A Self-Experimentation on the Detection of Forgets Using Encouraging Think/Say and Hear/Tally Statements

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This self-experiment investigated the effects of daily encouraging self-statements said orally within a one-minute counting period on the frequency of detected forgets. We used six weeks of initial baseline data (i.e., the Before condition) to assess the frequency of detected forgets in the absence of the intended treatment of encouraging self-statements. We observed an immediate change in frequency of detected forgets following the initiation of the encouraging self-statements. As the frequency of encouraging self-statements accelerated, the frequency of detected forgets improved to a total frequency spread of no occurrences, to 1 occurrence per counting period during the final five weeks of intervention. The frequency of detected forgets remained low for the four weeks without the counting periods for the daily self-statements.

Within the past 50 years, self-experimentation has remained mostly unexplored in the behavioral sciences. Rarely do behavioral scientists and practitioners experimentally analyze their own behavior. More often, scientists experiment on and observe non-humans in operant chambers or humans in laboratories, classrooms, clinics, and other numerous settings (Neuringer, 1981). Experiments with other participants provide meaningful and necessary information about human behavior. As B. F. Skinner (1953) expressed in *Science and Human Behavior*, however, there exists a part of the universe enclosed within the skin, and this portion of the universe remains relatively uncharted. Exploration and discovery of the inner self have the potential to provide great insight concerning one's inner problems and the solutions to those problems. Self-experiments have a long history in the medical and behavioral sciences. In the medical field, for example, over a period of 30 years, Sanctorius studied the energy expanded by living organisms by weighing all the food he consumed and then weighed his excrement. Some experiment involved more physically challenging procedures. For instance, Forssmann placed a catheter through the veins in his arm to his heart to demonstrate the feasibility of this medical procedure. Helsted used LSD in a self-experiment. Henry Head severed the nerves in his arm to study the regeneration of pain. Lazear performed the ultimate sacrifice in self-experimentation—he died from his experiment with yellow fever (Neuringer, 1981).
Experimental psychologists have a history of reporting their own experiences. The early volumes of *American Journal of Psychology* and *Psychological Review* document numerous cases in which the experimenter was the sole or major subject in his experiment. For example, Lombard (1890) examined the effects of fatigue on muscular contractions using his own muscles. Thorndike (1900) conducted a series of experiments on mental fatigue where he served as the primary subject. Dressler (1891) investigated his own response frequencies as functions of time of day and of physical and mental exercise. Ebbinghaus's (1913) inquiry into his own memory in an extensive series of experiments lasting for more than two years provided some of the most renowned studies of self-experimentation in psychology. His discoveries continue to influence experimental psychology.

More recently, Neuringer (1981) used himself in an experiment to study the effects of physical activities on intellectual tasks and behaving randomly. Also a number of Neuringer's students performed self-experiments of various conditions (Neuringer, 1996, May). Calkin (1981) and Conser (1981) performed self-experiments measuring inner behaviors of positive and negative thoughts and feelings. A number of reasons exist that encourage self-experimentation. Foremost, it expands our understanding of human behavior (Neuringer, 1981). Neuringer appears to believe that discoveries derived from non-human and human laboratory research ultimately offers only hypotheses about our own behavior. "If my interest is my own behavior, I must test on myself any hypothesis offered about me by the experimental analysis of animals or other people." (p. 89). Experiments conducted on humans and other animals in controlled settings may yield limited applicable results. Neuringer (1981) advocates that "A simple behavioral 'law' obtained from laboratories may be relevant for some people some of the time, but rarely will the law be relevant to all, all of the time." (p. 89). Ultimately, self-experimentation "is compatible with the experimental analysis field and, indeed, can be viewed as the next step in the evolution of that field: from the experimental analysis of the behavior of rats to the behavior of psychotic people to the behavior of normal people to one's own, ongoing behavior." (Neuringer, 1981, p. 90).

Some experimenters have concerns with doing and reporting self-experimentation as science. Neuringer addressed a number of these concerns in *Self-experimentation: A Call for a Change* (1981) and challenged those concerns. One major concern addresses the difficulty of replication. Consequently, this difficulty makes it harder to acquire knowledge about general human nature. Nevertheless, the difficulty of replication occurs with most experiments. Some experiments will yield more or better general insights than others. A second concern addresses experimenter bias, where expectations may be self-fulfilling. Experimenter bias, however, can exist in all areas of experimentation. Neuringer believes the checks and balances that accompany the scientific process will make the experimenter bias issue associated with self-experimentation less salient. Low experimental control presents a third concern from those who question the reliability of self-
experimentation. Consider, though, that Copernicus and Darwin worked within extremely complex and uncontrolled subject areas that resulted in gains in scientific progress (Neuringer, 1981). Fourth, self-experimentation takes time away from engaging in leisure activities not associated with experimentation. A fifth possible reason may be the lack of models who demonstrate the promise and benefits that can come as a result of employing and analyzing our own behaviors. The final concern, that some believe is the greatest, is the absence of measuring and reporting interobserver agreement. Ultimately, truth by agreement merely provides an indication that two independent observers agree to the existence of an occurrence or nonoccurrence of an event based on a definition under the control of similar contingencies. Consequently, this "agreement" has the potential to occur solely based on method rather than philosophy. Simply because the determinations of a response are only accessible to the individual performing the behavior does not make the response less real or less valid (Moore, 1995). These concerns possess a degree of validity. Nevertheless, overcoming these concerns is not an impossible task. Many scientists have succeeded, despite the obstacles, in performing self-experiments that produced great contributions to behavioral science.

We analyzed the effects of self-statements on the first author's (Melissa Judy) encounters with items previously forgotten. These self-statements focus on encouraging Melissa to improve her memory. To quantify this encouragement, she made a daily tally of the number of self-statements that she said orally during a one-minute counting period. Her remembrances of items forgotten appear as the total number of detected forgets within 24-hour counting periods. This self-experimentation on inner behavior represents the distinguishing feature of our research.

We addressed the following questions. What effects will daily encouraging self-statements said orally for one-minute have on daily encounters with items previously forgotten? Will encouraging self-statements be functionally related to the frequency of forgets detected? How will the number of daily self-statements change over the course of the experiment? How will encouraging self-statements affect the number of "quickies" (i.e., items expected to be completed within approximately 5 minutes but are forgotten) encountered each day? What effect will the absence of encouraging self-statements have on the frequency of detected forgets?

**METHOD**

Note: We wrote the Method section in first person singular to emphasize that the first author (i.e. Melissa Judy) served as the manager and behaver in this experiment.

**Participant**

The nature of this experiment dictated that I, Melissa Judy, serve as the sole participant of the study. As a 28-year-old college student, I engage in a number of activities and responsibilities. I spend a large amount of personal time working on school-related activities such as papers, study guides, projects, or reading. In addition, I work 3 to 4 days a week doing in-home personal care for individuals with disabilities. My father
and I frequently engage in social activities at home and in the community. For instance, we attend movies or the theater, eat out, and vacation together. I take care of many errands and household responsibilities for him as well. I coach and play sports (softball) from spring to fall and try to attend some professional sporting events and do other recreation with friends whenever possible (e.g., attend movies, eat out, talk). I often and quickly forgot things that caused me personal, professional, and academic difficulties. This behavior pattern generated concern and produced emotional distress and unpleasant consequences as a function of forgetting. Clearly, my behavior made me a suitable candidate for this research topic.

Settings
I counted detected forgets during each day of the study, in all settings and situations that I engaged. For example, I counted forgets while at home, at school, driving in my car, in every social setting, and during all activities. I collected data at any place and time of the day that I encountered an item previously forgotten.

Pinpoints
The number of detected forgets that occurred in daily twenty-four hour counting periods defined the pinpointed counts. I counted three characteristics of forgets. One characteristic included any thought or planned action for the future, whether immediate or distant, that I forgot to do in a designated or sufficient amount of time to complete the action. For example, I planned on my way home from school to buy bread and milk at the store. I bought the milk, but did not buy bread. If I "remembered" the bread after leaving the store, I counted that event a detected forgot. A second characteristic of detected forget included any piece of information that I did not remember within a 15-second period. For example, when I could not immediately recall the name of a person or a book title for instance, I counted that event a detected forgot. I called the third characteristic of detected forgets a "quickie." A "quickie" was any action I thought of with the expectation for it to occur within a short amount of time (approximately five minutes), but I forgot to do it. For example, my call-waiting signal sounded while my brother and I talked on the telephone. I answered the call-waiting to receive a call from my graduate adviser. I told my adviser I was on another line and asked if he would mind holding while I said good-by to my brother. After saying good-by, I disconnected the line and did not speak with my adviser. When I learned I left my adviser holding a dead telephone line, I counted that event as a "quickie" forgot. I measured the dependent variable daily throughout a twenty-four hour period beginning and ending at 8:00 AM each day during the study. I selected this counting period as a result of the variable amount of sleep that I receive each day. I usually go to bed between 1:00 AM and 3:00 AM in the early morning and rise sometime between 7:00 AM and 8:00 AM. The twenty-four hour interval enabled me to record data at any time. For example, I could record when I tended to stay up later than normal, or if I woke up and remembered something forgotten. Consequently, I displayed counts on a Standard Celeration Chart with the counting period floor marked at the 24-hour frequency line.
Experimental Design
I used a single-subject withdraw design (A1 A2 B A2) to assess the effects of encouraging self-statements on the number of forgets occurring in a twenty-four hour period. I measured the number of detected forgets during two baseline conditions (i.e., Before conditions), a treatment condition (i.e., During condition), and a return to baseline condition (i.e., After or Maintenance). I defined stability as celerations multiplying by x/1.1 or less or dividing by 1/1.1 or less per week. Following a stable celeration in the last three weeks of the second Before condition, I began the daily encouraging self-statements. After ten weeks in the treatment condition, I then returned to the After condition where I removed the daily encouraging self-statements, but continued to measure the number of detected forgets.

Materials
(1) I used Standard Celeration Charts (Pennypacker, Koenig, & Lindsley, 1972). (2) I used a wrist counter that has a button on the side that I pushed once per each count to keep track of detected forgets. Three windows on the face of the counter indicate the number of counts to 999. The counter increases at increments of 1 by pushing the button on the side, or manually operated knobs located on the face of the counter increase by 1's or 10's or 100's (Lindsley, 1968). (3) I used one data sheet to record the type of forget, the description of the detected forget, and whether the forget was a "quickie". I used another data sheet to display the total number of encouraging self-statements said daily and the date. (4) An audio tape recorder, GE model # 3-5363A. (5) Pad of paper for tally marks, and (6) Pens and pencils.

Procedures
Before1
Following the first week of data collection, I altered the initial definition of detection of forgets to the one described previously in the "pinpoint" section. Initially, the definition did not include the characteristic of a "quickie," and only involved detecting forgets that were concrete (e.g., to call someone, leaving a book at home, locking the door). It did not include forgets concerning mental issues, for example, people's names, things I wanted to say, and whether I forgot a forget. The following conditions used the improved definition.

Before2
This Before condition consisted of 5 weeks of data collection until I established a steady state of responding. When I detected a forget, I marked a count on the wrist counter. I also wrote the type of forget, and the description of the forget on the data sheet that I carried with me throughout the day. The different types of detected forgets consisted of "interpersonal," that applied to any forget that pertained to or directly affected another person (e.g., returning a call), "academic," that encompassed anything directly relating to school, or "personal," which pertained to all other detected forgets. A detected forget that would have acquired the characteristic of a "quickie" included any item that required execution within approximately 5-minutes, and that I subsequently forgot before completion. I transferred the information to the identical data sheet on my computer and charted on a Standard Celeration Chart the total number of detected forgets that occurred in a counting period of twenty-four hours. I
repeated this procedure each day except for those days that I voluntarily chose to postpone charting until the following day. I never exceeded two days without charting the data.

**During**

After I achieved a steady state of responding in the Before2 condition, I introduced daily one-minute oral encouraging self-statements (e.g., I will have less forgets. I will have more remembers. I will perform better. I will not forget anything today.). I created and used these self-statements to provide incentives and motivation to decrease the number of detected forgets and improve the amount of items remembered. I performed this intervention daily in the morning usually close to the beginning of the counting interval at 8:00 AM, as think-to-say and hear-to-tell learning channel sets. I said the statements into the audio tape recorder for one minute. I then listened to the recording, tallied the number of statements while it played, and transcribed the total number of self-statements I said on a data sheet that indicated the total number and the date. Approximately every day, I charted this information on a Standard Celeration Chart.

**After (Maintenance)**

I measured the maintenance of the behavior beginning in the 16th week of the study. Then I concluded the intervention of making oral encouraging self-statements and returned to the Before2 condition. I recorded detected forgets in the same manner as exercised throughout the study. When I detected a forget, I tallied it on the wrist counter, wrote the relevant information on the data sheet, and subsequently charted the data on a Standard Celeration Chart.

**RESULTS**

The overall results show an accelerating frequency of encouraging self-statements counted in one minute and a decelerating frequency of total daily detected forgets. The Standard Celeration Chart #1 displays the count per 24-hour period of detected forgets during initial Before conditions, the self-statement condition, and the After condition. The Chart shows the Before2 condition with the final three weeks of steady state of detecting forgets. The Before2 condition indicates a performance spread from no occurrences to 12 counts per 24-hour counting period. The During condition continued for approximately ten weeks, with the one-minute counting of self-statements in effect. The Chart displays an initial turn-down in celeration from the Before condition to the During condition. The total frequency for the During condition spread from no occurrences to 4 occurrences of detected forgets. The After condition consisted of 24 days of data collection. A steady state of responding occurred during the After condition, with a frequency spread from no occurrences to 1 occurrence. An exception to that frequency spread was the outlier data points charted on 6/29/96, 7/9/96, and 7/20/96.

Concerning the categories of detected forgets, I observed a higher frequency of personal forgets than of interpersonal or academic types. This may be because of the increased opportunity of personal activities and events. The personal category encompassed everything that was not interpersonal or academic. The count of encouraging self-statements charted displayed a total performance
change from 15 to 74 counts per minute. The frequency of encouraging self-statements said during a one-minute counting period had an acceleration value initially of x3, then an ending acceleration of xl. Standard Celeration Chart #2 displays the same counts as shown on Chart #1, except on Chart #2 we present these data by calendar weeks rather than by successive calendar days.

DISCUSSION

Following the implementation of the one-minute encouraging self-statements, we observed an immediate improvement in frequency of detected forgets. Melissa experienced a more profound effect on the frequency level of her detected forgets than on the celeration. This is consistent with findings in Calkin's (1992) analysis. Calkin noted that lower frequencies of troubling inners occurred following the introduction of positive one-minute counting periods with a jump-down in frequency rather than a deceleration. The lower frequency of detected forgets continued until approximately the final 5 weeks of the During condition where the total frequency bounce was no occurrences to 1 occurrence of detected forgets per day. During the 15th week of the study, there were 4 days when Melissa did not count detected forgets. This occurred because she went out of town and believed that the variety and type of activities she would engage presented numerous possible confounding variables likely to affect the accuracy of her counts.

When an experiment indicates that an event can be made to happen by manipulating another event, it is said that a functional relation exists between the two events (Cooper, Heron, & Heward, 1987). Following the removal of the independent variable at the onset of the After (Maintenance) condition, the frequency of detected forgets remained low. From a therapeutic point of view, this type of responding is desired. From an experimental standpoint, this is not desired because it limits the possibility of experimentally establishing a relationship between the counts of detected forgets and the self-statements. Melissa's counts displayed on the Standard Celeration Chart do, however, suggest the existence of a functional relationship between frequency of self-statements and detected forgets.

The acceleration of self-statements corresponded with a frequency change in the detected forgets. This pattern may indicate an increased concentration focusing on improving her behavior. It is possible that our results occurred because the self-statements focused Melissa's attention on remembering and becoming more aware of her forgets and how to prevent them. Melissa reported that she consciously forced herself not to forget as many items as she had during the previous day or days. Once she noticed that her behavior improved, Melissa said that the improvement encouraged her even more to continue trying to increase the daily self-statements and decrease her frequency of forgetting.
CHART # 2

SELF STATEMENTS
THINK / SAY  HEAR / TALLY

BEFORE
BEFORE
DURING
AFTER MAINTENANCE

SUPERVISOR  ADVISER  MANAGER  BEHAVIOR  LABEL  COUNTED
MELISSA L. JUDY  28  DEPOT  FORGETS

DEPOsitor  COLLEGE OF EDUCATION  MELISSA L. JUDY  TIMER  COUNTER  CHARTER
OHIO STATE UNIVERSITY  MELISSA L. JUDY  28  AGENCY  TIMER  COUNTER  CHARTER

COUNT PER WEEK
10,000
5,000
1,000
500
100
50
10
5
1
The limitations of this study preclude the demonstration of a suggested functional relationship between the one-minute counting periods and the detection of forgets. This study did, however, (a) emphasize the importance of an apparently effective instructional method, and (b) emphasize a demonstration of improving troublesome inner behavior. This self-experiment showed a change in frequency of detected forgets, the maintenance of improved inner behavior, and a replication of response patterns as reported by other experimenters (e.g., Calkin, 1992; Cooper, 1991). This analysis of replicated patterns follows the experimental procedures exemplified by Ferster and Skinner's (1957) experiments with schedules of reinforcement rather than the use of steady state logic in the search for functional relationships (Sidman, 1960).

An increase in frequency of daily self-statements occurred in the During condition. On the first day of the intervention, Melissa orally made 15 self-statements. On June 20, she made 74 self-statements. Melissa demonstrated a steady acceleration of self-statements. This is most likely because of practice that enabled her to quickly develop an extensive repertoire of self-statements and the opportunity to repeat previously verbalized statements.

Melissa experienced a deceleration of the number of "quickies" recorded in a 24-hour counting period immediately following the implementation of the encouraging self-statements. Again, this could be attributed to the increased attention Melissa placed on her performance, and the improved thoughtfulness and focus on her daily activities.

During the 31 days of the After condition, the frequencies of detected forgets spread from no occurrences to 1 occurrence. Three days of data collection contained outlying data points. We considered these frequency counts outliers because they were not consistent with the counts observed in the other 21 days in the after condition. Additional environmental factors may have contributed to the increased frequency recorded on those days. Without encouraging self-statements, Melissa achieved a steady state of responding that was consistent with the last 5 weeks of the During condition.

One limitation of the study involves the inability to establish accuracy concerning whether a detected forget was actually something forgotten. No other person can confirm the occurrence of a detected forget, nor can another individual verify the true value of the frequency of detected forgets within a counting period of 24 hours. This relates to the problem of experimenter bias, a concern of self-experimentation. If the results of the study indicate a potential self-fulfilling prophecy, no one can prove or refute that possibility.

A second limitation relates to time constraints and follow-up assessments of generality. Data collected at additional points after the study may improve the believability of the effects of self-statements on the frequency of detected forgets.
Some suggestions for further research include conducting more self-experiments measuring inner behaviors. Research involving a number of participants engaging in self-experimentation who possess a variety of backgrounds and living situations may provide understanding regarding behavior change techniques, especially with inner behaviors. The more information we learn about ourselves and our own behavior, the more we can apply this information to help others with their problem behaviors.

Self-experimentation is an underdeveloped area of research. To expand on this research, individuals can simultaneously measure remembered pinpoints and detection of forgets. This type of information may provide a better picture of the effectiveness of the intervention. Calkin's (1981) study that reported the effects of one-minute timings on both positive and negative thoughts illustrates this suggestion. She found that there was a negative correlation between the frequency of positive and negative thoughts and feelings. Simultaneously, as the frequency of negative thoughts decreased, the frequency of positive thoughts increased.

A second suggestion is to monitor the context (e.g., daily events, situations) to analyze the effects of a constantly changing context on frequency of inner behaviors. Days spent relaxing in front of the television may possess less potential for a large amount of items remembered or forgotten than, for instance, a day beginning at dawn that is filled with numerous errands and chores to do. Furthermore, analyzing the context may provide additional information about whether specific events or stimulus conditions are correlated with higher frequencies of forgets and remembers or negative and positive self-statements.

We suggest using distributed practice of encouraging self-statements as a third area for future research. Instead of performing the intervention for one-minute in the morning, perhaps the participant can say the self-statements during four 15-second or six 10-second counting periods distributed throughout the day. We believe it would be worth trying distributed counting periods with difficult to change inner behaviors.

Fourth, an experimenter may also attempt to alter or expand the categories of forgets. Melissa's categories included personal, interpersonal, and academic. Other participants could reduce Melissa's classifications into additional, smaller, or more specific categories. In addition, the data pertaining to the frequency of each category could be monitored and analyzed to determine which, if any, occur independently of each other.

Finally, it would be desirable for researchers and practitioners to realize the potential of self-statements as an intervention technique for changing inner behaviors. Ultimately in this study, we found that a successful change in the frequency of detected forgets accompanied daily accelerated encouraging self-statements. Calkin (1992) also witnessed success in her analysis of the 45 studies assessing the effects of interventions on inner behavior. She found that using one-minute positive self-thoughts (they were not oral statements) can improve behavior.
We proposed to determine the effects of encouraging self-statements on the frequency of detected forgets, and to improve Melissa's interaction with her environment. At the end of this study Melissa said, "My personal and academic life have benefited from this experience. I remember more items necessary to function efficiently in my day-to-day life, and I feel better about my behavior and myself. I believe other persons can apply the procedures I used in numerous situations and settings for improving both inner and outer behaviors."

REFERENCES


