MODIFICATION OF TRANSSEXUALISM: A BEHAVIOR MODIFICATION PROGRAM FOR CONDITIONING MASCULINE BEHAVIORS IN AN EFFEMINATE BOY

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Operant conditioning techniques were used to condition male-typical behaviors in an eight-year-old effeminate boy who had been described as transsexual.

A probe of toys and activities was administered, which showed a trend toward his choosing feminine toys and activities. Psychological tests were also administered.

The conditioning programs were in two phases. Both phases consisted of positive reinforcement of behavior associated with masculinity. The first phase was carried out by E and the second by the parents. E's phase consisted of programs to condition masculine sports skills, competitive behaviors, and masculine verbal responses. The phase conducted by the parents consisted of both the verbal and competition programs. The parents also administered a mathematics program.

The sports programs consisted of procedures to condition behaviors appropriate to baseball and tennis. The competition program employed an electric football game. A MYCOM teaching computer was used in the verbal program.
The results indicated a gradual shifting from female-typical to male-typical behaviors. All programs were termed as successful, but improvements were suggested for the mathematics program.

A token economy motivational system was designed to help implement the reinforcement program. Monetary contingencies were also placed on the parents to insure their adequate performance on the programs.

It was stated that this type of program is recommended because of its effectiveness. Also, it is specific to a degree which allows parents to be able to carry out the procedures.
MODIFICATION OF TRANSSEXUALISM: A BEHAVIOR MODIFICATION PROGRAM FOR CONDITIONING MASCULINE BEHAVIORS IN AN EFFEMINATE BOY

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MODIFICATION OF TRANSSEXUALISM: A BEHAVIOR MODIFICATION PROGRAM FOR CONDITIONING MASCULINE BEHAVIORS IN AN EFFEMINATE BOY

Writers have singled out deviant sexual behavior as a portent of a crumbling civilization (Spengler, 1947, p. 103). The media portray the sexual deviant as a depraved misfit, a burden on society, and a totally unhappy person.

The types of sexual behavior classified as deviant vary from social group to social group. Coleman (1964, p. 379) defines sexual deviation as "... any method of obtaining sexual satisfaction which is disapproved by the community..."

In the American culture, cross-gender deviations are the most obvious forms of these classes of behavior. Due to social taboos and regulations, very little actual scientific data has been gathered on these deviations (Bentler et al., 1970). The cross-gender deviant shows behaviors that are defined by society as being appropriate for the opposite sex. The most common cross-gender sex deviations are (1) homosexuality, (2) transvestism, and (3) transsexualism.

Behaviors exhibited by these three groups are similar in many respects (Money and Epstein, 1967). Homosexuals take as sex partners individuals of their own sex.
Transvestites dress in clothes typically associated with the opposite sex. The most distinguishable and hardest to deal with of the three, though, is the transsexual. Transsexuals say that they are in every way a member of the opposite sex except for anatomical characteristics. For this reason, they often seek endocrinological and surgical treatments to produce the desired anatomical changes.

Newman (1970) and others in the field have described cross-gender sex deviates as being profoundly unhappy. It seems strange that these types of deviations should at all exist, since social pressure toward ordinate sexual behaviors is formidable. Questions about when and how these deviations take place are being asked by both researchers and laymen. The origin of sex-typical has been the focus of much research.

Sex-typing, as defined by R. R. Sears et al. (1965), is the process by which a child develops role behavior appropriate to his ascribed gender. There are many different theories which attempt to explain sex-typing. About the only thing on which these theories agree is that gender identity is established at an early age (Green, 1968). Randell (1959) states that problems usually become evident before the age of twelve. Pauly (1965) suggests, furthermore, that the process is difficult, if not impossible, to reverse.

There are four major varieties of theories of sex-typing. They are (1) constitutional or physical theories, (2) Freudian
Constitutional theories.—Aside from the primary anatomical characteristics, some authors express a hypothesis that secondary sex-typical behavior is also inborn (Benjamin, 1966). Green and Money (1960) state that this may be the result of a genetic factor. Newman (1970) cites primate studies that have indicated that the sex hormone levels during the prenatal period are of critical importance. For the most part, though, these theories are relegated to a secondary position. As Biller and Borstelmann (1967) point out, constitutional predispositions can be extensively modified through experience.

Psychoanalytic theories.—Most of the research on the development of sex differences has been guided by such Freudian-derived concepts as "identification," "incorporation," "internalization," and "introjection" (Mischel, 1966). Psychoanalytic theory, says Hetherington (1965), stresses the role of fear of punishment and identification with the aggressor. Colley (1959) states that Freud considered this a basically instinctual phenomenon. Bronfenbrenner (1960) asserts that although Freud at times stressed anatomical differences between the sexes as predisposing to different behavior patterns, he also emphasized the essential bisexuality of both males and females. He seemed to see parent-child relationships as a major determinant of sex-role
development. The boy perceives the father as punitive and threatening, as the "source of decisive frustrations" (Fenichel, 1945, p. 95) during the oedipal period. This seems in psychoanalytic theory to be a principal prerequisite for the boy's masculine development.

An extension of the Freudian hypothesis of identification with the aggressor, as cited by Bandura and Walters (1963, p. 94) is Whiting's status-envy theory of identification. It states that a young boy will learn masculine behavior only if he sees his father (or father-surrogate) as the primary consumer of valued resources. He identifies with the parent who occupies an "envied status."

Role theory.—Role theory is another attempt to explain the acquiring of sex-typical behavior. According to role theory, the child does not identify with the parent but with the role the parent plays in his interaction with the child.

One role theorist, Parsons, in his social power theory (Parsons and Bales, 1955) considers identification to be a function of the relative power of the father as a controller of resources. He states that a boy will identify with the person who is most able to dispense both rewards and punishments. Parsons (1958) considers that identification encompasses the behaviors a child learns in the context of a social role with a parent. These behaviors, he states, are those which are systematically elicited and reinforced
in the course of the child's interaction with the adult. They are not necessarily the behaviors which are typical of the adult.

In support of this theory, Mussen and Distler (1959) found that boys who exhibit strong male identification perceive their fathers as powerful sources of both reward and punishment.

Taking both identification theory and role theory into consideration, though, Heilbrun (1965) states that there may not be real differences in the basic formulations of the theories. The only differences may be in the words used to specify the theories.

Learning theory.—Theories of sex-typing based on the various learning theories hypothesize that identification follows the laws of learning (Lynn, 1959). In some of them, identification is excluded as a mediating process (Colley, 1959).

Hetherington (1965) surmises that learning theories stress the facilitating effects of reward in promoting identification. Colley (1959) explains that the acquisition of appropriate sex-typing is contingent upon what the child learns of the expectations which the significant adults and others in his life have for him. This being the case, identification as a mediating process is not required.

Learning theory, state Biller and Borstelmann (1967), stresses the rewarding and affectionate father in relationship
to his son. They also assert that the father's nurturance appears to facilitate masculine development more than the father's punitiveness. They state that this is a fact which is more consistent with learning theory than with psychoanalytic theory.

Bandura, as cited by Mischel (1966), asserts that boys' and girls' sex-typical behavior is determined by male or female models to which they differentially attend. This modeling theory would predict, as Sears et al. (1957) contend, that sex-typed behaviors that are observed in the repertoires of the parents and are modeled after by children represent an important basis for appropriate sex-typing.

According to Bandura and Walters (1963), reinforcement is not the most important determinant of response acquisition and selection in modeling theory. It facilitates modeling, but sensory and cognitive aspects play a major role in the selection of appropriate responses.

Although he does not mention the acquisition of sex-typical behavior directly, a model can be extrapolated from the writings of Skinner (1938, 1953, 1969). This model employs the concept of differential consequences. This is the process of selectively consequating some behaviors while ignoring others. The behaviors which are followed by reinforcement will increase in rate and those not reinforced will decrease. A higher probability of repetition exists for those behaviors which are reinforced. Also, objects and
persons associated with reinforcement tend to become reinforcing themselves. Because of early association with reinforcement, the attention of adults, especially parent, becomes highly reinforcing for the child. Thus, when parents pay attention to the child, they reinforce any behaviors occurring in close temporal proximity to their attention-giving behavior. The behaviors to which they attend are more likely to occur in the future.

Behaviors defined as socially acceptable are more likely to be reinforced by the parents, so sex-typical behavior is more likely than sex-atypical behavior to be reinforced and increase in rate. It may also be the case that emitting behaviors similar to the parents' behaviors becomes reinforcing to the child (Skinner, 1969). In this case, this generalized imitation would lend support to a modeling aspect as stated by Bandura (1969, Bandura and Walters, 1963).

If the parents or their substitutes reinforce the sex-atypical behaviors of the child, he will be more likely to exhibit behavior not typical to his sex.

Learning theory models of development, says Martin (1954), are more parsimonious than identification models. To refine this further, differential reinforcement rather than modeling may be more decisive in the acquisition of sex-appropriate behaviors. This is exemplified, he explains, by the fact that many behaviors are never observed by the child: e.g., adult sexual relations.
Many hypotheses have been stated as to why some children do not develop sex-typical behavior, and develop the cross-gender deviations mentioned above. Some say it is a learning problem. To others it is a biological problem. Many say it is a dynamic mental problem. Money and Primrose (1968) among others conclude that it is probably a combination of the three.

As noted above, behaviors exhibited by homosexuals, transvestites, and transsexuals are similar in many respects. Homosexuality, though, will not be dealt with directly at this time.

Transvestism and transsexualism have many symptoms in common (Money and Epstein, 1967). Benjamin (1967) states that a sharp clinical differentiation between them cannot always be made. Transvestism may exist independently of transsexualism, but for all intents and purposes the latter always includes the former (Money and Epstein, 1967). Several writers have incorporated the two into one category called eonism (Money and Epstein, 1967; Randell, 1959; Pauly, 1965). Pauly (1965) and Randell (1959) credit Havelock Ellis with first using the term in 1936 in his book *Studies in the Psychology of Sex*. He called this condition eonism after the Chevalier d'Eon, a French diplomat at the Court of St. James, who lived as a woman for much of his life.

Several theories have been employed to explain the etiology of transsexualism and the associated transvestite
behavior. Most of these theories seem to agree on only one thing: that is, that the onset of the transsexual "wish" was at an early age (Randell, 1959).

As mentioned earlier, some writers assert that there is a possibility that the disorder is inborn (Benjamin, 1966). Green and Money (1960) surmise that a genetic factor may be involved. Newman (1970) cites studies concerning the effects of prenatal hormone levels in primates. Both Pauly (1965) and Lukianowicz (1965) state that data do not support this hypothesis.

Another line of research reported by Money et al. (1957) concerns a process they consider to be analogous to "imprinting." This process, they say, determines the child's gender-role orientation regardless of the actual biological sex. They cite their studies with hermaphroditic children to support their hypothesis.

Freudian psychoanalytic theory has been employed by many to explain transsexualism. Fenichel (1945) suggests that the transvestite man becomes the "penile woman" by supplanting his love for the mother by identification with her in his wearing of feminine clothes. This fetish supposedly is symbolic of the mother's fictionalized penis.

Others, such as Morgenthaler (1970), have said that disturbances of this type result from a disharmony between ego and drive development, which proceed at different speeds. Stoller (1968, p. 105) describes a depressed, overly permissive mother and a passive and distant father as being a specific family constellation in male transsexualism.
As with general sex-typing, theories of the etiology of transsexualism employing the learning theory models appear to be more parsimonious than other models. In these models, the transsexual behaviors are learned, for the most part, through interactions with significant adults.

Bandura states that three social learning variables emerge as important determinants of deviant sexual behavior. The first is that the parents may be inappropriate models. Whitener and Nikelly (1964) make a similar observation. The second is that once the responses are elicited, they are endowed with exaggerated sexual significance and strong positive valence. The third is that parents tend to maintain children's deviant sexual responses through both direct and vicarious reinforcement (Bandura, 1969).

In a study of the mothers and wives of thirty-two transvestites, Stoller (1967) found that the subjects were initiated into transvestism by being dressed in girl's clothing or highly rewarded whenever they dressed themselves in feminine apparel. Litin et al. (1956) describe a case history also supporting these results.

Following the model stated above using Skinnerian principles, transsexualism would appear to be an extreme case of the result of a response chain of inappropriate sex role behaviors being reinforced. In transsexualism, there is also probably inappropriate verbal behavior. This is probably due to monitoring behavior on the part of the transsexual himself.
and also to direct reinforcement from his verbal community. It may be the case that the transsexual has no, or few, behavioral skills appropriate to his sex and only has skills appropriate to the other sex. He monitors this fact and surmises that being a member of the opposite sex would have greater reinforcement value for him. Also, in most instances, children are given attention for appropriate behavior. It may be the case for transsexuals that many abnormal behavior patterns have been directly reinforced, as was noted by Stoller (1967) and Litin et al. (1956) above.

Male transsexuals do not tend to exhibit many of the skills associated with being a male. They tend to show a pattern more in accord with the pattern shown by females in quantitative abilities. Poffenberger and Norton (1963) state that more boys than girls like mathematics as a school subject. Boys score higher on tests of quantitative aptitudes than verbal tests; girls score higher on tests of verbal aptitudes than on quantitative tests (Funkstein, 1963). In a study by Funkstein (1963), it was shown that males who have difficulties in learning mathematics and who have underlying low quantitative aptitudes in relation to their verbal aptitudes would have difficulty in assuming the masculine role. Money and Epstein (1967) found that male transsexuals, transvestites, and effeminate boys obey perfectly the trend of verbal comprehension being greater than perceptual organization and freedom from distractibility being less than both.
Male transsexuals also seem not to exhibit the aggressive behavior that Sears et al. (1957), Minuchin (1965), and Hokanson (1971) describe as being associated with being masculine. Invariably, the adult male transsexual will report a childhood aversion to fighting, to boys' competitive games, and to rough, outdoor activities, as Money and Primrose (1965) report. They also report that the male transsexuals were labeled as "sissy" by their peers. They much preferred the security of home and little-girl activities.

Bandura (1969, p. 516) reports that deviant sexual patterns rarely change "spontaneously," and have proved equally unresponsive to the planned efforts of psychotherapists employing various strategies. What about therapy for these persons? Is it possible?

Pauly (1965) says that core gender identity is difficult, if not impossible, to reverse. Adult transsexualism is irreversible by psychological methods, states Stoller (1967). He does say, though, that it may be treatable in the small child, as does Newman (1970). Benjamin (1967) sees endocrine therapy and surgery, to bring the anatomical characteristics in line with the psychological characteristics, as a logical approach.

Newman (1970) states that psychotherapy beyond childhood has not proven effective. He explains that the therapist must establish a working relationship with the patient in which his cross-gender feelings and aspirations can be explored and
the possibility of reversing them by psychotherapy or other treatment assessed. Lukianowicz (1965) contends that, at present, there is no satisfactory treatment for transsexualism. Bruce (1967) maintains that with transvestites the therapeutic aim should not be to cure or change, but rather to help him accept himself and achieve full personality expression.

Many attempts have been made to treat cross-gender deviations and some therapists have reported success. Biegel (1967) reports using hypnosis somewhat successfully on transvestite behavior. Psychoanalysis was reported successfully by Greenson (1966) and Dellaert and Kunke (1969) in cases of a child and an adult respectively.

In recent years, a therapeutic approach showing moderate success has been behavior therapy. Most of this therapy has been aversion therapy of one type or another. Successful aversion treatment in which shocks were administered to the surface of the skin while transsexuals and transvestites carried out their deviant behavior or imagined themselves performing the same activities was used by Marks and Gelder (Gelder and Marks, 1969; Marks and Gelder, 1967). Later research by Marks et al. (1970) has shown improvement in transvestites but not transsexuals. Transvestism has also been treated by others using aversion therapy and has brought about marked and enduring changes (Blakemore et al., 1963; Cooper, 1963; Glynn and Harper, 1961; Lavin et al., 1961; and Morgenstern et al., 1965).
One criticism of aversion therapy has been that it terminates the inappropriate behavior but does nothing to instate appropriate behaviors (Haynes, 1970). A step in the positive direction has been attempted in the treatment of homosexuality. In some studies, the emitting of appropriate responses resulted in the termination of aversive stimuli (Feldman and MacCulloch, 1964; Freund, 1960; James, 1962; and Solyom and Miller, 1965).

Sears et al. (1957) make the statement that one method of sex-typing is direct teaching of sex-appropriate behavior. It would seem logical that if masculine skills were taught to a male transsexual and associated with reinforcement, he would be reinforced by the male role and thus come to "like" it. Skinner (1969, p. 39) states that "We 'like' a way of life to the extent that we are reinforced by it."

This direct teaching method is the method used in the following study with an eight-year-old boy described as transsexual.

Method

Subject

The subject was an eight-year-old boy who had been described as being transsexual. Feminine behavior was first noticed between the ages of two and three. He exhibited overt feminine behaviors and speech and was reported to have expressed the wish that he wanted to be a girl. Rarely playing with boys, he seemed to have few
male friends. It was reported that he played with dolls and other feminine toys when he got the chance. Observations of his dressing in feminine clothes and jewelry had been made. Prior to the time that programs were begun, he had been seen by several general practitioners, a psychiatrist, a heart specialist, a community mental health center, and two psychologists. He was referred for behavior modification after evaluation by the psychologists.

Procedure

It was decided that the best way to approach the problem was the direct reinforcement of male-typical behaviors and verbal responses.

Before beginning the programs, an attempt was made to obtain baseline data on the behaviors defined as being ones that disturbed the parents the most. A list of behaviors was drawn up. These included the following:

1. Asking for a doll (number of times asked).
2. Combing or brushing a wig or girl's hair (number of times observed).
3. Making statements to the effect "Boys' 'stuff' isn't fun," or "Girls' 'stuff' is fun" (number of times stated).
4. Sitting with legs crossed at knee (number of minutes).
5. Wearing feminine type clothing or adjusting his own to appear feminine: e.g., pull T-shirt down over shorts to look like a dress (number of minutes).
(6) Asking to take ballet lessons (number of times asked).

(7) Sitting to urinate (number of times).

(8) Standing in front of the record player dancing in ballerina fashion (number of minutes).

Also, at this time, S was daily given a systematic probe to assess masculinity and femininity in play habits and as an overall indicator of the degree of masculinity. The probe consisted of fifteen activities. Five of these, on face validity, were considered masculine, five neutral, and five feminine. He was given an hour each day to engage in any of these activities he desired. Similar methods of sex-role assessment have been employed by several earlier researchers (Biller, 1968; Sears et al., 1965, p. 176; Minuchin, 1965). Pictures of toys have also been used (Rabban, 1950; Pauls and Smith, 1956; DeLucia, 1963; Anastasiow, 1965). Also doll play has been utilized (Sears et al., 1957; Emmerich, 1959). There were only two stipulations for this probe. They were that S could not participate in these activities any time except during the session, and he could participate in only one activity at a time. At any time during the session, S could trade the toy he was playing with for any other one in the assortment. The number of minutes he played with each toy or participated in each activity was recorded.
As stated above, the probe items were divided into groups of masculine, feminine, and neutral sex desirability. The masculine group consisted of the following: (1) a toy knife, (2) a toy motorcycle, (3) a dart gun, (4) a toy electric razor, and (5) an assortment of spacemen. The neutral group included (1) a children's card game, (2) two books (book of animals and a Golden Book Encyclopedia), (3) a drawing book, (4) modeling clay, and (5) a View-Master viewer. In the feminine group there was: (1) a doll, (2) cosmetics, (3) a purse and high heels, (4) a wig, and (5) jewelry.

It was found that due to the parents' schedules, they were not able to observe S enough to get any accurate data on the behaviors they were supposed to record. Data were obtained from the probe, however.

After one month of the parents administering the probe, S came to stay with E. He was given a room of his own which he could decorate in any way he chose.

S attended a remedial classroom each morning with several other children who experienced difficulties with some school subjects. Mathematics was S's area of concentration in this classroom. His afternoons were free for the first three weeks of his stay. At that time, he usually played with another boy. S usually took the feminine role in their play.
After three weeks, programs were begun. The main objectives of the programs were to teach skills usually associated with being a boy. Sports were the main points of concentration in these programs. Competition was another area of concentration. In the competition program, S was to be reinforced for winning. The third area of concentration was that of verbal behavior. S was to be reinforced for "saying" things defined as being masculine in orientation.

For the sports programs, tennis and baseball were chosen as the broad skill areas to be taught. Tennis was chosen because of the possibility of playing against a wall, thus doing away with the necessity of having to play with another person. It was also chosen for the hand-eye coordination skills which it would seem to develop. These skills would be an asset in many male-type games. Baseball was chosen mainly for its popularity among young boys.

The tennis program, if carried to completion, consisted of five steps in shaping the playing behaviors. The first response step was for S to take the racket in hand, toss the ball into the air just above his head, and hit the ball with the racket. Step two consisted of E bouncing the ball to S. After one bounce, S, in turn, would strike the ball with his racket, sending it back to E. Number three began as the first step. S hit the ball with the racket. The ball was to hit a wall and bounce back to S, who was to hit
it once more. Step four was to employ a partner for S. In this step, they were to hit the ball back and forth. The fifth step was to "fade in" the net and regulation distance. The measure for each step was the per cent of possible hits which were successful (ball striking racket). S was reinforced for each successful hit.

The baseball program was, if carried to completion, divided into four skill types. The first was for S to take a bat and attempt to hit a ball thrown to him. The measures on this were the per cent of pitches at which he struck, out of the total thrown, whether or not he hit them. Also, the per cent of pitches out of the total thrown that were hit was recorded. Reinforcement was given for each hit. The second skill was pitching toward a target. The measure was the per cent of successful pitches (target hit) out of the total number thrown. S was reinforced for each successful pitch. The program was to terminate with participation in baseball games with other boys. The measure here was the per cent of the total number of minutes of the game which S was observed in his assigned position (i.e. pitcher, outfield, batter, etc.). Reinforcement was to be given for per cent of time in position after the game was completed.

An electric football game was utilized for the competition program. S and E sat at a table and played the game for standard thirty-minute sessions. Each down was considered a discrete unit. If S's team made a gain of yardage,
he was reinforced. He was also reinforced for keeping his opponent from making yardage. Touchdowns by S's team were also reinforced. S was reinforced for each successful down.

For the verbal program, a MYCOM Multipurpose Individualized Educational Computer was used. This unit is available from the Mycom Corporation of Fort Worth, Texas. This program employed a modified sentence completion technique. It consisted of sentence fragments to be completed by multiple choice options. Three options were given for each sentence fragment. The content of each option was analyzed as masculine, neutral, or feminine. Each triad of options contained one masculine, one neutral, and one feminine option. Each of the options could complete the sentence equally as well as the others. The masculine response in each triad was defined as the correct response.

The sentence fragments and options were divided into sixteen ten-item sections. These sections were programmed individually for the MYCOM unit. During each session, S was given one ten-item section. He was to read the sentence fragment and indicate on the MYCOM unit which option he had chosen. If he chose the masculine item, a green light flashed on the machine and the item was counted correct. When he chose one of the other options, a red light would flash and the item would be counted wrong. When S missed
an item, the machine required him to choose the correct option before he could go on to the next item. The machine gave S immediate feedback on the correctness of his response. He was reinforced for each correct response. Per cent of correct responses was recorded for each session.

Before this verbal program was begun, a probe consisting of sentence completion items was administered. The content of his responses was analyzed as masculine, feminine, or neutral. The measure used was the per cent of masculine responses.

As the time for S's return home neared, it was determined that his parents were going to need to continue his programs. Due to their lack of available time, the parents were not going to be able to carry out all programs. Since it would be necessary for the programs to be administered during the evening hours, the sports programs were dropped. This was done because there would be insufficient daylight for them to be carried out.

The competition and verbal programs were continued by the parents. In addition to these programs, a mathematics program was instituted. This mathematics program was considered important because of the positive relationships that have been found between quantitative abilities and the masculine role (Funkstein, 1963; Poffenberger and Norton, 1963).

The mathematics program employed the MYCOM unit as did the verbal program. Addition, subtraction, multiplication, and division were to be taught in this program. Each of these
functions was programmed separately. Each section was divided into subdivisions or levels. The section began with one's (i.e. $1 + 1 =$, $1 + 2 =$, $1 + 3 =$, etc.) and ended with a subdivision in which all problems for that section (i.e. addition) were intermingled. S repeated each level until a criterion of ninety-five per cent correct was met. When this criterion was reached, S advanced to the next level. A problem was presented and six answer options were given. S indicated his answer preference on the MYCOM unit. As in the verbal program, a green light flashed if he was correct and a red light flashed if he was wrong. S was reinforced on a fixed ratio schedule. He received reinforcement for each sixth correct response.

During each session, he was required to work sixty problems. After a few weeks, this began to take him an extremely long time to complete, so a time contingency was added. A tandem schedule was employed (Sidman, 1960, p. 123-124). The fixed ratio schedule was kept as before, but S could not keep any reinforcers earned if the session was not completed within a twenty minute time period. For instance, if S was correct on fifty-nine problems, he would have received nine reinforcement units. If it took him over twenty minutes, though, to complete the session, he could keep none of the nine.
A token economy (Ayllon and Azrin, 1968) was set up to facilitate reinforcement on these programs. Tokens were given as immediate reinforcement for correct behaviors. The tokens could be traded for an array of items and privileges. Sometimes S saw something he wanted or found an extra privilege he wanted to enjoy. He was to ask for it, and his parents would put a price on it. He could purchase it if he wished and if he had enough tokens. The parents were also continually endeavoring to find new items and privileges to put on his list of backup reinforcers.

Monetary contingencies were also put on the parents, to keep them functioning adequately on these programs. An amount of money was put on deposit with E, and an agreement was drawn up between the parents and E. If they carried the programs out correctly and sent all data to E on time, a part of the money was returned on a fixed interval schedule. If at any time they did not carry out these stipulations as specified, part of the money was remanded to E.

As stated above, S was free during the afternoons of the first three weeks of his stay with E. During this time, several psychological assessment instruments were administered by an impartial third party. The instruments administered were as follows: (1) Wechsler Intelligence Scale for Children (WISC), (2) Wide Range Achievement Test (WRAT), (3) House-Tree-Person (H-T-P), (4) Bender Visual Motor Gestalt Test (Bender).
(5) Thematic Apperception Test (TAT), (6) Rorschach Test, (7) Modified MMPI Mt Scale, and (8) Sentence Completion (two instruments). The two forms of the sentence completion instruments used were a standard boys' sentence completion form and a form consisting of sentence fragments similar to those given in the verbal program mentioned above. The content of S's responses to these sentence fragments was analyzed for masculine content. The responses were assessed to contain masculine, neutral, or feminine content. The two forms were combined and the number in each sex category division was recorded. After the home programs had been in effect for three months, these measures were taken again.

Results

Figure 1 of the appendix illustrates the data obtained from the systematic toy probe. Cumulative number of minutes that S played with the toys is plotted on the ordinate, and data sessions in three session blocks are plotted on the abscissa. Initially, the number of minutes S played with feminine toys increased at a higher rate than either the number of minutes with neutral toys or the number of minutes with masculine toys. Later, the rate of his playing with feminine toys decreased as the minutes spent with neutral toys increased with more rapidity. After the seventeenth block of sessions, there is a sharp increase in the number of minutes S played with masculine toys.
The sports programs are depicted on Figures 2 and 3. Figure 2 shows the baseball program. The per cent of successful responses is plotted on the ordinate, and data sessions are plotted on the abscissa. Fairly low rate baselines can be seen here, with steady increases during the experimental sessions. The tennis program shown in Figure 3 shows much the same pattern of increase during the experimental sessions.

The competition program is depicted in Figure 4. The per cent of successful responses is plotted on the ordinate, and data sessions are plotted on the abscissa. This shows a steady increase from baseline level to a peak at the sixteenth session. There is a decline from the seventeenth to the twentieth session. At this point, there is an increase.

Depicted in Figure 5 is the verbal program. Per cent of correct responses is plotted on the ordinate, and data sessions are plotted on the abscissa. Through the baseline and through the first three sessions of the first set of experimental sessions, there was a persistent low per cent correct. On the eighth session, the per cent of correct responses increased to one hundred per cent. From the eighth session, the per cent correct remained between ninety and one hundred per cent.

The mathematics program is depicted in Figures 6 and 7. In Figure 6, the per cent of correct responses is plotted on the ordinate, and data sessions are plotted on the abscissa. The per cent of mathematics problems correctly answered consistently
stayed above the seventy-five per cent level and most sessions were above the ninety per cent level. The number of trials that were needed for S to reach criterion for advancement in the mathematics program is depicted in Figure 7. Except for a peak of fifteen trials, the number of trials to criterion remained at five or below.

There were several preprogram-to-postprogram changes in the psychological instruments administered to S. The WISC showed a nine point increase in the Full Scale I. Q. There were increases of six and eleven points on the verbal and performance scales. The WISC also showed a three scaled score point increase on the arithmetic subtest. The WRAT showed a similar increase in the total number correct on the arithmetic session. S drew a male first on the posttest of H-T-P, whereas he drew the female first on the pretest. The male figure was also larger on the posttest than on the pretest. The sentence completion tests were content analyzed for masculinity, femininity, and neutrality of sex content of the responses. This analysis showed a change from a pretest thirty-three per cent feminine responses to sixteen per cent on the posttest. Neutral responses went from fifty-seven per cent to forty-four per cent. The masculine responses showed an increase of thirty per cent. The pretest of masculine responses was ten per cent and the posttest per cent was forty per cent.
Discussion

Toys and play habits have been used in assessment of masculinity-femininity by several researchers (Minuchin, 1965; Sears et al., 1965, p. 176; and Biller, 1968). Also, permissive doll play (Sears et al., 1957, p. 384) and structured doll play (Emmerich, 1959) have been employed in this manner. Rabban (1950) and others (Fauls and Smith, 1956; DeLucia, 1963; and Anastasiow, 1965) have employed pictures of toys in the measurement of sex-role behavior. These prior research data indicate that this is a valid measure of sex-role behavior.

Reference to Figure 1 demonstrates that S's choices of toys on this toy probe were consistently feminine during the baseline period. The feminine choice rate was increasing rapidly, with neutral choices being made at a slower rate. Choices of masculine toys were non-existent except for a few sessions.

After the period of residence with E and his family, the S's neutral choice rate began to increase rapidly while the feminine choice rate decreased. Masculine choices were still almost non-existent. When this probe was reinstated after the home programs had been in effect for a while, a greater change was noted. The feminine choice rate continued to decrease and the neutral choices continued to increase. The greatest change, though, was a sharp increase in the rate of S's choosing masculine toys. At this stage, his choosing feminine toys was occurring at a very low rate.
Overall, these probe data depict a trend in which choices appear to gradually change from feminine play objects and activities to those of a masculine nature. The occurrence of these changes in probes with the introduction and execution of the various training procedures is obviously more than coincidence.

The baseball and tennis behaviors, according to Figures 2 and 3, seemed to be on the increase at the time of termination of the programs. It appears that the reinforcement procedure was the prime factor in this increase. This assumption is supported by the fact that four of the baselines (catching, hitting, and both tennis measures) were decreasing at the time of the initiation of the reinforcement procedure. Shortly after this initiation, the increase began.

Likewise, the increase in the successful responses in the competition program seems to be a function of the reinforcement procedure. Referring to Figure 4, this is supported by the fact that the baseline data were decreasing when reinforcement was begun. At this point, there is an increase of over twenty per cent and a steady increase throughout the first set of experimental sessions which E conducted. A decrease occurred in the second experimental period. This seemed attributable to technical difficulties the parents experienced with the program at that time. The later increase showed a return to normalcy in the program.

It would be predicted that increase in this program would depict an increase in aggressiveness and competitiveness. It
has been pointed out above that this has been found to be associated with other male-typical behaviors (Sears et al., 1957, and Hokanson, 1971). This program was considered an important part of the total behavior modification program.

The verbal program was considered the most important because of the verbal factors associated with transsexualism. The main difference between transsexuals and other cross-gender deviates is the transsexual's verbal expression of wanting to be a member of the opposite sex. This program reinforced S for making male-typical verbal responses. Reference to Figure 5 demonstrates that the data for this program indicated that S mastered the concept early; so, effectively, he was merely being reinforced for saying masculine things.

It was predicted that this association with reinforcement would be an antecedent condition to his "liking" the masculine verbal responses (Skinner, 1969, p. 39). An increase in masculine responses was noted on the sentence completion tests indicating a shift in verbal behavior. More will be said about these tests below. It was predicted that making masculine verbal responses would increase the amount of positive reinforcement value of boys and decrease S's aversion to playing with most boys. It could be said that his saying he wanted to be a girl was his real problem, not a dynamic, mental, attitudinal process in which deep-seated problems caused him to want to be a girl.
As per Funkstein (1963), the mathematics program, as depicted in Figures 6 and 7, was initiated to increase quantitative behaviors associated with the masculine role. As the program progressed, though, it was determined that another type of quantitative program might be more functional. A program stressing the logic aspects of mathematics might serve to increase quantitative abilities somewhat better. Though there was a slight increase in arithmetic scores, as shown by the WISC and WRAT, the increase was not enough to support its extensive use for this program.

A change which attests to the total facilitating properties of these programs was the increase seen in the full scale score of the WISC. These data are conjectured as depicting an increase in S's ability to generalize from specific knowledge. This is merely a conjecture, though, and cannot be supported.

Human figure drawings have been regarded as a valid method of assessing sex-role orientation. In many studies (Brown and Toler, 1957; Biller and Borstelmann, 1965; Lefkowitz, 1962; Green, 1968), the sex of the first figure drawn in tests such as the H-T-P has been significant as a measure of sex-role orientation.

On successive administrations of the H-T-P, S's data revealed changes consistent with the intent of the program. As stated previously, S drew the female figure first in the preprogram administration. The male was drawn first in the postprogram administration. This is seen as at least a
partial reversal in orientation. This is also indicated in that the male figure was drawn larger in the second administration.

Change was also shown in the sentence completion tests. These changes were not merely changes toward masculine responses, but changes away from feminine responses, also. It is shown that in this standard situation, $S$ makes more verbal responses of a masculine nature than he did before the beginning of the programs. $S$'s mother has also noticed changes in his verbal behavior in home situations, but no data has been taken on this.

From the data presented, one can conclude that this seems to be a relatively straightforward and systematic approach to this problem. It may also be mentioned that due to the nature of these programs, parents can administer them, thus making them available to more people. This type of program also seems more acceptable to most parents than the aversion therapies reported by other behavior therapists. More research needs to be done in this area, but these procedures set forth here seem to be a fruitful avenue to follow.
APPENDIX
Fig. 1—Cumulative number of minutes played with probe toys as a function of experimental phases.
Fig. 2—Per cent of correct responses on baseball program.
Fig. 3—Per cent of correct responses on tennis program.
Fig. 4—Per cent correct on competition program across experimental phases.
Fig. 5—Per cent correct on verbal program.
Fig. 6--Per cent correct on math program.
Fig. 7—Number of trials to 95% correct on math program.
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