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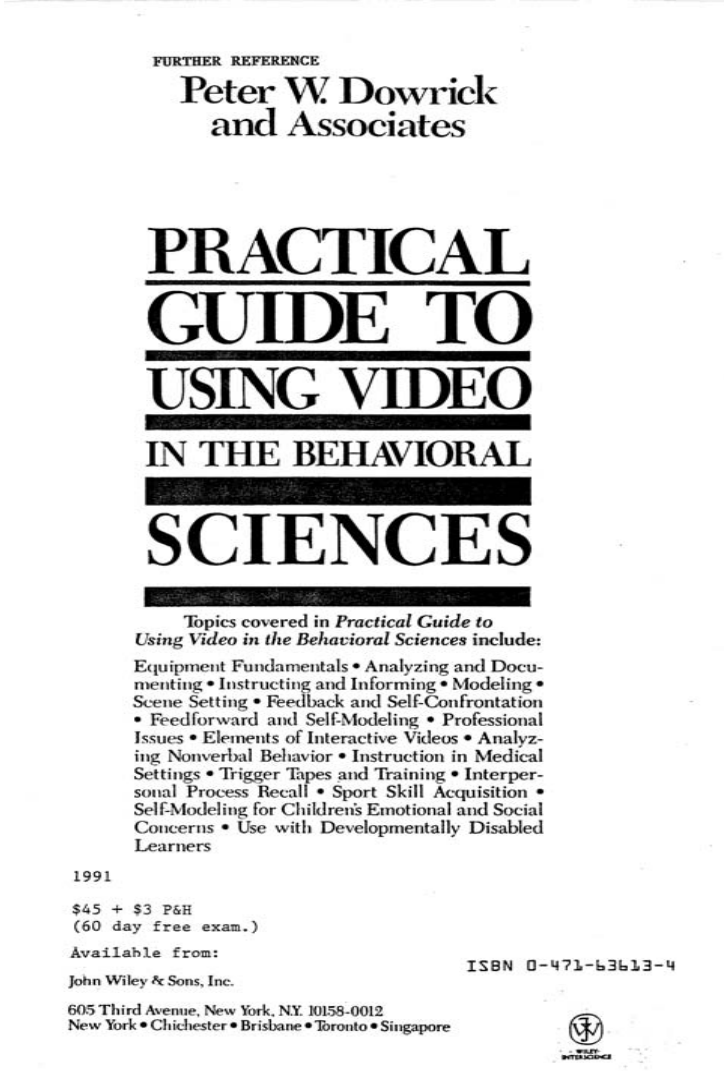

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CHAPTER 7

Feedforward and Self Modeling

OVERVIEW

Video replay can be deliberately structured through planning and editing in various ways. This chapter describes the application of self modeling, in which recordings show only adaptive behavior. The term feedforward *is coined to refer to video images of target skills not yet achieved, created by editing together component behaviors that are manageable for the trainee or client. Principles are presented for creating video feedforward and* positive self-review, *which refers to selectively compiling the best recorded examples of target skills already manageable but infrequently achieved. Applications of self modeling are reviewed and issues raised about mechanisms, limitations, and strengths are discussed. These issues include subject participation and awareness, efficacy compared with other interventions (including peer modeling and unedited replay), and when and when not to use different forms of self modeling. The methodology is summarized based on successful applications in different areas: disruptive behavior, selective mutism, depression, anxiety, sports, social skills, physical disabilities, and provider training. The chapter ends with a step-by-step description of developing and implementing a self modeling-based package for the training of social safety skills in young adults with developmental disabilities: assessment, task analysis, video capture, editing, viewing the tapes, and evaluation.*

P.W.D

As indicated in the previous Chapter 6, to be most productive, video replay is structured in different ways for deliberate effect. The most distinctive use for predictable behavior change purposes is undoubtedly *self modeling*. This use is conceptually, as well as procedurally, distinctive. Self modeling is operationally defined as "a procedure in which people see themselves on videotapes showing only adaptive behavior" (cf., Dowrick, 1983, p. 105; 1986, p. 201). Logically, the concept is not confined to videotape, but may refer to any system in which people can observe themselves as models for future action. For example, audiotapes, still photographs, and print have been used. (In the imaginal medium, self modeling becomes indistinguishable from mental rehearsal).

The term *self modeling* was first coined by Creer and Miklich (1970) in a brief description of an intervention for a boy, "Chuck," with severe social deficits. After

several other interventions had failed, these psychologists hit upon the idea of making a videotape in which the boy would be his own model. Chuck rehearsed several adaptive coping scenes and then played them for the camera until a satisfactory scene was captured. A multiple baseline evaluation showed that Chuck made remarkable gains from repetitively viewing his 5-minute tape and his progress did not appear to derive from the rehearsal or other miscellaneous aspects of the procedure.

A similar procedure dubbed "self-as-a-model" was developed independently around the same time by Ray Hosford (See Hosford, Moss, & Morrell, 1976; Hosford, 1980). Hosford's first application was with an adult who stuttered; an audiotape was made under conditions to minimize stuttering and then edited to remove dysfluencies. Again, repeated review of this adaptive recording produced positive results where other interventions had failed. Both these examples illustrate the use of supportive conditions to maximize a one-time performance by the subject. Hosford enhanced these effects by editing to remove errors and distractions. Both examples illustrate forms of maximized "positive self-review" (the best of possible current performance) discussed in detail later in this chapter.

In 1975 I began a series of studies to investigate different ways to produce self modeling tapes (see Dowrick, 1976; 1983; 1986). In the first of these studies (Dowrick & Raeburn, 1977) a 4 year old boy, "Paul," was taught to be less "hyperactive." Observations had indicated that Paul's hyperactivity could be reinterpreted as an inability to play by himself, so specific skills were targeted for acquisition. A video was constructed to illustrate these targets: solo play (family members were actually in support but out of the picture during recording) and extended time on task (e.g., sequences with Play-Doh® that lasted 10 seconds were repeated twice for an apparent 30 seconds on task). Systematic self-review of these tapes, as with other reported self modeling studies, showed clinically significant gains where other interventions had not. With hindsight, this procedure can be seen as conceptually distinct from the earlier approaches, although it comes under the general definition of "showing only adaptive behavior." In this case, the construction of the videotapes went beyond maximizing the best current performance. Potential future behavior was identified and deliberately constructed on videotape from components of the existing repertoire—a strategy for which the term *feedforward* is coined.

FEEDFORWARD

Feedforward is a term invented deliberately to contrast with *feedback*. Whereas feedback denotes information about current or recent performance, feedforward depicts the future. Most usefully, it refers to future adaptive behavior not previously evident. In general, it may refer to any kind of instruction, including peer modeling or self modeling. It seems most admirably suited to the audiovisual medium, partly because the medium provides such a complete description of the "instruction"—if a picture is worth a thousand words, how many for a moving picture with a sound track?

The procedure of video feedforward has related inherent advantages. The methodology builds a picture of future behavior based on existing skills. The process of using the subjects themselves determines that. For example, a 14-year-old gymnast can do a perfect takeoff, one-and-a-half flips in the air, and a perfect landing-but never in a single sequence. Perfect landings are achieved only after a single flip; one-and-a-half flips are accessible only on the trampoline, not from the boards. Filming the components from separate angles and editing together the sequence provides the perfect set of instructions for this gymnast because the presentation is visually complete and entirely in the subject's own terms.

Another inherent advantage is that procedural expediency usually ensures that instructional elements are of the optimal scope. To explain by way of analogy: If I give directions for someone to get to the airport, I am careful to do so in the "largest" terms useful to that person. If the person knows the major roads and intersections, I refer to those; if the person does not, I might begin with "go out the parking lot and turn right" and use such ploys as "ask the toll attendant for further directions." In all instances, I try to use elements already in the repertoire: If the person cannot tell left from right I help him or her call a cab. Nor do I say "stand up, put your left foot in front of your right ..." because although those skills are in the repertoire, it would be tedious and inefficient to break down the instructions to that level. In video self modeling, capturing the "largest elements" occurs naturally because anything else would create more work. Thus in a sense the optimal task analysis is automatically (or at least, readily) achieved.

Principles for Use with Video

A detailed example that incorporates feedforward is described at the end of this chapter, and a laundry list of principles is given in Figure 7.1. In general, video feedforward has been used when more typical approaches have failed, if dramatic changes are pressingly required, or if a "self-image" issue seems to be standing in the way of progress. First, perhaps even more than with other interventions, a clear analysis of *what* change should take place is necessary. The creation of a video image of the desired adaptive functioning is then achieved by a combination of strategies including maximizing the environment, providing support that is off-camera or can be edited out later, planning separate pieces that can be put into a different context by editing, and taking advantage of technology such as mirrors, voice-over, and slow motion.

Self modeling, particularly its feedforward element, has obvious implications related to self-efficacy. Bandura (1986, p. 403) described self modeling as providing both skills information and the basis for strengthened self-belief, the essential elements of self-efficacy. According to Bandura, self-efficacy is a major mediating influence in support of generalization and the maintenance of behavior change, particularly in the face of adversity. Whereas the data are not yet all in, the early signs are that an unexpectedly high level of generalization and maintenance results from some self modeling interventions. For example, mentally retarded young adults have been trained with self modeling to make safe decisions in interactions with strangers. Even though their training involved only six viewings of a 2-minute tape,

A: VIDEO FEEDFORWARD

Advocated in one or more of these circumstances:

Individualization of intervention called for.

Rapid or extensive personal change is necessary.

A major factor seen as a "self-image" problem.

Other approaches ("treatments of choice") have failed.

Task analysis:

Analyze in visual terms exactly the precise behavior desired.

Use video recording to establish the current capability (approximation to the goal).

Begin to consider how the components of missing capability can be achieved on videotape.

Establish an individualized list of the task's components with trainee/client participation.

Achieving the "future" image, potential strategies:

Maximized conditions for best performance (primarily environmental, but may include "psyching up," even psychotropic medications).

Support (physical or social) off-camera.

Checklist and/or storyboard-style planning for required elements.

Off-camera coach and camera operator collaboration to achieve these elements.

Components captured in alternative (but not clearly visible) settings.

Slow motion and/or still-frame emphasis.

Mirrors to transfer right-side capability to left side, and vice versa.

Editing to resequence events, and so on, for planned complex behavior image.

Voice-over dubbing to point out crucial and positive attributes.

B: POSITIVE SELF-REVIEW

Advocated in one or more of these circumstances:

Trainee's/client's skills are at a very low level.

Skills/confidence/motivation have fallen off previous level.

Video recording and review routines are already in place.

Trainees/clients are able to edit their own tapes.

Goal specification:

Identify currently desirable skills occurring at low frequency.

Rank order the importance or benefit of the goals.

Maximizing the video image, potential strategies:

Maximize conditions for best performance.

Moderate amount of practice by trainee/client before recording.

Record from subject's viewpoint and selected other viewpoints.

Avoid recording unwanted material.

Edit to select and repeat adaptive sequences.

Dub self-instructions, affirmations.

Figure 7.1 Guidelines in the development of self modeling applications.

and there were no opportunities to practice, adaptive use of the training was reported months or even years later in circumstances tangentially related to the original training scenarios (see Dowrick, 1986, pp. 116-121). For a more detailed discussion of generalization possibilities, see Chapter 17.

POSITIVE SELF-REVIEW

Procedurally simpler than feedforward is what may be termed *positive self-review* (or PSR; cf., "positive self-monitoring," a term used in sport psychology, Kirschenbaum, 1984). PSR refers to the selective review of superior performances drawn from the current repertoire. Conceptually, the difference between PSR and feedforward lies in the definition of the behavior that is targeted for change. For example, if the gym instructor has determined that the takeoff jump needs to be perfected, he or she may follow the trainee with the camera all day to capture a few exemplary jumps. Repetitive review of these exemplars will in all likelihood increase the frequency and consistency of their occurrence (and subsequently increase the opportunity for the gymnast to concentrate on the rest of the floor exercise). The use of PSR is increasingly but anecdotally reported in gymnastics and other sports such as tennis and skiing (see Chapter 15 for more formal studies). By contrast, feedforward as described above targets behaviors that have *not* occurred before. (Sometimes it is the *combination* of components that is important and therefore the identified target of change).

Principles for Development and Use.

Figure 7.1 contains a list of considerations, and procedural details of applications are described at the end of this chapter and in Chapters 15 and 16. PSR is useful for beginning skill acquisition or when there has been a drop-off in performance. It might also be cost-beneficial in settings where video recordings are routinely made for other purposes (e.g., counselor training) or where trainees are taught to edit their own tapes. Unlike feedforward, the identified targets for performance enhancement do not require component analysis. The effort in producing PSR tapes will be reduced primarily by optimizing the conditions of performance. (The presence of a camera is itself often a major contributor).

As previously stated, PSR should be applied to adaptive but infrequently occurring behavior. Of course, if a target were not infrequent, why would we want to increase it? We might, however, inadvertently expose behavior that already occurs frequently to repetitive self-review—and herein lies a trap. Paying additional attention to a well-established skill is most likely to lead to its deterioration (Johnston-O'Connor & Kirschenbaum, 1986). In general, this effect may be seen either as an interruption by conscious attention to automated activity (the racing driver thinking about timing the clutch with the stick shift), or it may be carelessness induced by inattention to areas of vulnerability (the tennis player standing flatfooted, overconfident of a strong forehand).

This difference has led to a distinction in treatment between "beginners" and "experts," that may be oversimplified. With beginners almost any skill is likely to be low in naturally occurring frequency, so there are good prospects for simply recording much footage and editing out the errors. This is exactly what we found in a study of pool players (Gonzales & Dowrick, 1982). In our study, the better players tended to get worse rather than better, and with hindsight it is easy to see why: By selecting *all* successes, most would have typified "easy" shots—that is, the shots that were frequently successful. It would be a mistake to suppose that PSR does not work with experts; however, it is more difficult to apply. Although it has not been put it to empirical test, the implication is that we need to identify the more difficult shots for the better pool player and edit together those shots only. The more skillful a person is, the more his or her training must be individualized.

Positive self-review does not appear to have the same potential for generalization as feedforward, but it does have implications for maintenance. The possible impact on learning and memory of repetitively seeing oneself being successful in difficult circumstances is tantalizing but unexplored. The potential for maintaining skills that are infrequently used (or have deteriorated for other reasons) is more transparent and is supported by at least some evidence. In personal safety training for people with disabilities, early findings showed quite unanticipated effects over time (see Dowrick, 1986, pp. 116-121). It turned out, fortuitously, that trainees from the program had kept their self modeling tapes and would watch them every couple of months, "to remind themselves how to talk to strangers," as it were. The fact that these tapes were originally of a feedforward nature is probably irrelevant. After the feedforward training, the skills were acquired, so the subsequent use of the tapes was more like positive self-review. Reacting to strangers who tried to pick them up at bus stops, and so on occurred with fortunate irregularity, so later reviewing of the tapes possibly acted as booster training to a skill that otherwise could be expected to fade with disuse.

This possibility was put to practical advantage in a military hospital setting by one of my students. This student supervised technicians who repaired medical equipment, sometimes under urgent conditions in the middle of the night. She observed inevitable delays while technicians familiarized themselves with procedures related to equipment they had been trained to repair some time previously but which infrequently broke down. Therefore, she made videotapes at the peak of training. When technicians were called at 2 A.M. for emergency repairs, they took a few minutes to review the tape and went straight to work. (The military personnel were apparently grateful enough for this procedure that they calculated the cost savings and paid her 10% as a bonus). Other procedures in the literature, using video PSR to support maintenance of learning, are described in Chapter 8.

APPLICATIONS

Self modeling has demonstrated behavior change with a variety of populations and applications. In a previous review (Dowrick, 1983) and more recently, self modeling

treatments have been documented for *personal and social adjustment* in the following areas: depression, eating disorders, hyperactivity, tantrums, cross-gender behavior, sexual dysfunction, dressing, eating, bed making, class disruption, anxiety, phobias, and aggression. They also have been documented in *communication*: public speaking, stuttering, selective mutism, sign language, assertiveness, social skills, interviewing, and job seeking. Self modeling has also been used to teach physical and vocational skills such as walking, swimming, basketball, billiards, running, gymnastics, figure skating, kayaking, weight lifting, juggling, walking with prosthetic devices, physical therapy, reading, writing, arithmetic, and increased job productivity.

These applications have been systematically evaluated with populations that include professional and amateur athletes (Maile, 1985; also Chapter 15), depressed adults (Dowrick & Jesdale, 1990), offenders and ex-offenders (Hosford, Moss, & Morrell, 1976; Batts, 1978), counselors and teachers (Hosford & Johnson, 1983; Hosford & Polly, 1976), college students (Germaine, 1983; Holman, 1990), abusive parents (Barmann, 1982), adults with developmental disabilities (Dowrick & Hood, 1981; also Chapter 17), children with physical disabilities (Dowrick & Dove, 1980; Pigott & Gonzales, 1987; Scraba, 1989; Greelis & Kazaoka, 1979), disturbed children (Dowrick, 1978; Gonzales, 1988; also Chapter 16), depressed children (Kahn, Kehle, Jenson, & Clark, 1990), school children with conduct disorders (Kehle, Clark, Jenson, & Wampold, 1986; Murray, 1982), and children struggling with fractions (Schunk, 1987). No specific population seems to be unable to profit from self modeling, although certain populations may experience higher gains.

Neither does the scope of application seem limited by age. Published studies report the use of self modeling from pre-school to adulthood; I have used it clinically with children under 3 years old (eating disorders) and with a great-grandmother in her 70s (child management training). Nor does cognitive functioning seem any more important here than in other forms of modeling or instruction. In Chapter 17, work is described with severely impaired individuals, and, with colleagues at Johns Hopkins, I have used self modeling with a highly gifted child with social deficits.

The published studies just listed, among others, are empirical demonstrations. That is, some are descriptions of case studies where other approaches had failed, and some are reports using individual and multiple-subject designs. A few are group or individual designs in which self modeling is shown to be superior to other interventions or placebos. It is instructive to consider some of these studies and related findings that raise issues about the mechanisms, limitations and possible strengths of the procedure.

Awareness

At conferences and other settings where self modeling was discussed during its early days, there was much curiosity about the subjects' awareness of the methodology and how that might affect their performance. Were they being tricked into thinking something that was not true? Did they simply need an external perspective on what it

was they were supposed to be doing? My own early work was almost exclusively with young children experiencing disabilities that limited debriefings and discussions about the procedure, so I was pleased to discover Ray Hosford's successes with adults who were sophisticated enough to understand exactly what was going on.

One consideration has been that self modeling taught discrimination of "appropriate" behavior and provided additional opportunities for reinforcement. For example, in a procedure they referred to as "self modeling" (although it differs from other definitions), Olson and Rardin (1977) showed slides to hyperactive children of themselves on-task or off-task (out-of-seat, etc.) to teach discrimination. In conceptually related procedures with videotapes, Schwarz and Hawkins (1970) replayed recordings from the classroom to apply consequences (praise, rebukes) to a child watching himself on tape (they referred to "delayed reinforcement"—see also a similar study with adolescents by Mayhew & Anderson, 1980). The discrimination notion has much in common with the current concept of self modeling as an instructional procedure. The possibility that contingent consequences might be necessary in self modeling has been contradicted by many studies (e.g., Dowrick, 1978b, Dowrick & Raeburn, 1977; Dowrick & Dove, 1980) in which any commentary while watching the tapes was deliberately avoided. Providing consequences in the context of a recorded event (Van Houten & Rolider, 1988) may be a helpful procedure in its own right, and it may be usefully incorporated into situations in which an individual needs to be taught how to model from oneself (see examples in Chapter 17), but it is not a *necessary* component of self modeling.

Another aspect of awareness was investigated by Miklich, Chida, and Danker-Brown (1977). They applied self modeling to institutional compliance with bed making in an asthma hospital, such that the children thought the videotaping was to help a university student with a media project. That is, Miklich and colleagues showed that self modeling did more than just focus attention on the target of treatment as in a placebo effect by demonstrating the procedure to be effective without subject awareness.

At the other end of the scale, self modeling has been confused with "false feedback"—that is, are we tricking people into thinking they did better than they really did? This apprehension is the result of thinking that all video replay is somehow "feedback." There is no doubt that the procedure can sometimes result in deception, but ethics aside, the scientific question is whether the deception is a necessary contribution to the efficacy. The answer is definitely no; indeed, it seems certain that false feedback is an inferior technique. A student of mine did a thesis study in which pool players saw themselves on videotapes that showed successful outcome shots only (Gonzales, 1982). One group saw exclusively their own successful shots, as performed (PSR); another group saw bad shots that were faked to appear successful. Both groups did equally well. Subjects in the second group were under the impression they were reviewing real performances—one person, following what seemed to be an obvious fake, actually remarked, "Yeah, I remember that one." But the gains were modest, and only the beginners (in both groups) did significantly better than a no-treatment control group. (See earlier remarks on the dangers of PSR with well-established skills.)

By contrast, deliberate involvement of the trainee in creating the "future image" has proved considerably advantageous. Ray Hosford once told me how one of his cases of assertiveness-anger management training was at an impasse until he involved his client in selecting some of the crucial sequences to be edited. The possibility that trainee participation may enhance the procedure's effectiveness has impressive implications both procedurally and theoretically. Another student's thesis study concerned the use of self modeling to train national-class power student's thesis study concerned the use of self modeling to train national-class power lifters (Maile, 1985). Using a multiple baseline across lifts, the gains were so great during self modeling that no gains were registered for weeks afterwards, even though other training continued. Of most interest was that the trainees helped to select the weights that they would appear to be lifting—just as they participated in other aspects of planning their training schedules and goals.

In clinical applications (e.g., rehabilitation) and with students in video training courses, I consistently stress the value, *not* the disadvantage, of client participation. The procedure is best presented as a straightforward depiction of potential future behavior, not a bogus past. If the emphasis is on positive self-review, then the message is, "Here are good examples of what you should do more often." If using feedforward, the message is "Here is your goal; this is what you will look like when you've mastered this difficult situation."

Relative Efficacy

A few studies have compared self modeling with other interventions. In many of the reported case studies, self modeling was found successful after other approaches had failed. It is difficult to *equate* interventions for direct, fair comparison, but some have tried.

An obvious target for comparison is peer modeling. The circumstances of an early study with selectively mute children (Dowrick & Hood, 1978) were fortuitous in this respect. For two children who would not speak at school but would speak in their homes, a self modeling program was designed after an unsuccessful attempt to set up contingency management interventions. Both children had constant exposure to classmates who spoke freely but did not serve as effective models. After self-model tapes for each child had been constructed, both children watched one tape only, a number of times. The other child’s self-model tape was then used, and the procedure was repeated for two more phases. At each session, one child saw a self-model while the other observed a peer model. The overall effects, compared with other attempts at intervention, were rapid and educationally significant. Systematic observations revealed that changes accrued during self modeling only. The procedures to create the self modeling tapes, recently replicated by Kehle, Owen, and Cressy (1990), are summarized in the “Methodology” section of this chapter.

Other studies have found self modeling at least as effective (teacher training, Hosford & Polly, 1976; attention-deficit disorders, Murray, 1982), or somewhat more effective, in comparison with peer modeling (disruptive classroom behavior, McCurdy & Shapiro, 1988). Thus, in some circumstances, peer modeling may be as effective and more economical (cf. Petroski, Craighead, & Horan, 1983); but when

individualization is necessary, self modeling may be more accessible (Creer & Miklich, 1970), or the self-element may have special significance (as in selective mutism), making self modeling the intervention of choice.

Another target for comparison is contingency management because of its established efficacy in skill training. The only reported study that directly addressing this issue concerned productivity in a sheltered workshop (Dowrick & Hood, 1981). Fifteen subjects were randomly assigned (within their level of disability) to one of three groups: self modeling, cash incentives, and attention control. We attempted to make intervention time equal across the groups. In the case of cash incentives, a daily points system with weekly backup was provided at a level of elaborateness that required the same supervisory staff effort as the self modeling. Improvements in productivity following brief intervention showed the active treatments to be statistically superior ($p < .05$), the self modeling group producing the greatest changes. These were maintained at a 4-month follow-up.

Another obvious comparison is with unedited video replay. An early study with a child diagnosed "hyperactive" (Dowrick & Raeburn, 1977) produced results similar to those reported for the selectively mute children: positive gains during self modeling, and no progress with unedited videotapes. In another intervention with attention-deficit children (Kehle, Clark, Jenson, & Wampold, 1986), the unedited replay condition led to an increase in disruptiveness. These and similar findings from other studies in which these comparisons can be made (e.g., Boggs, 1989; Dowrick & Dove, 1980; Johnson, in press) are most readily explained by the self modeling paradigm: Video is a medium for instructional potential such that whatever is shown increases the probability of that behavior occurring in the future. These probabilities can be outweighted by other influences such as self-correction or support, described in Chapter 6; otherwise, there is every reason to believe that the positive and negative influences of video self-review will be directly proportional to the adaptive and counteradaptive behavior evident in the recording.

The question, "Is self modeling better than intervention X?" is too broad to be useful. We need to ask, "*When* is self modeling likely to be more effective, more cost-beneficial, or easier to implement?"

Limits

Much can be learned about the mechanisms and characteristics of a procedure by scrutinizing its limitations, most of which are not in the published literature. As just noted, when self modeling is limited to positive self-review, the procedure is effective only when the videotaped exemplars occur infrequently in the current repertoire. When the approach has been simply to edit out all the mistakes without reference to the individual's ability, only "beginners" are likely to benefit. Thus, an individualized approach to PSR and feedforward is often warranted.

Because of the individualization, self modeling as a group treatment has not been attempted. Application to a genuinely collaborative process (e.g., problem solving, team sports) seems logical. But to apply the procedure to a setting of several relatively independent individuals (e.g., classroom) simply for economy's sake, the

prospect is a little daunting—like trying to get a family photograph in which not one person is scratching or looking the wrong way. There are other ways to make the procedure more economical. Since effective tapes are usually only 2 or 3 minutes long, the time spend on the "active ingredient" (subject watching video) is incredibly brief. Making the tapes longer does not usually make them more effective, so setting up can take more time than viewings. One approach has been to show several tapes at one sitting, as we did with a number of co-workers from the same workshop (Dowrick & Hood, 1981). Presumably watching their workmates' tapes did not do any harm. If watching someone else's tape might do some good, there is the powerful possibility of combining self- and peer modeling by carefully choosing one member of a setting with whom to make the video recordings. Another approach is to arrange for trainees to watch their tapes at home, an increasingly available option, provided it is monitored and prompted.

As with any technique, there will be those individuals for whom it is developmentally inappropriate. For people with mental retardation self modeling has enjoyed considerable success—perhaps because it is visual rather than language -based, because the "self" element makes it engaging, or because of the inherent individualization. But the question has frequently been asked, "What are the lower limits of cognitive functioning for which self modeling is effective?" Such a question cannot be answered in terms of a developmental age or an IQ score. It is better to ask, "*How* can we teach individuals to learn from observing themselves if they are not already able to do so?"

The following case illustrates one approach. At the Johns Hopkins Medical Institutes I endeavored to help teach a boy of 30 months (developmentally much younger) to feed himself using self modeling. He had just learned after intensive therapy, to take food orally, having since birth depended on a tube inserted directly into his stomach for all his nutritional requirements. He expressed obvious delight at seeing a videotape (for feedforward, fittingly enough) that showed him feeding himself with a spoon, constructed from components of the task, some in slow motion. However, he made no attempts whatsoever to use a spoon except to wave it in the air and wait to be fed. I then made more recordings with his therapist and re-edited the tape to break the action into segments. Between each segment, the therapist commented on what had just happened and prompted what was about to happen: for example, "Good, good holding the spoon; now put the spoon in the food." This tape then proved a clinical success. Apparently, in this boy's case, his attention needed to be drawn to specific activity on the recording. In Chapter 17, Pat Krantz and colleagues describe other approaches to extending the usefulness of video applications to clientele experiencing severe disabilities.

SUMMARY OF METHODOLOGY

Few attempts have been made to standardize the methodology of self modeling. Until recently, much work has been exploratory with inventive methods to create videotapes to meet the self-model definition. In his dissertation research, Gonzales

(1988) used a uniform approach, applied to the same four behaviors (bed making, eating, saying "thank you," and peer interactions), with four different children in an inpatient treatment unit for emotional disturbances. The interventions were applied to each child in a different order and carefully monitored; the results showed clear evidence of efficacy. Whereas the main purpose of the study was to add to the empirical foundation of self modeling, it also served to clarify the methodology by setting out parameters and procedural steps in making the tapes for each behavior. Tapes were a predetermined length, reviewed at specified intervals. The content was produced by supporting the natural occurrence of desired behavior, followed by editing and repeating target sequences, for enhanced positive self-review effect.

In my own dissertation research (Dowrick, 1976), self modeling was used with 18 children who had physical disabilities, and was applied to different behaviors according to clinical priorities. The study sought to explore different methodologies within the parameters that the tapes would be 2 minutes long and would illustrate only those behaviors that the collaborating physical and occupational therapists indicated were developmentally appropriate for acquisition. Thus, tapes were created by editing together preplanned components, primarily for a feedforward effect.

There have been many other explorations of methods to create the effect of future images and variations in the conditions of review. Some elements of a consensus have emerged:

- Careful preplanning of tape content.
- Subject participation where possible.
- "Capture" recordings using one or more strategies discussed next.
- An edited 2– to 5-minute tape.
- Self-review about six times spaced over 2 weeks.
- Repeated process for further improvement.
- Review after 3 months or as necessary for maintenance.

Procedural Strategies

Following are synopses of applications for which methodological strategies are evident. These strategies are tentative, emerging as they do from a limited number of studies in each case. Meanwhile the list serves to document a variety of successful approaches. More detailed methodology in a specific application is described at the end of this chapter; others in Chapters 15 through 17.

Disruptive Behavior

More studies have been reported in self modeling interventions with hyperactivity, attention deficits, and so on than in any other area (review by Woltersdorf, 1989; other examples cited in this chapter and described in Chapter 16). The main approach has been to "catch 'em being good" in the classroom and edit for positive

self-review. Some labor can be saved by providing incentives during filming. (In a suitable context, the presence of the camera can be an asset). Quickly stopping the recording of unsuitable material helps to extinguish acting out and also reduces the amount of editing required.

Selective Mutism

Sometimes a child who speaks freely at home will not talk at school (the mutism is setting-specific). A self-model film can be made by recording the child in the home but with school display boards in the background and an interviewer out of sight. Using a transcript of this recording, and with the child dressed in the same clothes as on the film, an attempt is made to recreate the recording in the classroom with the teacher as interviewer in sight. (It is expected that the child will remain mute during the second recording.) These two tapes are then edited together; collated, as it were—readily done if two video players can be fed into one editing recorder.

In other cases, a child may be disinhibited to talk when a significant person, usually a parent, is present (the mutism is person-, not setting-, specific). Here the recording can be done in the school setting, and it may be enough that the parent is simply present but out of view of the camera. In this case, the only editing necessary will be to maximize (e.g., by variety of demands or responses) the selection of sequences to produce a 3-minute tape. If the child will talk only to the parent, another recording with the teacher, using the "collator" editing strategy, will be necessary.

Depression

Most depressed people can be helped to identify a situation pleasant or exciting enough that, during its recounting, they become more animated than usually. Video recordings can then be edited for self modeling using criteria to maximize the display of non-depressed behavior. Clients can help to identify how they would like to see themselves, including dress and deportment (see Chapter 16 for more details). Social deficits can also contribute to depression, in which a different approach is used—see "*Social Skills Training*" in this chapter.

Anxiety Disorders

A person can be seen, on video, to cope with a normally threatening situation by using the *hidden support* technique—that is, physical or emotional support is planned so that it is not evident in the recording or can easily be edited out afterwards. (Psychotropic medication has been used on rare occasions; Dowrick, 1979.) The only phobias reported to be treated by self modeling have been those of medical or dental treatments. In such cases, a brief hierarchy (up to five items) has been useful. Subject participation may again have particular value, because anxiety and coping reactions are so individual.

Sport

Good results for some sports and other physical activities have been obtained using the *displaced-outcome* strategy. That is, an outcome or other difficult component is

recorded from a relatively easy situation (e.g., below-maximum-weight squat, without showing actual weights; flip and twist from a trampoline, without showing the trampoline). The action from a situation slightly beyond current capacity that leads up to the desired outcome is also recorded (e.g., loading weights and getting into position; floor exercises run-up). These components are then edited together in the correct order. A reminder of the value of selecting and planning the exact target behaviors is provided by Scraba (1989) in her study of self modeling to teach swimming to physically handicapped children. Her outcome measures included stroke quality and speed, the first of which improved greatly. It is clear from an examination of her procedures that the self modeling tapes carefully illustrated the desired elements of quality, but showed nothing to reflect elapsed time. Presumably speed, in this case, will be affected in the long term as a product of practice with improved strokes.

Positive self-review (as previously described for "disruptive behavior") can also be used for beginners, or for advanced players and athletes if edited to include only infrequent successes that occur during competition. Note that positive effects can often be enhanced technologically—for example, by using slow motion, close ups, certain camera angles, or the distance distortion of a zoom lens.

Social skills training

Self modeling tapes frequently have been created using the strategies of "hidden support" for anxiety-related performance deficits, or "displaced outcome" for anger management. When the key *situations* that need social resolution have been identified, the choice or combination of strategies usually follows. For example, a teenager has a reflexive outburst when criticized, no matter how warranted or gentle the criticism. But if someone else gets angry, he or she can at least be coached to say quite reasonably, "Let's cool it—I'd like to talk about this later," and calmly leave the situation. This reaction (by the teenager's choice) is recorded and then edited in place of his or her uncontrolled anger in response to criticism. Feedforward effects can often be created in this way when social competence is greatly dependent on the person to be interacted with (e.g., an older sister vs. a friend). When prompted role play of components of effective social interaction is possible, edited video may take the place of the behavioral rehearsal and practice across differing situations normally expected. Further details about the application to personal safety as a social skill are described in the "Methodology by Example" section of this chapter.

Physical Handicaps

Again, self modeling tapes may be created with a combination of the hidden support and displaced-outcome techniques (see demonstrations on film, Dowrick, 1978a). Determining the key *components* of the skill to be acquired is usually the prerequisite task. For someone learning to walk with prosthetic devices or to button clothes despite cerebral palsy, a feedforward picture of the complete action may be put together from several isolated components. Physical support is commonly used (e.g., electrical stimulation from an unseen source), and optical tricks are useful—for example, filming the mirror image of the left foot movement to show what the right

foot should look like or copying a recording played in reverse to show an upward movement when only a downward movement can be executed. Again it should be stressed that superior results are achieved when clients are aware that these are *targets* of therapy—future images not representative of current performance—and are aware of how these images are achieved. A 30-year-old woman, with whom I used a mirror image (she had a life long spinal injury affecting torsiflexion at one ankle), then started using a mirror at home at her own initiative for other asymmetrical difficulties.

Direct Service Providers

Training for teachers and counselors using self modeling has mostly relied on PSR tapes edited from supervision videotapes. This approach is most useful with beginning trainees, although it is time-consuming to search through tape recordings that are generated in this way. These edited tapes might then be effective for peer-modeling, and thus pay a return for the effort.

An alternative suited to advanced trainees, is self-directed PSR. This strategy would be applied to generally accomplished providers extending to new skills, for example, a classroom teacher learning incidental teaching for a setting with autistic children. The teacher would video record himself (or herself) attempting the new task, edit (simply copy) together the best examples from a task analysis checklist, and review the edited tape every day for a week. Suppose there are 20 items on the checklist, and the first week the teacher demonstrates 8 items effectively. This process continues until it appears that the teacher has demonstrated mastery, at which point the tape is checked by a supervisor. This approach has a number of potential advantages; the most obvious is to minimize supervision time.

METHODOLOGY BY EXAMPLE

Some methodology will be described in detail through a specific application. Further details of the procedural review and model program development in self modeling can be found in the thesis completed by Perry (1989). The work is part of a long-term project for training the social safety skills of young adults with developmental disabilities. contributions have been made from a number of student assistants and providers at service agencies (Hope Cottages and Association for Retarded Citizens of Anchorage; Dowrick, 1986; Dowrick, McManus, Germaine, & Flarity-White, 1985; Perry, Dennis, Bolivar, & Dowrick, 1988).

Programs designed for people with developmental disabilities need to be flexible in order to address distinctive behaviors and unique environmental problems in the integration of the individual into the community. One of the primary limitations for such integration is a lack of social safety skills (Stuart & Stuart, 1981). This population is especially vulnerable to exploitation because it lacks basic safety knowledge, judgment, and skills that provide protection. In a review of programs to teach social skills to developmentally disabled adults, Davies and Rogers (1985) showed the importance of visual instruction, repeated practice, individual situations, and social reinforcement—elements readily provided by self modeling.

There are six major steps in the general self modeling process: assessment, task analysis, video capture, editing, viewing the tapes, and evaluation. From a review of the self modeling literature, discussions with other practitioners, and our own experience, we developed an initial methodology for our program, which we called the "best guess" framework. We then applied our best guess with intensive evaluation at each step, refined it, reapplied it, and so on, until our evaluations confirmed that no further refinements were necessary—that the program was the "best possible" under the system we had.

Assessment

The program's efficacy rests on effective assessment. Assessment includes operational definitions, a behavioral task analysis of the components of the desired behavior, observations of the behavior in question, and an individual assessment of skills to determine the selection of target behaviors.

The task at hand was limited to training the clientele to stay safe with strangers in a public place. The use of operational definitions served to clarify function and outcome. Safe behavior was defined as avoiding inappropriate overtures (e.g., request for a phone number, offer of a ride) while maintaining sociability in normal conversation. Role play baselines to elicit behaviors that could be evaluated for vulnerabilities were videotaped. Responses to six types of situations—charm, trick, harassment, verbal threat, physical force, and small talk (nonthreat)—served as a baseline for comparison with post-training role plays, at the same time providing information about specific skill deficits. Following is the script for a trick situation.

S: Hi! My name is _____. I'm a friend of your mom's (*or other person*)
C: (*Response*)
S: She sent me here to pick you up. My car is right over there. (*Gesture*)
C: (*Response*; *if negative, continue*)
S: Oh, it'll be okay. I'm an old friend of the family. You can trust me.
C: (*Response*; *if negative, continue*)
S: Are you sure you don't want a ride home?
C: (*Response*)

Task Analysis

A behavior analysis approach to the assessment of skill deficits and target behaviors was selected. A generic analysis of safety skills was combined with an individual assessment. Verbal and nonverbal behaviors from social skills inventories (Dowrick, 1986) were used to compile a checklist of elements contributing to the individual's safety. For each person we developed a semistandard questionnaire incorporating the checklists, which included the client's existing skills and provided information about his or her functioning in the environment, idiosyncratic vulnerabilities, and high-risk situations. Specific target behaviors and circumstances for training were chosen on the basis of preassesment role plays to address individual skill deficits

during the video capture session. For example, one client who had been through another personal safety program would call the police whenever an unknown man spoke to her ("Hi, my name's Mike"); another would accept rides from anyone when she was walking home, loaded down with shopping bags ("My name's Robert—you don't know me, but I'm a friend of your mother's . . ."). In each case there were different components of effective social responding (engaging in small talk without giving away a home address; turning away without smiling, after saying "no thank you") that the women could or could not do under different circumstances.

Video Capture

Based on individual skill deficits, the video capture session was preplanned to elicit examples of specific behaviors and sequences of action. (Preplanning the video capture session clarifies content, ensures that necessary components are present, and reduces the amount of video capture needed.) Individually tailored role plays with a male "stranger" (usually a service provider known to the client) were used to address these deficits and unique scenarios. Capture footage was limited by selective taping of complete acceptable sequences, insertion of desired components (e.g., gaze, body posture) at desired times, and non-verbal cuing (directions and gestures off-camera) if the client was unable to produce the desired component behaviors. Video capture includes all skills and components identified in the analysis, as well as the role play situation pertinent to the individual. Recording only the behaviors identified in preplanning in the approximate sequence desired reduces the amount of tape to be reviewed during editing.

Editing

In the video editing process, we selected and arranged the component behaviors to present complete sequences that showed the individual responding in a safe manner. The task was to construct in a predetermined manner selected elements from the video capture to produce a 3-minute self modeling tape with specified content and format. Each tape began with an introduction by the client herself ("Hello, my name is Robyn, and this is my safety tape") and ended with a still frame of the client's smiling face in close-up. The content of the tape included two situations of major importance in which the client conducted herself gracefully and effectively stayed safe in her own terms. Key elements, especially those of difficulty, were emphasized with slow motion, still framing, or by abrupt elimination of sound if the nonverbal aspect was important. Each little scene included an escalation of effort by the "stranger" to put the client at risk.

Viewing Schedule

Optimal viewing was three times per week (one viewing each time) for 2 weeks, a total viewing time of about 20 minutes. Written schedules included planned dates and viewing times, dates and times actually viewed, and the initials of the client and

the person responsible for the tape. Thus we could monitor compliance with the schedule and restrict access to the tape, while this part of the program was delegated to the client or other individuals. Written instructions for viewing conditions were necessary to ensure standardization in this case.

Evaluation

Post-evaluation role plays conducted after the 2 weeks of intervention provided evidence of behavior change. Questionnaires and interviews with house parents and co-workers provided us with validation of safer behavior in the community and enabled us to evaluate the overall integrity and viability of the program, as well as the effectiveness of the self modeling procedure. Exit interviews were used for debriefing and to obtain information about the clients' perceptions and reactions to the self modeling process.