Running Head: STAFF TRAINING MANUAL

AN EVALUATION OF A STAFF TRAINING MANUAL FOR TEACHING BEHAVIOURAL PRINCIPLES AND PROCEDURES TO DIRECT-CARE STAFF

By

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In Partial Fulfillment of the Requirements for the Degree of

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DOCTOR OF PHILOSOPHY

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Table of Contents

Acknowledgements.....ii

Table of Contents.....iii

List of Tables & Figures.....vi

Abstract.....1

Introduction.....2

DC Staff Training.....2

Personalized System of Instruction.....5

Computer-Aided Personalized System of Instruction.....6

The Present Study.....7

Methods.....7

Participants and Setting.....7

Materials.....8

Course manual.....8

Introduction sheet.....9

Knowledge test.....9

Videotape.....10

Generalization datasheets.....10

Procedure.....10

Pre-tests and post-tests of ABA knowledge.....10

Generalization tests.....10

Teaching method assignment.....11

CAPSI sessions....12

Lecture sessions....12

Self-study sessions....12

Inter-Observer & Procedural Integrity....13

Social Validity....14

Results....14

Pre- and Post-tests....14

Knowledge tests....14

Generalization tests....20

Participant Withdrawal....26

Social Validity....28

Discussion....29

Recommendations for Future Research....37

References....39

Appendices

A....45

B....46

C....50

D....51

E....56

F....59

G....62

H....70

I.....79

J.....80

List of Tables & Figures

Table 1. Results of all inter-observer and procedural integrity assessments.....13

Figure 1. Percent correct on pre- and post- knowledge tests across teaching methods on a 48-item multiple-choice test.....15

Figure 2. Percent change in performance from pre- to post-test scores across teaching methods on a 48-item multiple-choice test.....16

Figure 3. Mean percentage errors per multiple-choice question on pre- and post-knowledge tests, across content categories.....18

Figure 4. Pre- to post-test scores across teaching methods on a generalization procedure test.....20

Figure 5. Percent change in performance from pre- to post-test scores across teaching methods on a generalization procedure test.....21

Figure 6. Mean percentage errors per teaching task on pre- and post-generalization tests.....24

Figure 7. Changes in percentage of intervals in which handmouthing behaviour occurred across reinforcement and chaining procedures from pre- to post-generalization test.....26

Figure 8. Percentage of participants' withdrawal from each group in the study.....27

Figure 9. Summary of participant rationales for withdrawing from the course.....27

Figure 10. Mean rating on social validity questions per teaching method from all participants who completed the course.....28

Abstract

Direct care (DC) staff are primarily responsible for applying procedures without extensive training. However, there is little research on methods for training DC staff. This study evaluated a training manual designed to teach DC staff (n = 30) behavioural principles and procedures. Participants were equally divided into three groups to compare the relative effectiveness of teaching methods suggested in the literature: computer-aided personalized system of instruction, lecture method, and self-study. Regardless of teaching method, there were statistically significant overall increases in correct responses on a before-and-after-training multiple-choice test ($t = -7.66$, $p = .00$) and a before-and-after-training generalization (application) test ($t = 2.62$, $p = .02$). This indicates that the training manual developed for the study is an effective tool for increasing both knowledge and application ability of DC staff, and suggests that further development of the manual would be productive. As an evaluation of the manual, this study also provided information regarding the levels of topic difficulty. There were high dropout rates (course non-completions) in two of the three groups: 80% in the CAPSI group, 50% in the self-study group, and only 20% in the lecture group. This indicates that social contingencies such as occurred for the lecture group are highly effective for DC staff. Furthermore, an evaluation of challenging behaviour that occurred during the generalization tests indicate that DC staff have difficulty teaching individuals with developmental disabilities new skills, and managing challenging behaviour. Overall, the study provides support for continued efforts to research more effective and efficient means for training DC staff. Future research should include strong contingencies to increase course completions in order to fairly compare the teaching methods.

An Evaluation of a Staff Training Manual for Teaching Behavioural Principles and Procedures to Direct-Care Staff

Frontline or direct-care (DC) staff who work with individuals with autism and developmental disabilities are responsible for applying procedures prescribed by behaviour analysts. However, DC staff often have received little or no training in behaviour analysis. Therefore, DC-staff training is crucial to the integrity of behavioural programs. Without such training, it is difficult for DC staff to effectively apply behavioural procedures or to effectively communicate with the behaviour analysts who prescribed these procedures, which further restricts the ability of DC staff to effectively apply the procedures. Typically, the individuals responsible for training DC staff are the behaviour analysts responsible for writing therapy programs (Harchik, Sherman, Hopkins, Strouse, & Sheldon, 1989; Kissel, Whitman, & Reid, 1983). However, because of their other duties, behaviour analysts tend to have little time to train DC staff. It is therefore extremely important to discover ways to effectively and efficiently train DC staff in basic behaviour principles and their application.

DC Staff Training

Research involving DC staff has mainly been done in settings where the support of a behaviour analyst is not available on a regular basis or in which incidental teaching is used during self-care (Kissel, et al., 1983; Lerman, Vorndran, Addison, Contrucci-Kuhn, 2004; Ivancic, Reid, Iwata, Faw, and Page, 1981; Quilitch, 1975; Page, Iwata, Reid, 1982). In these settings DC staff are expected to apply behavioural programs as initially taught, without subsequent supervision or continued support. However, in many Applied Behaviour Analysis (ABA) programs there is frequent support of a behaviour analyst,

and it would be desirable for DC staff to know how to read and implement behavioural programs designed by behaviour analysts.

In addition, most studies on DC-staff training focus on either teaching[1] DC staff to implement a few specific procedures or on teaching principles that can be applied to just a few skills. For example, Quilitch (1975) used behavioural procedures to increase DC-staff-led recreational activities for individuals with developmental disabilities. Parsons et al. (1996) taught DC staff how to implement several programs in just a day. Kissel et al. (1983) trained DC staff to correctly implement behavioural procedures with one self-care skill, and DC staff were able to generalize the procedures to other self-care skills. Smith, Parker, Tuabman, & Lovaas (1992) demonstrated DC staff could significantly improve treatment skills through a workshop in behaviour principles and procedures, but failed to generalize application of procedures to the natural environment. Gardner (1972) demonstrated that role-play was more effective in teaching the application of behavioural procedures than lecture methods, but not as effective as traditional lecture methods to teach knowledge[2]. For other examples, see Ivancic et al., (1981) and Parsons, Reid, and Green (1996).

The majority of this research has demonstrated that modeling, role-play, and feedback has been more effective in teaching DC staff to apply specific behavioural procedures than traditional lecture methods that attempt to teach staff how to read and write about behaviour analysis (Gardner, 1972; Harchik et al., 1989; Kissel et al., 1983; Sarakoff & Sturmey, 2004).

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[1] In this context, the term "training" refers to an attempt at making one proficient through instruction and practice; whereas, "teaching" refers to providing the learning opportunity or the method of which the training is provided ("Train and Teach," n.d.).

[2] In this context, the term "knowledge" refers to verbal behaviour about ABA principles and procedures.

Since Gardner's (1972) study, it seems that DC staff trainers have avoided using teaching approaches other than role-play. However, role-play training procedures result in limited generalization. Although some research has been able to produce generalization to other settings or tasks within the same skill area, no study has demonstrated generalization of the procedures to unrelated skill areas. Therefore, to promote generalization it seems necessary that staff demonstrate knowledge about the principles behind the procedures; whereas, role-play only affects application of the specific procedures tested.

With regard to teaching general principles, of the studies mentioned above Gardner (1972) was the most extensive. He used a training manual combined with lecture to teach DC staff knowledge of three topics: (a) reinforcement, (b) shaping techniques, and (c) stimulus control. He tested improvement using a true-false test. Studies involving more extensive training of behavioral principles – also using the lecture method to impart knowledge – have been reported by Buzhardt and Heitzman-Powell (2005) and Luiselli and St. Amand (2005).

Buzhardt and Heitzman-Powell (2005) provided interactive on-line training modules combined with a face-to-face application session with role-play and feedback. For each module, participants wrote a pre- and a post-test designed to test knowledge of behavioural principles and procedures. Mean scores on the modules showed a 17% increase from pre- to post-test. However, the authors noted that the participants had all taken college-level courses in ABA, and baseline scores were fairly high (mean = 66.5%). Although participant performance in the role-play sessions was reported as

improved (e.g., participants asked fewer questions and used correct terminology), no measure of application was provided.

Luiselli and St. Amand (2005) focused on using a lecture-based system in small groups with target material broken down into modules in 2-3 hour PowerPoint® presentations. Each module was explained in a lecture accompanied by an oral question and answer period. For each module, participants wrote a pre- and a post-multiple-choice test designed to test knowledge of behavioural principles and procedures. Mean scores on the modules showed a 10-40% increase from pre- to post-test, and the gains were maintained at follow-up. However, many pre-test scores were already high, and no test was conducted to check generalization to application of procedures learned.

Personalized System of Instruction

A solution proposed to address the issue of teaching principles of ABA to DC staff has been to use a behavioural procedure such as Keller's (1968) personalized system of instruction (PSI; Thomas, 2005). Numerous studies have shown that PSI-taught courses produce higher exam scores and retention than traditionally taught courses (Born & Davis, 1974; Born, Gledhill, & Davis,1972; DuNann & Fernald, 1976; DuNann & Weber, 1976; Kulik, Kulik, & Cohen, 1979; Kulik, Kulik, & Bangert-Drowns, 1990; McMichael & Corey, 1969). In comparison to traditional lecture methods, PSI increases exam scores significantly (0.48 standard deviations), decreases student exam scores variability, requires less instructional time, brings lower performing students performance to the level of higher performing students, results in more positive attitudes and ratings from students, and produces longer lasting effects of learning (Farmer et al., 1972; Gaynor & Wolking, 1974; Kulik et al., 1990; Kulik et al., 1979; Semb, 1974).

Keller's original method involved students called "proctors" who had previously mastered the course material. Research has shown that proctors' knowledge of the material increases through the act of providing feedback (Farmer, Lachter, Blaustein, & Cole, 1972). Within-course proctors, or peer-reviewers, have also been used in PSI, resulting in beneficial effects on their learning (Coyne, 1978; Gaynor & Wolking, 1974).

An important component of PSI is its self-pacing feature, rated as highly desirable by students, that allows them to complete units quickly and at their own choosing. Another tenet of PSI is that students must master units of material before moving on to subsequent units. Two criticisms of PSI are that it is time consuming and costly. Researchers have developed ways to offer courses through the use of computers, thereby eliminating the administrative problems associated with PSI.

Computer-Aided Personalized System of Instruction

CAPSI, a computerized extension of PSI, has been demonstrated to be an effective teaching method in university and college courses (Kinsner & Pear, 1988; Martin, Pear, & Martin, 2002a, b; Pear & Crone-Todd, 1999). Pear and Crone-Todd (1999) provided a preliminary analysis of the social validity of CAPSI. A large percentage of the students (91%) were satisfied with the method and 71% felt that the peer-review process assisted them in learning the course material. The authors concluded that CAPSI is a valuable tool for assessing the teaching/learning process.

Mastery on CAPSI unit tests is reached through short, essay-style responses, and feedback on unit test questions is provided in the same manner (Pear & Novak, 1996). This has allowed for research into aspects of peer-reviewing such as type, accuracy, and student responding to, feedback. In general, peer-review feedback has been as accurate as

that of instructors or teaching assistants, and detailed to include comments such as praise, models, references, questions, and suggestions (Martin et al., 2002a, 2002b).

The Present Study

The present study sought to evaluate a training manual to teach behavioural principles and procedures to direct-care staff who work with adults and children with developmental disabilities. Thus, the purpose of this study was to provide information about how to effectively train DC staff on the basic principles of behaviour analysis and their application. Furthermore, in order to determine the relative effectiveness of teaching methods suggested in the literature, the training manual was either (a) combined with CAPSI, (b) combined with the lecture method, and (c) used completely on its own – i.e., self-study. The study is thus relevant to the challenges faced by behaviour analysts in training DC staff.

Method

Participants and Setting

DC staff were recruited from St. Amant, a residential and outreach facility dedicated to providing care and services for Manitobans with developmental disabilities and autism. A target of 30 staff were chosen for the study for practical recruitment purposes, and to replicate Gardner's (1972) study in which there were 10 participants per group. Thirty individuals consented to participate in a four-week training study[3]; 25 participants were provided with work time to participate in the course, and 5 participants requested to participate in the course on their own time. Information concerning participant demographics, type of education each participant had received, and any

[3] A four week period was chosen to allow for multiple lecture sessions per unit of material without making the course unduly long, since the staff had other job requirements to attend to.

training they may have received in behavioural principles and procedures, was collected to determine inclusion for the study (Appendix A). Individuals were included if they were employed at St. Amant, had access to a computer with Internet capability, and signed a consent form (Appendix B) unless they had: (a) taken a formal course in behaviour analysis within the last 2 years; (b) received training as a parent, tutor, or senior tutor through an ABA program within the last 2 years; (c) received training as a researcher in ABA; or, (d) had participated in ABA training in all principles and procedures for another study.

There were 37 staff who returned a signed consent form and were contacted to complete the demographic questionnaire. Of the 37 staff who signed a consent form, 26 females and 4 males attended pre-test sessions and were included in the study. These participants ranged in age from 23 – 63 years, and their amounts of education and job training varied. Their mean amount of staff service to St. Amant was 7.53 years, and ranged from 0.25 – 33 years. Upon successful completion of the training course, each participant received a Certificate of Completion (Appendix C). Successful completion of the training course was defined as completing the pre- and post-knowledge and generalization tests and achieving 80% mastery[4] on the knowledge post-test.

Materials

Course manual. The materials consisted of a short training manual on behavioural principles and procedures that was divided into nine units, and contained a table of contents and a glossary. The self-study and CAPSI groups received study questions in the training manual relevant to the material in each unit. The training manual was written by

[4] A criterion of 80% was chosen as is commonly used in the literature to denote mastery (e.g., Luiselli & St. Amand, 2005).

the author of the current study and her advisor, and reviewed by two other experts in ABA to ensure that the content represents the principles and procedures accurately. To help ensure that the content and study questions would be understandable and answerable, respectively, by the target population, it was further revised on the basis of feedback from six individuals with various demographic and educational backgrounds and little or no prior ABA knowledge. The revisions included the addition of a glossary at the end of the text, the change of study question placement from the end of each chapter (or study unit) to sections within the chapters to enhance stimulus control of the relevant material, and various formatting changes. For example, a table on the types of reinforcers was converted to a point form list, arrows were added on tables illustrating temporal sequence (i.e., situation to behaviour to immediate consequence and long-term consequence). The revisions also included a few content changes; e.g., inclusion of further information on negative reinforcement such as "try not to confuse the word negative with something bad." The chapters in the training manual ranged from 2 to 8 pages (mean = 4.11; total = 40) of textual material and from 4 to 12 study questions (mean = 6.66; total = 60).

Introduction sheet. There was an introductory sheet for participants outlining each procedure and how points would be distributed in order to complete the training course, and a log for the participants to record course-related activities (Appendix D). The introductory sheet was given to and reviewed with the participants once they completed the knowledge pre-test and were assigned to a teaching method.

Knowledge test. To measure the increase in ABA knowledge, 50 test questions were selected from the multiple-choice questions in Martin and Pear's (2007b)

instructor's resource manual that most closely matched the content in the training manual (Appendix G). Questions 10 and 12 were removed due to lack of definition in the training manual.

Videotape. A video camera was used to tape lecture and generalization sessions.

Generalization datasheets. Three procedure sheets and corresponding datasheets (Appendices E) were provided to participants for a pre- and a post-generalization test. These datasheets have been used extensively by the author for ABA programming across numerous clients, staff, and skill areas over the last few years, and have proven useful tools as a program guide. Training proficiency scale items (TPS; Gardner, 1970; Gardner, 1972) were used to generate measurement on generalization tests in combination with additional items to measure procedural reliability of the participants' behaviour (Appendix F).

Procedure

Pre-tests and post-tests of ABA knowledge. Using the 48-question multiple-choice test, a pre-test occurred directly before any training occurred and a post-test occurred at the end of the 4-week training period for all participants remaining in the study.

Generalization tests. There was a pre- and a post-generalization test session in which participants were provided with written procedures to follow from the training manual, with a researcher (or trainer) acting as a client. There were three test procedures: (1) reinforcement, (2) extinction, and (3) chaining. Each participant was provided with a maximum five-minute period to review and practice the procedure. To introduce the test the trainer said "Your first task will be to teach a token system. I will be your non-verbal client. We have no expectations about how you'll do on this, please just try your best.

Please read through the entire page. You will do each task five times. You have five minutes, or let me know if you are finished sooner. You can go ahead." If the participant asked a question the trainer said "We have no expectations, please just try your best."

Generalization tests consisted of five trials for the reinforcement and extinction tests, and due to the length of the chaining test it was three trials. The items on the TPS (Gardner, 1970) and procedure sheets that corresponded with each procedure were rated as correct, incorrect, or n/a, according to the participant's performance. The raw scores and percentage of total possible scores were calculated and used to measure and compare application ability following each of the three teaching methods.

Teaching method assignment. The participants were matched by written knowledge pre-test scores, and randomly assigned to one of three groups of 10 individuals who worked with others in supporting individuals with special needs. Each group received a different teaching method: (a) CAPSI, (b) lecture, or (c) self-study. Participants were assigned a rank from 1 to 30 on the basis of their pre-test scores. Each participant was assigned to one of the three groups in such as way as to match the groups on pre-test scores. For example, if the rank order was 25, 25, and 24, the numbers would have been 1, 2, and 3, respectively (with ties broken randomly). Number 1 would be assigned to CAPSI, number 2 to lecture, and number 3 to self-study. Participants received their course material and a vocal summary of the information in the introduction sheet upon completion of the generalization pre-test. There were no statistically significant differences between the staff in the three groups in terms of scores or demographic information (more information is provided below).

All three teaching methods centered on material from the training manual, as well as the introduction sheet outlining participant learning activities. Consistent with procedures of PSI, the training manual provided to the CAPSI group included study questions, while the training manual provided to the lecture group did not. The self-study group was also provided with study questions in order to more closely compare it to the CAPSI group. The participants were provided with the instructor's (i.e., primary researcher) telephone number and e-mail address so that they could contact her with any questions during the course. Two-weeks into the course all participants were contacted by the instructor to see how they felt things were going with the material, to give them an opportunity to ask any questions, and to remind them to complete the coursework by the assigned date.

CAPSI sessions. CAPSI sessions consisted of participants preparing answers to study questions based on the material from the training manual, writing unit tests based on the study questions through the CAPSI program, receiving feedback from either an instructor or peer reviewers, and peer reviewing others' unit tests.

Lecture sessions. Lecture sessions consisted of six 30-minute presentations with visual aids (e.g., Microsoft PowerPoint® slides) and a question and answer period. Lectures were based on material from the study unit(s). Students were able to use their training manual during the lecture (e.g., review, highlight, make notes), and at home for review. Two sessions were provided on each lecture to allow increased flexibility for staff attendance.

Self-study sessions. Participants were provided with the training manual and study questions, and informed that they would be asked to write a test at the end of the four-

week period. The self-study section was added to control for the effects of the study questions in the CAPSI section, in comparison to the lecture section that contained no study questions.

Inter-observer & procedural integrity. Most lectures and generalization tests were videotaped for inter-observer agreement (IOA) and procedural integrity. One lecture was not videotaped due to technical difficulties, and six participants' generalization tests were not videotaped because they had not consented to this. IOA assessments were conducted on 30% of the participants' generalization test scores, test scoring, and all procedural integrity assessments. IOAs required that an observer and the experimenter recorded responses independently. A trial was considered an agreement if the same response was recorded by the experimenter and the observer, and a disagreement if different responses were recorded. The percentage agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements, and multiplying by 100% (Martin & Pear, 2007a). Procedural integrity assessments were conducted for 50% of all generalization test sessions (Appendix H), and for 50% of lecture session content to ensure the instructor covered the material in the training manual accurately. Procedural

Table 1

Results of all inter-observer and procedural integrity assessments.

Type of Assessment	Mean IOA (%)	Range (%)
Knowledge Test Scoring	99.74	97.92 – 100
Generalization Test Scoring	91.31	86.49 – 95.27
Generalization Test Procedural Integrity	93.10	89.66 – 97.41
Lecture Procedural Integrity	98.36	96.43 – 100

integrity required that an observer recorded whether the procedure occurred according to the datasheet. A trial was considered an agreement if the observer indicated that the procedure was followed correctly, and a disagreement if the procedure was followed incorrectly. The percentage agreement was calculated as the IOA procedure described above. Table 1 shows the results of all agreement assessments.

Social validity. An anonymous survey was given to participants asking them to rate their satisfaction with their respective teaching procedures (Appendix I). They were asked how much they liked the teaching method, how much they felt they learned from the teaching method, and how well they felt they could apply what they learned from the teaching method. Finally, they were asked how important they felt the skills gained were to their work.

Results

Pre- and Post-tests

Knowledge tests. Participants scores (percentage correct) on the knowledge pre- and post-tests were graphed across teaching methods. As seen in Figure 1, the most noticeable change from pre- to post-test is that there are a large number of post-test scores missing in the CAPSI and self-study methods. Due to the large number of participant withdrawals, it is impossible to make comparisons between relative effectiveness of the teaching methods. Data on withdrawal rate will be provided later in this paper.

Pre-test scores on knowledge tests ranged from 25 – 77%. An analysis of variance (ANOVA) was conducted to determine if there were any differences between pre-test

scores across the teaching methods. There were no statistically significant differences between scores per teaching method on the pre-test, suggesting that participants were

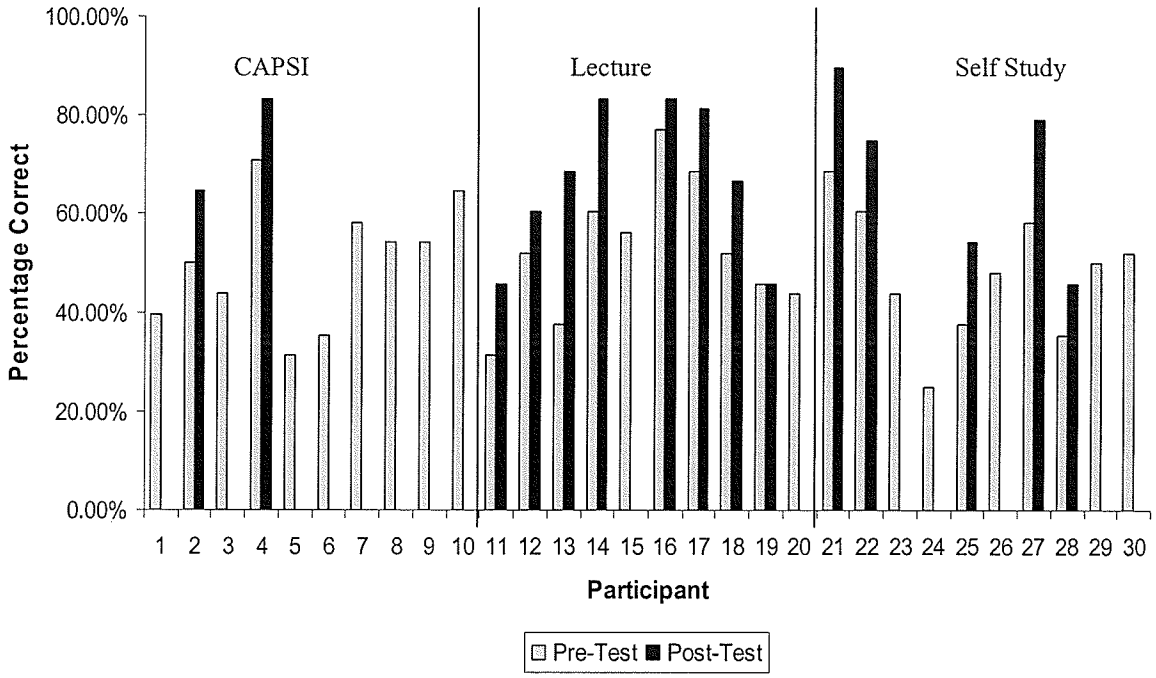

Figure 1. Percent correct on pre- and post- knowledge tests across teaching methods on a 48-item multiple-choice test.

evenly distributed across teaching methods ($F = .30$, $p = .74$). All participants who wrote a post-test increased their score on the multiple-choice test regardless of teaching method, with the exception of participant 19. A post-hoc paired-samples *t*-test revealed statistically significant differences across all participants from pre- to posttest ($t = -7.66$, $p = .00$). Six of the remaining 15 participants reached mastery on the multiple-choice test: participant 4 (CAPSI); participants 14, 16, and 17 (lecture); and, 21 and 27 (self-study).

Figure 2 shows the percent increase in scores from pre- to post-test, corrected for possible improvement on the post-test to reflect improvement for participants who had high baseline scores [(posttest – pretest)/(highest possible score – pretest score)]*100. The percent change from pre- to post-test varied across participants, regardless of

teaching method, and ranged from 16.13% - 66.67%. The pre- and post-test scores correlated largely, positively, and statistically significantly, with each other ($r = .88$, $p = .00$) indicating that higher the pre-test score, the higher the post-test score. Nine of the 15 participants who completed the study met with the researcher for a follow-up interview to investigate further the potential effects of using multiple-choice tests.

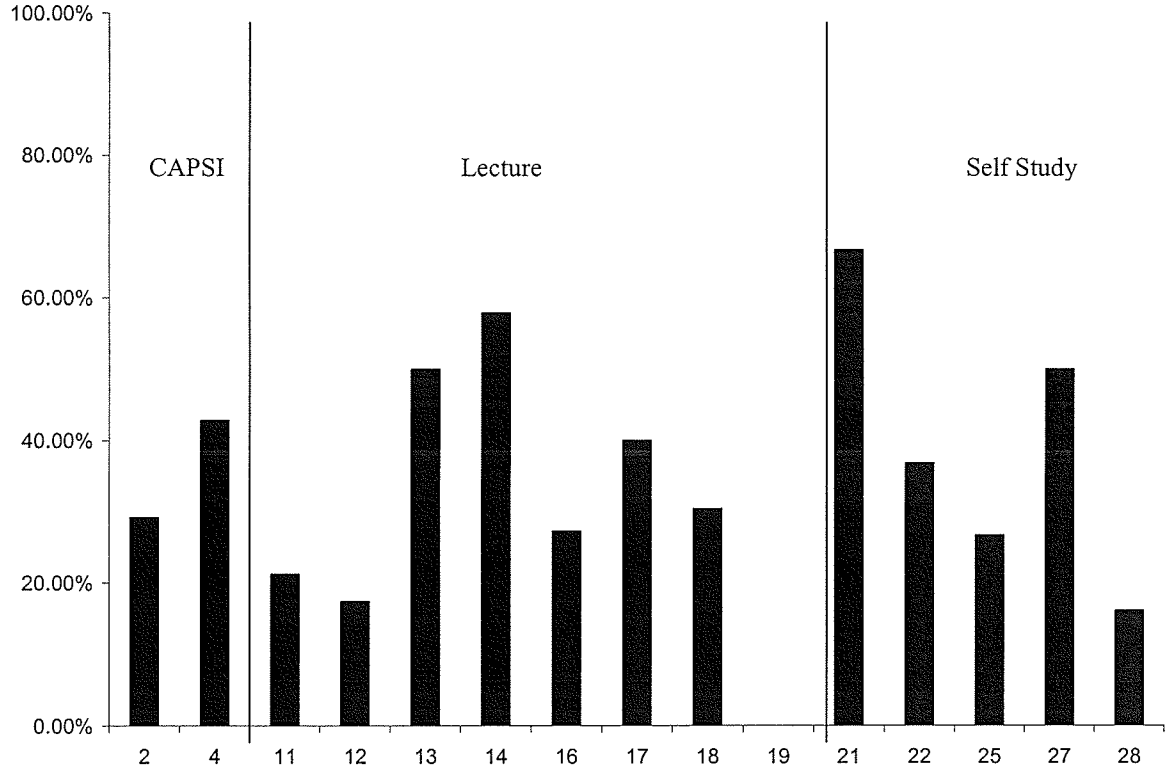

Figure 2. Percent change in performance from pre- to post-test scores across teaching methods on a 48-item multiple-choice test.

Participants who completed the course and consented to a follow-up interview were asked to indicate the strategies they used, if any, to answer questions on the pre-test; also, to compare this with their strategies used, if any, to answer questions on the post-test. All but one of participants interviewed indicated that they required a strategy to answer questions on the pre-test, and that they did not require a strategy on the post-test because they had learned the material. For example, participants indicated that on the pre-

test they used answers from subsequent questions to answer previous questions, or simply guessed if they could not answer the question on the pre-test. The same participants indicated that they did not use this strategy on post-test questions because they now "knew" the answers.

An item-by-item analysis of errors made on knowledge test questions was conducted to determine content areas the training manual was effective and ineffective as a tool to teach ABA (see Figure 3). The content areas were as follows: (a) behaviour and reinforcement, (b) escape and punishment, (c) schedules of reinforcement and stimulus control, (d) extinction and chaining, and (e) shaping and fading.

(a) There were large decreases in errors on items in the behaviour and reinforcement content areas that involved how one would apply reinforcement to behaviour; whereas, there was no change or increases in errors made on technical information such as the definition of reinforcement. This suggests that the training manual could possibly be improved by further explaining examples in comparison to the definition of reinforcement.

(b) There were moderate decreases in errors in the escape and punishment content areas across all items, including items that involved application of examples and technical information such as definitions. This suggests that the training manual provided clear information and examples on topics involving aversive control.

(c) There was a lot of variability in error patterns in the schedules of reinforcement and stimulus control content areas. In general, there were large decreases in errors on items that involved simple concepts (for example, intermittent versus continuous reinforcement or definition of stimuli).There were also increases in errors on

items that involved identifying specific types of schedules from examples, and discriminating between stimulus discrimination and generalization. This suggests that this

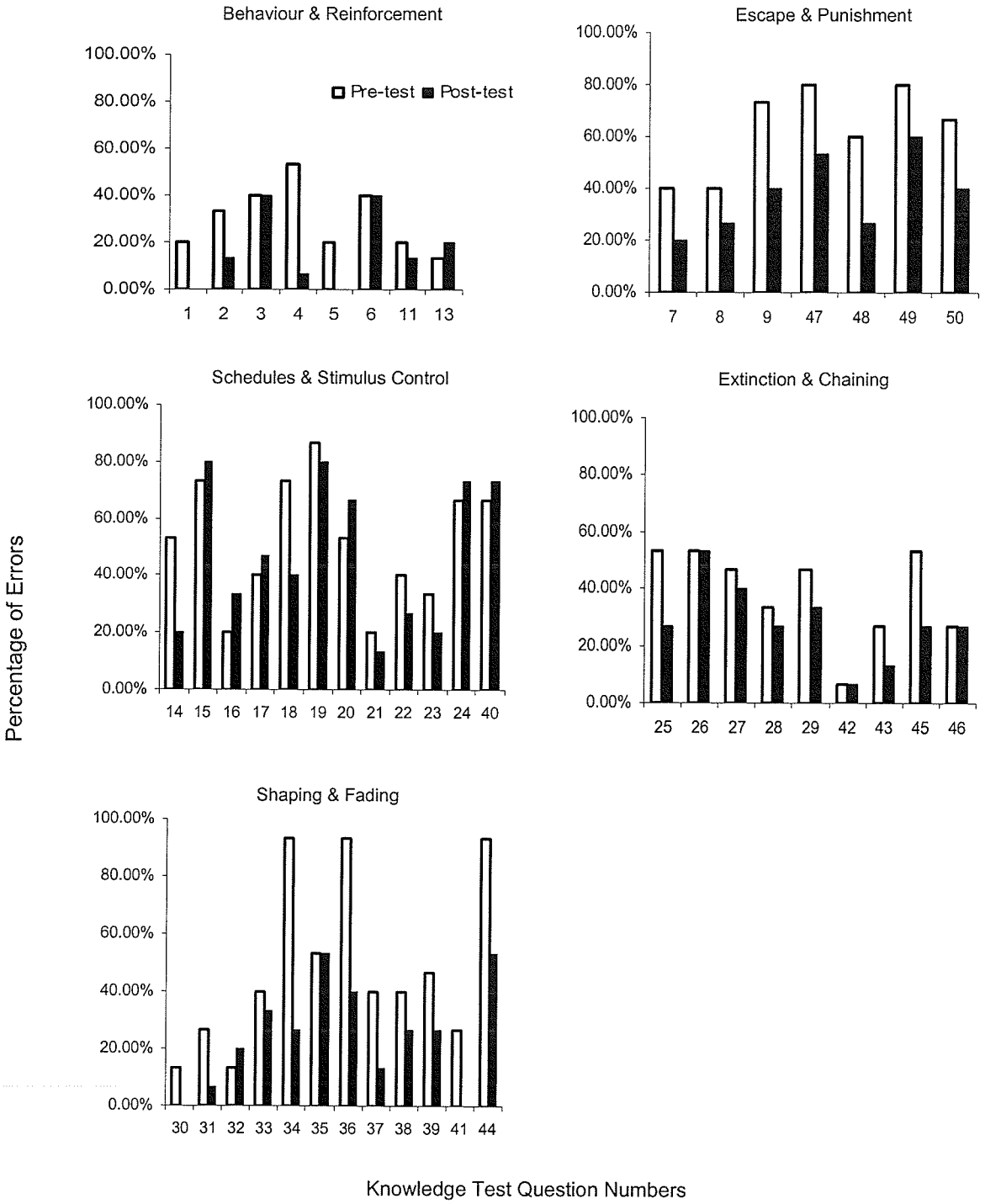

Figure 3. Mean percentage errors per multiple-choice question on pre- and post- knowledge tests, across content categories.

type of material or the terminology may be too complex for basic learners. A better strategy than the one used to teach reinforcement schedules may be to provide information and examples highlighting intermittent reinforcement and its effects in the basic training manual.

(d) There were moderate to large decreases in errors on items that involved general concepts related to extinction. There were small or no changes in errors on items that required discriminating between spontaneous recovery and extinction bursts. There were also large decreases in errors on items that involved technical definitions of chaining, but no change on items that involved extracting a definition from an example or general components of chaining procedures. This indicates that the side effects of extinction should be emphasized in the training manual and presented in such a way that clarifies the differences between spontaneous recovery and extinction bursts, and highlights the importance of task analysis in chaining procedures.

(e) The largest decreases in errors occurred in the shaping and fading content areas. There were large decreases in errors across items that involved technical definitions, and identification of procedures from examples provided for both shaping and fading. There was no change in errors on one item that involved extracting a definition from an example of shaping, and an increase in errors on an item that involved guidelines for application of shaping. In general, the decreases in errors were larger on items that involved fading concepts than items involving shaping concepts. This suggests that the training manual presented the material clearly, but could be improved by highlighting corresponding and contrasting aspects of shaping and fading through examples.

Generalization tests. Figure 4 illustrates each percentage score on the pre- and post- generalization tests, per teaching method. Pre-test application of ABA principles and procedures was fairly low for participants (mean = 49.66%, range = 30.08% - 78.62%). The majority of participants (80%) who participated in any of the teaching

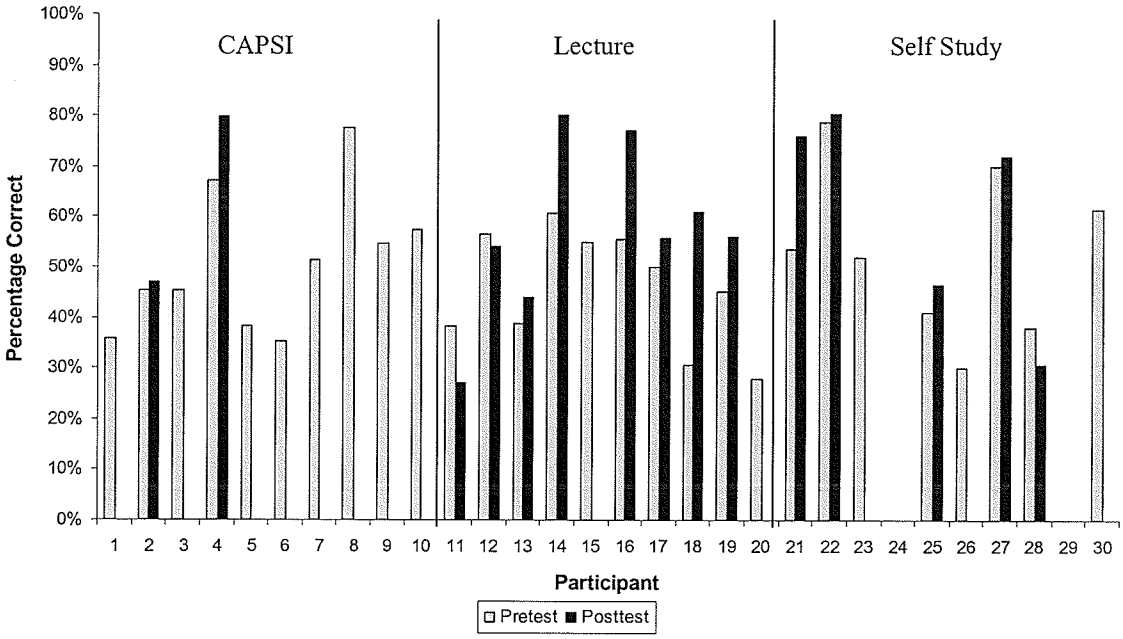

Figure 4. Pre- to post-test scores across teaching methods on a generalization procedure test.

methods improved in their application ability (mean = 59.12%, range = 27.05% - 80.41%) following the training course. An ANOVA was conducted to determine if there were any differences between pre-test scores across the teaching methods. There were no statistically significant differences between percentages per teaching method on the pre-test, suggesting that the participants were evenly distributed across teaching methods (F = .65, p = .53). Again, note that that a large number of post-test scores are missing in the CAPSI and self-study methods.

The majority of participants who performed a generalization post-test improved in performance regardless of teaching method. The exceptions were participants 11, 12, and 28. There were two participants who demonstrated mastery (defined as 80% correct) on the generalization test: participant 4 (CAPSI) and 27 (self-study). A post-hoc paired-samples *t*-test revealed statistically significant differences across all participants from pre- to post-test ($t = 2.62$, $p = .02$). The pre- and post-test scores correlated significantly and positively with each other ($r = .76$, $p = .001$) indicating that higher the generalization pre-test score, the higher the post-test score.

Figure 5 illustrates the percent change in scores from generalization pre- to post-test, corrected for possible improvement on the post-test to reflect improvement for

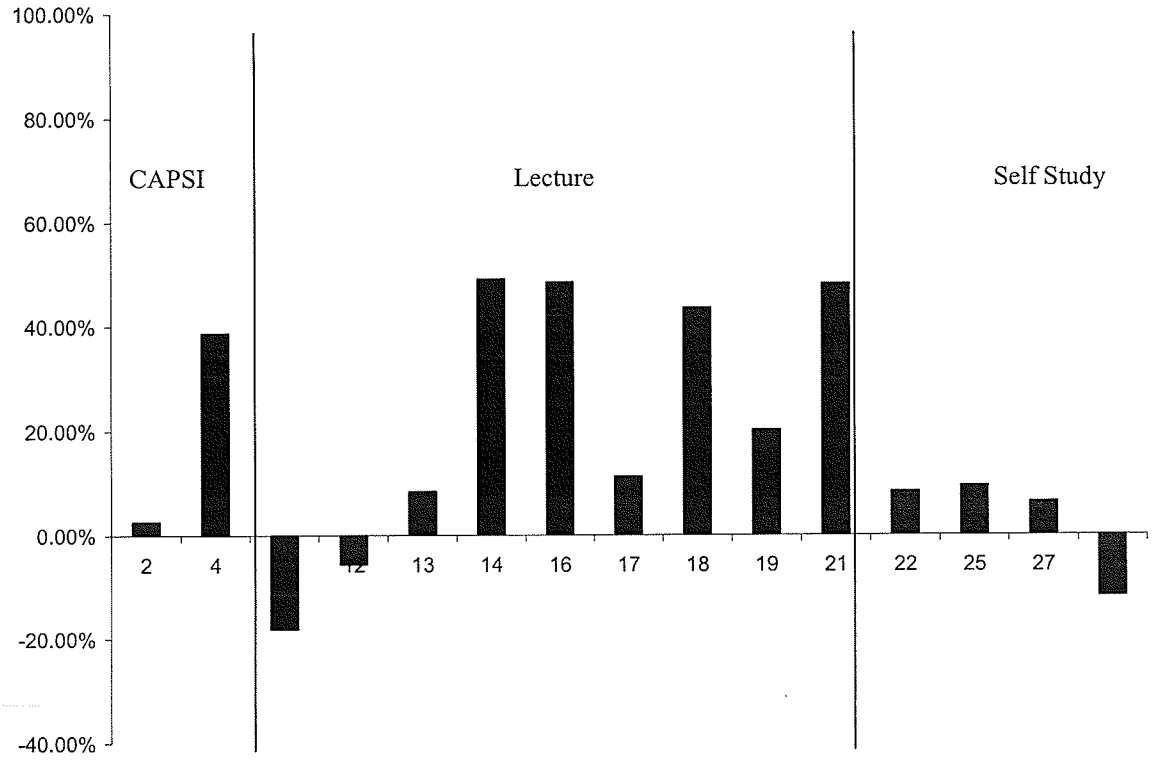

Figure 5. Percent change in performance from pre- to post-test scores across teaching methods on a generalization procedure test.

participants who had high baseline scores [(posttest – pretest)/(highest possible score – pretest score)]*100. The majority of participants improved in their performance regardless of teaching method. Percent increase varied across participants and ranged from -18.12% - 49.10%. The exceptions were participants 11 and 12 (lecture) and 28 (self-study), whose performances decreased in varying amounts. All participants who demonstrated mastery on the knowledge tests also improved their performance on the generalization test, and only one participant (participant 4) demonstrated mastery on both tests (Figures 1 and 4).

To investigate whether any differences were present between participants' change on knowledge tests and generalization tests, a post-hoc paired-samples *t*-test was conducted. There were no statistically significant differences between participants' scores on the knowledge and generalization tests ($t = .65$, $p = .53$), and the percent change on the two tests were not correlated ($r = .02$, $p = .95$).

Additional post-hoc correlations were performed to determine if there was a relationship between performance on knowledge and generalization pre- or post-tests. There was a large and statistically significant positive relationship between knowledge and generalization pre-test scores ($r = .63$, $p = .00$). This indicates that the better one performed on the knowledge pre-test, the better they performed on the generalization pre-test. There was also a large and statistically significant positive relationship between knowledge and generalization post-test scores ($r = .83$, $p = .00$). This indicates that the better one performed on the knowledge post-test, the better they performed on the generalization post-test. Thus, the better participants perform on knowledge tests (whether pre or post), the better they will perform on generalization test procedures

(whether pre or post). However, conclusions should be drawn carefully as these tests were conducted post-hoc.

An item-by-item analysis of errors made on generalization test items was conducted to determine content areas the training manual was effective or needed to be improved as a tool to teach application of ABA (see Figure 6). There were three procedures tested to determine participants' abilities in application of ABA: (a) reinforcement through teaching of a token system, (b) extinction to challenging behaviour, and (c) chaining through teaching a ring stacking task.

(a) There were decreases in errors across every item in the reinforcement test. The largest decreases involved starting out the procedure at the correct step, exchanging tokens for reinforcers, and recording data accurately. There were small decreases in errors across other items such as providing praise enthusiastically, and using effective prompts and prompt fading. The procedure involved the trainer putting her hand to her mouth when prompts did not occur within 3 seconds. Figure 7 demonstrates the percentage of handmouthing behaviour across intervals for the pre- and post-reinforcement tests. This tends to confirm the errors indicated in Figure 6, since handmouthing increased in correspondence with them. Although errors on reinforcement test items that involved properly ignoring inappropriate behaviour decreased, participants appeared to have difficulty dealing with more challenging behaviour and using strategies to minimize its occurrence. It is also important to note that the prompt required by participants was a full physical guided prompt. The data indicate that although participants attempted generally ineffective prompting strategies, they did generally try to use least intrusive prompts. The data also indicate that participants appear to have

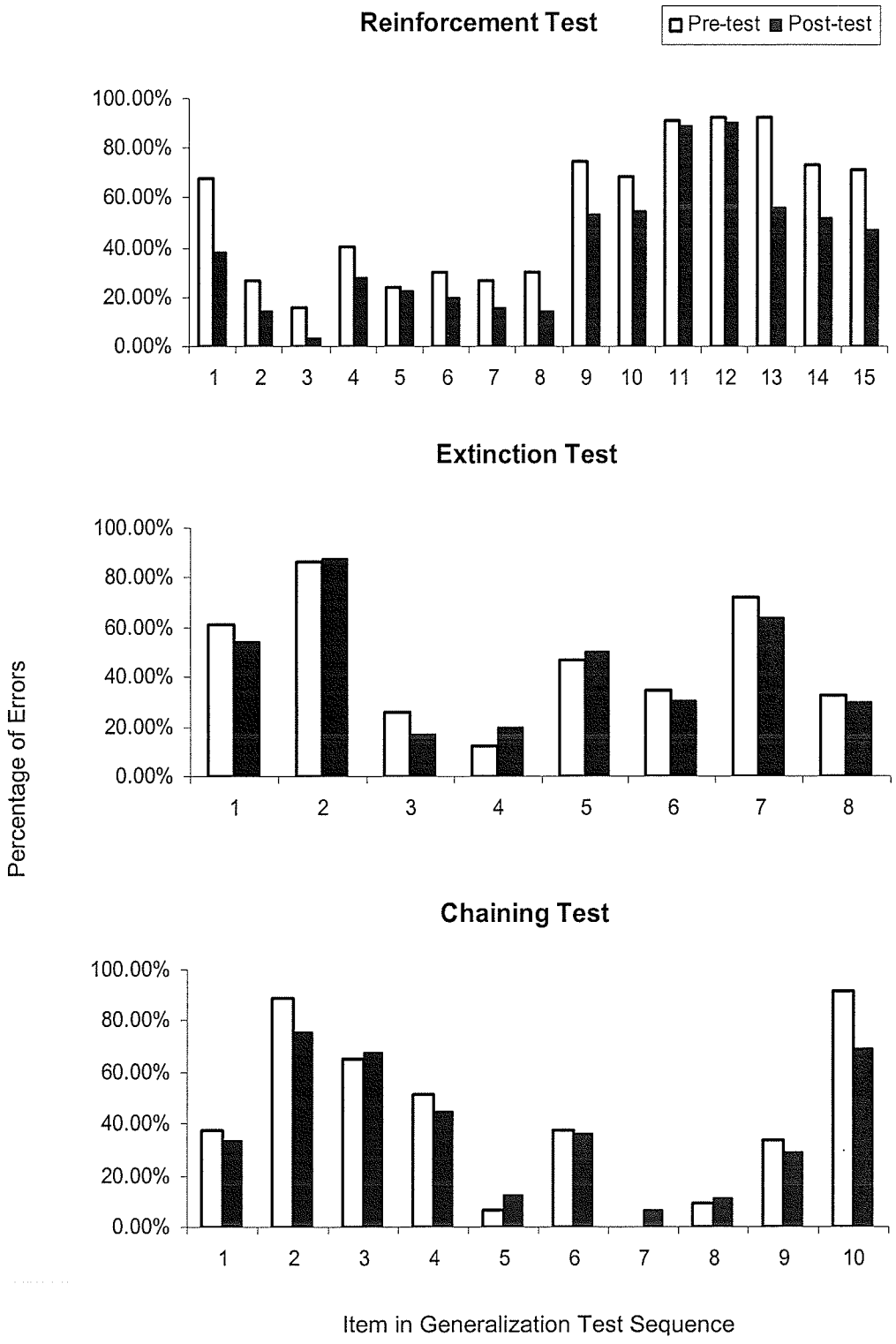

Figure 6. Mean percentage errors per teaching task on pre- and post-generalization tests.

difficulty providing enthusiastic praise for appropriate behaviours exhibited by clients who may engage in challenging behaviours.

(b) There were small decreases in errors across most items in the extinction test. Items that involved blocking aggressive behaviour, ignoring inappropriate behaviour, giving enthusiastic praise, and recording data had decreases in errors. However, many participants continued to make statements in response to the aggressive behaviour that were specified to have previously reinforced the behaviour. Furthermore, praise provided for appropriate alternative behaviour increased in errors, indicating that participants were unable to provide adequate reinforcement for alternative behaviour to replace aggressive behaviour; whereas, aggressive behaviour was getting reinforced. Although the amount of data recorded increased during the post-test, the accuracy only slightly increased.

(c) There were small decreases in errors across items in the chaining test that involved using appropriate demands, starting at the appropriate fading step on the chain (i.e., a full physical prompt), and using the correct chaining steps. Participants also decreased some errors in responding to inappropriate behaviour and recording data. Although participants improved in using the appropriate fading starting point, they increased in errors on using prompts effectively.

Similar to the reinforcement test, handmouthing was the default response for the trainer to engage in if prompting did not occur in the chaining task. Figure 7 confirms the errors demonstrated in Figure 6, as handmouthing increased as ineffective prompting occurred in the pre-test. However, there was a 20% decrease in handmouthing in the chaining post-test, indicating that participants did use more effective prompting in this task than in the reinforcement task.

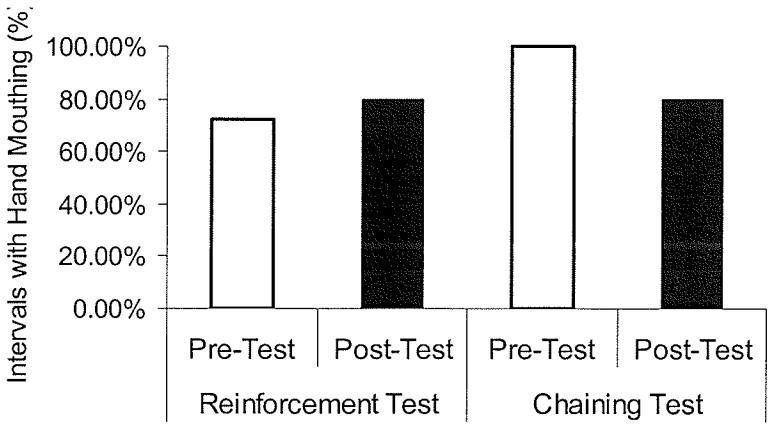

Figure 7. Changes in percentage of intervals in which handmouthing behaviour occurred across reinforcement and chaining procedures from pre- to post-generalization test.

It is possible that participants have more experience with a toy play task than teaching a token system, and therefore, they may have less difficulty providing more intrusive prompts on this type of task. Furthermore, errors regarding the amount and quality of praise provided for task completion increased. This indicates that participants have difficulty providing enthusiastic praise for appropriate behaviour.

Participant Withdrawal

Figure 8 demonstrates the large withdrawal rate in the CAPSI and self-study groups. At post-test, there were two participants remaining in the CAPSI group, eight participants remaining in the lecture group, and five participants remaining in the self-study group. The participants who withdrew were contacted to investigate reasons for the withdrawals.

Figure 9 provides a summary of the rationales provided by participants for their withdrawals. The majority of participants, including two of the five participants who

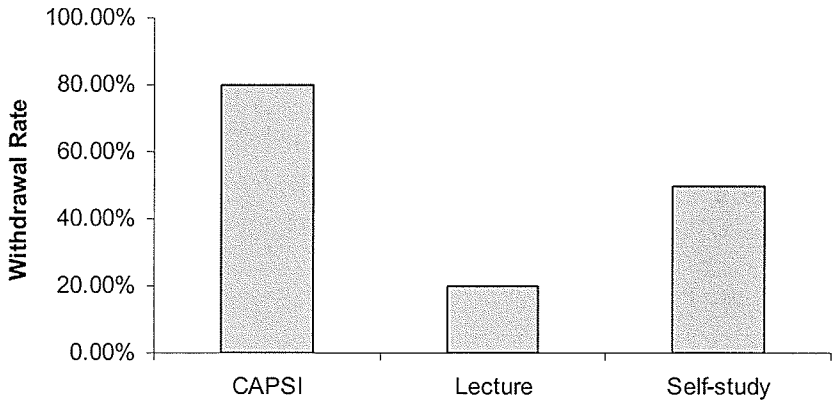

Figure 8. Percentage of participants' withdrawal from each group in the study.

volunteered to take the course on their own time, indicated they were too busy, even though many were provided with time during their shifts to participate. A few participants provided personal reasons or indicated the course was not what they thought and were not interested in continuing.

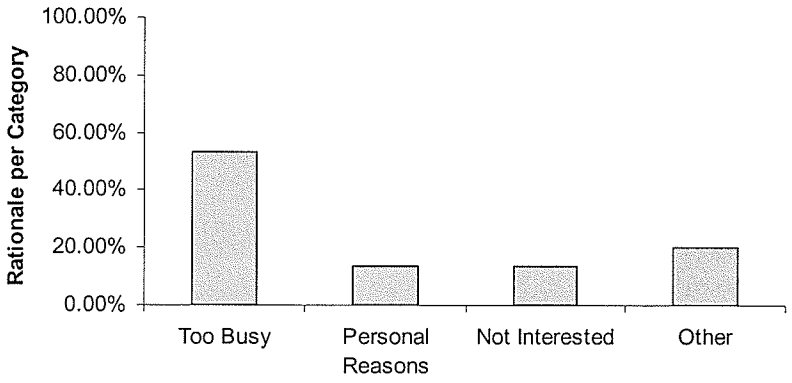

Figure 9. Summary of participant rationales for withdrawing from the course.

The remaining participants in the "other" category did not respond to inquiries. However, one participant in the lecture group obtained a job elsewhere during the study, one in the CAPSI group had complained that CAPSI was a lot of work, and one in the

CAPSI group indicated that she did not do well on tests because she received a restudy and did not wish to continue.

Of the eight participants who withdrew from CAPSI, only four had attempted to login to the system. The remaining four had written at least one test, and all had received restudies on their first attempt. Both participants who withdrew from the lecture method had attended only one lecture. Of the five participants who withdrew from the self-study method, two declined before they received the course material.

Social Validity

All participants who completed the training course filled out a social validity questionnaire rating each item from 1 – 3 (disagree, neutral, and agree, respectively).

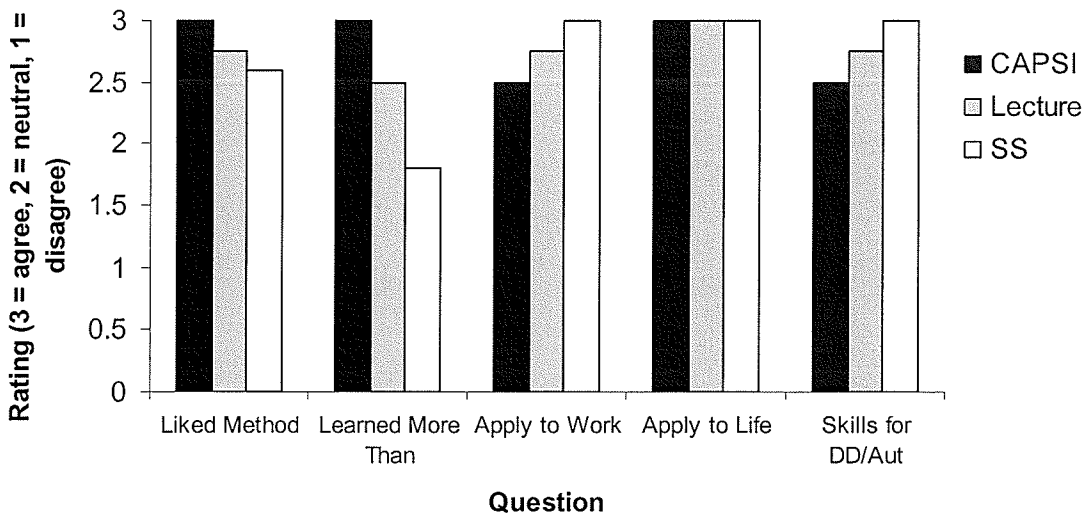

Figure 10. Mean rating on social validity questions per teaching method from all participants who completed the course.

Figure 10 illustrates the mean participant ratings in each teaching method on questions that asked whether they liked the teaching method, how well they learned from it, and how valuable the information they gained was for their daily lives and for their

work. Both CAPSI participants indicated they liked the method, and felt that they learned more from the method than they would from another.

The majority of the lecture participants indicated they liked the method, and while some indicated they felt they learned more from the method than they would any other, other participants indicated they felt neutral about that statement. The self-study ratings were slightly lower regarding whether they liked the teaching method, and the majority indicated they felt neutral about whether they would learn more from that method than another.

All participants indicated they felt they could apply what they learned about behaviour analysis to their daily lives, and the majority indicated they could also apply what they learned to their daily work and to work with individuals with autism and developmental disabilities. A few participants indicated they felt neutral about applying what they learned to their work and to work with autism and DD. These participants did not work directly with individuals with special needs; rather, they provided support to participants working with individuals with autism and DD.

Discussion

This study demonstrated that the training manual that was developed by the author and her advisor to teach basic information about ABA to DC staff appears to be an effective tool for that purpose. Regardless of teaching method, the training manual appeared to improve participants' performance on knowledge tests and tests of generalization – even for a group that had nothing but the training manual (i.e., the self-study group). In fact, knowledge of the application of reinforcement and technical definitions of most principles and procedures was significantly improved. This is

consistent with Luiselli and St. Amand's (2005) findings that DC staff's answers on tests of knowledge can increase up to approximately 40% through a basic training course. Knowledge of material of a more difficult nature, such as on specific schedules of reinforcement, may not be as important as a grasp of the general concept of intermittent versus continuous reinforcement.

It is also noteworthy that by teaching DC staff knowledge of ABA principles and procedures, their application ability overall can be improved prior to receiving direct training in applying the principles – as indicated by the generalization test. The current study improved upon Luiselli and St. Amand's (2005) study by examining several different teaching methods and by demonstrating generalization on a performance measure. By covering behaviour principles more extensively, as well as examining several different teaching methods, it also systematically replicated Gardner's (1972) demonstration that teaching verbal behaviour to DC staff improved their application of behavioural principles. In fact, even though only half of the participants in the self-study group completed the course, it is encouraging that the training manual alone appeared to be about as effective for the self-study group as it was for the lecture group. This indicates that there is a substantial percentage of DC staff that can learn behavioural principles with minimal direct training time by behaviour analysts. Finally, the study systematically replicated Buzhardt and Heitzman-Powell's (2005) study which used the lecture method to impact knowledge to participants who had a higher level of education.

The large, positive, and statistically significant correlation between performance on the knowledge and generalization tests is also consistent with previous research (Gardner, 1972). This suggests that the better one performs on a test of knowledge of

ABA, the better one will perform on a generalization test. This supports the notion that teaching either knowledge or application may facilitate ability on application or knowledge, respectively.

The analysis of pre- and post-generalization tests indicates that although errors can be decreased through teaching verbal behaviour about ABA, staff who work with individuals with DD and autism generally do not engage in the necessary skills to effectively teach their clients new skills, or manage challenging behaviours. This is consistent with descriptive analysis research of staff-client interactions indicating that the majority of challenging behaviour is maintained through conditional attention (Thompson & Iwata, 2001). Although not surprising, this is particularly troublesome as desirable behaviours are likely not reinforced; whereas, undesirable behaviours often are. Teaching the knowledge of ABA can reduce these errors somewhat; however, it does not necessarily result in desirable client behaviour change. This is also consistent with findings in previous research that indicate performance on tests of generalization has been limited when learning has occurred based on lecture alone (Gardener, 1972; Harchik, et al., 1989; Kissel, et al., 1983; Sarakoff & Sturmey, 2004). The literature suggests that a crucial component to increasing application ability is to include on-the-job feedback, opportunities to incorporate that feedback, and positive reinforcement for engaging in appropriate behaviour (Harchik et al., 1989).

It is unlikely that the improvements seen in the post-tests were due to chance. All but one participant improved their scores on the knowledge post-test, regardless of teaching method. The data indicates large, statistically, and clinically significant increases. Another perspective concerns the validity of using a multiple-choice method of

testing. A large proportion of participants who responded to a follow-up interview (88%) indicated they used a strategy in the pre-test phase that involved guessing on previous answers based on subsequent material contained in other questions. The same participants indicated that they did not use such a strategy when answering questions on the post-test. As some participants who indicated use of this strategy had high pre-test scores, the significance of their improvement on the knowledge post-test may not be fairly represented. Although multiple-choice may be more suited to instructors due to time constraints, it may not be the best measure of learning. Kritch and Bostow's (1998) research suggests that essay style responses (i.e., high-density responses) would be followed by higher scores on post-tests. Therefore, a better indicator of performance may be answers on short essay-style questions that require higher levels of thinking, rather than manipulating material already presented to participants in a multiple-choice format (Crone-Todd, Pear, & Read, 2000; Pear, Crone-Todd, Wirth, & Simister, 2001).

Although all groups showed overall improvement in both the multiple-choice and generalization tests, the large dropout in two of the groups made it impossible to compare the relative effectiveness of the teaching methods. Consistent results across remaining participants and teaching methods do seem to provide support that CAPSI and self-study may be at least as effective as lecture. However, the fact that the dropout rate was dramatically different (80% for CAPSI, 50% for self-study, and 20% for lecture) in the three teaching conditions is an interesting finding in itself. A likely reason for the high retention of participants in the lecture condition, relative to the other conditions, is that it provided a social contingency that the others by design did not.

That the CAPSI group had the highest dropout rate (80%) was probably due to the lack of a strong enough reinforcement contingency combined with a high response cost for engaging the CAPSI program, as 50% of the participants who withdrew never logged-in to the system. There was also a lack of social reinforcement as was provided in the lecture condition. This combination was not able to overcome the response cost involved in doing the CAPSI unit tests for those participants who had written a unit test and withdrew. For example, one of the participants appealed the restudy she received on her first unit test. The instructor explained that she would have to write the test again as her argument did not justify the error. She subsequently e-mailed the instructor to withdraw from the course, explaining that she did not perform well on tests. Of the other participants who withdrew, two of them had begun writing unit tests in the last week of the four-week course.

That the self-study method had the second highest dropout rate (50%) is likely due partly to the lack of social interaction involved in studying the material on one's own time and partly due to procrastination involved in self-pacing, without, however, having the high response cost of engaging the CAPSI program mentioned above.

The performances of some participants add support to some of the above conclusions. For example, the performance of one participant in the lecture condition did not change on the knowledge test. This individual attended very few lectures, and indicated she did not do much reading of the material on her own time; therefore, it is not surprising that her score went unchanged. One participant in the self-study condition who dropped out stated that she had simply not looked at the material by the end of the four-week period; therefore, she "guessed" she was withdrawing from the course. Of the five

participants in the self-study condition who withdrew, two had withdrawn prior to receiving the course material. They had both indicated they were not interested in participating in a self-study course.

The reinforcement contingencies for the CAPSI and self-study groups appeared to be insufficient in the current study. It would be important to investigate what could be used as reinforcers for staff. In the current study it was assumed that since staff were provided with work time to participate in the course, that they would do so because they were being paid. It was also thought that staff would participate because the course was offered for free. Finally, the certificate offered at the end of the course was also assumed to be a reinforcer. However, staff were also paid whether they did or did not participate in the course. In addition, the certificate was not presented until the end of the course and was contingent on mastery performance on the final exam. The delay and extra contingency may have offset any reinforcing properties the certificate may have had for the participants.

All participants who completed the course indicated that they persisted due to having a family member with autism, or due to an interest in learning in general, or due to an interest in learning more about behaviour analysis specifically. Clearly the motivational variables were not the same for the participants who withdrew. DC staff are considered difficult to motivate to perform well and to receive additional training in their jobs (Reid & Parsons, 1995). Buzhardt and Heitzman-Powell (2007) found that they were more successful in retaining staff in an online training program when staff were given additional funding for participating.

High ratings were provided by the majority of participants who completed the course on all social-validity items, regardless of teaching method. One noticeable difference between groups is that the two CAPSI participants who completed the course liked the method and felt they learned more than they would have from another method. These results are shadowed by the possibility that the participants who did not feel similarly simply withdrew from the course. It is also notable that all participants felt that they could apply what they learned to their daily life, and that the majority felt they could apply what they learned to their work. Those who indicated they felt neutral about their ability to apply what they learned to their work or with individuals with DD and autism were those who do not work directly with those populations, but instead provide support services to participants working with individuals with autism and DD.

The high dropout rate in the CAPSI and self-study groups made it impossible to compare the teaching effectiveness of the conditions. As mentioned above, this dropout in these two conditions was probably due to the lack of a sufficiently strong reinforcement contingency. Procrastination may also have been a factor contributing to the dropouts in both the CAPSI and self-study groups. Many studies on PSI with a college student population indicate that self-pacing, or the lack of it, is a problem (Ross & McBean, 1995; Semb, 1995; Wesp & Ford, 1982). Many students fail to complete all the units in a PSI-taught course due to procrastination. The withdrawal rates found in the current study with both the CAPSI and self-study participants are consistent with results found in college and university students in self-paced courses. In fact, several studies have researched different types of pacing schedules to impose upon students in order to

reduce the pacing problem (Miller, Weaver, & Semb, 1974; Ross & McBean, 1995; Wesp & Ford, 1982).

Valcourt (2007) evaluated whether senior tutors in an ABA program could refresh their verbal behaviour about ABA using CAPSI and the training manual used in this study. Students accessed CAPSI in a lab on specific dates and times. All participants worked at their own pace, and completed the course in its entirety. In fact, all participants completed the course in advance of the final date for completing the course. In hindsight, a true test of performance outcomes in the current study could have been achieved by specifying course sessions (i.e., dates and times to attend), while continuing to have the participants work at their own pace. This would have ensured that more than 40% of students would have come into contact with the CAPSI contingencies in order to provide enough reinforcement to maintain their behaviour. The social contingencies of meeting together in a lab may also have worked to the advantage of CAPSI similar to the way in which they apparently worked for the lecture classes in the present study.

Despite the withdrawals, the data overall provide support for the continued development of the training manual. As already emphasized, the training manual seemed to be about equally effective for all three groups – even though one group (the self-study group) received no instruction other than the training manual. Overall it appears that the manual was successful in decreasing errors in verbal behaviour made on many items that involved technical definitions and application of ABA procedures through examples. It also appears that concepts that require much more technical discrimination such as those involving specific schedules of reinforcement and stimulus control produce more errors than the basic principles and procedures do. The manual was also effective in changing

the behaviour of staff and decreasing more errors in application of ABA than not. The study therefore suggests that staff would benefit from additional specific training on how to apply shaping and fading effectively, and how to manage challenging behaviour effectively. The fact that no detectable differences between teaching methods other than in dropout rates was observed suggests that allowing DC staff to choose among various learning methods could be an efficient approach.

Recommendations for Future Research

Future research should strengthen the contingencies for participating in self-paced methods, including providing additional pay for completed participation. Another suggestion could involve testing the training manual with a parent population as the prospect of learning ABA procedures to assist their interactions with their children, could be a strong motivator for them.

Future research could add an additional component to the current study to determine if providing feedback and opportunities to incorporate that feedback in the application of ABA procedures would be necessary to bring staff performance up to mastery criterion (Lerman, et al., 2004; Parsons, et al., 1996).

Research could also provide the course in any of the teaching methods to test whether errors could be further decreased through responding to the errors in a revision of the training manual, as measured through the same multiple-choice test. Future research should also investigate the accuracy of multiple-choice as compared to essay-style questions in measuring student performance.

This study provides ample support for continued efforts to research more effective and efficient means for testing and training DC staff. It is clear that staff in these

positions do not necessarily possess the knowledge or skills, regardless of how long they have worked with a DD and autism population, to manage challenging behaviour or teach skills. All participants who completed the course had indicated they felt learning about ABA was valuable to their everyday lives, and the majority felt it would help them in their work with individuals with DD and autism. It would appear to be extremely important for staff that work with this client population to possess ABA skills. Therefore, it is extremely important to continue researching the most effective ways to provide this training to DC staff.

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Appendix A – Participant Information.

Gender	Age	Highest Education	Job Role	Yrs. of Service
F	28	Post-Secondary Certificate	Resident Assistant	11
F	30	Post-Secondary Diploma	Corporate Support Services	4
F	32	Some Post-Secondary	Resident Instructor	13
F*	36	Some High School	Resident Assistant	21
F*	51	Some Post-Secondary	Resident Assistant	33
F*	52	Post-Secondary Certificate	Resident Assistant	6
F*	26	Post-Secondary Diploma	Nursing	0.5
F	41	Post-Secondary Certificate	Corporate Support Services	8
M*	37	Post-Secondary Degree	Corporate Support Services	2
F*	26	Some Post-Secondary	Resident Assistant	5
F	23	Post-Secondary Certificate	Instructional Assistant	1
F	29	Post-Secondary Degree	Instructional Assistant	0.5
F	46	Post-Secondary Degree	Resident Assistant	0.25
F*	23	Some Post-Secondary	Resident Assistant	7
F*	60	Post-Secondary Diploma	Nursing	30
M*	29	Post-Secondary Certificate	Instructional Assistant	5
F*	34	Post-Secondary Certificate	Corporate Support Services	2
F	63	Post-Secondary Degree	Clinical Services	15
F*	40	Post-Secondary Degree	Corporate Support Services	3
F	48	Some Post-Secondary	Resident Assistant	7
F	54	Post-Secondary Diploma	Nursing	8
M	38	Some Post-Secondary	Resident Assistant	9
M*	43	Post-Secondary Degree	Resident Instructor	0.25
F*	50	Post-Secondary Degree	Nursing	3
F*	47	Post-Secondary Degree	Resident Assistant	0.25
F	37	Post-Secondary Diploma	Resident Assistant	1.5
F	27	High School Diploma	Resident Assistant	9
F	33	Post-Secondary Certificate	Resident Assistant	7
F*	47	Post-Secondary Diploma	Nursing	12.5
F	52	Post-Secondary Diploma	Nursing	1

* indicates the participant withdrew

Appendix B – Consent Form

UNIVERSITY OF MANITOBA

UNIVERSITY OF MANITOBA

PROJECT DESCRIPTION AND CONSENT FORM

Project Title: Comparing teaching methods to train staff: An analysis of generalizability and cost-effectiveness

This PhD thesis will be conducted by Kirsten Wirth, a PhD student in Psychology at the University of Manitoba under the supervision of Dr. Joseph Pear, Research Supervisor. This project has been approved by the Psychology / Sociology Research Ethics Board (PSREB) and any complaints may be reported to the Human Ethics Secretariat at 474-7122.

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

What is the study about?

Educational staff who work with individuals with autism are primarily responsible for applying teaching procedures in various settings. I will be studying methods for training staff to apply behavioural principles and procedures with individuals with developmental disabilities and autism.

What will the study include, and how long will it last?

The study will include nine units of material from a course manual that you will be given on applying ABA to behaviour of children with autism. The study will take 4 weeks to complete. During this period you will study the basic principles and procedures of behaviour analysis using a particular learning method. You will be given a pre-test with an application session at the beginning of the course and a post-test with an application session at the end to see how well the teaching method you have received has worked. The total number of hours may be approximately 16 or more, but this will depend on how often you participate or study.

Videotaping

With your consent, all sessions will be videotaped for reliability assessments of the teaching methods and application of what you have learned. Participation in the study will not, however, be affected if you choose to not consent to the videotaping of sessions.

Is participation voluntary?

Yes. You can choose not to do the study. Whether you participate will have no impact on your employment. Even after you consent to participate, you can stop at any time and your decision to do so will also have no impact on your employment.

What personal information will be obtained?

Some background information including your birth date, the type of education you have received, your work experience, and any special workshops or training you have received. This information will be collected for research purposes only. If you have taken any formal courses or training in ABA or Behaviour Modification, you will be unable to participate in the study.

Will my personal information be kept confidential?

All information obtained about the participant will be handled in compliance with the Freedom of Information and Protection of Privacy Act (FIPPA). All information will be kept confidential and stored in my office at St. Amant, in a locked filing cabinet. Only I or my research supervisor will have access to your performance in the course. Any presentations, reports, or publications about the project will not contain any identifying information. The data and videotapes will be kept until completion of the project and will then be destroyed in a confidential manner (i.e., approximately, October, 2007). Information about your performance in the course will be kept confidential.

What are the risks and benefits to taking part in the study?

There are no risks associated with the procedures of this project. Possible benefits include enhanced knowledge of ABA principles and procedures as well as the ability to apply them appropriately. You will receive a Certificate of Completion once the training has been completed. Participation may assist you in your work.

Will I receive the overall results of the project?

If you wish to be informed of the overall results of the project, please check YES in the appropriate box at the end of this form and we will send you a summary of the findings within approximately 3 months (i.e., approximately October, 2007) after the completion of the project.

Is there any payment or cost for participating?

There is no cost or remuneration for participation in this study. However, you will receive a certificate of completion as well as enhanced knowledge of ABA.

Signing the Consent Forms

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors,

or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

Researcher: Kirsten Wirth,

Research Supervisor: Dr. Joseph Pear,

This research has been approved by the Psychology/Sociology Research Ethics Board of the University of Manitoba. If you have any concerns or complaints about this project you may contact anv of the above-named persons or the Human Ethics Secretariat A copy of this Project Description and Consent Form has been given to you to keep for your records and reference.

Signatures

I, _____(***please print your name***) hereby consent to participating in the research project entitled *Comparing teaching methods to train staff: An analysis of generalizability and cost-effectiveness.*

By giving consent I allow the research project staff to:

- Conduct teaching sessions for each of 9 units.
- Conduct a pre- and post-test.
- Conduct a pre- and post-application test.
- Include your results in publications, reports, and talks, so that others may learn from this project. Your identity, however, *will not* be disclosed.

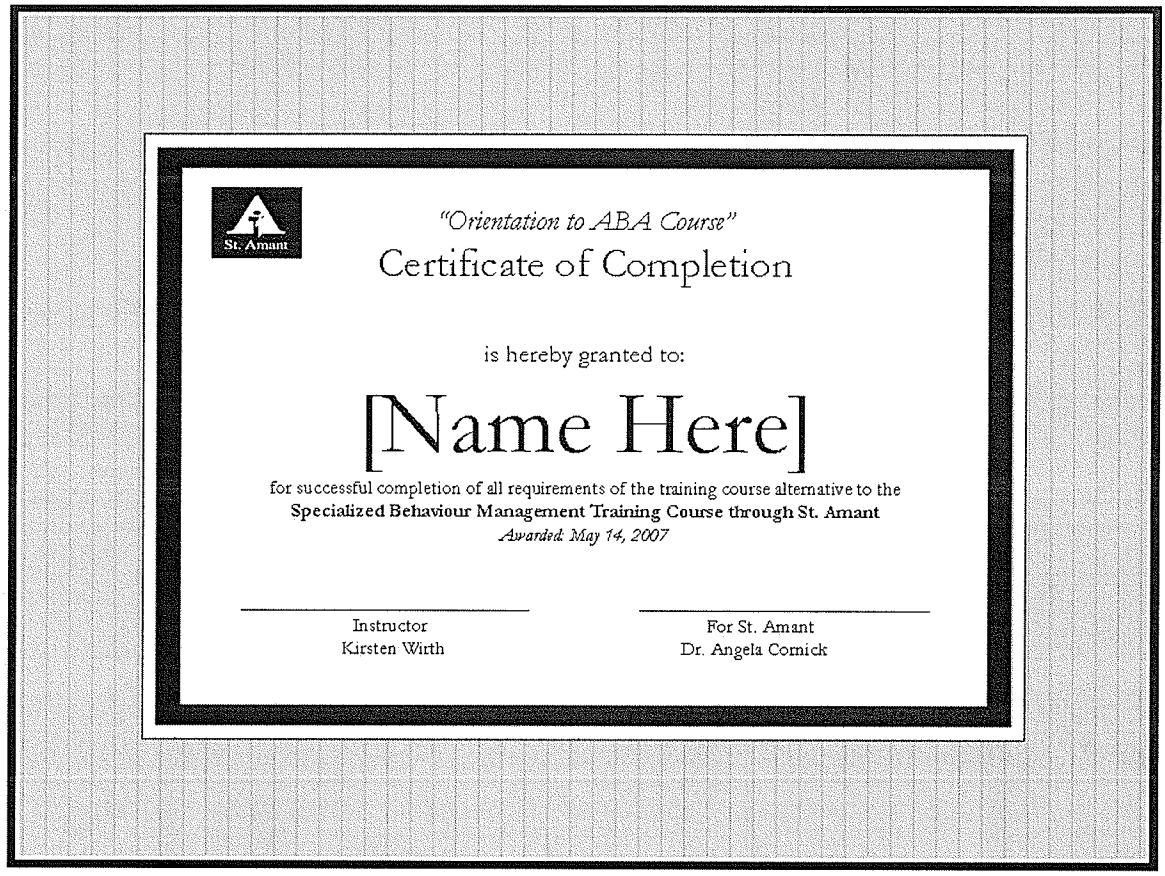
I can revoke or amend this consent at any time and for any reason.

Please check YES or NO for the following items:	**YES**	**NO**
• I would like to receive the overall results of this project.		
• I agree to participation in this project and I give permission for the researcher to videotape all sessions.		
• I agree to participation in this project but do not give permission for the researcher to videotape all sessions.		

Name of Individual	**Signature of Individual**	Date
Name of Researcher/Delegate	**Signature of Researcher/Delegate**	**Date**

Please return all 4 pages of this *Project Description* in the enclosed stamped envelope to the researcher. Keep the extra copy for your records. Thank you for cooperation.

Appendix C – Certificate of Completion



Appendix D – Introduction Sheet

INTRODUCTION TO THE STUDY – CAPSI Method

Thank you for agreeing to participate in this study. As you already know, you will have the opportunity to learn about Applied Behaviour Analysis (ABA) through this study. When you have completed the training course, you will receive a Certificate of Completion! The study will take 4 weeks to complete. After the 4 weeks you will write a post-test and participate in a brief application session to see how much you remember from the course. You will be given a manual on ABA to work from. Each chapter or unit in the manual has a set of study questions based on the material in chapter. Each unit test will be composed of three of those study questions, chosen at random. Each activity you participate in throughout the study will give you points (see explanation of points below). You should accumulate 100 points in order to complete the training course. Please fill out the attached activity log each time you engage in any study time, test writing, peer-reviewing, etc. This will help us to determine how much time such activities take. Your instructor is Kirsten Wirth, and you can correspond with her via telephone (256-4301 ext. 3476 or 803-2040), email (kwirth@stamant.mb.ca), or through the capsi message system (user id "wirth").

The Computer-Aided Personalized System of Instruction (CAPSI) is teaching method known as Personalized System of Instruction (PSI). Originally developed by the behavioural psychologist Fred S. Keller, and hence also known as the "Keller Plan," PSI is based on learning principles. A computer program facilitates course administration; hence, the version of PSI used here is called Computer-Aided Personalized System of Instruction (CAPSI).

You will have 4 weeks, Monday to Friday, 24 hours per day, to review the study material, answer study questions, and write unit tests for all units in the manual. Since each study question has an equal chance of being selected for the unit test, you should prepare for each question in advance of writing the unit tests.

Work will be conducted at your own pace. Unit tests must be mastered one at a time; one cannot move onto the next unit without passing the unit before it. The instructor or peer-reviewer will have 12 hours to review your test and assign a pass or restudy. A pass would mean you have mastered the unit (that is, **you have gotten each question completely correct**) and may write the next, and a restudy would mean you have a minimum of 30 minutes before the system will allow you to request another test. Failure to review tests within 12 hours will result in penalty points. This is to ensure that each person receives the quickest feedback possible. Therefore, if you are not available to peer-review on a given day, then you should change your availability to reflect that. In order to proceed through all unit tests, you will likely have to write at least 1 unit test per day. It is also recommended that you check your account within each 12 hour time period to ensure you don't miss any opportunities to peer-review (or lose points!!). Generally if you check at least twice a day, you should be fine.

Once you have mastered a unit you are then able to peer-review others' tests up to that level of mastery. There is no limit on the number of tests you can peer-review. You

must set your availability to peer-review in your course details by specifying the dates and times you will be available. If there are not peer-reviewers available, the instructor will review the unit tests.

When you peer-review, you must be stringent in your reviewing. If there is any component of any of the three answers that is incorrect, you must assign a restudy. You should also provide detailed feedback in the comments box addressing which portion(s) in the answer is/are incorrect, or suggestions on how the answer can be improved. This will only benefit your co-worker and yourself. Furthermore, the instructor will be checking your work in the course to ensure quality peer-reviewing.

If you disagree with a peer-reviewer or instructor reviewing of your test, you may use the appeal function available at the end of your test. To make a good appeal, you must defend your answer in terms of its content. That is, you should argue for why the answer meets all of the requirements of the question. (Please do not say things like "I know the material" or "I think the reviewing was too harsh," this will not be effective when appealing). Login information: go to www.webcapsi.com; enter your name and password as assigned by your instructor.

Point System: You will need to have written a pre and post-test, participated in a pre and post application session, and earned a minimum of 100 points in order to complete the training. However, it is very likely that you may earn more points than that. See table 1 for a description of how many points will be earned per activity, and a hypothetical sample of what your work could look like.

Table 1. How to earn points.

Activities Required for Total Points	**Points**
Pre-test written	5
Pre Application session	5
Post-test written	2 per question
Post Application session	5
Unit test points (CAPSI)	0.56 ea
Peer-review points (CAPSI)	0.5 ea
Late peer-review points (CAPSI)	-0.5 ea
Minimum Total Points	**100**

Hypothetical work:	**Points**
Wrote pre-test	5
Participated in application session	5
Wrote post-test	80
Participated in application session	5
Completed all 9 unit tests (CAPSI)	5.04
Peer-reviewed 5 tests (CAPSI)	2.5
Late peer-reviewing 1 test (CAPSI)	-0.5
Total Pts Accumulated	**102.04**

Best of luck!

Kirsten

INTRODUCTION TO THE STUDY – Lecture Method

Thank you for agreeing to participate in this study. As you already know, you will have the opportunity to learn about Applied Behaviour Analysis (ABA) through this study. When you have completed the training course, you will receive a Certificate of Completion! The study will take 4 weeks to complete. After the 4 weeks you will write a post-test and participate in a brief application session to see how much you remember from the material. You will be given a manual on ABA that lectures will be based on. Please fill out the attached activity log each time you engage in any study time, attending lectures, etc. This will help us to determine how much time such activities take. You should accumulate 100 points in order to complete the training course. Your instructor is Kirsten Wirth, and you can correspond with her during lecture sessions, via telephone (256-4301 ext. 3476 or 803-2040), or email (kwirth@stamant.mb.ca).

Lecture sessions will consist of three 20-30 minute class-like presentations per week with visual aids and a question and answer period. Lectures will be based on material from the manual. The manual may be used during the lecture (e.g., review, highlight, make notes), and may be taken home.

Table 1. How to earn points.

Activities Required for Total Points	**Points**
Pre-test written	10
Pre Application session	5
Post-test written	2 per question answered correctly
Post Application session	5
Minimum Total Points	**100**

Hypothetical work:	**Points**
Wrote pre-test	10
Participated in application session	5
Wrote post-test	80 (40 questions answered correct)
Participated in application session	5
Total Pts Accumulated	**100**

Best of luck!

Kirsten

INTRODUCTION TO THE STUDY – Self study

Thank you for agreeing to participate in this study. As you already know, you will have the opportunity to learn about Applied Behaviour Analysis (ABA) through this study. When you have completed the training course, you will receive a Certificate of Completion! The study will take 4 weeks to complete. After 4 weeks you will write a post-test and participate in a brief application session to see how much you remember from the material. You will be given a manual on ABA that has related study questions. Please fill out the attached activity log each time you engage in any study time, etc. This will help us to determine how much time such activities take. You should accumulate 100 points in order to complete the training course. Your instructor is Kirsten Wirth, and you can correspond with her via telephone (256-4301 ext. 3476 or 803-2040), or email (kwirth@stamant.mb.ca).

Table 1. How to earn points.

Activities Required for Total Points	**Points**
Pre-test written	10
Pre Application session	5
Post-test written	2 per question answered correctly
Post Application session	5
Minimum Total Points	**100**

Hypothetical work:	**Points**
Wrote pre-test	10
Participated in application session	5
Wrote post-test	80 (40 questions correct)
Participated in application session	5
Total Pts Accumulated	**100**

Best of luck!

Kirsten

ORIENTATION TO ABA ACTIVITY LOG

Date	Time Start	Time End	Total Duration	Activity (e.g., studying)

Appendix E – Generalization Procedure Sheets

Unit 2 – Reinforcement Test

Target: Train client to use a token system.

Materials provided: Tokens, token board, bucket of toys

Procedure:

PHASE I:

- Four tokens are on the token board
- Client X will earn the 5th token for every correct response
- You help Client X place the token on the token board
- Client X can choose from an array of reinforcers as a trade in
- Keep token board in view of client

Client X's behaviour	Your behaviour
	1. Ask the client to do something simple (e.g., clap hands).
2. Client X emits a correct response →	**3**. Praise and give a token, help client put token on board.
4. Client X has all tokens on token board →	**5.** Show client the token board and say: "you got all your tokens, give" and open your hand.
6a. Client X takes all the tokens off the board and puts them in your hand (this may require prompting at first) →	**[6b.** Help client put tokens in your hand.]

Data Collection: Record data after each trial. Record date. Place checkmark each time client has exchanged all 5 tokens for reinforcement.

Date	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5

Unit 5 – Extinction Test

Target: Use extinction to decrease aggression towards others.

Rationale: Client X's aggression towards others was reinforced by saying things like "no" and "don't do that."

Materials provided: A colouring board, crayons, bucket of toys

Procedure:

While engaging the client in a colouring activity, each time Client X attempts to engage in aggression towards you, use extinction to decrease it.

Client X's Behaviour	Your behaviour
1. Aggression towards you →	**2.** Block client by holding your arm straight. **3.** Remain neutral. **4.** Ask the client to do something simple (e.g., clap hands).
5. Complies with an instruction →	**6.** Deliver praise and other reinforcers.

Data Collection: Record data after each instance of aggression. Record the date. Place a checkmark under "aggression" each time it happens.

Date	Aggression

Unit 8 – Chaining Test

Target: Client will play with toys consistent with an identifiable theme.

Materials provided: A stacking ring.

Method: Total task presentation (chaining)

Procedure:

Client X's behaviour →	Your behaviour
	1. Say "play."
2a. Client X emits all responses correctly	**2b**. Help client to emit all responses correctly by prompting each step (AS NECESSARY): **Full prompt**: hand over hand assistance **Partial prompt:** some hand over hand or gesturing **No prompt**. **2c**. Across trials try to decrease prompting.
	3. Give praise and other reinforcers.

Data Collection: Record data after each chain completion. Record type of prompt used for each step (FP = full prompt, PP = partial prompt, N = no prompt).

Trial	1	2	3
1. Set up base of stacker			
2. Put largest ring on			
3. Put second largest ring on			
4. Put third largest ring on			
5. Put last (smallest) ring on			

Appendix F – Generalization Test Datasheets

Reinforcement Test

- place a check for Y, and x for no, n/a if not applicable

Participant	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Has 4 tokens on the board					
*Uses correct verbal commands					
*Uses physical prompts effectively for instructions (moves to FP w/I 3 sec)					
*Withholds reinforcement correctly					
*Properly ignores inappropriate behaviour					
*Gives verbal reward enthusiastically (above a neutral volume and tone)					
[a]*Gives verbal reward with primary [token] reward					
*Gives the [token] reward quickly (w/I 3 sec)					
Helps client put token on board					
[a]*Tells client "you got all your tokens, give"					
Prompts client to put tokens into hand					
*Uses physical prompts effectively for giving tokens (moves to FP w/I 3 sec on 1st token)					
*Uses physical prompts effectively for exchanging tokens (moves to FP w/I 3 sec on 1st token)					
Provides client with reinforcers in exchange					
Recorded data					

[a]Note: If the token exchange occurs out of order, all steps following it are incorrect

Extinction Test

- place a check for Y, and x for no, n/a if not applicable

Participant	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Blocks client by holding arm straight					
*Withholds activity reinforcement correctly (moves activity at least 1" away; w/I 5 sec)					
*Properly ignores inappropriate behaviour (does not provide vocal SR+)					
*Uses correct verbal commands					
*Gives the reward quickly (w/I 3 sec)					
*Gives verbal reward enthusiastically (above a neutral tone and volume)					
Recorded Data					

NOTE: Colouring is never the SR+, but anything given after that (w/I 5 sec) can be the SR+ (e.g., more crayons)

Chaining Test

- place a check for Y, and x for no, n/a if not applicable

Participant	Trial 1	Trial 2	Trial 3
*Uses correct verbal commands (Says "play" in the instruction)			
*Starts with the correct step (FP; if no, then #4; if yes, then #5; regardless of which step they start with)			
*Uses physical prompts effectively (moves immediately to FP if started with failed PP or NP)			
*Uses the proper sequence of steps[a]			
*Fades physical prompts effectively			
*Properly ignores inappropriate behaviour			
*Gives the reward quickly (w/I 3 sec; can be vocal)			
*Gives verbal reward enthusiastically (above a neutral tone AND volume)			
Recorded Data			

[a]STACKER ORDER:

BASE

BLUE RING

GREEN RING

YELLOW RING

RED RING

* Denotes TPS items

Appendix G – Pre and Post Written Tests

Orientation to Behaviour Modification Pre or Post-Test **Name:** _____

Instructions: Please circle the best answer for each question. You will have an hour to complete 50 multiple choice questions. Good Luck!

1. Which of the following is an example of behaviour?
a) hair colour
b) the colour of someone's eyes
c) the clothes someone is wearing
d) dressing in the morning

2. Behavioural assessment seeks to:
a) determine the underlying mental disturbance responsible for behavioural symptoms
b) identify the type of mental disorder assumed to underlie particular patterns of abnormal behaviour
c) identify potential controlling variables of problem behaviours, and select behavioural treatment
d) determine the necessary intelligence level of potential clients as a prerequisite to behaviour modification programs

3. The principle of positive reinforcement states that:
a) if, in a given situation, and individual is given a choice of two or more items, the item chosen will be the positive reinforcer
b) if, in a given situation, somebody does something that is immediately followed by a positive reinforcer, then that person is more likely to do the same thing again
c) if, in a given situation, an individual is positively reinforced, then that individual will select that situation on future opportunities
d) a reinforcer can be used to strengthen behaviour

4. The best way to determine if something is reinforcing is to:
a) ask the individual what they prefer for a reinforcer
b) watch others perform the same behaviour and find out what reinforces them and use that with the individual of concern
c) conduct an experimental test in which you present an item following some behaviour on several trials to see if that frequency of the behaviour increases
d) provide a choice situation in which the "something" is presented along with known reinforcers to see if it will be chosen by the subject instead of the known reinforcers

5. In training programs in which reinforcers are dispensed frequently, it's best to use a small amount of the reinforcer in any one trial in order to:
a) let the client know there's more to come
b) minimize satiation and maximize the number of trials in a training session
c) ensure that the program is cost-effective
d) prevent the client from becoming greedy

6. Why do individuals reinforce the undesirable behaviour of others?
a) the undesirable behaviour is an aversive event which reinforcement terminates (for a while)
b) these individuals are reinforced by other individuals' failures
c) we learn more from our mistakes than from our successes
d) the undesirable behaviour is undergoing stimulus shaping

7. If you use escape conditioning to change a behaviour, the behaviour is likely to _____.
a) remain the same
b) completely stop
c) decrease
d) increase

8. A child screams loudly in a restaurant, causing some embarrassment for the parent. The parent gives the child an extra dessert, and the child is quiet. The parent's behaviour of giving the extra dessert has been influenced by:
a) avoidance conditioning
b) escape conditioning
c) Sidman avoidance conditioning
d) punishment

9. Escape conditioning and positive reinforcement are similar in that:
a) both involve aversive events
b) both involve reinforcers
c) both lead to an increase in the likelihood of behaviour
d) both cause fear as a side-effect

10. A reinforcer for which tokens can be exchanged in order to maintain their reinforcing power is called a(n):
a) secondary reinforcer
b) conditioned reinforcer
c) back-up reinforcer
d) primary reinforcer

11. Conditioned reinforcers that can be accumulated and exchanged for other reinforcers are known as:
a) adventitious reinforcers
b) tokens
c) back-up reinforcers
d) extrinsic reinforcers

12. In a behaviour modification token system, tokens can be exchanged for more powerful reinforcers called:
a) extrinsic reinforcers
b) primary reinforcers
c) intrinsic reinforcers
d) back-up reinforcers

13. The fact that they can be given immediately after a desirable behaviour occurs and cashed in at a later time for a back-up reinforcer is one of the major advantages to using:
a) unconditioned reinforcers
b) extrinsic reinforcers
c) intrinsic reinforcers
d) token reinforcers

14. When reinforcement occurs after some but not all responses, a(n) _____ schedule of reinforcement is being used.
a) continuous
b) duration
c) interval
d) intermittent

15. Each time you turn on the TV, a picture appears. This is an example of:
a) fixed-ratio reinforcement
b) variable-ratio reinforcement
c) continuous reinforcement
d) fixed-interval reinforcement

16. During piece-rate pay in a sewing factory, a worker is paid $10.00 for every ten pairs of pants. This is an example of:
a) a fixed-ratio schedule
b) a fixed-interval schedule
c) continuous reinforcement
d) a fixed-duration schedule

17. Reinforcement occurring after a variable number of responses, where the number varies around some mean value defines the _____ schedule.
a) variable-ratio
b) variable-interval
c) variable-ratio-with-limited hold
d) variable-interval-with-limited hold

18. When reinforcement occurs after the behaviour has been engaged in for a continuous period of time, where the specified time varies around some mean value, there is a _____ schedule in effect.
a) VR
b) VD
c) FR
d) VD/LH

19. A child pounds pegs into a peg board and is reinforced by getting the pegs level with the board. The is an approximation of a _____ schedule.
a) fixed-duration
b) fixed-ratio
c) variable-interval
d) variable-ratio

20. When Suzie plays the slot machines in Las Vegas, her gambling behaviour is reinforced on a _____ schedule.
a) variable-interval
b) variable-duration
c) fixed-ratio
d) variable-ratio

21. A _____ is defined as any physical event or object in the environment that can affect an organism.
a) stimulus
b) positive reinforcer
c) discriminative stimulus
d) natural reinforcer

22. Reinforcing a response in the presence of a particular stimulus and extinguishing that response in the presence of some other stimulus is known as:
a) an intermittent schedule
b) a shaping procedure
c) a reinforcer sampling procedure
d) stimulus discrimination training

23. When behaviour becomes more probable in the presence of one stimulus or situation as a result of having been reinforced in the presence of another stimulus or situation, we say that _____ has occurred.
a) stimulus generalization
b) stimulus discrimination
c) response generalization
d) stimulus control

24. If teaching a child to say "red" in the presence of red objects increases the chances that the child will also say "red" to pink objects, we say that _____ has occurred.
a) response generalization
b) stimulus generalization
c) stimulus control
d) stimulus discrimination

25. If in a given situation, an individual emits a previously reinforced response which is not followed by the usual reinforcing consequence, then that person:
a) is less likely to do the same thing again in that situation
b) will stop emitting that behaviour immediately in that situation
c) is more likely to do the same thing again in that situation
d) will become very aggressive in that situation

26. The reappearance of an extinguished behaviour following a rest is called:
a) intermittent reinforcement
b) an extinction burst
c) spontaneous recovery
d) indirect reinforcement

27. Which of the following is <u>not</u> a potential problem of an extinction program?
a) the behaviour may get worse before it gets better
b) the program may produce aggression by the person whose behaviour is being extinguished
c) spontaneous recovery may occur
d) other reinforced behaviours will also decrease in frequency

28. If a parent ignores the behaviour of a child, that is an example of extinction if:
a) the child listens to the parent
b) the parent's attention was reinforcing the child's behaviour
c) the child is obedient
d) the child's behaviour was annoying to the parent

29. An increase in responding during extinction is commonly referred to as:
a) an extinction burst
b) spontaneous recovery
c) an establishing operation
d) a pitfall of extinction

30. The procedure used for developing a new behaviour by successively reinforcing closer approximations and extinguishing preceding approximations to achieve a final desired behaviour is called:
a) intermittent reinforcement
b) shaping
c) fading
d) discrimination training

31. Shaping is a procedure that involves two principles, namely:
a) intermittent reinforcement and extinction
b) continuous reinforcement and instructions
c) positive reinforcement and extinction
d) reinforcer sampling and premack principle

32. A guideline for effective application of shaping is to:
a) never move to a new approximation until the student has mastered the previous approximation
b) overtrain at each approximation to ensure mastery
c) reinforce each approximation about 4 times before moving on to the next approximation
d) make each approximation somewhat difficult to avoid boredom

33. Across several golf practices, a golfer is reinforced for hitting 5 shots, then 7 shots, then 10 shots, and then 15 shots. This is an example of _____ shaping.
a) topography
b) duration
c) intensity
d) frequency

34. Sally tells her dog to sit while pressing down on the dog's rump. When the dog is in a complete sitting position, she gives it a dog biscuit. Over trials, Sally pushes the dog down with less and less force until eventually it is sitting on command. Sally's procedure exemplifies:
a) shaping
b) fading
c) stimulus discrimination training
d) intermittent reinforcement

35. Tom teaches his dog to sit on a particular area of the carpet in his living room by first reinforcing the dog for being anywhere in the living room, then for being within approximately six feet of that specific area, then for being within approximately three feet of the area, and finally only when the dog is sitting on that particular area. Tom's procedure exemplifies:
a) fading
b) chaining
c) shaping
d) intermittent reinforcement

36. The gradual change, on successive trials, of a stimulus that controls a response so that the response eventually occurs to a partially changed or completely new stimulus, is known as:
a) fading
b) stimulus discrimination training
c) shaping
d) S^D training

37. If a parent tries to teach a child to hold a pencil and make a line on a piece of paper by physically guiding the child's hand, and if over successive trials the physical guidance is gradually lessened to the point where the child will be able to draw a line without any help whatsoever, the parent is using:
a) an extinction procedure
b) a fading procedure
c) S^D training
d) stimulus discrimination training

38. A stimulus that you want to eventually control a target behaviour is called a(n):
a) effective stimulus
b) training stimulus
c) starting stimulus
d) final desired stimulus

39. George teaches his dog to bring him the morning newspaper by first reinforcing the dog for sniffing at the paper, then for picking it up in its mouth, then for carrying it a few steps, and finally for bringing it all the way to him. George's procedure exemplifies:
a) fading
b) stimulus discrimination training
c) intermittent reinforcement
d) none of the above

40. Susan praises her child for saying "please" before being given a treat, and for saying "thank you" after receiving the treat. Susan's procedure exemplifies:
a) stimulus discrimination training
b) extinction
c) verbal prompt
d) intermittent reinforcement

41. When a teacher demonstrates a correct behaviour, the teacher is using a(n):
a) physical prompt
b) environmental prompt
c) verbal prompt
d)modeling prompt

42. You pour a cup of coffee. You add sugar and then cream. You stir the coffee and then take a sip. The taste of the coffee with the cream and sugar is the reinforcer. This is an example of:
a) stimulus shaping
b) shaping
c) stimulus discrimination
d) a stimulus-response chain

43. A chaining method in which the client is required to attempt each of the steps in the chain from the beginning to the end on each trial is referred to as:
a) forward chaining
b) total task presentation chaining
c) pure part chaining
d) backward chaining

44. In _____, the end result of the procedure is some new stimulus control of a particular behaviour.
a) shaping
b) fading
c) chaining
d) prompting

45. With _____, the terminal behaviour is a new sequence of responses, with a "clear-cut" stimulus signaling the end of each response and the start of the next.
a) fading
b) shaping
c) chaining
d) prompting

46. The process of breaking a task down into smaller steps or component responses to facilitate training refers to:
a) forward chaining
b) establishing operation
c) pure part chaining
d) task analysis

47. An event which, when presented immediately following a behaviour, causes the behaviour to decrease in frequency, is referred to as a(n):
a) S^D
b) punisher
c) primary reinforcer
d) natural reinforcer

48. A traffic ticket is an example of:
a) physical punishment
b) reprimands
c) time-out
d) response cost

49. If a teacher is unable to detect most instances of a behaviour to be punished, then the teacher should have serious doubts about the value of implementing a punishment procedure because:
a) the student seems to get used to the punisher and can put up with more of it
b) intermittent punishment is less effective than continuous punishment
c) you can not apply an experimental test to this type of situation to detect all instances of the undesirable behaviour
d) this increases the likelihood that the punisher will become a positive reinforcer

50. To increase a behaviour, you can:
a) punish it
b) negatively reinforce it
c) withhold reinforcement following the behaviour
d) positively reinforce an incompatible

Appendix H – Procedural Reliability Datasheets

Token board script

Trials | Researcher

		CORRECT	INCORRECT	N/A
Pre	Read script	☐	☐	☐
Pre	Hand procedure sheet and pen to participant	☐	☐	☐
Pre	Put token board on table w/ tokens beside	☐	☐	☐
Pre	Have toys on the floor to the right of participant	☐	☐	☐
1	Wait for instruction	☐	☐	☐
1	Correct response (follow instruction)	☐	☐	☐
1	Wait for FP to accept reinforcers	☐	☐	☐
1	If no FP w/I 3 sec, slowly move hand to mouth	☐	☐	☐
1	Respond to FP to hand tokens to participant & take reinforcer	☐	☐	☐
1	If no FP w/I 3 sec, slowly move hand to mouth	☐	☐	☐
2	Wait for instruction	☐	☐	☐
2	Incorrect response (do not follow instruction)	☐	☐	☐
2	Wait for FP, repeated, or new instruction	☐	☐	☐

2	If no FP or instruction w/I 3 sec, slowly move hand to mouth	☐	☐	☐
2	Correct response (follow instruction)	☐	☐	☐
2	Wait for FP & accept reinforcers	☐	☐	☐
2	If no FP w/I 3 sec, slowly move hand to mouth	☐	☐	☐
2	Respond to FP to hand tokens to participant & take reinforcer	☐	☐	☐
2	If no FP w/I 3 sec, slowly move hand to mouth	☐	☐	☐
3	Wait for instruction	☐	☐	☐
3	Correct response (follow instruction)	☐	☐	☐
3	Wait for FP	☐	☐	☐
3	If no FP w/I 3 sec, slowly move hand to mouth	☐	☐	☐
3	Respond to FP to hand tokens to participant & take reinforcer	☐	☐	☐
3	If no FP w/I 3 sec, slowly move hand to mouth	☐	☐	☐

		CORRECT	INCORRECT	N/A
4	Wait for instruction	☐	☐	☐
4	Grab a token and place on the token board.	☐	☐	☐
4	Wait for FP, repeated, or new instruction	☐	☐	☐
4	If no FP or instruction w/I 3 sec, slowly move hand to mouth	☐	☐	☐
4	Correct response (follow instruction)	☐	☐	☐
4	Wait for FP & accept reinforcers	☐	☐	☐

4	If no FP w/I 3 sec, slowly move hand to mouth	☐	☐	☐
4	Respond to FP to hand tokens to participant & take reinforcer	☐	☐	☐
4	If no FP w/I 3 sec, slowly move hand to mouth	☐	☐	☐
5	Wait for instruction	☐	☐	☐
5	Incorrect response (do not follow instruction)	☐	☐	☐
5	Wait for FP, repeated, or new instruction	☐	☐	☐
5	If no FP or instruction w/I 3 sec, slowly move hand to mouth	☐	☐	☐
5	Incorrect response (do not follow instruction)	☐	☐	☐
5	Wait for FP, repeated, or new instruction	☐	☐	☐
5	If no FP or instruction w/I 3 sec, slowly move hand to mouth	☐	☐	☐
5	Correct response (follow instruction)	☐	☐	☐
5	Wait for FP & accept reinforcers	☐	☐	☐
5	If no FP w/I 3 sec, slowly move hand to mouth	☐	☐	☐
5	Respond to FP to hand tokens to participant & take reinforcer	☐	☐	☐
5	If no FP w/I 3 sec, slowly move hand to mouth	☐	☐	☐

Extinction

Trials | Researcher

		CORRECT	INCORRECT	N/A
Pre	Read script	☐	☐	☐
Pre	Hand procedure sheet and pen to participant	☐	☐	☐
Pre	Colouring activity is facing client w/ all crayons to the right of colouring activity	☐	☐	☐
Pre	Have toys on the floor to the right of participant	☐	☐	☐
1	Start by colouring	☐	☐	☐
1	Throw 2 stimuli, at participant, 1 at a time	☐	☐	☐
1	Respond to prompting/guidance	☐	☐	☐
1	Comply with instruction	☐	☐	☐
1	Take reinforcer if provided (for 5 sec)	☐	☐	☐
1	Colour for 10 sec	☐	☐	☐
2	Put down crayon	☐	☐	☐
2	Lightly hit/attempt to hit participant on right arm	☐	☐	☐
2	Respond to prompting/guidance	☐	☐	☐
2	Comply with instruction	☐	☐	☐
2	Take reinforcer if provided (for 5 sec)	☐	☐	☐

2	Colour for 10 sec	☐	☐	☐
		CORRECT	**INCORRECT**	**N/A**
3	Put down crayon	☐	☐	☐
3	Attempt to take stimuli from participant	☐	☐	☐
3	Resist prompting/guidance	☐	☐	☐
3	Attempt to hit participant on right arm	☐	☐	☐
3	Respond to prompting/guidance	☐	☐	☐
3	Comply with instruction	☐	☐	☐
3	Take reinforcer if provided (for 5 sec)	☐	☐	☐
3	Colour for 10 sec	☐	☐	☐
4	Put down crayon	☐	☐	☐
4	Get up from table and lightly kick/attempt to kick participant in the right shin	☐	☐	☐
4	Respond to prompting/guidance	☐	☐	☐
4	Comply with instruction	☐	☐	☐
4	Take reinforcer if provided (for 5 sec)	☐	☐	☐
4	Colour for 10 sec	☐	☐	☐
5	Put down crayon	☐	☐	☐
5	Get up from table and lightly kick/attempt to kick participant in the right shin	☐	☐	☐
5	Respond to prompting/guidance	☐	☐	☐

5	Comply with instruction	☐	☐	☐
5	Take reinforcer if provided (for 5 sec)	☐	☐	☐
5	Colour for 10 sec	☐	☐	☐

Chaining

Trials | Researcher

		CORRECT	INCORRECT	N/A
Pre	Read script	☐	☐	☐
Pre	Hand procedure sheet and pen to participant	☐	☐	☐
Pre	Stacking ring on its side, rings layed out beside it	☐	☐	☐
Pre	Have toys on the floor to the right of participant	☐	☐	☐

	4 FP'S; 1 PP	**CORRECT**	**INCORRECT**	**N/A**
1	Wait for instruction	☐	☐	☐
1	Wait for FP (3 sec)	☐	☐	☐
1	If no FP w/I 3 sec, slowly move hand towards mouth	☐	☐	☐
1	Respond to FP for stacker base	☐	☐	☐
1	If no FP w/I 3 sec, slowly move hand towards mouth, then respond to FP	☐	☐	☐
1	Respond to FP for BLUE ring	☐	☐	☐
1	If no FP w/I 3 sec, slowly move hand towards mouth, then respond to FP	☐	☐	☐
1	Respond to FP for GREEN ring	☐	☐	☐
1	If no FP w/I 3 sec, slowly move hand towards mouth, then respond to FP	☐	☐	☐
1	Respond to FP for YELLOW ring	☐	☐	☐

1	If no FP w/I 3 sec, slowly move hand towards mouth, then respond to FP	☐	☐	☐
!!!!1	Respond to PP for RED ring	☐	☐	☐
1	Allow participant to FP each step in chain; complete last step (RED ring) with less (PP)	☐	☐	☐
1	Accept reinforcer if provided	☐	☐	☐

	THROW; 3 FP'S; 2 PP'S	**CORRECT**	**INCORRECT**	**N/A**
!!!!2	Throw stacker base	☐	☐	☐
2	Respond to prompting/guidance	☐	☐	☐
2	Wait for instruction	☐	☐	☐
2	Wait for FP (3 sec)	☐	☐	☐
2	If no FP w/I 3 sec, slowly move hand towards mouth	☐	☐	☐
2	Respond to FP for stacker base	☐	☐	☐
2	If no FP w/I 3 sec, slowly move hand towards mouth, then respond to FP	☐	☐	☐
2	Respond to FP for BLUE ring	☐	☐	☐
2	If no FP w/I 3 sec, slowly move hand towards mouth, then respond to FP	☐	☐	☐
2	Respond to FP for GREEN ring	☐	☐	☐
2	If no FP w/I 3 sec, slowly move hand towards mouth, then respond to FP	☐	☐	☐
!!!!2	Respond to PP for YELLOW ring	☐	☐	☐
!!!!2	Respond to PP for RED ring	☐	☐	☐
2	Accept reinforcer if provided			

	2 FP'S; 3 PP'S	CORRECT	INCORRECT	N/A
3	Wait for instruction	☐	☐	☐
3	Wait for FP (3 sec)	☐	☐	☐
3	If no FP w/I 3 sec, slowly move hand towards mouth	☐	☐	☐
3	Respond to FP for stacker base	☐	☐	☐
3	If no FP w/I 3 sec, slowly move hand towards mouth, then respond to FP	☐	☐	☐
3	Respond to FP for BLUE ring	☐	☐	☐
3	If no FP w/I 3 sec, slowly move hand towards mouth, then respond to FP	☐	☐	☐
!!!!3	Respond to PP for GREEN ring	☐	☐	☐
!!!!3	Respond to PP for YELLOW ring	☐	☐	☐
!!!!3	Respond to PP for RED ring	☐	☐	☐
3	Accept reinforcer if provided	☐	☐	☐

Appendix I – Social Validity Questionnaire

Please fill out this anonymous survey on the training methods you experienced. Your feedback will provide important information for future training programs.

Evaluation of ABA Training

Name (optional):
Date (M/D/Y):

	Place checkmark where applicable		
	Agree	Neutral	Disagree
Please record the teaching method you learned from here _____.			
I liked the teaching method used in this training.	❒	❒	❒
I feel that I learned more from the teaching method than I would from another method.	❒	❒	❒
I feel that I can apply what I learned to my work.	❒	❒	❒
I feel that I have gained valuable skills for my work with individuals with autism or developmental disabilities.	❒	❒	❒

Suggestions for improvement or additions to the training:

Appendix J – Raw Data

Participant	Knowledge Test (max. 48)		Generalization Test	
	Pre	Post	Pre	Post
1	19		51/143	
2	24	31	65/143	60/128
3	21		63/139	
4	34	40	98/146	115/144
5	15		53/139	
6	17		47/133	
7	28		74/144	
8	26		107/138	
9	26		71/130	
10	31		78/136	
11	15	22	52/136	33/122
12	25	29	77/136	78/144
13	18	33	55/142	61/139
14	29	40	85/140	116/145
15	27		45/82	
16	37	40	82/148	114/148
17	33	39	68/136	79/142
18	25	32	38/124	87/143
19	22	22	63/140	83/148
20	21		36/129	
21	33	43	54/101	112/148
22	29	36	114/145	119/148
23	21		71/139	
24	12			
25	18	26	56/137	66/142
26	23		40/133	
27	28	38	98/140	104/146
28	17	22	30/79	42/137
29	24			
30	25		88/143	