

A DESCRIPTIVE ANALYSIS OF THE USE AND EFFECT OF A SELF-MANAGEMENT PROJECT IN AN
UNDERGRADUATE COURSE IN BEHAVIOR ANALYSIS

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Undergraduate male and female students enrolled in an introductory behavior analysis course with minimal instruction on self-management were given modified exploratory logs to use in a self-management project. Students self-monitored behavior via the log, constructed their own interventions, and reported changes in behavior and extent of success in a write up at course end. Changes in self-reported descriptions in the logs as well as the written results of a pre and post survey of emotional responses were counted. Successful self-management project interventions were reported by most students. Correspondence between planned and actual events increased. Negative reinforcement procedures characterized most students' intervention. Correspondence between events at pre and post and actual log reports was highest at post.

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INTRODUCTION

Of all knowledge, the wise and good seek most to know themselves.

–William Shakespeare

Know thy behaviors, know thy environment, and know the functional relation between the two.

–Israel Goldiamond

Definitions and Importance of Self-Management Skills

Kazemi et al. (2011) pointed to the American Psychological Association's (APA) guidelines to justify teaching self-management to undergraduate students of psychology. The APA Task Force on Undergraduate Psychology Major Competencies lists 10 goals that psychology majors should meet, with one of them being personal development. Within the personal development goal the APA further specified that students should develop insight into their own and others' behavior and apply effective strategies for self-management and self-improvement.

Goldiamond (1965) defined two forms of self-control that he identified as arising out of research conducted in operant behavior laboratories. The first form of self-control he identified involved instructing a participant to set up the procedures that change his environment and thereby bring his behavior under different control. Goldiamond described this clinical relationship as, "the experimenter as the consultant" with the participant eventually becoming his own experimenter. Goldiamond often took this approach because he believed that of the various individuals who can apply control procedures to someone (such as teachers, counselors, parents, and the participant themselves), the participant is the one most concerned with his behavior and is most in contact with it, its conditions, and its consequences (1965). To

exemplify this approach he drew from two case studies of college students who reported having problems in their lives that involved difficulty studying and overeating. Goldiamond met with both of the students for one or two sessions to deliver specific instructions for making environmental modifications and developing response routines. One student reported back after a few weeks, the other after a few months, both with stories of successful interventions. Similar to the arrangement described above, Varley, Webb, and Sheeran (2011) used Richards (2004) description of self-management and arranged interventions where the client used literature and techniques presented in a variety of formats to manage his or her mental health difficulties with little direction from relevant professionals.

The second form of self-control described by Goldiamond (1965) involved training participants in the functional analysis of behavior and having them try to determine for themselves the procedures they should apply. All of the supporting case studies described by Goldiamond involved several sessions of guided analysis as well as teaching intervention design in several behavior analytic topic areas such as the relation of behavior to its consequences, stimulus change, establishment of new behavior, and stimulus control. All of the participants described in the case studies using this form of self-control took extensive records of conversations with the experimenter as well as daily activities they engaged in, and constructed graphs of their own behavior.

Similar to Goldiamond's (1965) second approach, Kirsch (1978) published the findings of case study research using a technique he called self-management training (SMT). Kirsch characterized SMT as occurring in two stages, the first stage resembled traditional assessment and treatment development, and the second stage involved proper self-management training.

Kirsch taught the participant, Susan, to be her own behavior therapist, to assess problems within a behavioral framework and to develop specific problem solving strategies. At intake, Susan reported suffering from deficient memory, poor intelligence, and lack of self-confidence. After determining Susan's digit span and IQ were normal, Kirsch began therapy sessions that included overt and covert rehearsals of anxiety-arousing situations, structured homework assignments consisting of successive approximations of her behavioral goals, and required her to keep records of her progress. Kirsch also attempted to modify Susan's overt verbal behavior by using a counter conditioning procedure each time Susan made a negative statement to herself. Whenever Susan made a negative statement, Kirsch would encourage her to make several positive statements to herself.

During the fifth therapy session Susan reported successfully using the covert rehearsal strategy independently when faced with a challenging social situation during the week. At this point the nature of the therapeutic relationship changed. Kirsch praised Susan's ability to problem solve using the techniques they practiced during sessions and suggested she might be capable of designing her own therapeutic strategies for obtaining her goals. In future sessions Kirsch asked Susan to evaluate her progress during the week, determine what the next step should be, and devise her own homework assignment. At that point Kirsch took on the role of teacher, reinforcing successes and drawing attention to oversights. Kirsch made special note that Susan, not him, developed most of the treatment components. At 1 month, 5 month, and 8 month follow up sessions, Susan reported success, sometimes unsolicited, which Kirsch interpreted as a testament to the nature of the therapeutic relationship.

Kazdin (1974) put Goldiamond's (1965) approach to self-management into a category of treatments called instigation therapy. He described this technique as one where a therapist teaches a client to modify the client's extra-therapeutic environment and to apply behavior change techniques to his own behavior. Thus, the individual learns to become their own therapist and to regulate their own behaviors and the events that control them. The intervention is executed and conducted by the participating client with self-monitoring of behavior in daily situations in which the behavior change technique is implemented..

Kazdin (1974) further reported that self-management had typically been found in the literature in one of two ways. First, the literature considered self-management as an assessment technique, used to evaluate the effectiveness of another experimental intervention, and second, as the intervention procedure itself. To the first point, Kazdin reported that self-management can prove effective when it covaries with some other therapeutic intervention like desensitization, contingent praise, and therapist contact. However, Kazdin (1974) noted that little evidence existed that supported self-management alone as effective in altering behavior.

The History of Relevant Self-Management Research

In 1974 Bowersock developed a procedure he called contingency self-management for individuals struggling with anxiety. His procedure first taught the participant to discriminate between tense and relaxed muscles by sequentially tightening and relaxing groups of muscles throughout the body. After practicing the relaxation technique for a week the participants learned to associate key words ("calm," "relaxed") with the physiological and emotional state of relaxation. While continuing to practice the relaxation exercises the participants were also

instructed to say the words calm and relaxed before engaging in overt behaviors they enjoyed (like watching television). A week later the participants continued relaxation training, but also learned how to relax differentially by learning to relax muscles not in use at any particular time. For example, when standing, the face, arms, and shoulders should be relaxed. Finally, the participants learned to practice relaxation for another week and to use the coverants “calm” and “relaxed” anytime they felt nervous. Bowersock (1974) found his contingency self-management procedure effectively decreased the self-reported occurrence of anxiety related behaviors like fainting and insomnia.

In 1977 Worthington published findings on the extent of participant honesty in reporting the success of self-management projects in an undergraduate psychology course. In this class participants received extensive training in self-management techniques and the literature surrounding those techniques. Students practiced designing interventions by being given an example situation and then receiving feedback from the experimenter on their own intervention designs before beginning data collection. Students were required to complete a project write up that provided a definition of the target behavior, specified the goal for the project, described the intervention, and included data from baseline and intervention conditions. At the end of the course the students completed a 13-item anonymous questionnaire that asked them to evaluate their project and their honesty in reporting the project results. In their write ups 62% of students said they reached their goal and were successful, 30% said they were successful even though they did not reach their goal, and 8% said they were unsuccessful. Despite these generally positive results reported by the students in their write ups, Worthington (1977) reported that on the questionnaire 7 of 109 students

(6%) said they were successful and reached their goal, and 6% said their project was unsuccessful. Through a planned comparison, Worthington reported that people who said they had reported honestly and people who attempted to decrease undesirable behaviors were more successful in the project. The largest percentage of users found “self-reinforcement administered by external users” to be the most helpful technique.

To assess the effects of self management-training on academic performance and further identify the most effective method of self-management in that setting, Dean, Malott, and Fulton (1983) conducted the following experiments. In Experiment 1 students in an undergraduate psychology course were offered 5 extra credit points for participation. Each student had six meetings outside of the classroom with an experimenter to learn self management procedures. Procedures included: constructing and displaying prominently if-then rules like “If I do this behavior, then I can expect this consequence to follow,” instruction in self-monitoring and recording, performance graphing, and schedule planning, environmental management, constructing and prioritizing lists of tasks, and thorough review sessions with the researcher. Bonus points for extra credit were contingent upon completing assignments for the self management project. If students missed a project deadline they were penalized 1 bonus point. Eight of 9 students showed academic improvement and median quiz scores rose from 70% to 88% (Dean et al., 1983). In experiment 2, Dean et al. (1983) evaluated the following individual self-management procedures: hourly self recording, student-developed rule statements, and environmental management procedures. In this experiment, 6 low performing students were solicited for participation from a different undergraduate psychology course. The students met once with the researcher and were instructed to begin self-monitoring and self-

recording on an hourly basis. The remainder of the intervention was performed by visually inspecting the student's scores on in-class quizzes each week. If the student did not improve satisfactorily on the quiz after the self monitoring component, then they received the rule construction training. The same procedures were followed for exposure to the environmental arrangement training. Three students received rule construction training and the environmental management training. Three students improved their academic performance after exposure to the self monitoring component. No lasting effects were demonstrated as a result of exposure to the second component, rule construction. And during the final component, environmental management, the remaining 3 students improved their quiz scores substantially (Dean et al., 1983). The authors make an interesting point about the contingencies governing individuals assent to self-record. That is, during times when an individual must report when they were neglecting homework or other planned activities, self-punishing statements may result from the self-recording. Increases in target behavior may occur if the student behaves to terminate these statements, in this way strengthening a self-awareness and self-evaluation repertoire through negative reinforcement.

Hamilton (1980) used Goal-Attainment Scaling (GAS), the Generalized Expectancy for Success Scale (GESS), and the Rotter's Internal-External Locus of Control Scale (I-E) to measure student successful behavior change during an undergraduate psychology course. These scales, given pre and post course, are designed to measure behavioral and emotional change, generalized expectancy for successful goal attainment across "situational domains" (i.e. public, private, familiar, interpersonal, vocational), and the extent to which individuals believe that reinforcement is causally related to their own behavior, respectively. Course components

included history, theory, and practical application of self-control principles. Students were required to complete a self-modification project that included: 2 weeks of baseline, history of the problem, functional analysis of the target behavior, measurement procedures, graphs, and descriptions of intervention techniques. Students targeted behaviors such as caloric intake, studying, exercise, smoking, and depression. GAS scale results indicated 83% of students met goals specified for behavior change and 86% met goals specified for emotional change. GESS and I-E scale means revealed greater pre post change for students identified as “successful” by the GAS scale. Overall, students reported that self-monitoring, self-instruction, self-praise, and structured diaries were among the most used, implemented, and helpful of the self-management techniques (Hamilton, 1980).

Factors Affecting the Success or Failure of Self-Management Efforts

Successfully managing one’s own behavior appears to require at least two things: (1) sensing environmental events that inhibit desired behavior and occasion undesired behavior, and (2) designing and implementing changes that occasion desired behavior and inhibit undesired behavior. For the majority of people, a repertoire of self-management skills may not be important until demands from school or work require significant attention. In this environment, self-management skills can mean the difference between an individual’s success or failure to meet expectations in school and the work place.

Through questionnaire and interview techniques Perri and Richards (1977) identified several characteristics of successful self-managers. Successful self-managers reported (a) using more techniques for longer periods; (b) using certain techniques such as self-reward; and (c) using methods that seemed to vary according to the problem with which they were dealing. As

an example, successful students within a group trying to improve their studying reported greater use of written self-monitoring and self-reward procedures. Additionally successful self-managers rated themselves as more motivated and committed to personal change than did unsuccessful self-controllers. Successful participants also set their goals and standards for change higher at the outset of their self-management endeavor, and they used a greater number of techniques for longer periods. They also reported using self-control methods more frequently and more consistently.

Varley, Webb, and Sheeran (2011) found that participants exposed to if-then plans for implementation intentions used in conjunction with self-help materials were more successful after an eight-week follow up than participants that did not receive the implementation intention plans. The implementation plan was a rule that specified when and how to execute particular self-management techniques. For example, "If I have put the kids to bed, then I will use my relaxation exercise."

To differentiate between successful and unsuccessful self-managers Worthington (1977) attempted to correlate the following factors to student success: grade point average, the percentage of the behavioral goal reached, estimated probability of using a self-modification program in the next two years, and self-rated adjustment.. Worthington found that successful self-management correlated significantly with future use but was not correlated to grades or self-rated adjustment. Worthington also found that the students who used self-reinforcement proved more successful than students that did not report using self-reinforcement and that self-managers who attempted behavior change that involved increasing a desirable behavior answered differently than did students who attempted to decrease an undesirable behavior.

Fifty-five percent of self-managers who tried to accelerate a desirable response reported they would have worked harder (and, presumably, attained greater behavior change) for a counselor, while only one quarter of self-managers who tried to increase a desirable behavior said they did their best. By contrast, 45% of self-managers who attempted to decrease a problematic behavior reported they would have worked harder if they were working with a counselor rather than managing themselves while the majority (53%) of self-managers who attempted to reduce a behavior said they did their best.

Participant Self-Reports as Dependent Measures

Probably largely due to the nature of self-management as an area of study, much of the extant literature and most adult clinical applications usually rely heavily—if not exclusively—on participant self-report as the primary dependent measure. This reliance on self-report brings with it a special set of potential problems and the literature reflects and discusses these.

When an individual engages in self-monitoring the monitoring itself can have an effect on the behavior of interest. Kazdin (1974) addressed many of the special considerations that techniques like self-monitoring bring to the table, such as reactivity, the timing and schedule of self-monitoring, and operant consequences. Kazdin addressed issues of reactivity directly and attributed the therapeutic effects of self-management to either or both of the following: (1) the effects of reactive assessment (that is, the subject's awareness that particular responses are being monitored); and/or (2) the effects of self-observation (as opposed to observation by an external agent).

Spector (1994) confronted apprehension surrounding self-report research with a two-part approach. He identified the constructs that self-report measures can be considered to

represent, and when these measures might prove useful. Spector used a three-component framework established by Spector and Brannick (in press) to identify the specific variance contributed by any single measured variable. According to this framework trait, method, and error variance within measures can influence the degree to which an experimental outcome can be attributed to the influence of a particular independent variable. When these components of variance are brought to bare on self-report measures, Spector made the following points: (1) proportion of trait variance in the observed variable will be smaller if researchers consider the self-reports to represent the objective environment rather than the respondent's perception of the environment; (2) responses made in self-report conditions can be systematically influenced by social desirability, making the way a question is asked a potential confounding variable; and (3) self-report data are subject to a high degree of error variance since the extent to which it can be influenced non-systematically by respondent error is quite large, which can make the data more unreliable.

Kazdin (1974) hypothesized that monitoring responses early in the response chain may suppress an undesirable target behavior than contacting consequences later in the sequence. Kazdin (1974) also brought researchers' attention to issues concerning the delay between the target response and the recording of that response. If the delay between the occurrence of behavior and recording of the behavior is great, the use of the self-monitoring procedure should be questioned. He explained that if self-monitoring constitutes an aversive event (if the occurrence of an undesirable behavior is recorded) or positive event (if a desirable behavior is recorded), a delay in recording may reduce the efficacy of the procedure, as would the delay of punishment or of reinforcement. Similarly, self-monitoring and self-evaluation may become

discriminative stimuli for either thoughts about the aversive consequences or the consequences themselves. Monitoring behavior can bridge the delay between the undesirable response and the ultimate aversive consequences. Conversely, when self-monitored behavior is a desirable behavior, self-monitoring may serve as a conditioned reinforcer that bridges the delay between the behavior and the long-term reinforcing consequences. Therefore, monitoring behavior can serve to reinforce the target response. (Kazdin, 1974).

A proponent of the use of diaries as a form of self-reporting to understand daily stressors, Almeida (2005) gave three reasons to support them. First, daily diaries may circumvent concerns about ecological validity that constrain findings from laboratory research. Ecological validity becomes a concern when the intervention developed in the laboratory proves ineffective in the natural environment. If the suggested intervention consists of monitoring one's own behavior in a diary, then the integrity of the intervention is not compromised because it is based on the person's real experience. Second, diary methods alleviate memory distortions that can occur in more traditional questionnaire and interview methods that require respondents to recall experiences over longer time frames. And, third, diary methods allow assessment of within-person processes, an atypical experimental design outside the field of behavior analysis.

Concerning the reliability of self-monitoring behavior, Kazdin (1974) remarked that when self-management is used as assessment, reliability is exceedingly important; when it is used as a behavior-change technique, the consistency and accuracy of measurement become certainly less crucial and perhaps irrelevant. In any given study, the behavior change evidence

in self-report measures cannot be considered necessarily to reflect actual change in nonverbal behavior in the absence of corroborative data. Similarly, given that Worthington (1977) found that most self-managers reported not presenting project data honestly, he reiterated the need for behavior and performance product measures in self-control research.

METHOD

Behavior Principles I

Behavior Principles I is an undergraduate course at the University of North Texas taught by an advanced level graduate student in the behavior analysis department. In this course behavior is examined as a part of the natural world, with primary focus on principles describing relations between operant behavior and its consequences. The principles of reinforcement, extinction, differential reinforcement, and punishment are related to naturally occurring events and to experimental and intervention procedures. Basic measurement concepts are also introduced. Students in the course were required to read *Principles of Everyday Behavior Analysis* (Miller, 2005).

Participants and Setting

One hundred twenty-five undergraduate male and female students in five sections of the Behavior Principles I course at the University of North Texas participated in this study. The data reported here were generated through a self-management project that served as part of the course requirements for all students. Of the 125 students a sample was selected and data from 20 students were taken from the logs of 75 students that met the selection criteria of having completed all 3 logs. The 20 students were semi randomly selected without regard for any of their individual characteristics. Eight of the students were male and 12 were female. Students ranged in age from approximately 18 to 45 years. For the majority of students, completing this course was their first exposure to behavior analytic curriculum.

The research took place in both the college classroom and the students' day-to-day environments outside of school. All participants received project instructions and a brief

background in self management in typically-furnished university classrooms. Student's observed and recorded their own behavior as it occurred in their day-to-day environments, which usually included their homes, workplaces, friends' homes, and the university campus.

General Order of Project Activities

At the third class meeting of the semester the researcher visited each section of the course to give a Power Point presentation and set expectations for the self-management project (see figure A.1). The researcher handed out the first exploratory logs to students and told the students to complete their logs daily for one week. After seven days the researcher visited each of the sections to collect the exploratory logs from the students.

One week after collecting the exploratory logs the researcher returned to each section of the course to distribute the second log and return the first log to the students. In the next seven days the students completed the second exploratory log. After the seven days the researcher returned to each section to collect the second log.

One week after collecting the second logs the researcher returned to each section to distribute the third log, the post-test, and the instructions for the project write up (see figure A.2). After 7 days the researcher returned to each section to collect the third log, post test, and write ups.

Materials

Modified Exploratory Log

During Weeks 1, 2, and 3 of the project students completed exploratory logs, which were modified versions of those included in Schwartz and Goldiamond, 1975 (see Figure A.3). The researcher modified the log by eliminating several of the context-specific questions and

simplifying the language of the column labels. The modified exploratory log is a table consisting of four columns labeled: “Time”, “What do you have planned?”, “What actually happened?”, and “How do you feel.” The log was printed on an 8x11 inch sheet of paper in landscape format.

Pre/Post-Test

Students received a pre- and post-test survey before and after completing all three exploratory logs (see figure A.4). The questions on both the pre-test and the post-test were as follows:

1. What makes you happy?
2. What makes you angry?
3. What excites you?
4. What makes you sad?
5. What frustrates you?
6. What annoys you?

Measures

Data for this study came from two sources: (1) the pre- and post-tests the students completed before and after their self-management projects, and (2) the exploratory logs the students completed during their individualized self-management projects. From these sources, several types of data were gathered.

Reliability of the Dependent Measures: Coding for Sameness and Difference across Written Responses

Written responses formed the primary source of data for this study. An analysis of each written response for point-to-point correspondence and thematic relationships was performed to determine the extent to which a response was or was not equivalent to another response. A

response was coded as having point-to-point correspondence between the stimulus and response product when the beginning, middle, and end of the verbal stimulus matched the beginning, middle, and end of the verbal response. (Sundberg, 2004). For example, when a student wrote, “Mother,” in response to the pretest question “What frustrates you?” and wrote “Mother “ again in response to the same question on the post test, then the two responses share point-to-point correspondence. Similarly, when a student wrote “work” in the “What do you have planned?” column of the exploratory log and also wrote “work” in the “What actually happened?” column of the exploratory log, then the two responses share point-to-point correspondence. When a written response did not correspond point-to-point with the controlling variable but the response varied according to the complexity of the controlling variables, the written responses shared thematic relationship (Michael, Palmer, Sundberg, 2011). For example, when a student wrote “My family (which includes my cats)” in response to the question, “What makes you happy?” on the pretest and wrote “Spending time with family” in response to the same question on the post test, then the two responses share thematic control. Similarly, when a student wrote “Dinner” in the “What do you have planned?” column of the exploratory log and then wrote “Ate green bean casserole” in the “What actually happened?” column, then the two responses share thematic control.

Measures Taken from the Pre and Post-tests

Events

An event was defined as a written description of any person, place, thing, emotion, circumstance, or situation in the participant’s environment that occasioned specific emotional behavior and excluded any vagaries. The number of events reported at the start and the end of

the participants' self-management project was measured by counting the number of different descriptions students wrote in response to the questions on the pre and post-test (What frustrates you, what makes you happy, what makes you sad, etc.) The description includes any person, place, thing, feeling, emotion, circumstance, or situation in the participant's environment. For example, in response to the question "What frustrates you?" students might describe events such as traffic, their children, or getting a poor grade in class.

Response Change

Response change refers to an instance when an *event* a student reported as occasioning a specific emotional response on the pre-test was not reported on the post-test. For example, if a student responded to the pretest question "What makes you happy?" with "getting a good grade" but did not write this in response to the same question on the post test, this would be counted as an instance of *response change*. As an example, on the pretest one student responded to the question "What frustrates you?" with "traffic." On the post test that same student responded to the same question with "missing class and co-workers." This was counted as one instance of *response change*.

New Events

An instance of a new event occurred if the student reported an *event* on the post-test as occasioning a specific emotional response that they did not report on the pre-test. This included descriptions of events that do not share either point-to-point correspondence or thematic relation to events described on the pre-test survey. For example, when a student wrote "Not getting to go home as much as I used to" in response to the question "What makes you sad?" on the pretest and then wrote "Not getting to see my friends at home a lot" and

“Thinking about graduation” in response to the same question on the post test, “Thinking about graduation” is a *new event*. “Not getting to see my friends at home a lot” is not considered a *new event* because it shares a thematic relationship with the previous response, “Not getting to go home as much as I used to.”

Measures Taken From the Exploratory Logs

Correspondence of Planned and Actual Events

Correspondence between planned and actual events occurred when the participant wrote the same description in the “What do you have planned?” column as they wrote in the “What actually happened?” column of the exploratory log within the same “Time” row. This included instances when participants wrote description in both columns with point-to-point correspondence, descriptions written in both columns that did not share point-to-point correspondence but did share thematic relations, as well as descriptions that employed symbols to indicate sameness such as ditto marks, check marks, or arrows.

Correspondence of Planned and Actual Events for Target Behavior

Correspondence between events (both planned and actual) and the target behavior those events might occasion refers to the degree to which both events the participants *predicted* would occur (planned events) and events that really did occur (actual events) occasioned the behavior targeted for change in each participant’s respective self-management project. Correspondence between planned and actual events and a given target behavior was high when both the planned event and the actual event each occasioned the behavior targeted for change, Correspondence between planned and actual events and a given target behavior was low when students described events in the “What actually happened?” column that were

not described in the corresponding “What do you have planned?” column. *Correspondence* between planned and actual events for the students’ target behavior was measured by counting instances of participants reporting in the “What actually happened?” column the same events they had written in the “What do you have planned?” column specifically for rows in the log they’d highlighted as the target of their intervention. To be counted as an instance of correspondence the participants must have written the descriptions in the same “Time” row.

Correspondence between Events Reported in the Pre and Post-Tests and Actual Events in the Exploratory Log

To measure correspondence between events reported in the pre and post-test and actual events reported in the exploratory log the researcher counted instances of participants reporting an event they identified on the pre- or post-test as occurring in the “What actually happened?” column of the exploratory logs. Event correspondence was counted and reported separately for the pre and post-test.

Correspondence between New Post-Test Events and Actual Events in the Exploratory Log

To measure correspondence between new post-test events and actual events, the researcher counted the number of times *new events* from the post-test were reported by the students in the exploratory logs under the “What actually happened?” column. To be counted as an instance of new event correspondence the descriptions had to share thematic relation, but point to point correspondence was not necessary.

Procedures

Before the students began the project they completed the pre-test survey. This survey asked them to describe their emotions as they typically occurred in their environment. The

students received no additional instructions or expectations for completing the pretest survey. After the students completed the pretest survey they returned the completed surveys to the researcher.

Next, the researcher delivered a brief PowerPoint (2010) presentation designed to provide students with a background in self-management as well as instructions for the project (see appendix). The presentation sought to teach three general skills: (1) modifying your environment, (2) monitoring your behavior, and (3) making social commitments (Epstein, 1998).

To provide the students examples of ways they might modify their environment, the researcher relayed a story involving B.F. Skinner and his desire to change his writing habits. In the story the researcher described Skinner moving his bed from its traditional location in his bedroom to his study. This modification allowed Skinner to structure his environment to occasion more frequent writing and capture the ideas that woke him from sleep without walking downstairs to another room. The students heard no other examples of environmental modification.

Next, to monitor their behavior, the students were introduced to the exploratory log and they learned to complete each of its four columns. To complete the “What do you have planned?” column the students were instructed to make a plan each evening for the following day. They were told to fill this column with the events they expected to occur the next day in the order in which they expected the events to occur. The students were told to fill the “Time” column, “What actually happened?”, and “How do you feel?” columns in real time throughout the following day. Students were told to document the time they began each new activity and describe this activity in the “What actually happened?” column. Then, they were told to

complete the “How do you feel?” column with a description of their emotional behavior during the corresponding activity. Figure 2 below shows an example of a completed sample exploratory log.

The students were told one more story about Skinner to illustrate the third guideline for self-management, that of making social commitments. Due to an eye condition, Skinner needed to use eye drops frequently as prescribed by his doctor. Skinner found the drops uncomfortable and he often forgot to use them. To use the drops more frequently, Skinner made a social commitment with his daughter. Skinner explained to his daughter that he would record the number of times he used the eye drops throughout the week and if he consistently used the drops they would go out for dinner together Sunday evening. If he had not used the drops consistently, they would stay in and eat. Following this example, the researcher suggested students devise their own social commitment to maintain their behavior change, if it suited their goal.

The students were told they would complete three exploratory logs. The first exploratory log was intended to be an assessment of the student’s current environment; therefore they were not instructed to make any changes to their environment before completing the log. The students logged for one week. At the end of the week they returned to class with their completed logs and highlighted in their log the behavior and corresponding emotion they wanted to change. The students were told to attend to the emotions column when selecting a target behavior, however, they were not told to attend specifically to positive or negative emotions. The students turned in their first week’s logs and the researcher

explained to the students that they would not log for the next week. After one week the researcher returned to their class and delivered instructions for the next exploratory log.

After one week the researcher returned to each section and delivered instruction for the next exploratory log. The original logs from the first week were returned to the students and blank logs for the second week were given to each student. Before beginning their exploratory logs for the second week, the participants were asked to change their environment in some way that they thought would likely change the behavior and emotions they had targeted in their previous log. The third week, the researcher returned to each class to collect the second log. Again, the students highlighted the behavior and corresponding emotions they were attempting to change.

A week passed and the researcher again returned to each class. The original copies of the logs from the second week were returned and blank logs for the third week were given to each student. The participants were then told that this third log was meant to assess the maintenance of their behavior change. They were not to make any additional changes in their environment, but were to continue behaving within the conditions they had created for their second log. Along with the third log the students were given the post-test survey. The post-test survey was identical to the one they completed at the beginning of the project. They were instructed to complete the post-test survey using the information they had gained through completing the self-management project. Also, the students were given instructions for a brief report of their project (see appendix). After a week, the students returned to class and submitted the final log, the post-test, and the project report.

For clarity's sake, Table 1 provides a task list that specifies the order of instruction and delivery of project materials as they occurred throughout the four weeks in which the self-management project was conducted.

Table 1

Gantt Chart of Self-Management Project Activities

Self-Management Project Order of Activities	Week One	Week Two	Week Three	Week Four
Instruct students to complete the pretest.				
Present instructions and context for the project via PowerPoint presentation.				
Distribute new exploratory log.				
Instruct students to highlight patterns in the log they want to target for their project.				
Collect the first log.				
Instruct students to modify their environment to change the pattern they highlighted in log 1.				
Collect the second log.				
Instruct students to continue logging with their environmental modification in place.				
Distribute written instructions for the project write up.				
Collect the third log.				
Instruct students complete the post test in class.				
Collect project write ups.				

RESULTS

Nineteen of the participants completed the project write up. Fifteen of 20 participants sought to increase the rate of some behavior that they described as having previously been associated with helping them avoid aversive emotional responding. Three participants wanted to increase the rate of some behavior that they described as having previously been associated with pleasant emotional responding. Thus, 75% of the students sought a behavior change based on avoidance of some aversive stimulus or other behavior (such as an emotional response or a thought). Two participants chose to increase the rate of both behavior that had been previously accompanied by positive emotions as well as behavior that had occasioned negative responding. Of the 19 participants that described the components of their intervention, 17 employed antecedent manipulations, one used consequent interventions, and one implemented an intervention that included both antecedent and consequent manipulations. Students frequently described manipulations that included setting alarms, leaving their dorm rooms to study cleaning their bedrooms, and engaging in bedtime routines. All of the students that completed the write up reported attempting an intervention to change their target behavior. Six students attempted multiple environmental changes at once. Four chose sequential modifications to their environment and only implemented a new intervention after the first did not produce the desired behavior change, and nine students implemented a one-time only intervention. Eighteen of 20 participants reported whether they considered their intervention to be successful, and most (17) participants reported that their intervention was, indeed, at least somewhat successful, with only one participant reporting their intervention proved unsuccessful. Further, most of the participants reported positive outcomes in terms of

the maintenance of their behavior change. Nineteen participants reported whether the change in their behavior had maintained, with 10 reporting that the change had maintained, four reporting that it had somewhat maintained, and five reporting that the change in behavior had not maintained. Generally, students reported more events on the posttest compared to the pretest. The number of events from the pre- and posttest that were actually corroborated by log reports tended to be dramatically lower than the total number of pre and post events reported.

Figure 1 shows the percentage of times the descriptions written in the “What do you have planned?” and “What actually happened?” columns shared point-to-point correspondence or thematic control.

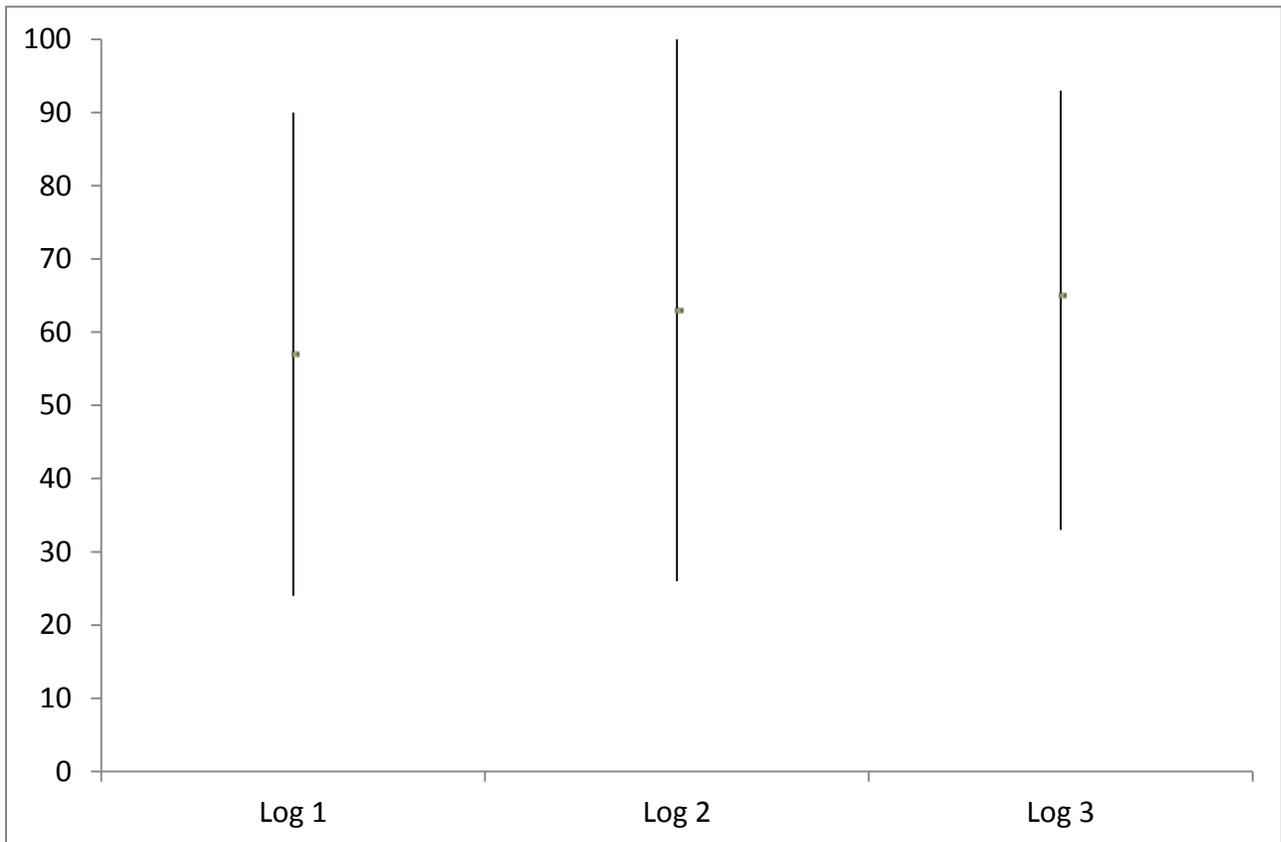


Figure 1. The percentage of student entries with correspondence across logs.

That is, the participant actually engaged in the planned activity or behavior. Median percentage of correspondence for log 1 was 57% with a range of 24% to 90%. Median percentage of correspondence for log 2 was 63% with a range of 26% to 100%. Median percentage of correspondence for log 3 was 65% with a range of 33% to 93%.

Figure 2 shows the percentage of times the descriptions written in the “What do you have planned?” and “What actually happened?” columns shared point-to-point correspondence or thematic control for the participants’ target behavior. If the descriptions in both these columns were identical or if the descriptions described similar events, an instance of correspondence was counted.

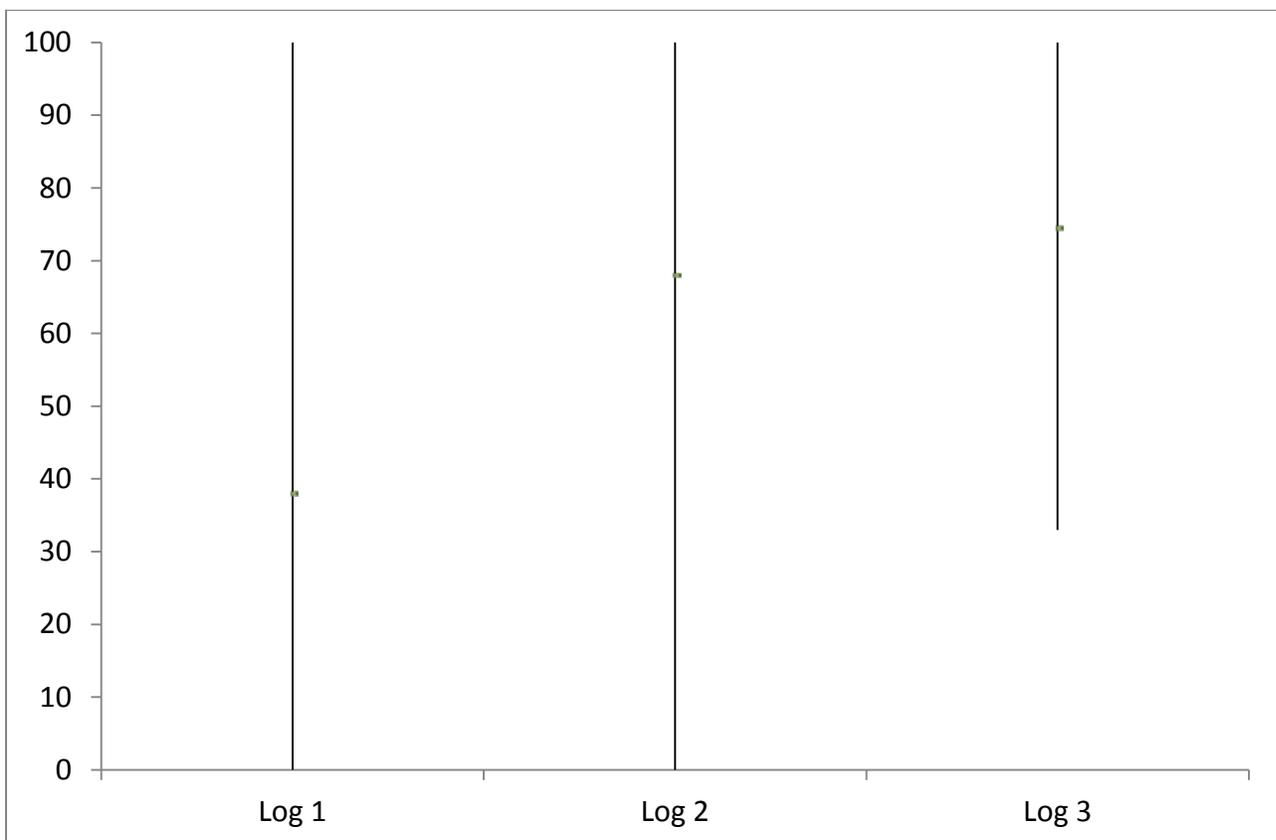


Figure 2. The percentage of student entries with correspondence for target behavior across logs.

Data for almost all of the participants (18 of the 20) showed increases in correspondence from the first to the final log. Median percentage of correspondence for log 1 was 38% with a range of 0% to 100%. Median percentage of correspondence for log 2 was 68% with a range of 0% to 100%. Median percentage of correspondence for log 3 was 74% with a range of 33% to 100%.

Thirteen participants reported more post events. For those that reported more, the range was 1 to 10 events with a median of 4 events. Seven participants reported fewer post events. For those that reported less, the range was 1 to 12 events with a median of 6 events.

Ten participants reported more new events than response change. Of those 10 the median number of new events reported was 13 with a range from 6 to 25 events. . Seven participants reported more response change than new events with a median of 11 response changes with a range from 3 to 20 changes. Three participants reported the same number of new events as response changes with a median of 17 new events/response changes ranging from 15 to 20 events/response changes.

Correspondence with descriptions in the logs proved highest with events from the posttest for most participants. For 12 participants, more events from the posttest were described in the logs. Of these 12 participants the median number of posttest events found in the logs was 5 with a range of 0 to 13 events. Five participants' pretest events corresponded highest with log descriptions with a median of 3 events, ranging from 0 to 7 events. Three participants' pre- and posttest events corresponded equally with descriptions in the logs. For these 3 participants, the median number of events was 3, ranging from 1 to 7 events. For 9 participants the difference between the number of pre and post events that corresponded to log reports was 1 or 0. For most participants, a small number of the new events corresponded

to log reports. The median difference between the total number of new events and the number of new events reported in the logs was 10 with a range of 2 to 24 events.

Data taken from the project write ups indicated that 16 students behavior change techniques were grounded in a pathological approach, whereas, 4 students behavior change techniques came from a constructional approach.

DISCUSSION

This study sought to discover if students in an undergraduate course could use a modified exploratory log to change their behavior within the context of a self-management project. Another possible benefit students could have potentially gained was the ability to see their environment through a behavioral lens and find empowerment in that. It was hoped that students would begin to understand their emotional responding as behavior that changed as they continued to manipulate contingencies in their overt environments. That they would find they could modify emotional responding just as successfully as they could modify their overt behavior.

The students who participated in the current study had the opportunity to change any behavior of their choosing. Interestingly, most students identified behaviors they wanted to change as products of negative reinforcement contingencies. That is, almost all of the students chose to decrease the negative feelings associated with a behavior by engaging in some other behavior more often. By contrast, only three students chose to increase the rate of a behavior that had a history of co-occurrence with a positive emotional behavior. Like many of us, they sought to avoid. Clinicians practicing acceptance and commitment therapy often use a five-pronged framework to understand why the repertoire of most individuals is susceptible to this “pull to avoidance.” Hayes and Smith (2005) wrote that individuals often find it difficult to understand the fundamental ineffectiveness of experiential avoidance because: (1) individuals assume they can control their thoughts and feelings, (2) individuals often learned that they *should* be able to control their thoughts and feelings, (3) children often perceive that the adults around them can control their thoughts and feelings, (4) people learn that their health and

well-being depend upon the absence of difficult private experiences, and (5) individuals experience the short term effectiveness of trying to control unwanted thoughts and feelings (e.g., a workaholic may work to avoid the recurring thought that they are worthless).

It seems that few individuals choose to modify their environments to make pleasing events happen more. Most of the participants in this study chose to behave more or differently to the extent that that behavior allowed them to successfully avoid at least some aversive feelings. The extent to which individuals behave within negative reinforcement contingencies correlates to their quality of life. Sidman (1989) wrote that when individuals live life largely under aversive control they become negative and inflexible, doing only what is necessary to “keep their nose out of trouble.” Similarly in the current study when given the choice, participants added more of these types of contingencies rather than approached positive reinforcement contingencies? By contrast, frequent contact with gentle, positive reinforcement contingencies, can improve learning, modify destructive habits, and generally help people lead healthier, more satisfying, more productive lives (Freedman, 2012).

Limitations of the Current Research

Lack of experimental control was one limitation of this study. In the current study, lack of experimental control means that readers cannot assume that any functional relationship exists between the exploratory log/self-management project and the participants’ ability to manage their own behavior. However, an extensive qualitative analysis of each participant’s logs and their responses on pre- and posttest surveys provided intimate knowledge of their approach to changing their own behavior and the contingencies operating in their real life environments. Another limitation of the current project involved teasing apart variables of

interest. Here, the participants were also learning behavior analytic material while executing the self-management project. Therefore one cannot determine how much of their success resulted from acting on information they learned in class.

This study relied on self-report as the main source of data. Hayes, Barlow, and Nelson-Gray (1999) identified the implications of relying on self-report measures as issues related to stimulus variables, organism variables, and agreement. Stimulus variables come into play in self-report because it can prove difficult to identify the nominal and functional stimuli for a client's reporting behavior. In the present study, participants' responses in the "What actually happened?" column of the exploratory logs could have been occasioned by the text "What actually happened?" or the responses could have been occasioned by an establishing operation related to please the researcher. Organism variables like a participant's ability to read and write could also confound self-report measures. Hayes, Barlow, and Nelson-Gray's (1999) points on agreement between self-report measures refer to the frequent inability of separate self-report measures (purportedly measuring the same behavior) to have the same results. In the case of the present research, one might question whether the pre- and post survey is an effective measure of change reported in the exploratory log.

Despite the presence of the previously described confounds, self-monitoring and verbal report is ubiquitous in adult clinical intervention. Thus, while rife with potential problems, self-report measures get used often and persistently. Karoly (2005) stated that 83% of surveyed behavior therapists reported using self-monitoring with 44% of their clients. Therapists may employ self-monitoring procedures so often because, in naturalistic settings, self-monitoring data prove more much more convenient and much less effortful and intrusive to obtain than

data taken by a trained observer. Despite concerns around the reactivity and reliability of self-reported measures, their use is often easier for the clinician and may foster greater self-awareness for participants. Previous researchers have written:

Asynchrony between response systems does not support the conclusion that self-report is a generally inferior measure, but helps to underscore that it is a unique form of measurement. Self-report assesses what the client says about what he or she is thinking, feeling, or doing. Furthermore, self-report is our most direct measure of cognitive responses (such as obsessions or negative self-statements) or of subjective experience (such as pain or sexual arousal)...What people think about their cognitive, motoric, and physiological behavior does matter, practically and philosophically...The critical advice here is not to assign global priority to measures, but to obtain multiple measures in order to produce a complete assessment of the client's responses. As one of several measures that are repeatedly administered over the course of treatment, self-report provides a unique assessment of client change. (Hayes et al., 1999, pp. 342-343)

Implications for Future Research

The literature supports the assertion that the use of self-monitoring within a self-management context can prove worthwhile as part of intervention in the adult clinical as well as undergraduate classroom settings. Further research is warranted to examine the use of the exploratory log as an effective self-management tool and way of self-reporting. Several questions arise from the present research that future researchers might consider exploring. First, do individuals that report fewer events at the completion of a self-management project also have higher event correspondence on any post hoc assessment or survey? That is, if participants report fewer events at the conclusion of a project, do they correspondingly become more accurate at identifying what variables control their behavior?

Further research might also explore any positive effects associated with the relationship between accurately identifying what controls their behavior and improving their say-do correspondence. That is, do participants not only become more accurate in reporting what

controls their behavior but also improve their say-do correspondence? Researchers may find an opposite relationship wherein if event correspondence decreases, overall log correspondence decreases as well.

Results from the pre- and posttests used in the current project occasion additional experimental questions, such as, whether participants that report the same number of new events than response changes, or more new events than response changes, have increased posttest event correspondence? And, finally, if there is no new event correspondence, does correspondence across self-reports decrease as well? That is, if none of the new events participants identify as controlling their behavior actually appear in self-reports, does say-do correspondence decrease overall?

The extent to which enrollment in Behavior Principles I affected the success of the students' self-management projects is unknown. Specifically, students might've successfully modified their behavior because they were also learning about, and were able to independently apply strategies in accordance with, basic behavioral principles.

APPENDIX
SELF-MANAGEMENT PROJECT MATERIALS

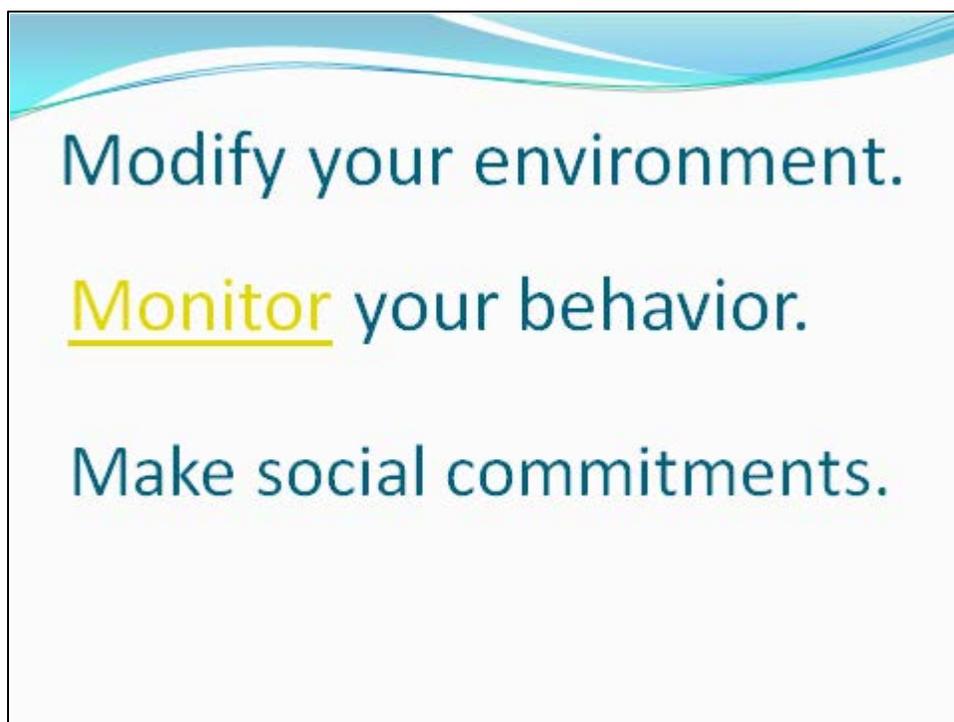


Figure A.1. Self-management project PowerPoint presentation slides.

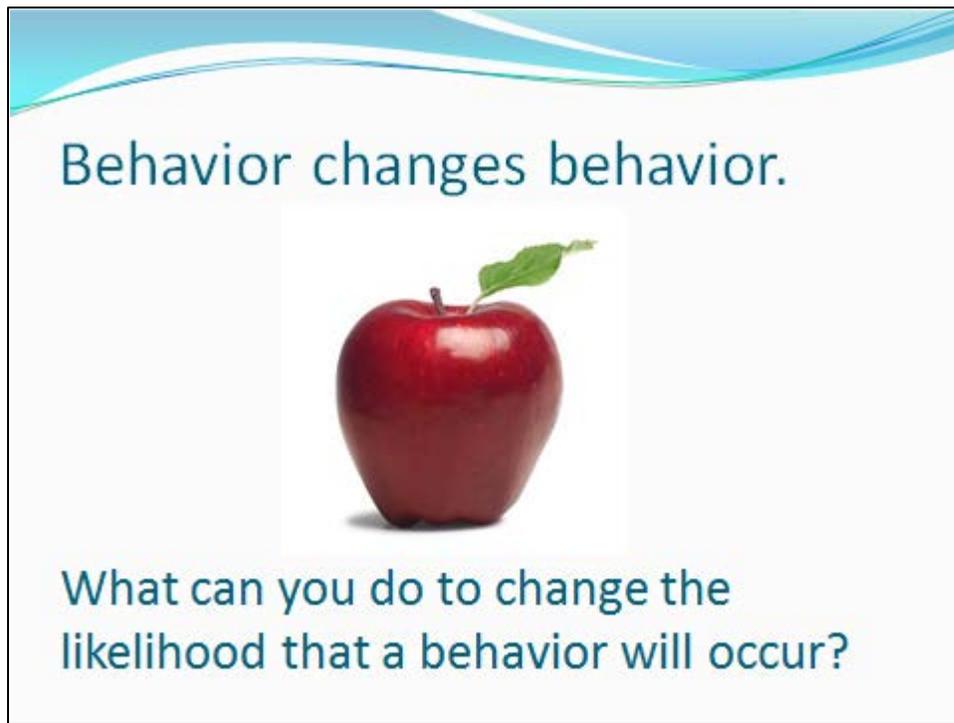


Figure A.1. Self-management project PowerPoint presentation slides.

Project Write-up

Self-Management Project

Write-up Instructions

The following questions should be answered according to the self-management project you completed this semester. Please type your responses in a separate document and submit your answers along with the final log and emotions survey in class on April 26th.

1. What behavior did you attempt to change for your project?
2. Describe the emotional behavior that typically accompanied this activity.
3. Describe how you modified your environment to change this behavior.
4. Was your environmental modification successful? Why or why not.
5. Did you have to attempt multiple environmental modifications? If so, describe your process of trial and error.
6. Now that you've completed the third and final log, were changes in your behavior maintained?
7. Now that you've completed the third and final log, describe the behavior and accompanying emotions as they currently exist in your environment.

DOW:

Date:

<u>Time</u>	<u>What do you have planned?</u>	<u>What actually happened?</u>	<u>How do you feel?</u>

Figure A.3 Modified exploratory log

Pre/Post-test

Self-Management Project- Student Survey

Please write your answers to the following questions in the space provided.

1. What makes you happy?
2. What makes you angry?
3. What excites you?
4. What makes you sad?
5. What frustrates you?
6. What annoys you?

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