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Skill acquisition and assimilation by means of different methods of corrective instruction

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SKILL ACQUISITION AND ASSIMILATION BY MEANS OF DIFFERENT METHODS OF CORRECTIVE INSTRUCTION

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ABSTRACT

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This thesis was designed to measure the efficiency of a variety of techniques in relation to extrinsic feedback. Accenting correct movements is thought to encourage learners to repeat these beneficial motions. Conversely, emphasizing errors is noted to dissuade learners from continuing poor habits.

The skill of free throw shooting in basketball was chosen as the skill to be acquired. Individuals utilizing accuracy enhancement techniques in conjunction with error corrective techniques improved three times as much as those only receiving feedback which only attempted to correct errors, nearly two times as much as those only receiving feedback which firmly entrenched positive motions, and eight times as much as the control group receiving no feedback to test improvement from repetition alone. It was concluded that individuals receiving both types of feedback received the most information and therefore were more efficient in acquiring the desired skill.

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Abstract

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Skill Acquisition and Assimilation by Means of Different Methods of Corrective Instruction

The process of learning is perhaps the most intriguing of all phenomena related to education. A great deal of inquiry, therefore, has been devoted to the problem of determining the nature of the learning process. In order to meet the instructional needs of learners at different stages in the learning process, it is essential that the instructor have a thorough understanding of how learning takes place.

Most authorities agree that the effective provision of information about performance represents a vital key in the management of learning. From the time of Pavlov, Thorndike's law of effect, and more recent reports on information theory, it is probable that no topic in the area of learning psychology has been of greater interest or more thoroughly investigated. Teachers who hope to be effective must become familiar with the concept of feedback and become skillful in providing information to learners about their progress.

Research on Feedback in Education

In an attempt to clarify the relative effectiveness of types of feedback in an education setting, McAllister, Stachowiak, Baer, and Conderman (1969) conducted a study employing a combination of reinforcement and punishment (i.e., a combination of positive and negative feedback) on two separate and distinct classes of behavior. They defined and recorded the frequency of four specific behaviors in two classes: inappropriate talking, inappropriate turning around, verbal reprimands by the teacher, and praise by the teacher. These actions were recorded as occurring or not occurring for each one minute interval in a class period. After a 27-day baseline

period, the teacher in one class began to administer verbal punishment for inappropriate talking (e.g., "John, be quiet"), and when periods of quiet occurred she socially reinforced the whole class (e.g., "Thank you for not talking"). The amount of inappropriate talking steadily declined from around 24% to 5%. On the 54th day the same contingencies were applied to turning around. The frequency of this behavior likewise fell rapidly from around 15% to 4%.

In a related study, Lowe (1973) applied either the use of praise (positive feedback) or blame (negative feedback) to obtain information on increased efficiency in an athletic task. One hundred and twenty five boys from an intermediate school were scored for five athletic events (broad jump, high jump, shot-put, triple jump, and 50-yard dash). It was concluded that praise improved the level of performance when compared with blame, and thus praise was the most consistent incentive for the improvement of performance.

The studies described above serve to illustrate that when verbal reinforcement is used as feedback, it is an effective method in shaping certain behaviors. Unlike previous studies, however, this study was not designed to examine verbal reinforcement, per se, but rather the roles different types of explicit corrective instruction might play in the skill learning process.

It is very difficult for an individual to learn a skill effectively without corrective feedback. With no indication of how a performance compares with a desirable standard, the learner lacks a point of reference. While it is true that with enough practice one can improve at skills such as throwing a bullseye in darts, bowling a strike, or hitting the ball straight in golf, it

remains that without proper instructive feedback poor habits will most likely develop. Conversely, repetition combined with proper instruction enhances performance and decreases the amount of time necessary for efficient skill acquisition.

In other words, without proper feedback individuals are essentially operating in the dark. This was, in fact, demonstrated first by Thorndike (1931) in his classic experiment to determine the effect of feedback on subsequent performances. In this experiment, students made 3,000 attempts to draw a four-inch line while blindfolded. During their practice, they were not told how closely their drawing approximated four inches. The 3,000 trials were organized into 12 sittings. Although performances varied, there was no general trend toward improvement. That is, the drawings in the later sittings were no better than those in the early sittings. In an attempt to replicate Thorndike's results, Kingsley (1957) conducted a similar experiment that also showed practice without feedback did not produce any improvement in performance.

In sports activities that require complex motor skills, the need for specificity of feedback appears to be very important. For example, George Brett, the American League batting champion in 1980, and teammate Hal McRae of the 1980 pennant winning Kansas City Royals praised batting coach Charlie Lau because of the clarity and precision of his feedback and instructions. In an article by sports writer Dick Young of the New York *Daily News* (October 30, 1980), McRae stated, "Most hitting instructors tell you to watch the ball and be aggressive, the way a doctor will tell you to take two aspirin and go to bed. Shoot, I heard that story when I was a kid. Old men talking across a checker board table talk like that. Use your hands

they tell you. They don't tell you when to use your hands." In the same article Brett stated, "Charlie said he saw three things in my hitting that he could change and make me improve....he moved me off the plate, closed up my stance, and told me to concentrate on hitting the ball from second base to the left field line." Both players went on to state that the thing that distinguished Lau from other coaches was the precision of his analysis.

These examples highlight the notion that technique is crucial in terms of acquiring consistent positive results in athletic skills. Athletes not properly instructed almost always develop habits that lead to inconsistent performance. Without instructional feedback of any sort, it is unlikely that proper learning will take place. A change in behavior can take place, but whether this change is in the desirable direction or not is almost accidental. One can develop greater consistency in response but there is no assurance that the consistent response will be more accurate than initial responses. Such consistency may be in drawing a four-inch line, doing a plie in classical ballet, or swinging a baseball bat. The result may be a consistently poor response.

After a skill has been well developed, it may be retained without external feedback. In fact, the skilled or experienced performer is usually more sensitive to the reception of internal feedback than is the novice. Such an individual can more skillfully interpret subtle cues that give evidence of success. At this point, the provision of feedback on a regular basis may no longer be necessary.

The reason feedback contributes to skill learning is that "feedback contains information that can adjust future conduct by past performance" (Wiener, 1967). Wiener states, "Feedback may be as simple as the common

reflex or it may be a higher order feedback in which past experience is used to regulate not only specific movements but also whole policies of behavior. Such a policy - feedback may, and often does, appear to be what we know under one aspect as a conditioned reflex and under another as learning" (Wiener, 1967, p. 47).

Sensory feedback theory implies that efficient learning is dependent upon the degree of self-regulatory control of sensory input placed by learners on a given situation (Smith & Sussman, 1970). Learning and integration of motion including performance factors are determined by the direct sensory feedback effects of space displaced motion and sensory input (Smith & Smith, 1970). A cybernetic system of behavior is governed by a multifaceted set of conditions that offer more than reward or punishment, it offers feedback. Feedback, in these terms, means not only telling the person that he or she is wrong, but also how they are wrong (Smith, 1966).

Every instructor, whether it be in education, the workplace, or athletic competition, corrects errors in learning and execution by either accentuating what has been performed correctly, or rectifying what was executed incorrectly. It is this aspect of reinforcement that this study wishes to examine; namely, the effects of different types of extrinsic feedback. Which, if any, method of corrective instruction allows for most efficient assimilation and highest retention? If one style of correction is shown to be more efficient than another, then it would be beneficial for coaches and instructors to train accordingly.

Having been intimately involved in athletics my whole life, I have long been interested in different methods of corrective instruction. For example, when instructing an individual in a specific task, does it confuse

that individual by telling him or her what not to do? Is the process of muscle memory most enhanced by concentrating only on pointing out what is done correctly? Or does it make the most sense to combine these two philosophies and instruct by accenting positive motions as well as using error corrective techniques?

In this study, free throw shooting, in the sport of basketball, was the means by which these forms of instruction were tested. Free throw shooting was selected for this purpose because it is a useful variable for isolating the different methods of corrective instruction, in that free throw shooting percentage can be augmented by refined form and repetition. Thus, if one method of instruction is more efficacious toward learning, this task should be suitable to measure this.

This study is designed to measure the efficiency of a variety of techniques in relation to extrinsic feedback. Accenting correct movements is thought to encourage learners to repeat these beneficial motions. Although the methods of corrective instruction are not by definition positive and negative reinforcement, the group that received instruction in the form of accuracy enhancement was labeled the "Positive" group. This group only received feedback that firmly entrenched positive movements. Another technique that was tested is that of an error corrective philosophy. This second group, which received feedback that did nothing other than to correct improper movements, was labeled the "Negative" group. A third group received feedback that firmly entrenched positive movements, as well as utilizing error corrective techniques. This group was labeled the "Both" group. Finally, the fourth group acted as an untreated control, and

thus received no feedback and therefore served to test improvement from repetition alone. The control group was labeled the "None" group.

Hypothesis 1. This hypothesis predicted that participants in the "Positive" group would demonstrate greater improvement than those in the "Negative" group. It was thought that accenting the positive would encourage subjects to repeat beneficial motions, and conversely, that only telling the participants what not to do does not give the learner as much information as affirming positive movements.

Hypothesis 2. It was predicted that participants in the "Both" group would exhibit greater improvement than either the "Positive" group or the "Negative" group. The "Both" condition was thought to provide the most information to the learner.

Hypothesis 3. Finally it was predicted that every treated group would show greater improvement than that of the control group because each treated group had received feedback and the control had not.

METHOD

Participants

The four methods of corrective instruction ("Positive," "Negative," "Both," and "None") were tested on 48 men and women. These individuals were selected from introductory and intermediate human performance courses in basketball at San Jose State University and Cañada College, athletes from the San Jose State and Cañada College basketball teams, as well as high school athletes from the summer basketball camps at Cañada College. Each participant was randomly assigned to one of the four methods of corrective instruction groups, with the exception that males and females were distributed equally across the four groups. As a result of this process, each corrective instruction group consisted of ten men and two women.

Stimuli and Procedure

Gymnasium facilities located at San Jose State University and Cañada College were utilized. A consent form was filled out prior to the experiment, with each participant receiving a signed copy. At the start of the experiment, each participant was allowed a 15-minute warm-up period, after which a baseline score of the number of made attempts out of ten free throws was established. Following the establishment of their baseline score, each participant received a brief instructional period lasting about 10 minutes. During this instructional period, proper free throw shooting technique was presented (The instructions given during this period that were presented to all participants are detailed in Appendix A).

Next, each participant received three sets of instructions that each were approximately 15 minutes in duration. These three sets of instructions

were all followed by a test of made free throws out of ten attempts. The independent variable was the method of corrective instruction. That is, each member of the four correctional feedback groups was instructed and tested individually, and the participants in each of the four groups received a different type of instructional feedback. Specifically, one group of participants was told only what they were doing correctly in terms of proper shooting technique, another group was told solely what they were not doing correctly, a third group was instructed as to what they were doing correctly and also what they were doing incorrectly, and finally, the fourth group acting as a control group received no instruction at all testing improvement from repetition alone. Example scripts for the instructional groups that received feedback are listed in Appendix B. In addition, during this feedback period, the participants in all four groups answered a brief self-regulatory questionnaire before shooting each set of ten free throws (See Appendix C for a copy of this questionnaire). The self-regulatory questionnaire contained several items, including the predicted score for the participants next test of ten free throws, a satisfaction rating on the previous test, as well as a perceived self-efficacy rating prior to each test. The entire process from start to finish for each participant required approximately 80 minutes.

Results

The mean number of baskets and the standard deviation for each test for each treatment group are listed in Table 1. To test the hypotheses of this study, the critical values that are listed in Table 1 are those for the Baseline Test (i.e., a Pretreatment Test) and for Test 3 (i.e., the final Posttreatment Test). Here it should be noted that there were no significant differences between groups for the baseline scores indicating that the four groups were comparable in free throw shooting prior to the treatment manipulations.

Table 1

Basket Means and Standard Deviations for Each Treatment Group for Each Test

	Test			
Group	Baseline	1	2	3
Positive	5.3 ± 1.4	3.8 ± 1.5	6.3 ± 2.2	6.3 ± 1.2
Negative	6.1 ± 1.2	6.7 ± 1.2	6.3 ± 1.7	6.7 ± 2.6
Both	6.0 ± 1.9	6.5 ± 2.1	6.9 ± 1.4	7.8 ± 1.4
None	6.8 ± 2.0	7.2 ± 1.8	6.8 ± 1.9	6.6 ± 1.7

*The Overall Mean and Standard Deviation = 6.4 ± 1.9.

By inspection of Table 1, it can be seen that by the third test all groups had improved with the exception of the group that received no instruction. Since the third test score was the critical score for testing the effectiveness of the methods of corrective instruction, change scores were derived by subtracting the baseline score from the third test score for each participant. The means and the standard deviations for these baseline - Test 3 change scores for each treatment condition are listed in Table 2. These change scores represent the improvement made from the baseline to the Test 3 score.

Table 2

Means and Standard Deviations for the Baseline-Test 3 Change Scores

Group	No.	M	SD
Positive	12	1.00	1.21
Negative	12	0.58	2.28
Both	12	1.75	1.29
None	12	-0.25	1.14
*Overall	48	0.77	1.67

As can be seen by inspecting Table 2, the "Both" group, i.e., the group that received both positive and negative instruction, improved their mean free throw shooting scores by almost twice as much as the "Positive" group, about three times greater than the "Negative" group, and were eight

times greater than the group receiving no instruction, at the time of the third free throw test.

Next, using the values summarized in Table 2, a one-way Analysis of Variance was computed and the results of this analysis are summarized in Table 3. This analysis revealed that for the baseline-Test 3 difference scores, the instructional conditions used in this study had a significant overall effect on free throw shooting proficiency.

Table 3

Summary of the Analysis of Variance Used to Test the Differences Between the Mean Changes Scores for the Four Treatment Groups

Source	df	SS	MS	F	P
Between Subjects	47	130.48			
C (COND)	3	25.06	8.35	3.49	.02
Subj w Groups	44	105.42	2.40		

To further examine the effectiveness of each method of instruction against the untreated control, post hoc analyses were conducted by computing separate t-tests. The results of these analyses are presented in Table 4. These post hoc analyses make it clear that both the "Positive" group and the "Both" group received types of instruction that produced significant levels of improvement over the group that received no instructional feedback.

Table 4

Post Hoc Analyses; t-test Results

t(22)	Positive	Negative	Both
Positive	-	-	-
Negative	0.55, N.S.	-	-
Both	1.39, N.S.	1.54, N.S.	-
None	2.45, $p < .05$	1.12, N.S.	4.00, $p < .01$

In addition to these analyses, an analysis of variance was computed to test differences in the self-efficacy questionnaire scores between the four groups and this analysis revealed no significant results (Appendix C). Finally, although gender effects were not statistically analyzed because of the small number of women in each group, inspection of data suggests that there were no systematic gender differences.

Discussion

The effects of positive and negative reinforcement on behavior have received a great deal of attention in psychology and sports research, and as has been noted, it has been demonstrated that positive reinforcement is a more effective means of shaping behavior than negative reinforcement (e.g., McAllister, Stachowiak, Baer, and Conderman, 1969.). Of importance to this study, Lowe (1973) extended the use of positive and negative reinforcement into the realm of athletic performance with his use of praise and blame. He demonstrated that praise improved the level of performance when compared with blame, and was a more consistent incentive for improvement of athletic performance. It is a logical conclusion then that similar results should be illustrated in skill learning when applying positive and negative methods of corrective instruction.

Because of these earlier findings the first hypothesis predicted that the "Positive" group would show greater improvement than the "Negative" group. Hypothesis 1 was only partially confirmed in that individuals receiving feedback which firmly entrenched positive movements showed nearly twice as much improvement as those instructed by means of error corrective techniques. However, the difference in improvement between these groups was not statistically significant.

Hypothesis 2, which predicted that participants in the "Both" group would improve more than those in either the "Positive" group or the "Negative" group, was also only partially confirmed. As is shown in Table 2 and Table 4, the "Both" group improved almost twice as much as the "Positive" group, and more than three times as much as the "Negative"

group. However, while both of these differences approached significance, neither attained statistically significant results.

Hypothesis 3 was also only partially confirmed as this hypothesis predicted that every treated group would exhibit greater improvement than that of the "None" control group which received no corrective feedback. While it is clearly demonstrated in Table 2 that all of the treated groups exceeded the improvement of the "None" control group, it is also true, as is shown in Table 4, that the difference in improvement between the "Negative" and "None" control group was not significant. These results are, for the most part, consistent with the findings of Thorndike (1931), who illustrated that without proper feedback individuals show no improvement in drawing a four-inch line. As hypothesized, it proved to be no different in athletic skill acquisition, for the untreated control was the only group to show no improvement by the final test score (Tables 1 and 2). Thus the clarity and precision of instructional feedback, as well as the amount of feedback provided proved important. This was especially evidenced by the superior change scores of the group receiving "Both" types of instructional feedback (See Table 2).

Professional athletes like George Brett testify to the importance of precision and clarity when receiving instructional feedback. Information rich in detail appears to allow better knowledge of proper technique that ultimately leads to more consistent performance. This was certainly the case with free throw shooting. In a very brief period of time (approximately one hour) participants who received comprehensive feedback displayed substantial improvement in their technique and form, as well as their results. That is, participants in the "Both" group went from a mean of 6.00

to a final test score of 7.75, an improvement of nearly 2 full shots out of ten attempts! It is logical to conclude even better improvement and results would occur with extended practice and increased instruction.

As hypothesized, participants receiving "Negative" instruction improved some, "Positive" instruction improved more than "Negative," and the participants receiving "Both" types of instruction were able to learn the most. It stands to reason that skill learning is enhanced by proper feedback, and the method of instructional feedback that is able to provide the most information to the learner proved to be the most effective teaching technique. It has been shown that providing feedback to the learner that teaches positive and negative instruction together provides more information to the learner than positive alone and negative alone, and this is most likely the cause for the highly significant improvement of the "Both" group.

Only teaching the learner what he or she did incorrectly appears to be the least effective teaching technique. This method in and of itself provides the least amount of information to the learner. Merely telling an individual what was wrong only eliminates one way of doing things. It does not provide the correct way, but only eliminates an error. "Negative" correction, therefore, in and of itself simply does not provide enough information. "Positive" correction alone explains what the correct movement is but does not give information to the learner as to what errors he or she is making. Only positive and negative combined provide enough feedback whereupon the learner may make the necessary corrections. Negative instruction is, however, a critical ingredient for effective instruction. The issues that remain, therefore, are which method should

precede the other, positive or negative, and to what ratio of positive to negative should be administered. For instance, it may be more effective to give positive instruction first and negative second, or perhaps it would be better to reverse this order providing negative first and then conclude each instructional point with the positive.

In conclusion, when teaching any skill that requires muscle memory, it is best to include both positive enhancement methods of instruction in conjunction with error corrective techniques. Informing the learner of correct form as well as errors allows the individual to improve quickly and efficiently. In about one hour, participants illustrated dramatic changes in both technique and results, and there is reason to believe similar results would occur in any form of skill acquisition.

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Appendix A

Free Throw Shooting: Natural Body Positions and Correct Technique

In this section, criteria is given for proper free throw shooting technique. Examples of scripts used for each method of constructive instruction in the study are recorded in Appendix B.

Finger Position - in most cases there is a natural space between the middle and index finger. The space between the middle and ring finger will be less. The fingers should not be spread to grip the ball because this will prevent proper rotation of the basketball.

Thumb Position - in most cases the thumb and index finger form approximately a 45 degree angle.

Shooting Hand - the shooting hand should be relaxed on the ball so that the valve air hole can be seen between the middle and index fingers. Placing the hand on the ball in this manner will properly locate the hand side to side. The elbow should be located directly in line with the shoulder and hip, while the index finger should be in the center of the ball. When the shot is thrown, the index and middle fingers should push with the pads to obtain a definite backward rotation.

Off Hand - the off hand helps to balance the ball in a natural shot alignment position. Before the ball is shot, the off hand should release from the ball as the middle and index fingers push down through the ball.

Palm on the Ball - when the shooting hand is placed on the ball in a natural relaxed manner, there is adequate space between the ball and the palm.

Elbow Position - before the shot the elbow should be under the ball in a natural position. As the shot is taken and the elbow rises above the shoulder, the back of the hand should be cocked at a 45 angle. The pads (tips) of the middle and index fingers face directly toward the mid-point of the rim (target). When the wrist starts forward the elbow moves laterally and, upon completion of the follow-through, is in direct line with the pads of the middle and index fingers and the target.

Arms - the ball should be held in a natural position. Arms should not be extended away from body, for this position will cause tenseness. The elbows should not be brought back so that the ball is against the chest, for in order for a player to shoot, he must move the ball forward and this movement is not necessary. As the shot is taken, the elbow elevates upward to promote proper arch.

Shoulders and Hips - they should face the target area. A slight variation between players can be expected, however the non-shooting shoulder should face the target area.

Eyes - the ball should be centered to the right eye for right-handed shooters and the left eye for left-handed shooters.

Knees - the shot should start with a flex of the knees and continue in one fluid motion. The shot starts in the leg muscles.

Foot Position - the shooting foot should be pointed toward the center point on the back of the rim. The feet should be set so that the player is balanced. If, by a push, a player can be easily moved sideways, then the feet are too close together. Conversely, feet too far apart cause strain and tenseness. Therefore the feet should be set about shoulder width for proper balance and maximum appropriation of strength.

Follow-Through - the concept of the follow-through is when the middle and index finger pads have pushed down through the ball. A player must deliver the ball in a definite repetitive pattern to obtain consistent delivery. The follow-through must be completed, but not necessarily held. The shooter should simply follow the arch of the ball as it is released, and should feel that he/she is reaching out as far as possible and is merely dropping the ball in the basket.

Range of Motion of the Follow-Through - when a player starts the forward movement of the hand, the finger pads are at 0 degrees. As the hand goes forward, the middle and index finger pads push down through the ball completing about 100 degrees of movement. Players should strive to have their follow-through be as close to 100 degrees as possible each time they shoot. The wrist should move in a downward motion only, and will turn out as the follow-through is being completed.

Wrist Movement - the wrist should move down and never turn sideways. The hand, on completion of the follow-through, will turn slightly outward. When the shot is delivered, the wrist energizes the release, moving before the forearm. By releasing the ball in this manner, the forearm will be forced up with the elbow inverted, with the middle and index fingers pointing downward.

Rotation - one of the most important concepts in delivering a basketball is to have consistent symmetrical backward spin. At this point it is crucial to develop a definite repeated pattern. Left or right side rotation is not desirable, nor is the so-called "knuckleball", a shot which contains no spin.

Finish - the individual should finish the shot leaning forward with his/her weight on the balls of the feet. The head should never finish behind the vertical plane of the hips during a free throw or any other shot. The head should always be in front of the hips to prevent falling away or drifting. Fading causes the shot to be completely contingent upon upper body motions and therefore wastes all preceding leg movement. Fading also causes the shot to be inconsistent, for one will never fade or drift the same way twice. Thus the arms must then compensate for varying amounts of drift.

Positive Routine - players are told to have a definite routine. I agree, with a minor exception: a player should do, within the time allotted, the pre-ritual shot routine until he/she feels comfortable. In other words, one should not get caught up in the ritual of bouncing the ball twice and then shooting, if, after the second bounce, he/she is not ready or comfortable. The pre-ritual movements prior to a shot should be flexible to the point; namely, shoot when ready. The most important thing a player must do prior to delivering the ball is to place the shooting hand correctly on the ball. The pre-ritual routine might relax the player but the hand placement, ball location, and middle index finger alignment determines the accuracy of the shot. Each shot has a different set of circumstances with varying degrees of pressure and distractions.

- Early or late in game
- Opponent harassment
- Fans in background

The shot will be addressed slightly different by individual players.

- Taking deep breaths to relax

- Bouncing the ball once, twice or three times

Five Basics - In Order

- Correct Techniques
- Preparation
- Comfortable at Line
- Concentration
- Confidence

Good free throw shooters have the ability to blend the first four disciplines and by doing so their confidence level is above the average player.

Appendix B

Examples of Scripts

Positive instructional scripts:

- "That shot went in because you kept your eyes on the target."
- "Excellent follow-through."
- "Good job of keeping your elbow in that time."
- "On that shot your knees were bent and your weight shifted perfectly."
- "This time after you finish dribbling make sure you pause just a second before you shoot."
- "Very nice rotation on that shot. Continue to concentrate on leaning forward when you shoot."

Negative instructional scripts:

- "You didn't follow through that time."
- "Don't fade away, that's why the shot was short."
- "You keep taking your eyes off of the target. On this shot don't take your eyes off of the rim."
- "Your knees weren't bent that time and your shoulders were not squared up to the target."
- "This time concentrate on not drifting."
- "Your elbow keeps going out. Don't let your elbow go out this time."

Both positive and negative instructional scripts:

- "Good balance on that shot, but don't watch the ball after you shoot it."
- "Your hand position is excellent, but you are not following through."
- "You are bending your knees too much, but the rotation of the ball is perfect."
- "Excellent follow-through, but make sure you concentrate on leaning forward and not falling away."
- "Good balance and wrist movement, but try this time to keep your shoulders and hips squared up to the basket."
- "Great job on keeping your elbow in, but don't spread your feet so far apart, it throws off your balance."

Appendix C

SELF-REGULATORY QUESTIONNAIRE

Prior to Baseline

1. For your first set of 10 free throws, state your confidence level (0% being completely unconfident and 100% being totally confident) for the following totals:

1____ 2____ 3____ 4____ 5____ 6____ 7____ 8____ 9____ 10____

2. You are going to shoot a set of ten. How many out of ten do you think you will make?

_____

Prior to 2nd set

1. For your next set of 10 free throws, state your confidence level (0% being completely unconfident and 100% being totally confident) for the following totals:

1____ 2____ 3____ 4____ 5____ 6____ 7____ 8____ 9____ 10____

2. On a scale of 0-100 (0 being very unsatisfied and 100 being ecstatic), how satisfied are you concerning your last set of free throws?

_____

3. You are going to shoot another set of ten. How many out of ten do you think you will make?

_____

Prior to 3rd set

1. For your next set of 10 free throws, state your confidence level (0% being completely unconfident and 100% being totally confident) for the following totals:

1____ 2____ 3____ 4____ 5____ 6____ 7____ 8____ 9____ 10____

2. On a scale of 0-100 (0 being very unsatisfied and 100 being ecstatic), how satisfied are you concerning your last set of free throws?

_____

3. You are going to shoot another set of ten. How many out of ten do you think you will make?

_____

Prior to 4th set

1. For your next set of 10 free throws, state your confidence level (0% being completely unconfident and 100% being totally confident) for the following totals:

1____ 2____ 3____ 4____ 5____ 6____ 7____ 8____ 9____ 10____

2. On a scale of 0-100 (0 being very unsatisfied and 100 being ecstatic), how satisfied are you concerning your last set of free throws?

_____

3. You are going to shoot another set of ten. How many out of ten do you think you will make?

_____

Prior to final set

1. For your next set of 10 free throws, state your confidence level (0% being completely unconfident and 100% being totally confident) for the following totals:

1_____ 2_____ 3_____ 4_____ 5_____ 6_____ 7_____ 8_____ 9_____ 10_____

2. On a scale of 0-100 (0 being very unsatisfied and 100 being ecstatic), how satisfied are you concerning your last set of free throws?

_____

3. You are going to shoot another set of ten. How many out of ten do you think you will make?

_____

4. How many hours did you practice during the last week?

_____hours