer assessment, participants worked on a coding task and earned coupons which could be exchanged for the categories of items/activities assessed during the preference assessments. The results of the reinforcer assessment were then compared with the results of the preference assessment methods. Results suggested that the accuracy of surveys alone was poor and that verbal or pictorial choice assessments, in which an individual chooses one of two concurrently available stimuli, appeared to enhance the likelihood of differentiating high from low preferences and identifying reinforcers in that population. In a systematic replication of this study with 20 participants, Northup (2000) found that the overall accuracy of the survey method was only 57%.

In another study, Wilder, Ellsworth, White, and Schock (2003) compared a survey with verbal and pictorial stimulus choice procedures in adults of average intelligence who had a diagnosis of schizophrenia. The authors used procedures similar to Northup et al. (1996). They found that although there were few differences in total accuracy among the three methods, the overall accuracy of the survey method was only 56%.

Although these studies suggest that the survey method of identifying potential reinforcers may not be very accurate, the extent to which these results apply to verbally competent adult employees is unknown

because no research on preference assessment among employees in an organizational context has been conducted. The purpose of the present study was to extend preference assessment methodology to organizational behavior management. More specifically, the purpose was to assess the accuracy of a survey for identifying reinforcers and compare the utility of the survey method to a verbal choice method of assessing preference for stimuli among adult employees.

METHODS

Participants and Setting

Four adult women participated in the study. Participant 1 was 25, participant 2 was 29, participant 3 was 43, and participant 4 was 55; all worked 40 hours per week as administrative assistants at a university. Sessions took place in private rooms near the participant's offices on the university campus. The rooms contained a table and three to four chairs. Each participant took part in one Phase 1 session, which was about 15 min in duration. Phase 2 session was between 20 and 30 min. in duration and were conducted 1-2 days per week over three weeks.

Response Definitions and Measurement

Stimuli. Six stimuli were initially identified for use in the study based on informal interviews with participants, cost, and ease of item delivery. More specifically, after each participant was asked to nominate preferred items/activities that they would like to earn at work, a list of 12 items and activities was generated. Next, the list was narrowed to 6 stimuli based on cost and ease of delivery. The same six stimuli were used with all 4 participants. The six stimuli used were coupons for a casual clothes day, leaving work 10 min early, enlisting an assistant for a task, a $5 gift certificate to a local store, a $5 gift certificate to a local movie theater, and unlimited access to a small snack (i.e., either candy,

gum, nuts, or sunflower seeds), free of charge, for one work day. A control item was identified for each participant before Phase 1 session began by describing the list of all 6 items to each participant and asking her to choose the one that she would least prefer to receive. Control items were the snack for participants 1 and 2, and the casual clothes day for participants 3 and 4.

Phase 1: Stimulus Preference Assessment

Two methods of SPA were conducted: a survey method and a verbal choice method.

Survey. A survey based on Daniels (1989) was administered verbally to each participant. All six items described above were presented. The experimenter began the survey by asking "How much work would you be willing to do to gain access to each item?" Participants were then told, "Indicate your answer by ranking each item as 0 (none at all), 1 (a little), 2 (a fair amount), 3 (much), or 4 (very much)." A percentage score was calculated for each item by dividing the score the participant gave to an item by the total possible score for the item (i.e., 4) and multiplying by 100%. Items with scores of 75% or greater (i.e., scores of 3 or 4) were considered to be high preference.

A second, independent observer scored all surveys. An agreement between observers was defined as both observers identifying identical numbers as having been circled on the survey. Interobserver agreement was calculated by dividing the number of agreements by the number of agreements + disagreements and multiplying by 100%. Agreement was 100%.

Verbal choice. A questionnaire was constructed to assess preference for each of the six stimuli and was administered verbally. Each item was compared once with every other item in a verbal format (e.g., "Would you rather get a $5 movie certificate or a coupon that can be exchanged for leaving 10 min early from work one day?"). The questionnaire was introduced to participants by asking, "Which would you do a lot of hard work to get?" A percentage score was calculated by dividing the number of times an item was chosen by the number of times it was presented

(5) and multiplying by 100%. Items with a score of 75% or greater (i.e., items chosen 4 or 5 times) were considered to be high preference.

A second, independent observer scored all verbal choice preference assessments. An agreement between observers was defined as both observers scoring the same item. Interobserver agreement was calculated by dividing the number of agreements by the number of agreements + disagreements and multiplying by 100%. Agreement was 100%.

Data on administration time for each of the two methods were collected for all participants. Although both methods were quick, the survey took less time to complete (M = 68 sec) than did the verbal choice method (M = 97 sec).

Phase 2: Reinforcer Assessment

Dependent variable. The dependent variable during the reinforcer assessment was the number of sheets of paper filed by each participant. This task was used because each participant reported that they were often asked to perform this type of task at their job. The task was simulated. That is, participants were not required to file the papers as part of their job duties. Each sheet of paper had either a letter or number on it. Participants were required to file each sheet according to the specific letter or number depicted on the paper. When asked about the task, all participants stated that it was "boring."

Coupon system. Six coupons were used to represent each of the items used in the study. Each coupon had the name of the item which was represented written on it (e.g., "movie gift certificate coupon"). Coupons could be exchanged for the items/activities that they represented immediately after sessions. Arrangements were made with the participant's supervisors to honor the 10 min off, assistant to a task, and casual clothes day coupons. The movie gift certificate, store gift certificate, and snack coupons were honored by the experimenter. All items/activities were provided on a 1:1 ratio; that is, one coupon could be exchanged for one item/activity. Each participant was exposed to a baseline condition and the reinforcer assessment condition. A second

baseline condition was conducted after the reinforcer assessment condition.

Baseline. During baseline, participants were told "this is a task that is similar to some of the duties you perform at work. Sort these papers according to letter and/or number. Do as much as you want, as little as you want, or none at all." Sessions lasted until the participant said "I'm done." The experimenter sat about 10 ft away from the participant and read a book.

Reinforcer assessment. During this condition, each of six coupons was made available, contingent on completed filing, in a multielement design. Each participant was given an initial brief explanation of the coupon system and was then asked to repeat the explanation. All participants correctly repeated the explanation of the coupon system. Participants were then told, "You can earn as many coupons as you want for filing. You can do as much as you want, as little as you want, or none at all." Participants were also told that any performance above their baseline criterion would earn one coupon. Six sessions were conducted per session block (one per item). Three to four reinforcer assessment sessions were conducted with each participant. The reinforcer assessment phase stopped when the cumulative total filing for each item either exceeded baseline filing or when the participant did not file any papers for an item in the last session (or some combination of the two). The order of sessions was randomly determined for each session block. A given session ended when the participant said, "I'm done." Session length ranged from 0 sec to 16 min, 26 sec for participant 1, 0 sec to 37 min, 43 sec for participant 2, 0 sec to 12 min 15 sec for participant 3, and 0 sec to 28 min, 47 sec for participant 4. The number of filed papers required to earn each coupon was determined individually based on the average number of papers filed per min during baseline (8 for participant 1, 39 for participant 2, 9 for participant 3, and 32 for participant 4). Each participant was informed of this criterion number of papers to file and the criterion number was written in large font on a sheet of paper which was placed next to each participant during each session. Earned coupons were distributed at the end of each session.

For each participant during each session, the number of filed papers was tallied. A second, independent observer also tallied the papers during 74% of sessions. An agreement was defined as both observers agreeing on the exact number of papers filed during a session. Interobserver agreement was calculated by dividing the number of agreements by the number of agreements + disagreements and multiplying by 100%. Agreement averaged 100%.

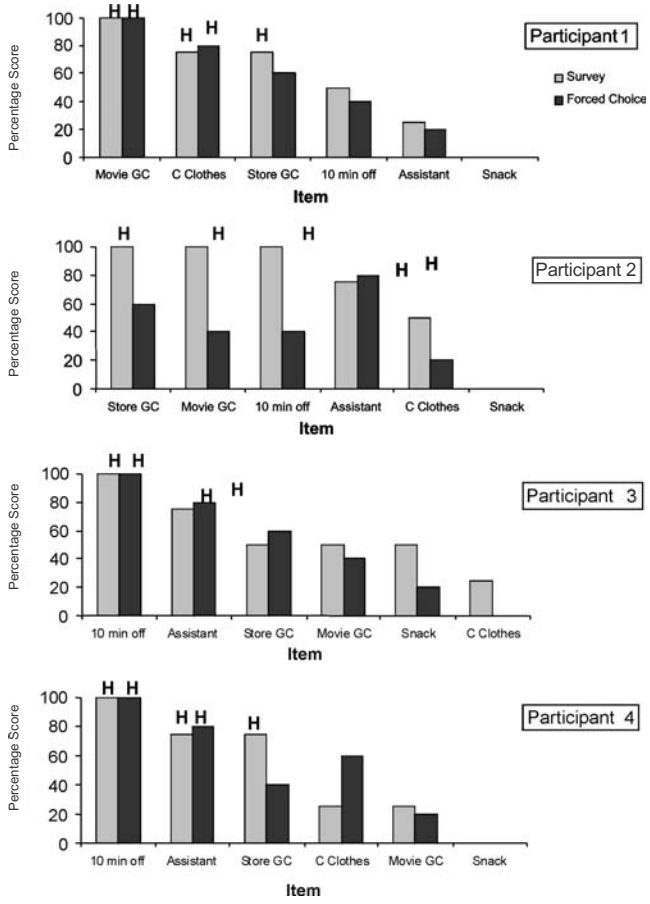
RESULTS

Figure 1 presents the results of the two methods of stimulus preference assessment for each participant. For participant 1, the survey method identified three items as high preference and the choice method identified two of the same three as high preference. For participant 2, the survey method identified multiple items as high preference; the choice method identified only one item (i.e., an assistant for a task) as high preference. For participant 3, both the survey and the choice methods identified two items (i.e., 10 min off from work and an assistant for a task) as high preference. For participant 4, the survey method identified three items as high preference and the choice method identified two of the same three as high preference.

Figure 2 presents the results of the reinforcer assessment. An item was considered to show clear reinforcement effects if the cumulative total coding associated with the item was (1) greater than during baseline and (2) greater than coding associated with the control item. Clear reinforcement effects were demonstrated for all participants for at least two of the items.

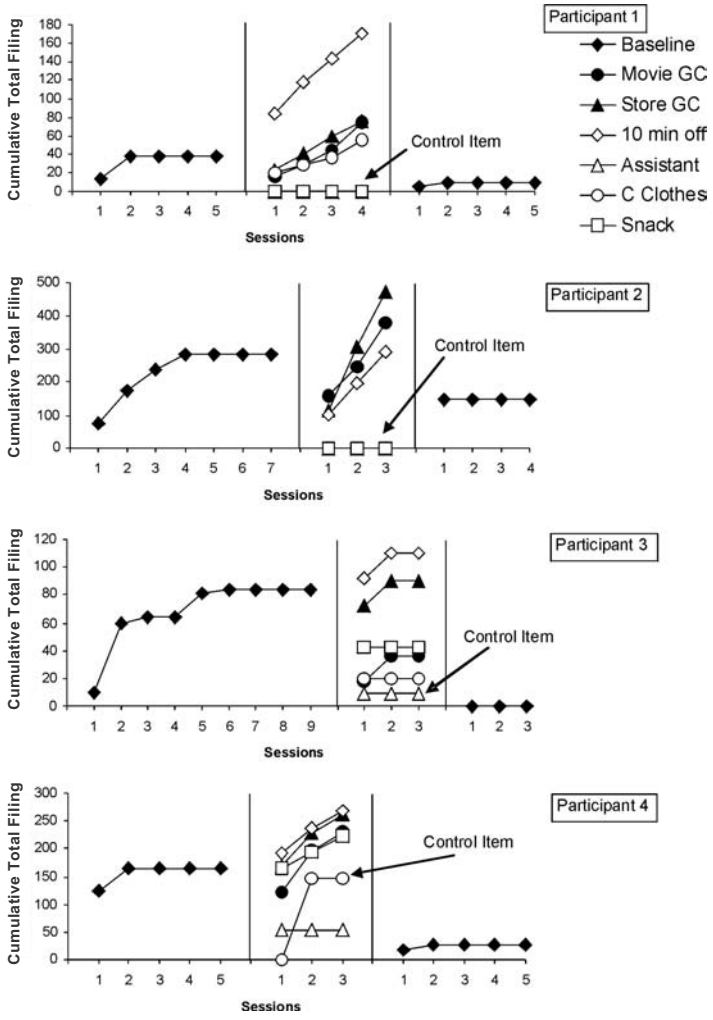
For participant 1, the reinforcer assessment showed that four items functioned as reinforcers (movie GC, store GC, 10 min off from work, and casual clothes day certificate). The survey method of stimulus preference assessment identified three of these four items as highly preferred. The choice method identified two of these four items as highly preferred.

FIGURE 1. Selection Percentages for Each Item of Potential Reinforcers for the Survey Method and the Verbal Stimulus Choice Method of Preference Assessment for Each Participant. The Letter "H" Above a Method Indicates That the Method Identified That Item as Highly Preferred



For participant 2, the reinforcer assessment showed that three items functioned as reinforcers (i.e., movie GC, store GC, and 10 min off from work). The survey method of stimulus preference assessment identified all three of these items as highly preferred, but also identified an assistant for a task as highly preferred. The choice method only identified an

FIGURE 2. Cumulative Number of Papers Filed During Baseline and Reinforcer Assessment Conditions for Each Participant



assistant for a task as highly preferred, and did not identify any of the three items that functioned as reinforcers as preferred.

For participant 3, the reinforcer assessment showed that two items functioned as reinforcers (i.e., store GC and 10 min off). Both the survey method and the choice method of stimulus preference assessment

identified 10 min off as highly preferred, and also identified an assistant for a task as highly preferred.

For participant 4, the reinforcer assessment showed that three items functioned as reinforcers (i.e., movie GC, store GC, and 10 min off). The survey method of stimulus preference assessment identified 10 min off, assistant, and store GC as highly preferred and the choice method identified 10 min off and an assistant for a task as highly preferred.

Table 1 presents the overall accuracy of each SPA method for the identification of reinforcers when compared with the results of the reinforcer assessment. Four outcomes were possible for each SPA method: (1) true positives were items that had been identified as high preference during Phase 1 and that functioned as reinforcers during Phase 2, (2) false positives were items that had been identified as high preference but that did not function as reinforcers, (3) true negatives were items that had been identified as low preference and that did not function as reinforcers, and (4) false negatives were items that had been identified as low preference but that did function as reinforcers. Total accuracy was calculated by summing true positives and true negatives and then dividing by the total number of all positives and negatives (24). The survey method was 71% accurate; the choice method was 50% accurate.

DISCUSSION

The results of this study suggest that the survey method of stimulus preference assessment was more accurate than the choice method for

TABLE 1. Comparisons of the Results of the Preference Assessments with the Results of the Reinforcer Assessments

	True Positives	True Negatives	False Positives	False Negatives	Total Accuracy
Survey	9	8	3	4	71%
Forced Choice	4	8	3	9	50%

these employees. These results are inconsistent with previous research examining SPA methods in verbally competent populations (e.g., Northup et al., 1996; Northup, 2000; Wilder et al., 2003); in general, these other studies have found that the survey method of preference assessment is often less accurate than choice methods. Unlike other populations, perhaps verbally competent adults can accurately rank and/or describe items which will function as a reinforcer for their behavior.

On the other hand, the choice method, which is also "verbal" did not prove to be a valid method of identifying reinforcers in the current study. Perhaps the format of the choice method, which required respondents to choose between two alternatives, was less familiar to employees and therefore yielded less accurate results.

It is possible that the results of this study might have been different had the task used been different (e.g., more difficult or "interesting"). Future research should continue to investigate the relationship between SPA and reinforcer assessment. The extent to which items/activities identified in a SPA actually function as reinforcers might depend on the task or activity used in the reinforcer assessment. Future research should also examine methods of assessing preference among groups of employees in organizations. Since OBM interventions are typically implemented with a number of employees, efficient methods of assessing preference and identifying reinforcers among many individuals should prove beneficial.

Although there are some situations in which a preference assessment may not be useful when developing interventions in organizations (e.g., when setting up a pay for performance system), there are other situations in which such an assessment should prove helpful. For example, some items that might be delivered to employees as part of a performance improvement plan may not be eligible to be purchased (e.g., time off or an assistant with a task); preference for these items can be systematically analyzed for each individual with the use of a preference assessment. Assessments might also be useful for managers who would like to arrange an impromptu performance management system and/or would like to be able to provide something more personal than a check when employee performance improves or meets set goals.

There are a number of limitations to this study. First, because coupons were provided rapidly in a multielement design, order effects may have occurred. However, the order in which the categories were presented was randomized across sessions, reducing the likelihood of order effects. Another limitation of the study is the small number of participants. This study should be replicated with many employees, ideally in different types of industries and positions. Finally, only six items were used in this study and the items used were identical for each participant. The use of identical items for each participant may have affected the extent to which clear differences in preference for items/activities were found. Future research should employ a larger number and a wider variety of items.

Future research should also examine methods of enhancing preference assessment. In the current study, even the survey method had a fairly large degree of error. It is possible that another, as yet unidentified or unexamined method of SPA will prove to be more accurate and less prone to error with verbal adult clinical populations.

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The Effects of a Combined Task Clarification, Goal Setting, Feedback, and Performance Contingent Consequence Intervention Package on Telephone Customer Service in a Medical Clinic Environment

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Ramona Mathews

ABSTRACT. Appointment coordinators at a mid-western medical clinic were to provide exceptional telephone customer service. This included using a standard greeting, speaking in an appropriate tone of voice during the conversation, and using a standard closing to end the call. An analysis suggested performance deficiencies resulted from weak antecedents, poor knowledge and skills, and weak performance

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contingencies. An intervention package consisting of task clarification, goal setting, feedback, and performance contingent consequences was designed to improve customer service behaviors of four participating appointment coordinators. An ABAB reversal design was used, and overall performances of all four participants increased during intervention phases. This study indicates that a multi-component intervention may be an effective strategy to increase telephone customer service behavior in medical clinic settings.

KEYWORDS. Customer service, task clarification, goal setting, feedback, performance contingent consequences

Customer service is an important element of any organization within a competitive market. Greater competition within the health care industry has increased the importance of customer service (Eisenberg, 1997) because in most markets health care customers (e.g., patients, their families, and organizational purchasers) are able to choose among competing providers (Dwore, 1993). Satisfaction with an organization's customer service is critical to the success of that organization as it increases the chances of creating regular customers and decreases the possibility those customers will seek similar services elsewhere (Rosselli, Moss, & Luecke, 1989).

Often one of the first contacts a customer has with a medical facility is a telephone conversation with an appointment coordinator or receptionist. Although these employees are not medical-care professionals, the quality of their customer service can affect consumers' perception of their total health care experience (Roselli et al., 1989). The most frequent interaction between a customer and an appointment coordinator involves a customer calling or coming into the clinic to set up, reschedule, or cancel an appointment. Another common interaction involves a patient calling for general information about their appointment or about services provided by the clinic.

One approach to improving customer service provided by telephone personnel is to provide performance feedback to employees. Performance feedback has been used in combination with other techniques to increase performance in a variety of organizational settings (e.g., LaFleur & Hyten, 1995; Wilk & Redmon, 1990). Here we will define feedback as "information about performance that allows people to change or improve that performance" (Daniels, 2001, p. 120). Alvero, Bucklin, and Austin (2001) reviewed the feedback literature in four journals between 1985 and 1998. Their review supported three conclusions: (1) feedback does not always improve performance reliably (2) the combination of feedback with other procedures (e.g., goal setting, incentives) is more likely to improve performance than when feedback is used alone, and (3) more information regarding the function of feedback (antecedent stimulus or behavioral consequence) is needed. In the present study, a performance analysis found that feedback was not given to appointment coordinators related to the specific customer service behaviors they were expected to perform. If any feedback was given, it was inconsistent, irregular, and non-specific. Therefore, one component of the current intervention was to provide behavior-specific, frequent feedback in a standard form.

A second procedure that may be useful in improving customer service is goal setting. Wilk and Redmon (1990) implemented a daily-adjusted goal setting and feedback procedure to increase processing efficiency in a university admissions department. Each morning employees met with their supervisor, who set their daily performance goals and provided feedback on their previous day's performance. The supervisor also provided verbal feedback on performance twice during each day. Wilk and Redmon found immediate performance increases, reductions in overtime dollars spent by the department, and decreased absenteeism. In the medical clinic setting where the present study took place, no goals existed for appointment coordinators to guide their telephone customer service. Thus, concrete goals were set and communicated to the appointment coordinators as part of the intervention package.

The use of performance contingent consequences may be another useful technique for improving customer service. Dierks and McNally (1987), for example, improved the rate of check processing at a major

bank by more than 300% when performance contingent pay was introduced. Amazingly, these gains were maintained over a period of six years. During the same intervention period, employee turnover dropped from 110% in baseline to 0% in the contingent pay condition, and annual overtime hours paid fell from 475 to 13. Jessup and Stahelski (1999) examined the effects of goal setting, feedback, and performance contingent rewards on quality in a manufacturing setting. Using a within-subjects comparison, they reported that feedback did not appear to be sufficient to improve performances because quality did not improve until a difficult to attain goal was set, and large rewards were delivered contingent upon meeting this goal. As is typical in most workplace settings, appointment coordinators in the present medical clinic obtained no performance contingent consequences prior to the present intervention.

A fourth procedure that may prove useful in improving customer service is task clarification. Task clarification involves providing verbal and/or written descriptions of job responsibilities and duties. Wilson, Boni, and Hogg (1997) implemented a task clarification workshop for police staff and found increases, ranging from 7% to 28%, in courteous behaviors. The addition of praise and corrective feedback delivered by individuals outside the organization increased courteous behaviors by approximately 13%. In a related study of 26 hotel banquet employees, LaFleur and Hyten (1995) used task clarification (training, job aids, and checklists), graphic feedback, goal setting and performance contingent monetary bonuses to improve the accuracy and timeliness of hotel function setups. The quality of staff performance (measured as accuracy plus timeliness of setups) increased from about 70% to almost 100% when the treatment package was in place. Prior to the present intervention, no task clarification procedures had been implemented in the medical clinic targeted in the current study.

Customer service too has been explicitly targeted for performance improvement through the use of some combination of feedback, goal setting, performance contingent rewards, and task clarification. For example, task clarification, feedback, and social praise were used to improve customer service provided by bank tellers (Crowell, Anderson,

Able, & Sergio, 1988). Eleven verbal behaviors were used to define customer service (e.g., greeting, using the customer's name, voice tone, closing, expression of appreciation, etc.). Each of the three intervention procedures was implemented separately. Following the introduction of task clarification, customer service improved by 12% over baseline. Feedback, consisting of a publicly posted chart for each bank teller along with verbal feedback given by the manager, produced an overall 6% increase over clarification levels. Finally, after social praise procedures were introduced, another 7% increase was observed.

Austin, Olson, and Wellisley (2001) included self-monitoring in their treatment package, along with task clarification and public posting to improve the performance of customer service representatives at an insurance agency. Austin and colleagues targeted two customer service behaviors: the percentage of transactions during which the customer's name was used and the percentage of transactions during which tellers suggested additional services available to customers. This combination intervention yielded a 51% improvement in the use of customer names and a 56% improvement in suggesting additional services.

To our knowledge, only one study in the organizational behavior management (OBM) literature targeted customer service in a medical setting. Nielsen (2004) improved patient satisfaction within a rural hospital's emergency department (ED) by increasing communication between nurses and patients with respect to patient waiting times. Triage nurses walked through the waiting room every half hour and explained any reasons for delays or extended wait times. Prior to this intervention, only 44% of (ED) patients rated their service as "excellent" or "very good"; however, in the month following the implementation of half-hour walk-throughs, these ratings increased to 88%.

The purpose of the present study was to replicate and demonstrate the effectiveness of OBM applications in a medical clinic environment. Management at the location for this study indicated that appointment coordinators were not complying with the clinic's telephone standards. Therefore, the present intervention focused on increasing telephone customer service behaviors. A performance analysis was conducted to aid in the design of a multi-component intervention. The analysis

suggested the inclusion of task clarification, goal setting, feedback, and performance contingent consequences. Thus, the present study examined the effect of a combined intervention package on three telephone customer service behaviors.

METHOD

Participants and Setting

Female appointment coordinators (ACs; N = 4) working at a Midwestern outpatient specialty clinic participated. Their range of experience was between 1 and 2.5 years at the start of this project. Participants worked within the same reception area, but each had a separate workstation with a desk, computer, and telephone. The computers gave ACs access to all patient account information. One AC workstation was accessible to patients in the waiting room and was used for appointment check-ins. The other three workstations were not accessible to the waiting room but were only available to patients who needed to schedule future appointments after their visit. In addition to face-to-face interactions with patients, ACs used the telephone to set up medical appointments either when the patients called, or when the AC initiated the patient contact.

Targeted Performances

A review of the previous month's patient satisfaction ratings showed that only 27.3% of customers who returned patient satisfaction surveys rated the service they received from participants as "good," "very good," or "excellent." This percentage was well below the 50% goal set by the medical clinic. Customer evaluations were based on appointment and access service both on the phone and face-to-face. For example, one question asked patients to rate the "courtesy and helpfulness of phone staff."

The focus of this project was to improve telephone customer service behaviors of ACs. The clinic's telephone standards identified the following three behaviors which contribute to the quality of telephone customer service:

Greeting. ACs were required to include the four components of an appropriate telephone greeting: (1) saying "hello/good morning/good afternoon, etc."; (2) identifying the clinic and center; (3) identifying the AC by name; and (4) offering help to the caller.

Friendly voice tone. The tone of voice used by the appointment coordinator was to be friendly throughout the interaction. Characteristics of a *friendly voice tone* included: energetic, enthusiastic, variation in rate and tone, personalizing the call by using the caller's name, and offering any additional assistance to the caller beyond the primary purpose of the call.

Closing. ACs were required to conclude all telephone interactions with the three components of an appropriate closing: (1) offering additional help; (2) saying "thank you"; and (3) saying "have a nice day" or another appropriate closing.

Performance Analysis

A performance analysis was conducted to assess the variables that may have accounted for the poor performance of the three target behaviors. A variation of Gilbert's (1978/1996) Behavior Engineering Model (BEM) was used to analyze these performances. The analysis was based on observations and an interview with the ACs' manager. Interview questions focused on antecedent stimuli (e.g., Is there sufficient information or direction provided to ACs about their job responsibilities to prompt performance of the target behaviors?), knowledge and skills (e.g., Did the ACs receive proper training to know exactly what was expected of them?), equipment and processes (e.g., Do the ACs have all the necessary equipment available to them to perform well?), and consequences (e.g., Are there incentives for the ACs to perform the target behaviors?). Other recent studies within the OBM literature have also used variations of Gilbert's model to carry out performance analyses

(Austin, 2000; Austin, Carr, & Agnew, 1999; Austin, Weatherly, & Gravina, 2005; Pampino, Heering, Wilder, Barton, & Burson, 2003; Pampino, MacDonald, Mullin, & Wilder, 2003).

The analysis revealed deficiencies in antecedent stimuli, knowledge, and consequences. Antecedent stimuli were insufficient in two ways. First, ACs were unaware that the clinic had telephone standards. They did not receive training or written documentation regarding updated procedures and standards. In the absence of these antecedents, ACs did not know what constituted an appropriate telephone greeting and closing, or the characteristics of a friendly voice tone. Second, ACs did not have a quick reference guide (e.g., a job aid) to refer to with samples of correct behavior. Finally, ACs were given infrequent and inconsistent feedback on their performance of these behaviors and no performance contingent consequences (e.g., rewards, praise) were in place. Instead, consequences tended to occur only when a complaint was made about an employee's performance.

Performance Improvement Package

Deficiencies uncovered by the performance analysis were used to develop a performance improvement package. A meeting was held prior to the onset of the intervention, during which the researcher and the AC Team Leader (who acts as the immediate supervisor for all ACs in the clinic) explained all components of the intervention package to the ACs.

Job aid. The job aid consisted of a small reminder card with a sample greeting, a list of the characteristics of a friendly voice tone, and a sample closing. The card was taped in a visible location next to each AC's telephone.

Task clarification. An updated handout of the clinic's Telephone Customer Service Standards was described, discussed, and given to the ACs at the pre-intervention meeting. This handout defined the components that constituted an appropriate greeting and closing for a telephone interaction. The handout also listed the characteristics of a friendly voice tone.

Goal setting. Goals were set for each of the target behaviors. The experimenter and management set these goals based upon the overall baseline performance of the ACs. Employees did not have input on the goal level, and baseline performance was not shared with them at any time throughout the study. The goal for the *greeting* was 75%, requiring that on average at least three of the four parts of an appropriate greeting were said across calls. The goal was set at 75% because baseline data indicated ACs said, on average, two of the four (i.e., 50%) required greeting components. The goal for a *friendly voice tone* was 100%, indicating that ACs were required to use a friendly voice throughout every call. This goal was set high because it was deemed to be the most important characteristic of appropriate telephone interactions. In addition, two ACs were observed to use a *friendly voice tone* during all calls in multiple observation sessions. The goal for the *closing* was that across all telephone interactions each AC included an average of at least 1.5 of the 3 components of the appropriate closing statements. This goal was set at 50% because baseline data indicated that ACs said, on average, zero to one (23%) of the three required closing components.

Performance feedback. Prior to collecting baseline and treatment data, management posted signs in the AC work areas to inform ACs that their phone calls might be monitored for quality assurance. Thus, ACs were aware that their calls could be monitored but did not know when they were being monitored. The signs were posted for about one month prior to collecting any data to minimize reactivity to monitoring.

ACs received performance feedback twice a week at the beginning of their shifts on Mondays and Wednesdays. Feedback was provided by sending each AC an email with an attached document containing a bar graph displaying the individual AC's performance on each target behavior relative to their goal. ACs were instructed about how to interpret these graphs during the pre-intervention meeting. Written feedback was also provided underneath the bar graph. If ACs did not meet their goal, they were told specifically what they could do to improve in order to meet their goal next time. If ACs met their goal, they were told that they had met their goal and were asked to email the researcher with their reward request (see below).

Performance contingent consequences. Twice a week, if ACs met the goals for all three target behaviors, they were able to choose one item from a menu of bonus items. An informal reinforcer assessment was conducted with all ACs to determine the items included on this menu. These items included: one movie ticket, $5.00 certificate redeemable at a fast-food outlet (e.g., Burger King), $5.00 gift certificate to a retail store of their choice (e.g., Target), a closer parking space next to the clinic entrance, one free movie rental, $5.00 gas card, free access to items available in the clinic's vending machines for a day ($5.00 limit), free lunch with their manager, or free coffee and donuts in the morning. The researcher delivered the performance contingent consequences to the ACs so that they (with the exception of the donuts) were delivered on the same day that they were requested.

Observation Procedures

Observations were conducted five days a week during 1 to 1 1/2 hour sessions. During the first 30 days of the project, observation sessions occurred both in the morning and afternoon. No systematic differences were observed in data collected across morning and afternoon sessions, so data were collected in the morning only from Day 31 through 51.

Phone calls were monitored by connecting to an individual AC's phone from a remote phone. This system reduced possible reactivity effects as observations did not have to be conducted in the ACs' work area. ACs were not aware of when their performance was being monitored. No auditory stimuli were present when AC's conversations were being monitored. All data were recorded on a data coding sheet.

Greeting. During the greeting portion of each call, the observer recorded whether the AC said each of the four components of an appropriate greeting. If a greeting component was included in the greeting, it was recorded as an occurrence. At the end of each session, the percentage of appropriate greeting components used was calculated as the total number of appropriate greeting components emitted in the session

divided by the total number of opportunities to emit a greeting component for that session multiplied by 100.

Voice tone. Voice tone was rated as either "friendly" or "not friendly." Observers rated each call based on the list of characteristics relating to a friendly voice tone. The voice tone had to be friendly throughout the entire duration of the call. Calls in which the voice tone was neither rude nor friendly were rated as "not friendly." However, these "neutral" voice tones were rated as "friendly" if the AC used the customer's name during the conversation. At the end of each session, a percentage of "friendly" voice tone interactions was calculated by dividing the total number of calls scored as "friendly" by the total number of calls.

Closing. During the closing portion of each call, the observer recorded whether the AC said each of the three components of an appropriate closing. If a closing component was included, it was recorded as an occurrence. At the end of each session, the percentage of appropriate closing components used was calculated as the total number of appropriate closing components emitted in the session divided by the total number of opportunities to emit a closing component for that session multiplied by 100.

Reliability. Inter-observer agreement (IOA) between two observers was assessed during 13% of the observation sessions. The first author served as the primary observer during the study, and one other administrative support staff member acted as a secondary observer. Observers listened to participants' phone calls at the same time, as observations were conducted in real time. Each observer listened to the phone conversations through an individual ear piece and did not interact with the other observer with regard to the data being collected. During baseline sessions, IOA for the target behaviors was: 98.9% for greeting, 93.3% for voice tone, and 97% for closing. During intervention sessions, IOA for the target behaviors was 98.2% for greeting, 100% for voice tone, and 100% for closing. The combined IOA was 97.9% for all three target behaviors when averaged across phases.

EXPERIMENTAL DESIGN

An ABAB reversal design was used to assess the effects of the performance improvement plan. Baseline I data were collected on the target behaviors for all four ACs and were collected until the behavior of all ACs was judged to be stable based on visual inspection. During this time, the ACs were unaware that their performance was being monitored and no feedback was given. After baseline observations concluded, the pre-intervention meetings were held. The multi-component intervention was implemented the following day and remained in place until behavior was judged as stable. At baseline II, all parts of the intervention were withdrawn, and ACs were told that the project had concluded. When decreasing trends in baseline II data were observed, the intervention was reintroduced.

RESULTS

Performances during the final five observation sessions in each phase were used to assess efficacy of the multi-component intervention. Individual data for all participants during all phases are described in Table 1.

Greeting

Figure 1 shows for each participant the percentage of appropriate greeting components used across all four phases. Across participants, ACs used an average of 45.6% (range 35.9% to 50%, SD = 4.3%) of the components of appropriate greetings during the last five baseline sessions. The multi-component intervention increased this performance in all ACs, and the group average increased to 95.4% (range 89.9% to 100%, SD = 5.5) in the final stable sessions of the initial intervention phase. Downward trends in performance were observed across observation sessions in all ACs throughout the return to baseline. By the end of this phase, the across participant mean had declined to 64.8% (range

TABLE 1. Total Number of Observations, Average, Standard Deviation, Range, and Effect Size for Each Behavior Within Each Phase Across All Participants

Participant and Behavior	Phase	N*	Average % (SD %)	Range %	D
Greeting:					
AC1	Baseline 1	42	35.9 (9.6)	29.2-50.0	7.6
	Intervention 1	108	95.0 (5.4)	87.5-100.0	
	Baseline 2	84	75.5 (13.1)	58.3-83.3	−0.3
	Intervention 2	65	70.5 (15.9)	54.2-90.0	
AC2	Baseline 1	42	48.3 (3.7)	41.7-50.0	8.2
	Intervention 1	57	96.7 (7.5)	83.3-100.0	
	Baseline 2	76	83.2 (11.2)	66.7-95.0	0.5
	Intervention 2	44	89.2 (11.2)	75.0-100.0	
AC3	Baseline 1	37	48.3 (3.7)	41.7-50.0	6.0
	Intervention 1	105	89.9 (9.1)	75.0-100.0	
	Baseline 2	90	53.3 (5.4)	50.0-62.5	1.6
	Intervention 2	66	65.8 (9.9)	50.0-75.0	
AC4**	Baseline 1	42	50.0 (0.0)	50.0-50.0	43.7
	Intervention 1	78	99.4 (1.6)	95.8-100	
	Baseline 2	84	61.9 (14.3)	50.0-95.8	1.3
	Intervention 2	66	77.7 (9.4)	62.5-100	
Voice Tone:					
AC1	Baseline 1	42	85.0 (14.9)	66.7-100.0	1.4
	Intervention 1	108	100.0 (0.0)	100.0-100.0	
	Baseline 2	84	90.0 (14.9)	66.7-100.0	0.9
	Intervention 2	66	100.0 (0.0)	100.0-100.0	
AC2	Baseline 1	42	80.0 (21.7)	50.0-100.0	1.3
	Intervention 1	59	100.0 (0.0)	100.0-100.0	
	Baseline 2	84	76.7 (9.1)	66.7-83.3	3.6
	Intervention 2	48	100.0 (0.0)	100.0-100.0	
AC3	Baseline 1	39	23.3 (19.0)	0.0-50.0	5.7
	Intervention 1	105	100.0 (0.0)	100.0-100.0	
	Baseline 2	90	16.7 (11.8)	0.0-33.3	4.2
	Intervention 2	66	66.7 (11.8)	50.0-83.3	
AC4	Baseline 1	42	40.0 (19.0)	16.7-66.7	4.5
	Intervention 1	78	100.0 (0.0)	100.0-100.0	
	Baseline 2	84	53.3 (7.5)	50.0-66.7	5.8
	Intervention 2	66	96.7 (7.5)	83.3-100.0	

TABLE 1 (continued)

Participant and Behavior	Phase	N*	Average % (SD %)	Range %	D
Closing:					
AC1	Baseline 1	42	27.8 (7.8)	16.7-33.3	3.3
	Intervention 1	108	50.0 (5.6)	44.4-55.6	
	Baseline 2	82	31.1 (6.3)	22.2-38.9	1.6
	Intervention 2	65	41.6 (6.7)	33.3-50.0	
AC2	Baseline 1	42	28.9 (4.6)	22.2-33.3	1.0
	Intervention 1	58	40.6 (15.7)	25.0-66.7	
	Baseline 2	82	30.0 (3.0)	27.8-33.3	0.8
	Intervention 2	48	32.2 (2.5)	27.8-33.3	
AC3	Baseline 1	37	21.1 (7.2)	16.7-33.3	1.2
	Intervention 1	104	27.8 (3.9)	22.2-33.3	
	Baseline 2	86	22.2 (3.9)	16.7-27.8	−0.2
	Intervention 2	66	21.1 (7.2)	16.7-33.3	
AC4	Baseline 1	42	15.6 (6.1)	5.6-22.2	4.8
	Intervention 1	78	53.3 (9.3)	38.9-61.1	
	Baseline 2	80	8.9 (7.4)	5.6-22.2	0.4
	Intervention 2	65	11.8 (6.5)	5.6-20.0	

* N refers to the total number of observations on each behavior within its respective phase.

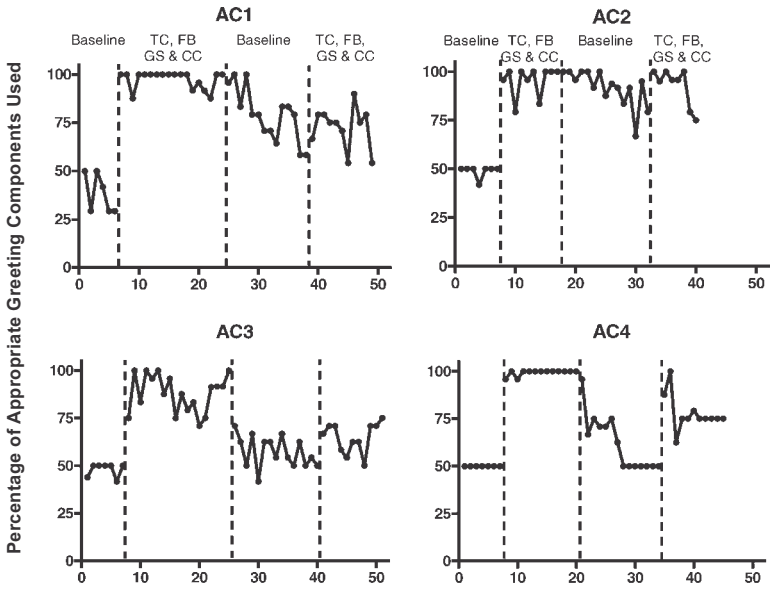
** Includes all data points instead of last five data points in all phases in order to calculate Cohen's *d*. The last five data points in all phases result in a standard deviation equal to zero, causing *d* to be undefined.

50% to 83.2%, SD = 7.4%) with 2 ACs (AC3 and AC4) returning to their previous baseline levels of performance. Reintroducing the intervention improved the performances of 3 of the 4 ACs, with AC1 being the exception. As a group, greeting performances increased to an average of 75.1% (range 65.8% to 89.2%, SD = 9.3%) of appropriate greeting components used.

Voice Tone

Figure 2 shows the percentage of calls during which a friendly voice tone was used throughout the entire call by individual ACs. In the final five sessions of the initial baseline phase, an average of only 57.1% (range 23.3% to 85%, SD = 18.7%) of calls were characterized as

FIGURE 1. Percentage of Appropriate Greeting Components Used by Each Participant During the Initial Baseline, Initial Intervention (Task Clarification, Feedback, Goal Setting, and Contingent Consequences), Second Baseline (reversal), and Second Intervention Phases.



"friendly." All AC performances increased to 100% of calls using a friendly voice tone with the introduction of the multi-component intervention. Every AC's performance deteriorated when the intervention was removed with the group average, 59.2% (range 16.7% to 90%, SD = 10.8), approximating that which was observed in the initial baseline. All AC performances improved in the final treatment phase, as the group averaged 90.8% (range 66.7% to 100%, SD = 4.8%) of calls characterized as friendly.

Closing

Across participants, less systematic effects of the intervention were observed on the final performance–use of appropriate closing statements.

FIGURE 2. Percentage of Calls During Which a Friendly Voice Tone Was Used Throughout the Call by Individual ACs Across All Four Conditions.

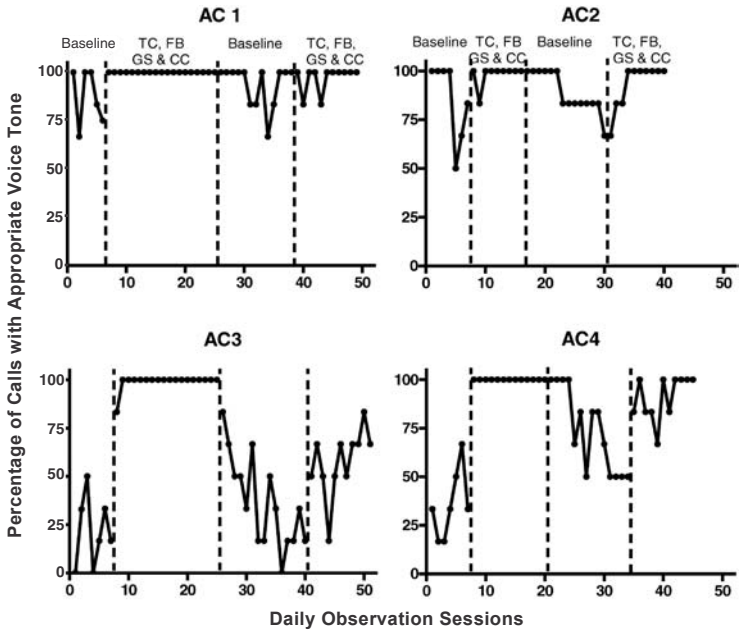
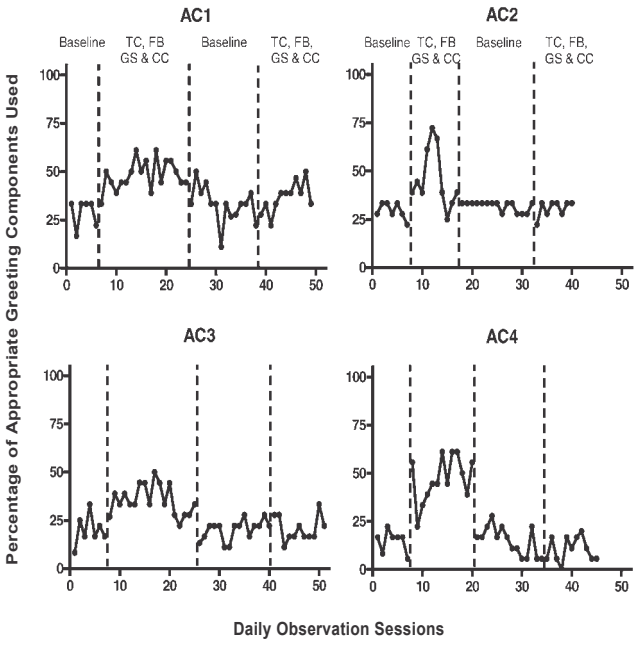


Figure 3 shows the percentage of appropriate closing components used across all four conditions for each participant. In the initial baseline, very few calls were concluded with the appropriate closing–the group mean was 23.3% (range 15.6% to 28.9%, SD = 6.4%). All AC performances increased with the introduction of the intervention (*M* = 42.9%, range 27.8% to 53.3%, SD = 8.6%) but the degree of improvement was nominal in participants AC2 and AC3. Use of the appropriate closing declined in all participants during the return to baseline (*M* = 23.1%, range 8.9% to 31.1%, SD = 5.2%) but it failed to increase when the intervention was reintroduced (*M* = 26.7%, range 11.8% to 41.6%, SD = 5.7%).

FIGURE 3. Percentage of Appropriate Closing Components Used by Each Participant Across All Four Conditions.



DISCUSSION

This study demonstrated that a performance improvement package including task clarification, goal setting, individual feedback, and performance contingent consequences was effective in improving telephone customer service behaviors of appointment coordinators in one department within a medical clinic. Across participants, telephone customer service performances increased with the introduction of the multi-component intervention, declined when the intervention was removed, and, with the exception of appropriately terminating the telephone conversation, increased when the intervention was reinstated. At the individual participant level, systematic effects of treatment

implementation, removal, and reintroduction were generally observed. The most consistent effects were observed in voice tone used during conversations with customer, which was arguably the most important of the three performances targeted for change. While greeting and closing performances were systematically affected by the introduction of the intervention, less reliable improvements were observed when the intervention was reintroduced after a baseline reversal.

A possible explanation of these diminished intervention effects during the reintroduction of the intervention phase is that ACs learned that taxes were charged to the ACs on some of the performance contingent consequences received for meeting their goals. Although these taxes were charged in the first intervention phase as well, the ACs and the authors were unaware of this until the return to baseline condition. Word of this taxation spread among the ACs and may have diminished their motivation to work for the contingent incentives during the second intervention condition.

The weakest effects of the intervention were observed for the third behavior, appropriately terminating the telephone conversation. Casual observations conducted during data collection suggest that this performance may have been precluded by customer behavior when, for example, the customer interrupted the AC before she was able to say all of the closing components.

A strength of this study is that participants were observed from a remote location, and therefore, reactivity effects were minimized. Although participants were aware that their telephone conversations could be monitored, they were not aware of which of their conversations were being observed. In addition, observation sessions were conducted at different times throughout the workday to further reduce potential reactivity effects. Knowledge that one's performance may be observed may result in an increase in maintaining performance standards, but monitoring alone is unlikely to produce increases in performance as large as those produced by monitoring in conjunction with consequences (e.g., feedback) delivered contingent upon the monitored performances (Larson & Callahan, 1990).

The results of the current study are similar to the outcomes of previous research that has utilized multi-component interventions (e.g., task clarification, goal setting, feedback) to increase performance (e.g., Austin et al., 2001; Crowell et al., 1998; LaFleur & Hyten, 1995). However, much like these previous studies, a weakness of this study is that it does not illustrate the independent contributions of each of the intervention components. Similar to findings from LaFleur and Hyten (1995), it may be possible that immediate increases in performance were due to task clarification, jobs aids, goal setting, and verbal descriptions of the link between improved performance and contingent consequences (antecedent components), as graphic feedback and performance contingent consequences had not yet been delivered. Still, the literature supports the use of multi-component interventions (e.g., Alvero et al., 2001; Jessup & Stahelski, 1999), and this study establishes that these interventions are effective in a medical clinic service setting.

One shortcoming of the present study is that the effect of improved telephone customer service performance on patient satisfaction was not determined. At the conclusion of this study, data from the patient satisfaction surveys were unavailable. Future research should attempt to measure the effect of OBM interventions on customer satisfaction (e.g., LaFleur & Hyten, 1995), as this relates directly to the social validity of such interventions. In addition, more research is needed to determine which components within multi-component interventions are responsible for performance improvement in OBM. A final suggestion for future OBM research would be to evaluate the importance of pre-intervention performance analyses and whether the use of such analyses yields more efficient and effective interventions.

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Effective Leadership in Superior-Subordinate Dyads: Theory and Data

Thomas C. Mawhinney

ABSTRACT. This paper describes and experimentally demonstrates the main tenets of an operant theory of leadership. Leadership is characterized in the current paper as involving problem solving operant behavior (Cerutti, 1989; Skinner, 1969) in a social context (Skinner, 1953). The theory was assessed under two experimental analogs modeled from generic formal organizational bureaucratic leader-follower role relations. Under a minimal leadership contingency (MLC) leaders and followers in N = 4 dyads interacted via button pressing and trigger pulling responses, respectively, and they received feedback on counters located on response panels in their separate rooms. Under the MLC every leader button press added a point worth money to one of the follower's counters but the leader received no points worth money based on follower

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Research data were collected between September 1977 and June 1978 and the project was funded by the Graduate School of Business, Indiana University, Bloomington, Indiana.

Differing portions and contexts of the data reported here were presented at the Academy of Management Meetings, Division 10 Organizational Behavior, Chicago 1986 and the Association for Behavior Analysis meetings, Philadelphia, 1988; Boston (OBM SIG), 2004.

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responses. A leadership contingency (LC) was identical to the MLC except that for every 19th follower trigger pull the leader received a point worth money. As anticipated, high rates of leader-follower interaction evolved in all dyads under the LC and appreciably lower rates occurred under the MLC as leader button pressing extinguished under the MLC with repeated exposures to the two contingencies presented in ABABAB fashion. Results were discussed in terms of the theory and data as they may be related to assessment and maintenance of leader-follower interactions and performance in OBM lab and field experiments.

KEYWORDS. Operant theory, superior-subordinate dyads, operant behavior, leadership, effective leadership, mutual reinforcement, follower performance, leadership contingencies

Laboratory and field analog research in the traditions of Organization Behavior Management (OBM) and published in the *Journal* (e.g., Beal & Eubanks, 2002; Bucklin, McGee, & Dickinson, 2003; Cole & Hopkins, 1995; Dickinson & Gillette, 1993; Hantula & Crowell, 1994; Notz, Boschman, & Tax, 1987) address practically significant performance and decision making issues that are difficult or impossible to address with experimental rigor in field settings (Dickinson & Poling, 1996; Latham & Huber, 1992). They provide the bases for better understanding phenomena examined in the laboratory and the promise of identifying and *assessing* more effective remedies of performance problems in field interventions informed by the methods and results of laboratory analog studies.

Establishing validity and reliability of OBM interventions is typically a complicated and demanding process when integrity of both the independent and dependent variables must be fully assessed (Poling, Smith, & Braatz, 1993). The status of baseline data series with respect to reliability and integrity of dependent variables is, nevertheless, the sine qua non of virtually all OBM interventions (Komaki & Goltz, 2001). Equally important is the need to fully assess these data to learn as much as possible

about the variables that maintain (Austin, Carr, & Agnew, 1999) the dependent variables eventually targeted for change and to identify and understand any perturbations that might be observed during baseline assessment whether the data are collected from archives or from direct behavior observations (cf. Langeland, Johnson, & Mawhinney, 1998 and Welsh, Luthans, & Sommer, 1993).

One function of experimental analogs in the traditions of OBM is experimental control of variation among observations (Duncan & Smoot, 2001; Mawhinney, Dickinson, & Taylor, 1989; Smoot & Duncan, 1997) as opposed to statistical control (Jessup & Stahelski, 1999) for variation in baseline dependent variables. These tasks are considerably complicated when the independent and dependent variables involve direct observations of social interactions among superior and subordinate role occupants in a work setting (e.g., Komaki, Zlotnick, & Jensen, 1986). Even when the independent variables appear to be relatively bureaucratic or mechanistic interventions such as superior, manager or supervisory training programs (Methot, Williams, Cummings, & Bradshaw, 1996; Welsh et al., 1993) the process remains social and complex. This is because the training process per se is but one step in a complex chain of events and contingencies typically devised and intended to precipitate and maintain, respectively, higher and lower levels of functional and dysfunctional subordinate performance-related behavior (Luthans & Kreitner, 1975; Welsh et al., 1993) and/or accomplishments (Gilbert, 1996). A laboratory analog of generic formal organizational roles of appointed superior-subordinate position holders that permits control of variables difficult or impossible to control in field settings should help address issues regarding integrity of independent variables that have arisen in field research (cf. Bourdon, 1977; Welsh et al., 1993; Rao & Mawhinney, 1991).

The purposes of this paper are to: (1) briefly review several field studies reported in the *Journal* that included elements of contingencies that were modeled into the experimental analogs used in this study to assess "effective leadership" as defined in this paper, (2) present an operant theory of effective leadership as a phenomenon involving contingencies of mutual reinforcement, (3) present controlled experimental laboratory data regarding the fundamental contingencies responsible

for "effective leadership" and (4) discuss implications of the theory and experimental data for laboratory and field research in the traditions of OBM (Mawhinney, 2000).

SELECTED DE FACTO OBM LEADERSHIP STUDIES

Although virtually any organizational behavior management study in which appointed leader behavior is changed with the objective of changing behavior among organizational members at lower levels in an organization's hierarchy would potentially qualify as a study of leadership, three studies published in the *Journal* were selected for review. The brief review of these studies was intended to prepare readers for some context regarding where a theory of leadership in the traditions of OBM might fit into our literature.

Welsh et al. (1993) trained supervisors in a Russian textile mill to discriminate between their subordinates' functional and dysfunctional performance-related behavior. Then, based on discriminations learned, they were to contingently administer rewards and corrective feedback respectively, when they observed subordinates engaged in each behavior on the job. The dependent variable, the subordinates' functional and dysfunctional performance-related behavior, was assessed reliably by direct observation. The content and rate of superior-subordinate interaction episodes was changed, ostensibly, by the superiors' training in administration of contingent rewards and corrective feedback. Changed superior behavior, the independent variable, was presumed to have produced observed change in the dependent variable during the two week intervention during which subordinates' functional and dysfunctional subordinate behavior rates respectively rose and fell as expected. Yet, neither superiors' administration of rewards nor their delivery of corrective feedback were observed or recorded. Integrity of the dependent variable was evident while integrity of the independent variable was not verified. The critical role that superior-subordinate interaction rates play in increasing and maintaining subordinate performance rates, while

difficult to assess in the field, can be directly observed and controlled in the lab.

Methot et al. (1996) provided a manager and four supervisors of an employment training center and residential care facility with three hours training regarding how to conduct goal setting and feedback sessions with subordinates and used Komaki's Operant Supervisory Taxonomy Index (OSTI) (Komaki et al. 1986) to assess one of their dependent variables that involved social interactions among superior and subordinate role occupants. The dependent variables were "contingent performance consequences" administered by the trained manager, trained supervisors and direct care staff. The OSTI was used to assess " . . . generalization of skills from the training context to on-the-job interactions with staff . . . the ultimate goal of changing supervisory behavior . . . [however], . . . was to improve services provided to clients by producing changes in the performance of direct care staff" (Methot et al., 1996, p. 7). Although delivery of contingent consequences as measured by the OSTI generalized from training of supervisors to their staff, results at the level of client behavior change (measured with reliable direct behavior observation methods) were mixed. Methot et al. (1996) attributed the mixed results to absence of formal performance feedback loops that might have provided feedback regarding desired behavior change among clients (i.e., staff performance) to supervisors and the manager. These feedback loops were specifically avoided because they would have confounded assessment of generalization of training from supervisors to staff. Feedback loops such as those omitted in the Methot et al. study can not only be subjected to greater control in the lab, they can be assessed within ABAB reversal designs instead of the multiple baseline used by Methot et al. (1996).

A very complex and lengthy intervention by Bourdon (1977) was, on the other hand, designed and implemented with the specific objective of institutionalizing levels and types of superior-subordinate interactions using formal feedback loops and other contingencies that would increase and maintain levels of organizational accomplishments that depended on them. "For many specific job outcomes [prior to the intervention] either measures were not available or data were not in a usable

form for individual accountability" (Bourdon, 1977, p. 24). The intervention components in each [of two] plant[s] included the following: (1) management position analyses and task clarification, (2) 30 weeks of instruction regarding OBM/OB Mod principles of "positive" behavior change and related procedures (texts used were Luthans & Kreitner, 1975 and Miller, 1975), (3) goal setting, (4) a point system, (5) a performance score card (cf. Abernathy, 2001) or matrix feedback (cf. Eikenhout & Austin, 2004) system via which points earned for several accomplishments were tallied and reported, (6) hands on behavior change projects designed, implemented and assessed by participant managers during their 30 weeks of training and (7) tangible "reinforcers" that could be acquired by "spending" points earned. Points earned functioned as a medium of exchange in token economy fashion (Ayllon & Azrin, 1968). The dependent performance dimensions measured, in common across managers, were the following: (1) efficiency, (2) quality, (3) attendance and (4) waste *in each superior's area of responsibility*. Variation in all of these performance dimensions were in part or largely and directly (e.g., attendance) a function of subordinates' performance-related behavior across managers. Thus, Bourdon's (1977) system presented each superior with a challenge regarding how to change subordinate performance-related behavior and accomplishments upon which the superior's token economy points depended. But, an element of the multi-element intervention included training regarding "behavioral tools" or skills superiors needed to succeed within the tangible extrinsic reward *system* (Abernathy, 2001; Brethower, 1982, 2000; Rummler & Brache, 1991; Sasson & Austin, 2005). So superiors were left to their own devices regarding how to solve their problem. The problem, of course, was how to earn points they could spend acquiring valuable tangible items from the token economy.

Bourdon's (1977) study differed considerably from those of Welsh et al. (1993) and Methot et al. (1996) in that it reported *no direct systematic observations* of plant manager, manager (superior's superior), supervisory (superior participant) or subordinate *behavior*. Rather, it was a systems level study in terms of the organizational system level independent variables manipulated and dependent variables assessed

(Brethower, 1982, 2000). Nevertheless, elements of the intervention package were designed in accordance with fundamental principles of our empirical theory of behavior in that every effort was made to bring the behavior of participants under the control of consequences over which they had some control (Baum, 1973; Hopkins, 1999; Poling & Braatz, 2001; Skinner, 1969). How they could gain the needed control was included in their training that focused on rules regarding how to apply our principles of behavior to effect changes in performance-related behavior among their subordinates (Bourdon, 1977; Luthans & Kreitner, 1975; Miller, 1975).

Evidence regarding integrity of the performance matrix-based point delivery system appeared in graphs that plotted participants' points earned and plant-wide accomplishments. Points earned and dependent accomplishment levels appeared, by visual inspection, to be correlated (Bourdon, 1977, pp. 31-34). By my calculation $r = 1.00$ for $N = 6$ monthly data points between superiors' points earned and percent attendance among subordinates after estimating the value of data points in Bourdon's (1977) first data graph. Although these data support integrity of the connection between points allocated among appointed leaders and plant-wide performance, the connection between behavior of appointed leaders, functional performance-related behavior among their followers and plant-wide accomplishments were not validated. That is to say, variables other than appointed follower behavior might have contributed to changes in plant-wide accomplishments, e.g., replacement of aged with new equipment, reengineering work processes (Rummler & Brache, 1991) and plant-wide human resource policy changes.

On the other hand, if appointed leaders adopted and followed rules (Agnew & Redmon, 1992; Malott, 1992; Skinner, 1969) regarding how to effectively identify functional and dysfunctional performance-related behavior and contingent administration of reinforcers, learned during training, these responses to the intervention could have operationalized the correlation-based law of effect (Baum, 1973). This would have resulted in increased rates of followers' functional performance-related behavior. Recall that the correlation-based law of effect

codifies the empirical fact that (Baum, 1973, p. 145): "behavior increases in frequency if the increase is correlated with an increase in rate of reinforcement or a decrease in rate of aversive stimulation" (p. 145). If this was what happened, then increased rates of follower's functional performance-related behavior would have resulted in leaders' receipt of reinforcement value (Rachlin, 1989) from points earned based on their performance matrix results being exchanged for dollar valued tangibles from the token economy-like reward system, albeit with some temporal delay. If so, the combination of leader training in conjunction with the performance matrix and token economy-like reward contingencies could have precipitated contingencies of mutual reinforcement among appointed leaders and their appointed followers (Baum, 1994; Rao & Mawhinney, 1991). But, no behavior (except perhaps subordinate absenteeism) was directly measured and reported. Thus, while the theoretical statements just elaborated regarding the role of mutual reinforcement and plant-wide performance improvements logically fit the data, reliable data regarding these complex dynamic contingencies were neither collected nor reported by Bourdon (1977).

What none of these studies included was a vantage point on the behavioral processes involved that would, among members of other research communities (e.g., Bass, 1960; Schriesheim & Kerr, 1977; Schriesheim, Neider, & Scandura, 1998), be characterized as manifestations of leadership. Members of the OBM community are not alone in viewing formally appointed superior position holders as potential independent variables when their interest is in changing the behavior of their subordinates. After all, that is precisely why leadership roles are created in formal organizations; they fill the gaps in formal information and reward systems because they can be highly flexible compared to static SOPs, rules and regulations that typically lag the pace of change in organizational requirements for changes in performance among members (Mawhinney, 2001; Mawhinney & Ford, 1977; Rao & Mawhinney, 1991; Skinner, 1953). For example, Bourdon (1977) took care to point out that long-term effectiveness of the performance (matrix) report system he described depended critically on it being changed with changing

conditions in the plants where it had been installed. And changes were, according to him, occurring at a rapid pace.

Of course, system changes, such as the initial introduction of Bourdon's (1977) intervention, if they did indeed produce changes in accomplishments, did so via a complex chain of events and behavior. These complex contingencies may not be apparent unless organizations are viewed as combinations of processes operating in conjunction with contingencies of reinforcement (Sasson & Austin, 2005). Both the Methot et al. (1996) and the Bourdon (1977) studies reflect an appreciation of these issues, i.e., the reciprocal relations among subordinate performance, organizational unit and/or organizational level performance and superior-subordinate interactions. But social processes were not discussed in detail in the articles reviewed here nor were any connections between their interventions and the concept of leadership addressed.

The account of leadership developed here and data related to it are intended to introduce an operant reinforcement-based theory of leadership that might help codify and draw together some of the OBM literature involving social interaction processes that might otherwise appear diverse, fragmented and unrelated. This may be accomplished by showing how, as above, superior-subordinate behavior interactions are related to one another by an operant conception of leadership.

AN OPERANT THEORY OF LEADERSHIP

Leadership, for present purposes, is "operant behavior of one person that effects a change in the context of the operant behavior of one or more other persons and thereby changes or maintains the other [person or] persons' operant behavior" (Mawhinney, 2001, p. 204). *Operant behavior context* refers to three-term ($A : B \rightarrow C$) (Poling & Braatz, 2001) or four-term ($A' \cap A : B \rightarrow C$; where A' is a potential EO) (Agnew, 1998; Agnew & Redmon, 1992; Mawhinney, 2001) *environmental contingencies*. For leadership to occur and effect some change in follower behavior the environmental contingencies of the leader and follower must overlap

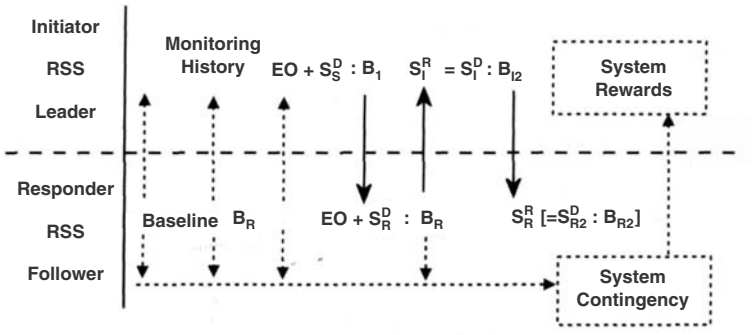
or be intertwined whether they are interlocked or not (cf. Azrin & Lindsley, 1956 and Glenn, 1991). In addition, if leadership is to refer to a relationship that involves ongoing interactions between the leader and follower, *their relationship must arise from and be ultimately maintained by contingencies of mutual reinforcement within which leader and follower engage in repeated interaction episodes* (Baum, 1994; Glenn, 1991; Mawhinney, 2001; Rao & Mawhinney, 1991). Interaction episodes, to the extent that their onset and terminus can be identified, can be assessed as correlated rates of leader-follower behavior or interaction rates through time (Mawhinney & Ford, 1977). Contingencies of mutual reinforcement should produce cooperative social relationships between superiors and subordinates if the correlation-based law of effect operates simultaneously on the behavior of both dyad members (Mawhinney, 2001).

In formal organizations organizational designers have created roles with role specifying stimuli (RSS) (e.g., role descriptions that enumerate their responsibilities: Brethower, 1982; Noe, Hollenbeck, Gilbert, & Wright, 2003) and other contingencies (e.g., Bourdon, 1977). These antecedent stimuli (RSS) and contingencies they specify are intended to insure that the superior position holder's behavior is reliably evoked by follower behavior the superior is charged with reinforcing or correcting (Welsh et al., 1993). The generic solution to this sort of problem is a change in behavior of an appointed leader that effects a change in the behavior of one or more appointed followers and thereby solves the organization's problem of fostering and maintaining functional and minimizing dysfunctional performance-related behavior among members at many levels of the organization. Accordingly, one question the current theory addresses is how to create conditions that will evoke leader behavior that sets the occasion for desired follower behavior. The answer suggested by this theory and developed in more detail below is that contingencies of mutual reinforcement between an appointed leader and an appointed follower(s) support interaction rates needed to support required rates of desired subordinate performance-related behavior.

A generic model of mutual reinforcement within this sort of dyadic relationship is depicted as a diagram in Figure 1. Although the diagram in Figure 1 was adapted from Baum (1994), it is important to note what some operant theorists might consider a *potentially important difference* in the diagram compared to Baum's original. And that is the addition of EOs that result in a depiction of four- as opposed to three-term contingencies in the diagram. That having been said, the initiator/leader's contingency is above and the responder/follower contingency is below the darker horizontal dashed line that divides participants in leader and follower contingencies. The contingencies are such that reinforcing consequences of the leader's behavior depend on the follower's behavior and vice versa. However, whether the follower's behavior functions as immediate reinforcement of the leader's behavior depends in part or entirely on presence of the System Contingency and System Rewards regulated by it that are directly or indirectly contingent on follower behavior or accomplishments produced by follower(s) behavior.

Although these contingencies depict interactions between a formally appointed leader and follower, *either role occupant might initiate an interaction episode* characterized by an explicit beginning and ending

FIGURE 1. Diagram of Superior-Subordinate Contingencies of Mutual Interaction Within the Context of Organizational Surveillance, Feedback and Reward Systems.



Source: Adapted from Baum (1994, p. 176) and published with permission of the author.

point as in Figure 1. For present purposes, however, the diagram is intended to depict a contingency that sets the occasion for *evolution* of interactions between a formally appointed leader and follower within formal bureaucratically structured organizations. Role specifying stimuli (RSS) that distinguish between superior and subordinate role occupants are observed in tasks they perform for which they are held responsible by the "system" and resources they are provided, by the "system," to perform their tasks. The superior's resource base will usually include official control of some tangible extrinsic rewards and social rewards that will depend on the superior's reinforcement history with the subordinate(s), i.e., highly "respected" leaders may be sources of powerful social reinforcement among followers as compared to less "respected" leaders (Goltz & Hietapelto, 2003).

Figure 1 begins with some time during which the leader is permitted to monitor follower behavior (denoted as Monitoring History). What is monitored, from left to right across time, is the baseline occurrence of follower behavior below the horizontal dashed line. The arrows pointing up within the baseline phase indicate a stream of follower behavior the leader might be officially responsible for monitoring and arrows pointing down indicate the collection and recording of a follower's behavior and/or accomplishments by some organizational system. This system is part of an organizational contingency that delivers delayed rewards to the leader based on rates of follower behavior and/or accomplishments, such as the superior's weekly performance (matrix) report and token economy reward system described in Bourdon's (1977) study and depicted in the System Contingency and System Rewards linkage in Figure 1.

The archetypal episode, depicted in Figure 1, begins with what Bass (1960) called *attempted leadership*. For present purposes this is a class of situational variables in the initiator's environment that in one way or another (i.e., EOs and S^Ds) set the occasion for and result in the leader initiating interactions with a follower. In Figure 1 this is depicted as stimulus control on the leader's first occasion of attempted leadership. (Although the combined EO and S^D depicted in Figure 1 appear only for the first instance of leader and follower behavior, it should be understood

that the remaining S^Ds might also be accompanied by the same or another EO(s).) More likely than not, the antecedents that set the interaction episode in motion are combinations of discriminative stimuli and EOs (Michael, 1982, 1993) of one sort (Agnew, 1998; Agnew & Redmon, 1992; Olson Laraway, & Austin, 2001; Schlinger & Blakely, 1994) or another (Klatt & Morris, 2001; Vollmer & Iwata, 1991). These antecedents could include instructions (contingency specifying stimuli, or CSS) (Agnew & Redmon, 1992; Skinner, 1957) and/or RSS from the leader's leader or superior's superior. They might also be rules (Agnew, 1998; Agnew & Redmon, 1992; Baum, 1994; Galizio, 1979; Mawhinney, 1982; Skinner, 1969) the leader discovered for solving a relatively ubiquitous and omnipresent problem virtually every appointed leader encounters on a daily basis, *how to gain access to reinforcements that depend directly or indirectly on follower performance-related behavior and/or accomplishments*. This larger environmental context belongs to the class of contingencies that constitute " . . . what Cerutti (1989) has called an 'informal [and in this case formal] occasion for problem solving' that 'appear[s] whenever the availability of reinforcement is discriminable but the form of responding is unspecified" (p. 272) (Rao & Mawhinney, 1991, p. 106). Thus, repeated occasions of attempted leadership are likely to belong to a very large category of behavior Skinner discussed in a book chapter entitled "An operant analysis of problem solving behavior" (Skinner, 1969, pp. 133-171). In this chapter Skinner compares and contrasts the concepts of contingency shaped and rule governed behavior. Much of his discussion of the subject involves social contingencies, no doubt because, as in the case of leadership, many problems and their solutions encountered by people in everyday life involve the behavior of other people in dyads and larger groups. For example, many principles of behavior used in OBM (Hopkins, 1999; Poling & Braatz, 2001) can be employed as rules that one person can use to effect a change in the behavior of another by changing their own behavior, e.g., tacts, mands (Skinner, 1957) and behavior modeling.

What we would call a solution to the leader's problem or a problem solved by an appointed leader, Bass (1960) called *successful leadership*.

Unless the subordinate's behavior in response to the superior's attempted leadership results in successful leadership, at some point the class of behavior called attempted leadership will extinguish for lack of an effect on follower behavior upon which the leader's rewards depend. By the same token, the subordinate's behavior will become erratic and eventually extinguish altogether if subordinate behavior evoked in the course of successful leadership is not also reinforced (Azrin & Lindsley, 1956). Bass (1960) reserved the term *effective leadership* for occasions when successful leadership included reinforcement of the follower's behavior that solved the leader's problem–access to or receipt of reinforcement(s). Recall that the formally appointed leader's ubiquitous and perennial problem is gaining access to reinforcements that, in formal organizational contexts, either directly or indirectly depend on followers' performance-related behavior and accomplishments. Thus, *effective leadership*, under laboratory conditions, is evidenced by an increase in and/or maintenance of follower performance-related behavior as a function of the leader's direct administration of subordinate rewards or the leader's mediation of the subordinate's access to rewards (Baum, 1994; Rao & Mawhinney, 1991).

Attempted, successful and effective leadership can occur in the absence of a formal system contingency such as the one depicted in Figure 1. And there may be other factors in a work setting that facilitate or work against a superior achieving effective leadership. In the absence of such a contingency, however, the appointed leader might well allocate behavior to activities other than attending to followers' behavior and its development (e.g., Luthans, Rosenkrantz, & Hennessey, 1985). Leaders' neglect of a follower(s) might set the occasion for attempted leadership on the part of the follower(s).

If a follower's access to powerful reinforcers depended on skill development and access to that development depended solely on interactions with the formally appointed leader, gaining access to and interactions with that leader would present the follower with a problem as defined above (Cerutti, 1989). Presented with this genre of problem the follower would likely engage in attempted leadership directed at behavior of the appointed leader. There might, however, be substitutes for leadership

should the leader fail to interact with the follower. For example, a leader might well be unresponsive to follower behavior in the absence of the system contingency depicted in Figure 1. Under these conditions the subordinate might engage in self-development via education off the job or might seek and receive assistance from peers. In the traditional leadership literature the concept of substitutes for leadership was introduced and developed to account for poor correlations between survey-based assessments of leader behavior and subordinate job performance (Kerr, 1976; Kerr & Jermier, 1977). But the concept is readily amenable to an operant interpretation (Mawhinney & Ford, 1977). Although peer group behavior can facilitate leader supportive group member behavior it may also work against leader support and favor conformity with group norms of work output restriction or resistance to needed change (Gowen & Jennings, 1990; Mawhinney & Gowen, 1990).

What can be gleaned from any of the three studies reviewed above is the fact that whatever contingencies maintained levels of the dependent variables during baseline conditions left considerable room for improvement in each study's respective dependent variable(s). This proposition was validated by the positive behavioral effects of each intervention reported for each study (Bourdon, 1977; Methot et al., 1996; Welsh et al., 1993). In the experiment described below this genre of organizational contingency, i.e., baseline conditions in the three studies reviewed, is called a *minimal leadership contingency* (MLC) (Rao & Mawhinney, 1991). This nomenclature was adopted to reflect the fact that although some frequency of effective leadership would be expected to occur in the presence of rudimentary contingencies of social interaction relating superior and subordinate behavior in formal organizations (e.g., RSS), there would be no assurance that effective leadership would be evoked and maintained at relatively high levels in the absence of explicit extrinsic contingencies of mutual reinforcement. A contingency that makes mutual reinforcement highly likely to occur during superior-subordinate interactions–we have called a *leadership contingency* (LC) (Rao & Mawhinney, 1991). The LC is depicted as the System Contingency and System Rewards in Figure 1 and is exemplified by the Bourdon (1977) performance matrix in conjunction with the token

economy-like intervention contingencies. *Removal* of the System Contingency and System Reward contingency from Figure 1 would result in depiction of an MLC.

The class of environmental contingencies that qualify as LCs is identified by the fact that members of that class make the leader's access to formal organizationally programmed reinforcement depend directly and/or indirectly on follower performance-related behavior and/or accomplishments. Thus, the LC would present appointed leaders with a situation that called for them to engage in problem solving behavior (Cerutti, 1989; Skinner, 1969) or, in the parlance of the current theory, it would set the occasion for attempted leadership. Solution of the problem would involve the appointed leader effecting change(s) in the behavior of an appointed follower(s), or *successful leadership*. According to our principles and theories of behavior (Baum, 1973; Hopkins, 1999; Poling & Braatz, 2001; Skinner, 1969) the leader would have to somehow change the follower's contingencies of reinforcement if the leader were to achieve successful leadership. Maintenance of leader-follower *social relationships* characterized by leaders and their followers typically solving their mutual problems in the presence of an LC would depend on effective leadership, i.e., follower cooperation with the leader would have to be reinforced, in the long run, by follower receipt of reinforcement directly or indirectly related to leader-follower interactions. If the LC was not always present, of course, the leader would likely learn to distinguish between occasions when the LC was present versus absent, i.e., discriminate between the LC and MLC.

As the three studies reviewed here suggest, interventions aimed at creating independent contingencies of social interaction, the LC described above, can focus on one or more of the organizational members that are to participate in the contingencies created. In the first two interventions, however, no work place contingencies that would qualify as independent experimenter controlled contingencies of social interaction (Weingarten & Mechner, 1966), i.e., no LCs, were created. If such contingencies had been created they would have been described as systems-level variables like the performance matrix included in the Bourdon (1977) study.

In the current experiment, response panels housed counters used to deliver points worth money and other interaction feedback. The superior's required responses were less effortful than the subordinate's required responses. Thus, the superior could respond at higher rates than the subordinate making it more likely the superior would "determine" the level of interaction rates. The superior also received more fixed-time pay than the subordinate. Thus, the superior was less dependent upon interactions with the subordinate for amounts of rewards received if the superior and/or the subordinate chose not to interact at all. Counters on their respective response panels delivered feedback to the superior and subordinate regarding their respective cumulative number of responses made during every 10 min session. During every session across all conditions, the superior and subordinate each received additional feedback regarding the other's performance. The contingencies just enumerated constituted our experimental analog of the MLC (Rao & Mawhinney, 1991). Under these contingencies the superior and subordinate could respond to each other in a relatively contiguous manner. Alternatively, one member might respond at high rates independently of their counterpart's responding. However, unless the superior's responding was reinforced by its effects on the subordinate's responding, any initial responding on the part of the superior was likely to suffer extinction with repeated exposures to the MLC. That is to say, the only potential sources of reinforcement for high rates of superior responding under the MLC were feedback on their own and their subordinate's responding.

The LC was operationalized by the addition of one more contingency to those described above. The additional contingency involved feedback and monetary rewards to the superior based on every 19th subordinate trigger pull. This contingency presented the superior with the problem of how to respond to information regarding subordinate responding in a manner that would result in increased subordinate response rates that would in turn result in more rewards received by the superior or reinforcement of the superior's response rates correlated with subordinate's response rates. Response rates of superiors and subordinates were expected to be higher under the LC compared to MLC

and well correlated with one another under the LC whether correlated or not under the MLC.

In the current experiment superior-subordinate dyads were exposed to the LC and MLC in a series of LC to MLC to LC conditions in ABABAB fashion. Given the superior engaged in effective leadership under the LC and experienced extinction or near extinction under the MLC, the subordinate might, nevertheless, engage in attempted leadership under the MLC. This is because there would be no way, other than absence of rewards delivered by the superior, for the subordinate to know a priori that high interaction rates were unlikely under the MLC. This is probably a fairly common contingency in the field. It is manifest on occasions when a subordinate seeks help with a performance-related problem for which a solution results in rewards for the subordinate while there is virtually no "pay off" for the superior providing assistance. In addition, attending to a subordinate's problem might be associated with a loss of reinforcement from responding to competing contingencies (e.g., administrative work or politicking, Luthans et al., 1985). Nevertheless, on some occasions this sort of attempted leadership by a subordinate might result in a subordinate's successful leadership of his/her superior even if short lived. Therefore, the empirical result of superior-subordinate learning across sessions of the LC and MLC presented in ABABAB fashion was expected to be manifest in higher response rates among subordinates than their superiors under the MLC and just the opposite, higher superior response rates, under the LC.

METHOD

Participants

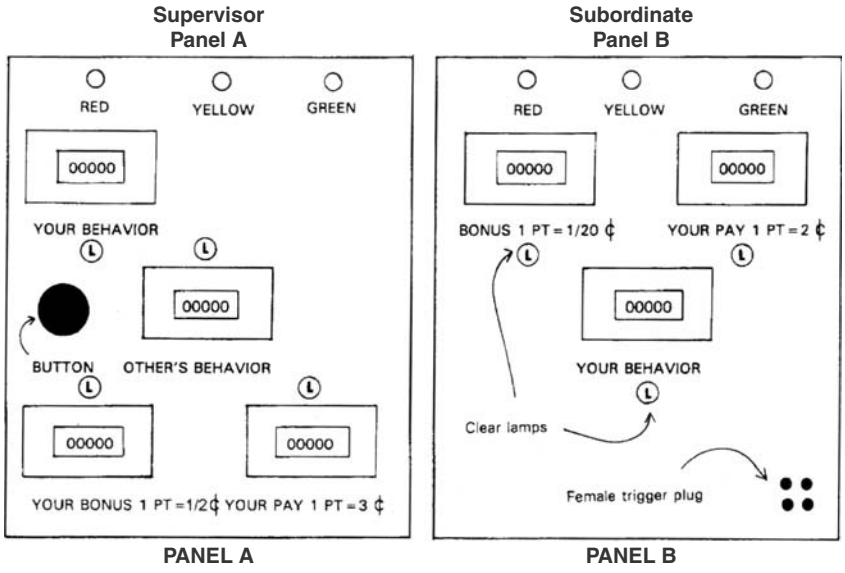
Eight men attending a Midwestern university and ranging in age from 20 to 25 were formed into N = 4 dyads (A, B, C and D). They were recruited with an offer of "experimental subject work" *for pay*. Accepting the offer simulated joining a work organization for hourly wages.

These offers of employment were made and the four experimental replications conducted between September 1977 and June 1978.

Apparatus

Dyad members sat in adjoining rooms with a response box on a table in front of them. The superior's room was designated by a sign on the door that read **SUPERVISOR**, in tall bold block letters; the follower's room was designated by **SUBORDINATE** on the door, again in tall bold block letters. Feedback concerning wage and bonus earnings was provided by counters on the front panel of response boxes as depicted in Figure 2. Each response box included descriptions of the feedback provided by each counter. In addition, participants' roles, in handwritten script, reading Supervisor's Panel A or Subordinate's Panel B appeared on mailing labels affixed to the upper edge of their respective response

FIGURE 2. Apparatus for Superior's (Panel A) and Subordinate's (Panel B) Response Inputs and Feedback.



box. The RSS (specifying the roles of each participant as either *supervisor* or *subordinate*), not present in the Rao and Mawhinney (1991) experiment, were intended to function as establishing operations that would initially evoke behavior on the part of both superior and subordinate position holders.

Job-related behavior. The superior's response was a button press with the button mounted on the face of the participant's response panel. The subordinate's response was a more effortful trigger squeeze or pull. The trigger was mounted on an airplane joystick attached to a tabletop and more fully described below. The rationale for the more effortful trigger pulling task of the subordinate was to make the superior less likely to suffer fatigue effects and more likely to have a higher ceiling response rate ceiling than the subordinate.

Control room. The superior's button and subordinate's trigger and all counters and interactions among counters were routed through and could be operated by switch settings, ratio programmers and interval programmers located in a master panel in a separate control room.

Participant separation. Blinds over the window between participants' adjoining rooms were drawn so that no visual contact was possible. Similarly, no auditory exchanges between rooms were possible. These physical arrangements insured against participants responding to extraneous sounds in the lab and/or communicating with one another via means other than their respective response panels and button or trigger mechanisms.

Panel A. The superior's panel contained four operative counters and one operative button (see Figure 2). (Another button and counter on the panel were inoperative and covered with black plastic tape.) A press on the button added one point to the counter directly above it and labeled "YOUR BEHAVIOR." Each superior button press added one point to the subordinate's (panel B) counter labeled "BONUS 1 PT. = 1/20¢" whenever the experimenters switched it on at the control panel. Another control room panel switch permitted experimenters to make every subordinate trigger squeeze/pull add one point to the superior's "OTHER'S BEHAVIOR" counter (center of panel A). A control room panel switch permitted experimenters to route the output of either ratio or interval

scheduling mechanisms to the supervisor's counter labeled "YOUR BONUS 1 PT = 1/2¢." The counter labeled "YOUR PAY 1 PT. = 3¢" was advanced by a fixed-time program every 30 s during every experimental and control session.

Panel B. The subordinate's panel contained three operative counters (see Figure 2). (One inoperative counter was covered with black plastic tape.) Each *superior* button press added one point to the counter labeled "BONUS 1 PT. = 1/20¢." The counter labeled "YOUR PAY 1 PT = 2¢" was advanced by a fixed-time programmer every 30 s during every experimental and control session. At the bottom of the panel was a female four-pin receptacle into which a plug wired to a trigger (mounted on an airplane joystick) was inserted (see cluster of four circles bottom right of panel B in Figure 2). The joystick per se was mounted at one end of a 35-cm (about a man's forearm length) long by 5-cm high by 10-cm wide piece of wood. The length of wood was immobilized by a clamp placed at a right angle to the side of the table top nearest where the participant sat facing the table; it pointed inward toward panel B from the clamp. At the other end of the wood, which was near the response panel, and rising vertically from that end of the wood, was the joystick. Immobilizing the joystick prevented participants from employing novel methods of squeezing/pulling or otherwise operating the trigger. Each pull or squeeze on the trigger added one point to the counter labeled "YOUR BEHAVIOR" providing performance feedback during every session.

Common panel features. A clear lamp either under or over each counter (see Figure 2) flashed every time the counter advanced. This insured that any counter activity was more likely to be noticed by participants. Red, yellow and green lamps at the top of each response panel were lit in combinations with a different combination associated with each experimental and control condition (see Table 1).

Control room monitoring. The two panels were connected to a master panel in the control room. From this panel experimenters could monitor each participant's performance in real time, alter reinforcement contingencies within and between participants and within and between sessions, and send artificial feedback (see descriptions of Superior Con-

trol and Subordinate Control Conditions) through any of the behavior feedback or bonus point counters.

Information and power asymmetry. The more effortful response for the subordinate insured that the superior could easily respond at a higher rate than his subordinate. Since the YOUR PAY counters moved at equal rates for leader and follower, once every 30 s, the superior was less dependent upon bonus payments for earnings than was the subordinate. However, both were dependent upon one another for bonus payments as indicated below and the superior earned less per subordinate response than vice versa. The superior was, however, better informed about his interactions than the subordinate in that he could see his own and his subordinate's response rates. The follower only observed leader behavior indirectly in the bonus payments he received from the superior. These differences operationalized analogs of formal organizational role differences discussed above, e.g., systems mediation of the superior's rewards based on subordinate responding and ability of superiors to monitor subordinate behavior without the subordinate's specific awareness of this activity.

Procedure

Participants were scheduled to arrive at the laboratory 10 min apart. When the first participant arrived at the reception area, the experimenter introduced himself and asked that the participant follow him. The participant was then given a brief tour of the two participant rooms and told, "This is an experiment involving two persons who are located one in each of these rooms. One is a subordinate [experimenter pointing to door label] and the other is a supervisor [experimenter pointing to other door label]." This permitted each participant to see that the panels differed between rooms, that the joystick trigger was located in only one room, and to identify the room in which the participant would be working.

The first participant to arrive was then escorted to a waiting room where he was told he would have to wait until the other person arrived. When the second participant arrived, he was given the same tour and information as the first participant and then immediately seated in the

room to which he had been assigned. He was told that the experiment would begin as soon as the other participant, who had already arrived and was waiting, was seated in the other room. The participant who had arrived first was then told that the experimenter was ready; he was then seated in the other room and told the experiment would soon begin. These procedures insured that participants never met face-to-face before the experiment and the procedures just enumerated were specifically devised to insure that participants never made any visual contact with one another prior to entering their respective workrooms.

A taped message in which participants were introduced to the experimental setting was played over ceiling speakers into the two rooms after the participants had been seated in their respective rooms. An attempt was made to avoid suggesting anything more about how they should behave in the experiment beyond what they might deduce from their surroundings and, in the sign on their door (in large bold block type) and script over each response panel that read either "supervisor" or "subordinate." The need to replay taped instructions never arose.

Each session was 10 min in length with few exceptions and all sessions occurred during a single day, i.e., all data were collected during a single visit to the lab (report total average time, if possible, for the day). This session duration was selected based on the results of 40 pilot sessions which indicated that sessions of this length would not produce fatigue effects in either member of the dyad. At the end of each session the experimenter entered each participant's room, recorded points from his counters and gave him his earnings, in cash, based on point readings from his counters. During each session, the experimenter watched the cumulative counters for responses by each participant and wrote the cumulative number of responses that had occurred at 2.5 min intervals during each session yielding four data recordings per session for each participant. The time between sessions was about one and a half to two minutes.

Two experimental and two control conditions were examined in a multiple reversal design (Komaki & Goltz, 2001; Sidman, 1960). The two experimental conditions, LC and MLC occurred in alternating ABA fashion for the first 11 sessions of the experiment beginning with

the first LC condition. This series was followed by presentation of control conditions that varied in order and frequency across dyads with LC and MLC occasionally interspersed among the control conditions. Treatment orders as well as cumulative number of superior-subordinate responses per session for each dyad appear in the Appendix.

Minimal leadership contingency (MLC). Trigger pulls by the subordinate and button presses by the superior advanced their respective counters labeled "YOUR BEHAVIOR." Response-independent, fixed-time (analogues of hourly wages) pay counters, labeled "YOUR PAY 1 PT. = 3¢" and "YOUR PAY 1 PT. = 2¢" for the superior and subordinate, respectively, advanced every 30 s. In this experiment, excluding the time to deliver cash payments between sessions, superiors and subordinates could earn about $3.60 and $2.40 per hour (approximately $8.00 and $5.33 per hour in 2005 dollars), respectively, by simply sitting in their rooms without interacting. Each superior button press added one point to the subordinate's counter labeled "BONUS 1 PT. = 1/20¢." Each subordinate trigger pull registered on the superior's panel labeled "OTHER'S BEHAVIOR." The yellow and green lamps were lit on the superior's panel and the red and green lamps were lit on the subordinate's panel.

Leadership contingency (LC). This contingency was a replication of the MLC contingency with the following additions: (1) every 19th response by the subordinate advanced the superior's counter labeled "YOUR BONUS 1 PT. = 1/2¢" by one point and (2) the red, yellow and green lamps were lit on both panels during this condition.

Superior response-independent contingency. In this condition a timing device reproduced the rate of rewards the superior received on his bonus counter during the steady state phase of the superior's leadership contingency (LC), but independently of the actual rate of the subordinate's responses; although, coincidentally, they could be the same (i.e., the counter was advanced on a fixed-time schedule, irrespective of responding). The inter-reinforcement interval, in numbers of seconds, was determined by dividing the number of rewards received by the superior *in the most recent session* of the superior leadership contingency into 600 s (or 10 min $\times$ 60 s). Equipment and time limitations did not

permit us to simulate any *local variations* in the response-independent reinforcement. With the timing equipment set at an inter-reinforcement interval required to reproduce the rate from the superior's LC, we then watched the control panel counter and stopped the session when the number of rewards required to match the number from the superior's LC had accumulated on the control room counter. Thus, the response-independent reinforcement rates essentially matched the rates from the prior LC session, but, included no local variations. Absence of local variations should have reduced the difficulty of detecting the response-independent rewards.

Subordinate response-independent contingency. This condition was the same as the superior LC except the procedure described above (and method of selecting the inter-reinforcement interval) reproduced the rate of reinforcement the subordinate received on his bonus counter during the steady state phase of his most recent LC session.

Independent Variables

The independent variables were the MLC and LC contingencies/conditions as described above. Under the MLC, the superior had no incentive to change subordinate behavior because its rate did not constitute a problem for the leader (Cerutti, 1989); there was no formal contingency between programmed rewards contingent on any change in or control of subordinate behavior under the MLC unless changing or controlling subordinate behavior was reinforcing per se. The LC made superior rewards, beyond time and baseline rewards for remaining in the experimental setting, depended directly, albeit with a brief delay, on subordinate behavior. The MLC for the subordinate resembled the LC from the superior's vantage point.

The LC, de facto, solved the subordinate's problem by presenting the superior with essentially the reciprocal problem–how to interact with the subordinate in ways that would increase their mutual interaction rate and thereby the superior's receipt of system-based rewards delivered contingent on subordinate response rate (see Table 1).

TABLE 1. Summary of Conditions and Response Panel Configurations

Experimental and Control Contingencies				
Description of contingency components[b]	Minimal Leadership	Leadership	Superior Control	Subordinate Control
Discrimination lights R = Red Y = Yellow B = Blue				
	Superior: YG	Superior: RYG	Superior: RG	Superior: RY
	Subordinate: RG	Subordinate: RYG	Subordinate: RG	Subordinate: YG
Superior responses advance subordinate bonus counter one point = 1/20¢	Yes	Yes	Yes	No
Superior's **"OTHER'S BEHAVIOR COUNTER"** operative	Yes	Yes	Yes	Yes
Every 19th trigger pull advances				
superior's 1 point = 1/2¢	NO	Yes	No	Yes
[a]FT-*t* sec schedules operates bonus				
t duplicates bonus counter rate of preceding LC session	No	No	Yes: Superior	Yes: Subordinate

Source: Adapted from Rao and Mawhinney (1991).

[a]The FT-30 sec (3¢ to superior 2¢ to subordinate) counters operated during all sessions, experimental and control sessions.

Dependent Variables

The dependent variables were superiors' and their subordinates' response rates across the two experimental conditions, LC and MLC, and relations among these rates, e.g., averages, differences and correlations.

RESULTS

Results appear in Figures 3, 4, 5 and Table 2. Data plotted in Figure 3 indicate that, following a period of interaction development, or learning via selection by consequences (Skinner, 1981) in conformity with the

correlation-based law of effect (Baum, 1973), by session number 11 the superior's leadership contingency (LC) supported higher rates of interaction and higher subordinate response rates across all four dyads than did the minimal leadership contingency (MLC). And in three of the four dyads the superior responded at a higher rate during session 11 of the leadership contingency (LC), than did the subordinate. The subordinate in Dyad B made 2 more responses than the superior during LC session 11. The same result was observed for the final LC session except for this session the subordinate in Dyad A made 21, or 2.1 responses/min, more responses than the superior in that dyad.

Visual inspection of these data plotted in Figure 3 suggests that in spite of the variation among interaction patterns and levels across

FIGURE 3. Superior (Closed Boxes) and Subordinate (Open Boxes) Response Rate Data for Each Dyad Plotted Across Sessions Grouped by Conditions, Leadership Contingency (LC), Minimal Leadership Contingency (MLC), Subordinate's Last Control Condition, and Superior's Last Control Condition.

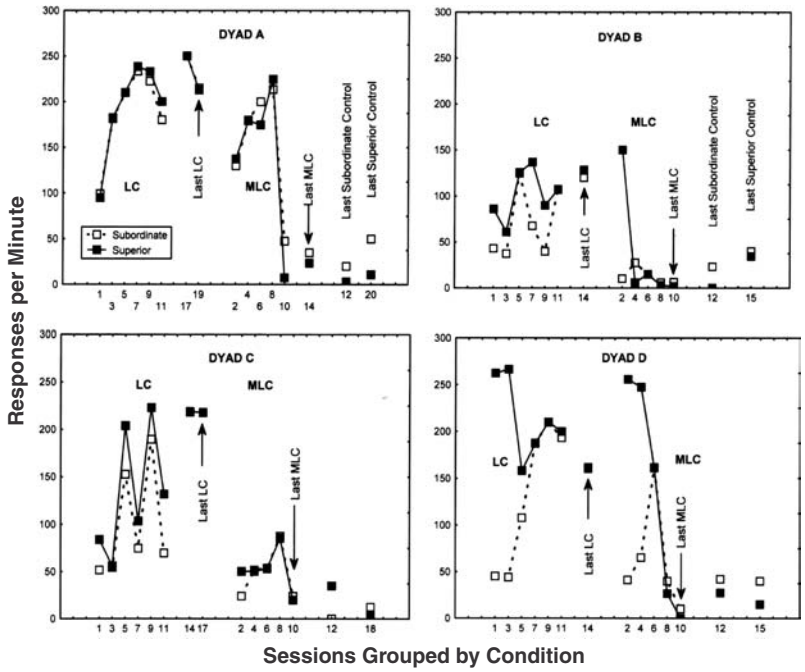


TABLE 2. Correlations Between Superior's and Subordinate's Response Rates Within Dyads Across the Last Two Sessions of the Supervisor's Leadership Contingency (LC).

Dyad	Last Two Sessions N = 8 Observations at 2.5 min. intervals
A	.999
B	.999
C	1.000
D	1.000

dyads, by the final LC session responding was probably highly correlated between superior and subordinate members within each dyad.

Data from superior and subordinate cumulative response rates during the n = 8 2.5 min. intervals of the last two sessions of the LC for all dyads appear in Table 2. The lowest within dyad correlation is 99.99 and confirms what is clearly visible in the data plotted in Figure 3: Superior and subordinate response rates were highly correlated within dyads. Data plotted for Dyad D in Figure 3 demonstrate that noncontingent administration of rewards by a leader, in the current context, failed to reinforce follower behavior. But, with experience, the leader can, as the leader of Dyad D did, learn to correlate administration of rewards with follower performances and achieve effective leadership. Leader D's effectiveness score (Figure 4) was 150.3, just under the mean of 159.35 for all the dyads in the experiment. The r = 1.00 for Dyad D reported in Table 2 was by no means an accident as the control data plotted in Figure 3 make clear.

Data concerning the control conditions (see Figure 3) indicate that in every dyad, extremely low rates of responding were supported by the noncontingent delivery of bonus rewards at rates virtually equal to those received by each participant targeted by the control (either superiors or subordinates) in their most recent prior LC session. The responding that did occur typically arose from responding early in the session followed by near complete cessation of responding later in the session. Taken together the evidence indicates that any degree of effective leadership

observed among dyads during the LC was due to the correlations that superiors and subordinates established between their behavior and not due to some coincidental rise in both of their response rates controlled by some confounding variable.

The bar graph in Figure 4 clearly reveals the fact that the MLC supported low rates of subordinate performance while the LC selected for high rates of subordinate performance as a function of the superiors' interactions with subordinates. Effective leadership was appreciable as measured by subordinate mean of 178.28 responses/min across dyads for their last session under the LC. Effective leadership measured as mean difference between subordinate responses/min for their last session of their LC and MLC across dyads was 159.35 responses/min. Mean responses/min across the four subordinates under the last MLC was 18.93. The difference is plotted as the bar at the far right in Figure 4. The subordinates' mean ratio of responses/min under the LC to MLC

FIGURE 4. Levels of Effective Leadership as Subordinate Response Rates Under Each Dyad's Final MLC and LC and as the Difference Between the Subordinate's Response Rate Under the Final LC and MLC. Rates Are Depicted by Height of Each Bar with the MLC, Open Bar, the LC, Filled Bar, the LC Minus MLC Rate, Shaded Bar, and the Last Three Bars Depicting the Mean of the N = 4 Subordinates for Each of the Three Bars, Open, Filled and Shaded, to the Left.

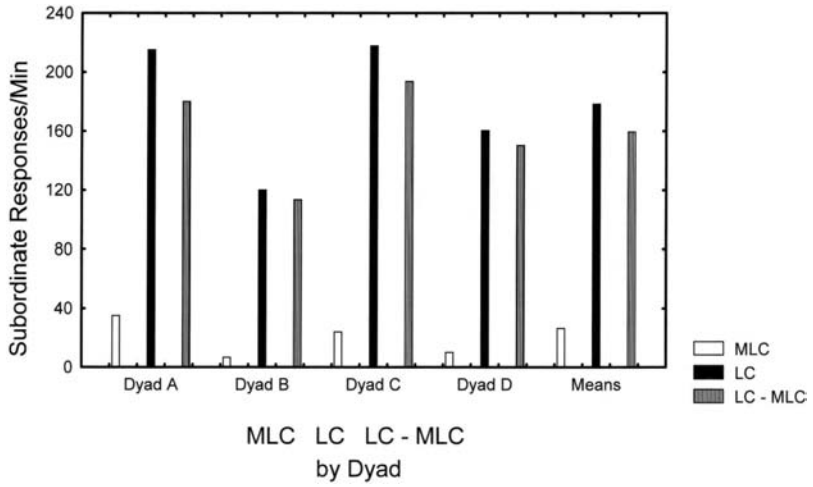
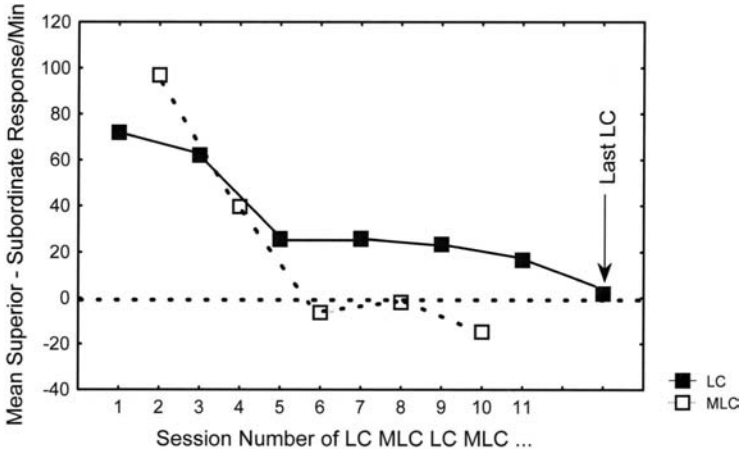


FIGURE 5. Mean of N = 4 Superior Minus Subordinate Response Rates for Each of the First Five MIC Sessions (Open Squares), and the First Six LC Sessions (Filled Squares). The Last Filled Square Is the Mean for an Additional Final Session for the Final LC Session Across Dyads.



was 9.42 : 1 or a nearly tenfold increase in effective leadership under the LC compared to the MLC.

In Figure 5 are plotted the mean of superior minus subordinate response rates of the four dyads for the first five MLC, first six LC plus an additional final session for the LC. The differences under the LC fall rapidly for the first three sessions and more slowly for the next four sessions to a final low of about 2 responses/min for the last session. Differences under the MLC immediately plunged from high positive to negative by the third MLC session and remained negative through the final MLC session. These data suggest that subordinates engaged in attempted leadership under this condition but were unable to develop more than minimal interaction rates with superiors under this condition.

DISCUSSION

The concept of leadership defined as "operant behavior of one person that effects a change in the context of the operant behavior of one or

more other persons and thereby changes or maintains the other [person or] persons' operant behavior" (Mawhinney, 2001, p. 204) was presented and its theoretical implications related to the concepts of attempted, successful and effective leadership. According to this theory appointed leaders will engage in attempted leadership as a type of problem solving behavior (Skinner, 1969) when confronted with a problem the solution to which depends on the leader changing follower behavior. The leader's perennial and ubiquitous problem is how to gain access to reinforcers, access to which depends on changing the rate of a follower's performance-related behavior. In this experiment appointed leaders and their followers, respectively, encountered presence and absence of this genre of problem under the LC and MLC. Although leaders could engage in attempted leadership, be successful following attempts to lead and engage in effective leadership thereafter under both the LC and MLC, effective leadership occurred at high levels only under the LC. Appointed followers, on the other hand, engaged in attempted but ultimately unsuccessful and ineffective leadership under the MLC. This result was no doubt due to the fact that they faced the type of problem that set the occasion for attempted leadership among their leaders under the LC while under the MLC their appointed leaders received no extrinsic reinforcements for engaging in "mutual reinforcement."

The solution to every appointed leader's problem under the LC required the leader to establish a correlation between his rate of responding and that of his subordinate. Each and every leader achieved this result by his final LC session. However, some variation in interaction rates and patterns of correlated interaction rate development was observed across the four dyads. The variation observed most likely reflected effects of individual differences among participants and/or differing evolutionary paths of leader-follower interactions across sessions of the LC and MLC. Whether leader-follower interaction rates varied as a function of moment-to-moment shaping of their interactions by relatively immediate consequences or due to members' experimenting with interaction rules, the causal mode responsible for ultimate interaction rates was selection by consequences (Skinner, 1981) as codified by the correlation-based law of effect (Baum, 1973). That is to

say, whatever rules of interaction (e.g., response counting, Holland, 1958) dyad members may have adopted, only those that conformed with requirements of reinforcement in conformity with the correlation-based law of effect (Baum, 1973) were likely to be maintained in this experimental setting. The selection process was readily apparent in leader and follower interaction rates of Dyad D when the leader delivered "reinforcers" noncontingently to his follower's behavior during the first two LC and MLC sessions. This practice resulted in the follower responding at minimal rates until the third LC session. During the third LC session the leader slowed his button pressing until it was correlated with that of the follower and therefore maintained the follower's performance and solved leader D's problem. Leader D's problem was, of course, how to gain access to reinforcements that depended on follower behavior when follower behavior rate increases depended on the leader correlating rate of button pressing with rate of point accumulations either on his "OTHER'S BEHAVIOR" or "YOUR BONUS . . . " counter. This is not to say that dysfunctional rules cannot occur within these contingencies and surely in the field (Notz, Boschman, & Tax, 1987).

An instance of apparent dysfunctional rule following was observed in the behavior of one leader in the Rao and Mawhinney (1991) experiment. That leader pressed his button at near maximal rates across 29 ten minute sessions that included random presentations of four conditions two of which were the MLC and LC examined here. In that experiment neither appointed leaders nor followers were provided with RSS. More importantly, when this leader's bonus pay was reduced by one cent for every 50 button presses (i.e., a response cost procedure; see Weiner, 1962) his behavior immediately shifted from noncontingent button pressing relative to his subordinate's responding to virtually tit-for-tat responding correlated with his subordinate's trigger pulls under the LC and near cessation of responding under the MLC. Those data suggest that while dysfunctional rules may be followed by a leader under a LC, apparently dysfunctional rule following is more likely to occur when rewards are not salient enough to function as reinforcers (Rachlin, 1989) and unlikely to occur when they are. Prima facie evidence of this sort of problem in a field setting might be appointed leaders allocating more

time to politicking than development of their followers (Luthans et al., 1985).

Before turning to the implications of these experimental results for field experiments, some discussion of the limitations of the study is warranted. There can be little doubt that the experimental analog was not entirely isomorphic to field settings with respect to the content of tasks performed and the means by which reinforcements were exchanged during superior-subordinate interactions, i.e., via response panels, button presses and trigger pulls versus verbal and other literally face-to-face interactions. Powerful consequences in the field, including exchanging "looks," oral and other verbal "comments" and presence of other people in the context, were absent from the analog but are critical elements of leadership in the field (Daniels & Daniels, 2005; Skinner, 1953). Superiors' and their subordinates' means of rewarding each other were limited to points exchanged for generalized conditioned *positive* reinforcements, points worth money (Braksick, 2000; Daniels & Daniels, 2004; Poling & Braatz, 2001) (delivered with almost no delay) making it less likely that the contingencies maintaining effective leadership were de facto aversive escape and avoidance contingencies (Malott, 1992). In addition, neither participant of any dyad was "free" to engage in social interactions among peers nor with anyone other than the other member of their dyad. Opportunities for superiors to interact with other superiors and to lead more than one subordinate were intentionally eliminated from the model assessed here. But, this study was specifically designed to simulate superior subordinate interactions from field settings while at the same time controlling for the virtually endless number of competing (Luthans et al., 1985) and confounding contingencies that exist in the field (e.g., substitutes for leadership, Kerr, 1976; Kerr & Jermier, 1977; Mawhinney & Ford, 1977), including interactions among peers within groups. For example, training and goal setting were hopelessly confounded with the performance matrix feedback system in the Bourdon (1977) study. This experiment was at the other extreme, only the most fundamental contingencies from the field, wages, means of exchanging rewards via performance-related behavior, and information about interactions were abstracted from the field

and modeled into this laboratory analog in terms of their functions rather than their virtually infinite topographies. It was thought, and, the data support the idea, that robust differences in rates of superior-subordinate interactions across the MLC and LC would appear in the lab when unmanageable variables in the field were removed or controlled in the laboratory analog. Results of the study lend support to the validity of that proposition. There was, however, some ambiguity regarding which party in each dyad was more or less responsible for interaction rates. But, according to Skinner (1953), this ambiguity is endemic to social relations of the sort we set out to assess: "The leader is not wholly independent of the follower, however, for his behavior requires the support of corresponding behavior on the part of others, and to the extent that cooperation is necessary, the leader is, in fact, led by his followers" (Skinner, 1953, p. 306). But, what, if anything, can be said about the correspondence between this laboratory analog and the field studies discussed above?

Again, leadership according to the current theory is "operant behavior of one person that effects a change in the context of the operant behavior of one or more other persons and thereby changes or maintains the other [person or] persons' operant behavior" (Mawhinney, 2001, p. 204). Increasing the degree to which leadership so defined was, de facto, among the objectives of each of the three research teams that published in the *Journal of Organizational Behavior Management* studies reviewed above (Bourdon, 1977; Methot et al., 1996; Welsh et al., 1993). Because the current laboratory results relatively unequivocally isolated the environmental contingencies that clearly did evoke and maintain effective leadership in the lab, the lab LC might serve as a type of benchmark against which to compare field contingencies and means by which their effects are assessed. For example, although functional and dysfunctional performance-related behavior respectively increased and decreased as expected during the Welsh et al. (1993) intervention, integrity of their independent variable was not assessed because only follower behavior was observed and recorded. By using the OSTI to assess contingent administration of consequences among the manager, supervisors and staff, Methot et al. (1996) insured integrity of their independent variable. But, neither of these interventions included a

formal feedback linkage from followers' behavior rates to their appointed leaders. (Need for this linkage was, however, recognized post hoc by Methot et al. 1996, and recommended for inclusion in future studies.) In addition, no systems level contingency linked changes in client behavior to extrinsic reinforcers among the other participants in the study. In spite of the fact that the Bourdon (1977) intervention clearly included all the elements of the laboratory LC on the appointed leader's side of leader-follower interaction contingencies, leader-follower interactions were neither observed nor reported; so there is no way of knowing whether effective leadership occurred, i.e., whether followers received reinforcements from interactions with their appointed leaders was not discussed.

Now that we know fairly precisely the essential elements of a lab LC that has reliably produced leadership as defined in the current theory and the difficulty associated with reproducing them in the field, field researchers can take these issues into consideration when planning future OBM type leadership interventions. In fairness to the three research teams whose work was reviewed here, their objectives did not include assessment of leadership as defined by the theory that guided this lab experiment. Rather, their objectives were pragmatic and focused on improving performance at one level of an organization, shop floor, by intervening at a level or two above, i.e., at the level of the manager and/or supervisor.

Skinner (1953), long ago, pointed out the fact that social contingencies are more variable and less reliable than nonsocial environmental contingencies. That is to say, independent contingencies of the physical world are exemplified in the lab by schedules of reinforcement that present an individual with more predictable behavior-reward contingencies than those involving rewards that depend on interactions with other people. In the current theoretical and empirical work, Skinner's argument has been supported. There was a fair degree of variation among problem solution patterns across dyads implicated by patterns of leader-follower interactions. For example, the points at which discrimination between the MLC and LC occurred were apparent and varied across dyads (cf. Dyad A, D and B, C). But, imagine what might have

occurred in the absence of the somewhat "mechanistic" LC. For example, if the leaders' rewards had depended on subjective ratings of followers' behavior, the correlation between actual follower behavior and rewards delivered to leaders on their "OTHER'S BEHAVIOR" and "YOUR BONUS . . . " counters might have been poorly correlated and their behavior might have extinguished as a result. In the presence of the highly valid and reliable LC created in this experiment, on the other hand, interaction rates were ultimately relatively high and stable.

Although the current experiment was highly abstract relative to what is required to address such issues in the OBM lab, it clearly shows how a fine grained analysis of a complex phenomenon from the field can be modeled into the lab for more controlled assessment. What would make sense at this juncture would be to systematically complicate the paradigm used in this experiment. This would be accomplished by carefully introducing additional features, e.g., verbal exchanges and face-to-face interactions, larger and larger follower groups, more and more complicated tasks, competing leader tasks (working on budgets versus interacting with followers), variations in leader/follower power relations and substitutes for leadership that would make the experimental context more and more isomorphic to field settings. Nevertheless, the current analog and results of exploring leadership using it should alert us to both the opportunities for refining leadership interventions and threats to their effective assessment posed by the fact that they require attention to both sides of the leadership equation–leader and follower contingencies of reinforcement that define effective leadership in the theory presented above.

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APPENDIX

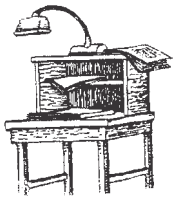
Superior and Subordinate Cumulative Responses per 10-min. Session and Conditions (Except where footnoted)

	Dyad A			Dyad B				Dyad C			Dyad D		
Session	Condition	Superior	Subordinate	Condition	Superior	Subordinate	Session	Condition	Superior	Subordinate	Condition	Superior	Subordinate
1	A LC[a]	950	993	A LC	861	433	1	A LC	839	518	A LC	2625	453
2	B MLC	1375	1301	B MLC	1501	103	2	B MLC	504	242	B MLC	2558	413
3	A LC	1825	1815	A LC	610	375	3	A LC	562	545	A LC	2665	442
4	B MLC	1793	1800	B MLC	60	275	4	B MLC	505	517	B MLC	2475	654
5	A LC	2101	2100	A LC	1257	1248	5	A LC	2039	1528	A LC	1583	1078
6	B MLC	1749	2001	B MLC	151	150	6	B MLC	531	540	B MLC	1618	1610
7	A LC	2386	2334	A LC	1370	676	7	A LC	1036	747	A LC	1874	1877
8	B MLC	2247	2136	B MLC	30	60	8	B MLC	854	876	B MLC	268	400
9	A LC	2330	2224	A LC	900	400	9	A LC	2230	1896	A LC	2101	2100
10	B MLC	75	475	B MLC	18	66	10	B MLC	200	240	B MLC	1	101
11	A LC	2002	1803	A LC	1071	1073	11	A LC	1320	696	A LC	2000	1934

12	C 6	30	200	C 6	0	233	12	C 6	350	0	C 6	274	422
13	C 5	1780	1710	C 5	475	475	13	C 5	1895	1881	C 5	2996	334
14	B MLC	236	350	A LC	1285	1200	14	A LC	2189	2185	A LC	1618	1604
15	C 5	2118	2001	C 5	344	401	15	C 5	2502	2436	C 5	150	400
16	C 6[b]	0	20				16	C 5	1063	1268			
16	C 5[b]	480	212				17	A LC	2178	2177			
16	C 6[b]	800	312				18	C 5	39	125			
16	C 5[b]	1214	412										
17	A LC	2502	2503										
18	C 5	526	652										
19	A LC	2129	2150										
20	C 5	110	509										

[a] Data from the first session are not presented; the superior did not respond in any way during this session and a payment was made to participants at five minute intervals during the session.

[b] Each of these sessions was 2.5 min in length; payments were made at the end of the series of 2.5 min sessions or after 10 min.



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