

BEHAVIORAL TREATMENT OF DEVIANT SEX-ROLE
BEHAVIORS IN A MALE CHILD¹

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This study demonstrated reinforcement control over pronounced feminine behaviors in a male child who had been psychologically evaluated as manifesting "childhood cross-gender identity". The clinical history of the subject paralleled the retrospective reports of adult transsexuals, including (a) cross-gender clothing preferences, (b) actual or imaginal use of cosmetic articles, (c) feminine behavior mannerisms, (d) aversion to masculine activities, coupled with preference for girl playmates and feminine activities, (e) preference for female role, (f) feminine voice inflection and predominantly feminine content in speech, and (g) verbal statements about the desire or preference to be a girl. The subject was treated sequentially in the clinic and home environments by his mother, trained to be his therapist. The mother was taught to reinforce masculine behaviors and to extinguish feminine behaviors, by using social reinforcement in the clinic and a token reinforcement procedure in the home. During this treatment, his feminine behaviors sharply decreased and masculine behavior increased. The treatment effects were found to be largely response-specific and stimulus-specific; consequently, it was necessary to strengthen more than one masculine behavior and weaken several feminine behaviors, in both clinic and home settings. A multiple-baseline intrasubject design was used to ensure both replication and identification of relevant treatment variables. Follow-up data three years after the treatment began suggests that the boy's sex-typed behaviors have become normalized. This study suggests a preliminary step toward correcting pathological sex-role development in boys, which may provide a basis for the primary prevention of adult transsexualism or similar adult sex-role deviation.

Young boys with feminine sex-typed behaviors have recently become the object of increased psychological interest, perhaps because of growing evidence that childhood cross-gender manifestations are indicative of later adult sexual abnormalities; *e.g.*, transvestism, transsexualism, or some forms of homosexuality (Green, 1967, 1968; Green and Money, 1961, 1969; Stoller,

1968, 1970). Anatomically normal male children with pronounced feminine characteristics are now diagnosed as having childhood "cross-gender identity problems" (*e.g.*, Green, 1968).

This paper reports the first of several children we have treated with the purpose of normalizing their sex-type behaviors. This boy, Kraig, was

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referred to us by a physician for treatment at the age of 4 yr and 11 months. His family was intact, including a normal brother 8 yr and a sister nine months of age. He exhibited all the psychiatric symptomatology of a typical boy with "cross-gender identification". The referring physician had found Kraig to be physically normal in terms of currently available methods of biomedical testing. Before treatment, Kraig had been described by a psychiatric authority on gender identity problems as one of the most severe cases he had assessed. He had a history of cross-dressing since he was 2 yr old; at that time, he also began to play with cosmetic items of his mother and grandmother. When the mother's clothing was unavailable, Kraig very frequently improvised in cross-dressing—*e.g.*, mop or towel over head for long hair, or long shirt for a dress. Kraig continually displayed pronounced feminine mannerisms, gestures, and gait, as well as exaggerated feminine inflection and feminine content of speech. He had a remarkable ability to mimic all the subtle feminine behaviors of an adult woman. At the same time, he seemed void of masculine behaviors, being both unable and unwilling to play the "rough-and-tumble" games of boys his age in his immediate neighborhood. He regularly avoided playing with his brother, he declined to defend himself among peers, and he was very fearful of getting hurt. On the other hand, he preferred to play with girls, and one neighbor girl in particular; even when playing house with the girls, he invariably insisted on playing the part of the "mother" and assigned the part of "father" to one of the girls. For a child his age, Kraig had an overly dependent relationship with his mother; he demanded her attention almost continuously. He appeared to be very skilled at manipulating her to satisfy his feminine interests (*e.g.*, he would offer to "help mommy" by carrying her purse when she had other packages to carry). He seemed almost compulsive or "rigid" in the extent to which he insisted on being a girl and in his refusal of all contact with masculine-like activities. From casual observation, normal 5-yr old girls show

much more flexibility than Kraig did in choosing between sex-typed behaviors.

There are at least four related reasons why one may want to treat a child like Kraig. First, Kraig's feminine behavior was increasingly leading him to social isolation and ridicule. Boys like Kraig are typically scorned by their peers and live a miserable social life (*cf.* Stoller, 1970). While society probably could afford to become more tolerant with individuals with sex-role deviations, the facts remain that it is not tolerant, and, realistically speaking, it is potentially more difficult to modify society's behaviors than Kraig's, in order to relieve Kraig's suffering. Secondly, since Kraig had these problems before the age of 5 yr, our best prediction (based on the literature) would indicate that he will have even more severe adjustment problems in adulthood. Most adult transsexuals and transvestites and some homosexuals report that their cross-gender behaviors began in early childhood (Green, 1968; Money and Primrose, 1968; Walinder, 1967; Zuger, 1966). It appears to be the case, in boys at least, that substantial deviation from appropriate sex-role behavior at the age of 5 yr leads to substantial gender problems in adulthood in the majority of cases (*cf.* Green and Money, 1969). Adult cross-gender problems not only develop early in childhood, but also contribute developmentally to difficulties in social relationships, so that by adulthood, the syndrome is frequently accompanied by other serious emotional, social, and economic maladjustments. For example, it is reported that (1) the most frequent accompanying psychopathology is depression (Pauly, 1969)—67% of the male transsexuals are thought to suffer intermittent depressive reactions, with suicidal ideation (60%), and actual suicide attempt in 17% (Pauly, 1965) to 20% (Walinder, 1967); (2) self-mutilation in the form of autocastration or autopenectomy was attempted in 18% and accomplished in 9% of one series of adult cases (Pauly, 1965); (3) the most common "treatment" imposed by society for transsexuals is arrest, trial, and imprisonment (Money, 1968);

and, (4) a recent study of the social and economic aspects of transsexualism found a high incidence of educational and work maladjustments, as well as a high proportion of criminal and other anti-social behavior (Hoenig, Kenner, and Youd, 1970). A third reason for treating Kraig is that intervention on deviant sex-role development in childhood may be the only effective manner of treating (*i.e.*, preventing) serious forms of sexual deviance in adulthood, since in adulthood such severe deviance appears to be quite resistant to psychological treatment (Baker, 1969; Benjamin, 1969; Pauly, 1969). Apparently, there is only one published report of the successful psychological treatment of an adult transsexual (Barlow, Reynolds, and Agras, 1973). Because adult transsexuals are extremely discontent, and because efforts to change their gender identity to match their anatomy have generally failed, many clinicians have concluded that surgical and hormonal sex-reassignment is the only ameliorative treatment available (*e.g.*, Baker and Green, 1970; Money, 1970; Randell, 1970). Adult transsexuals request sex-reassignment surgery, typically complaining, "I have a woman's mind trapped in a man's body". With the many surgical, psychological, legal, and ethical problems raised with attempted sex-reassignment procedures (*cf.* articles in Green and Money, 1969), it may be preferable to attempt to change the individual's behavior during the formative childhood years than to change the adult's body. Finally, Kraig's parents, who might have found his feminine gestures amusing at the age of 2 yr, were very alarmed when they "got out of hand" at 4.5 yr, and they strongly wanted him to receive professional help.

Current understanding is incomplete regarding the environmental conditions under which normalization of sex-role behavior could be accomplished. The lack of positive results from nearly all major forms of psychological treatment for the adult transsexual motivated the present authors to discover effective techniques for therapeutic intervention at an early develop-

mental period. Given that gender-related behaviors are established early in life (Green and Money, 1969; Hampson, 1965; Harlow, 1965) and are probably more susceptible to therapeutic intervention at such a time, it seems logical to attempt to study and treat cross-gender problems in early childhood. Unfortunately, however, the literature on children does not specify what we could do to help a child like Kraig. Therefore, our job became one of exploring environmental manipulations that might normalize Kraig's deviant sex-role behavior.

We chose to focus our treatment approach around social learning contingencies. Social learning variables have been generally considered to be the main source of sex-role deviance, although biological malfunction may be a potential contributing factor. A body of clinical literature suggests that the factors controlling human cross-gender behaviors are particular to an individual's immediate family setting or shared in a certain cultural milieu (*e.g.*, Litin, Griffin, and Johnson, 1956; Lukianowicz, 1959; Pauly, 1969; and Stoller, 1969). Most investigators have accepted the compelling evidence for an environmental etiology provided by Money, Hampson, and Hampson (1955), who reported that the gender role and orientation of individuals born with ambiguous sex (hermaphrodites) are correlated with sex of assignment and rearing, and not correlated with any one of the five physical variables of sex. Recently, however, the conclusions derived by Money *et al.* from their data have been challenged (Zuger, 1970), and the potential influence of biological variables on gender identity has been suggested by recent findings (*e.g.*, Evans, 1972). Clearly, more research is needed to determine the controlling variables in the development of sex-role behavior, and thus this area of investigation is a good testing ground for the evaluation of social learning theory.

METHOD

Employing a multiple baseline design across behaviors and situations, we trained several

gender-related behaviors (such as peer-play, doll-play, mannerisms, etc.) both in the clinic setting and in the child's home.

Observational Measures in the Clinic

The child was first observed and treated in the clinic play-room, which was furnished with various sex-typed toys placed on two child-sized tables (2 ft high; 5 by 2.5 ft top surface). "Boys' toys" were placed on one end of each table, and "girls' toys" were placed on the other end. The quantity and quality of the boy and girl toys were roughly equated.

One of the tables (Dress-Up Table) had clothing and grooming toys on it. On one side were girls' cosmetic articles and girls' apparel, consisting of a woman's wig, a long-sleeve dress (child's size), a play cosmetic set (lipstick and manicure items), and a set of jewelry consisting of bracelets, necklaces, rings, and earrings. These toys had been sex-typed as feminine by several investigators (Brown, 1956; Lefkowitz, 1962; Rabban, 1950; Sutton-Smith, Rosenberg, and Morgan, 1963). On the other side of the Dress-Up Table were boys' apparel; namely, a plastic football helmet, a sea captain's hat, an army helmet, an army "fatigue" shirt with stripes and other military decorations, an army belt with hatchet holder and canteen holder, and a battery operated play electric razor. This second set of toys had been sex-typed as masculine in several studies (Brown, 1956; Lefkowitz, 1962).

The second table (Affect Table) was also divided in two parts. On one side were placed girl toys associated with *maternal nurturance*; namely, a baby doll in a 3-ft crib with sliding side, a baby bottle, baby powder, and a "Barbie" doll with two sets of dresses, shoes, hat, and miniature clothesline. Many investigators have sex-typed these toys as feminine (Brown, 1956; Fagot and Patterson, 1969; Hartley and Hardesty, 1964; Rabban, 1950; Sutton-Smith *et al.*, 1963; Vance and McCall, 1934; Ward, 1963). On the other side were placed articles associated with *masculine aggression*, consisting of two dart guns with darts, a small target, a rubber

knife, plastic handcuffs, and a set of plastic cowboys and Indians (42 pieces, 2 in. tall each). This second set of toys had been sex-typed as masculine (Brown, 1956; Hartley and Hardesty, 1964; Sutton-Smith *et al.*, 1963; Walker, 1964). This toy table is abbreviated as "Affect Table" because the toys provide the opportunity for sex-typed affect expression—either maternal nurturance or masculine aggression.

The child's verbal behavior and play with these toys was recorded from behind a "one-way window" on a General Electric Tri-Pack closed-circuit television monitoring system. Simultaneously, the child's play and verbal behaviors were recorded from behind the "one-way window" by two observers on a multiple push-button response panel with two sets of keys for independent behavior rating. The response panel was wired to the Commercial Controls Corporation Motorized Tape-Punch, Model 2, which records key position every 1 sec on a Hewlett-Packard computer punch tape.

Procedure. Each time the subject came to the laboratory for a session, he was given the opportunity to play on the Dress-up Table for one 5-min play period and on the Affect Table for another 5-min play period. Each play period was separated from the next by a 2-min "break". The order in which the two tables were presented was randomized for each session. Each session was spaced from one to two days apart, on the average. By obtaining observational measures of masculine play and feminine play on the Dress-Up and the Affect Table, a multiple baseline was obtained over five or six sessions.

The experimenter led the subject into the experimental (play) room and gave these instructions: "When I leave the room, you may play with any of the toys on *this* table (pointing). Even though you will not see me, I can see you play; so, I will know if you are playing with this table or a wrong table. So remember, choose toys to play with from this table only."

The child was restricted by instruction to play with only one of the two toy tables present in

the room for two reasons. First, it was found that pilot normal subjects frequently mixed toys from the two tables in their play, complicating the scoring. If the subject was restricted to one toy table at a time, he had an equal opportunity to play with each set of toys, and the behavior was relatively easy to score. Secondly, the instructions provided the experimenter with an opportunity to tell the subject that he was in fact being observed, thereby avoiding deception. The subject was left alone in the room for 5-min, after which the experimenter re-entered the room and said: "Please put all the toys back on the table and come with me, now." The experimenter ignored the subject's questions and other verbalizations unrelated to the clarification of instructions.

After a stable baseline had been obtained, a noninteracting adult (a "probe" condition) was placed in the room while the child played on one of the tables. On the same day, the child played alone on the other table. The adult was instructed to watch passively as the subject played, and to defer any questions the subject might ask until after the play period. Immediately before leading him into the room for this condition, the experimenter instructed the subject: "This time your daddy (alternatively, mommy, or a stranger) will be in the room to watch you play. I told him/her *not* to play with the toys, but just to watch you play by yourself. Come with me into the playroom."

In all experimental conditions, the observer recorded appropriate play with masculine toys on the multiple push-button response panel by depressing key number 1 for the duration that the subject was in physical contact with a masculine toy and used the toy for its intended purpose; similarly, key number 2 was pressed for the duration of appropriate play with feminine objects. These two response categories were defined to be mutually exclusive; observers were instructed *not* to score (1) inappropriate play (*e.g.*, cross-gender role use of same-gender toy object, such as using the army belt for a bonnet), (2) feminine gestures, posturing, or gait, or (3)

play in which the subject was in physical contact with a toy from both classes of toys. This kind of objective behavioral observation in a free-play setting had been developed in detail by Lovaas, Freitag, Gold, and Kassorla (1965).

In order to obtain measures of observer reliability across several observers, three 20-sec time samples were recorded on videotape for each 5-min play period. A time sample was taken from each of the three successive 100-sec intervals, according to a schedule determined by a random numbers table. (The entire session was also recorded on audiotape, for complete transcription and scoring of verbal behavior.)

The reliability of the dependent play measures was determined by two procedures.

(1) Before this study began, three observers were already trained in a pilot investigation on normal boys and girls (4 to 7 yr of age) that used identical procedures and materials. Observer reliability was checked periodically throughout the present experiment by giving a second observer an independent set of response panel keys during the session. The recordings of both observers were scored parallel on the same computer punch tape. By this procedure, observer reliability data were collected and correlation coefficients were calculated for masculine behaviors between observers one and two and between observers two and three for 10-min sessions divided into 1-min segments; similarly, reliability coefficients were calculated for observations of feminine behavior between observers one and two and between observers two and three. The observers were aware of when they were being checked by a second *in vivo* observer; however, they were not aware of when the videotape samples were being taken.

(2) After all data had been collected in the laboratory setting, three previously untrained, naive observers scored randomly selected videotaped time samples for masculine and feminine behaviors. These observers were completely unaware of the research purposes, experimental conditions, and diagnoses of subjects (whether normal or patient). Correlation coefficients were

calculated separately for each behavior (masculine or feminine) on each table (Dress-Up and Affect).

Observational Measures in the Home

A daily behavior checklist was developed for Kraig to obtain reliable observational measures of his feminine behavior at home. The checklist form consisted of descriptions of frequently occurring feminine behaviors that were selected on the basis of the psychiatric referral information, interviews with the parents, and observations of the child's behavior by the investigators in the clinic and home settings.

Specifically, the descriptions of feminine behaviors on the daily behavior checklist for Kraig were (a) "plays with girls", (b) "plays with female dolls", (c) "feminine gestures", which included limp wrist, "swishy" hand, arm or torso movements, sway of hips, *etc.*, and (d) "female role play", which included impersonating or pretending to be female (like actress, mother, female teacher) when playing games (like "house", "school", *etc.*). Kraig's mother was instructed to observe and record her son's behavior for 10 min at four specific times daily, according to a schedule arranged with the experimenter. The recording was accomplished by placing a check after the description of each behavior observed during that time period. Observer reliability for this time-sampling procedure was checked once every three weeks throughout the study by home visits by research assistants. Reliability checks of this kind were made daily during the first three weeks of the procedure.

Treatment in the Clinic

After we had obtained baseline measures of the child's play in the clinic and home, we removed the Affect and Dress-Up Tables and began the treatment on the subject's play with a set of toys on what we called the "Therapy Table". This table contained toys that were different from those used on the Dress-Up and Affect Tables, because we wanted to use the

latter tables to assess generalization of treatment effect. The toys on the Dress-Up and Affect Tables will be referred to as the "generalization toys".

The toys on the Therapy Table most closely resembled those used by Rabban (1950) and the replication study by Sears, Rau, and Alpert (1965). The masculine-type toys were the following: (1) a plastic toy submachine gun with moving trigger, but silent; (2) a highway road scraper with adjustable blade; (3) a plastic race car with friction motor; (4) a plastic tugboat with moving helm and search light; (5) three miniature plastic soldiers; (6) a set of five small plastic airplanes; and (7) a plastic dump truck with moving dump mechanism. The feminine-type toys were the following: (1) a baby doll with feminine clothes and miniature nursing bottle; (2) a doll crib with moving side; (3) a doll bathinette; (4) two purses, one child size and one doll size; (5) a doll Baby-tenda (feeding chair); (6) a set of plastic toy tea dishes: two cups, two saucers, silverware, and a teapot; and (7) a wicker doll buggy with moveable canopy. The crib, bathinette, Baby-tenda, and buggy all had plain female infant dolls in them. The following criteria for uniform attractiveness were met by all the above toys: (1) all had at least one moving part, and (2) none had more than two distinct possible types of manipulation.

Both the mother and Kraig were seated next to the table, facing the mirror so as to allow the observers clear visibility of both. The mother wore a set of earphones that allowed the experimenter to communicate to her. Kraig's behavior on the Therapy Table was recorded in the same manner as had been used on the other tables.

The treatment procedure in the clinic. The procedure included several types of sessions: (1) baseline sessions, in which the child played with the generalization (Dress-Up and Affect) toys either alone or with an adult attending, (2) therapy sessions, in which the mother differentially reinforced the child's appropriate gender-related behaviors with the therapy toys, (3)

generalization sessions, in which the baseline conditions were replicated to assess the treatment effect with the generalization toys, and (4) reversal sessions, in which reinforcement contingencies with the therapy toys were withdrawn. Each type of session is described in detail and the ordering of the sessions is explained below.

Baseline sessions. Before the therapy sessions, we had obtained baseline data on the child's verbal and play behavior on the Dress-Up and Affect Tables described above. Two types of baseline sessions were obtained: (1) those in which the child was alone, and (2) those with an adult attending.

Therapy sessions. We treated the child in an attempt to extinguish feminine behavior and to develop masculine behavior. The mother and the child visited the clinic approximately three times weekly, for three 10-minute therapy sessions spaced over 1 hr. For each therapy session, the following conditions were in effect: the mother was instructed to wear her earphones and to sit with a large book in her lap. She was told to attend selectively to masculine verbal and play behavior by smiling to Kraig and complimenting him on his play, and to ignore feminine behavior by picking up the book to "read". She was told that more specific instructions would be delivered over the earphones, to enable her to carry out these general instructions effectively.

The experimenter led the child into the room and seated him in the child's chair so that he faced his mother. The child was then instructed: "You may play with any of the toys you like on the table (pointing), until I come back. You may talk with your mommy, too, if you want to. I'll be back in ten minutes." After 10 min, the experimenter re-entered the room and said: "Please put all the toys back on the table now, and come with me, Kraig." During the session, the mother was helped to extinguish feminine behavior (verbal and play) by instructions over the earphones such as, "stop talking to him now", "pick up the book and read", "ignore him now", "look away from him". Immediately after the mother's correct response, the experimenter

verbally reinforced that response; *e.g.*, "good", "great, that's what we want", "that's right", "excellent". Similarly, if the subject picked up a masculine toy when the mother was not watching, the experimenter instructed her, "quick, look at him now", or "talk to him now".

Initially, a large number of prompting instructions were given, in conjunction with a large amount of the experimenter's approval. After four sessions, the prompts were largely faded out. The reinforcement schedule was continuous for several more sessions before it also was thinned. When Kraig began tantrum or other uncooperative behaviors (he typically did when his mother ignored him), the experimenter was particularly supportive of the mother. In fact, when the mother first withdrew her attention for Kraig's feminine play, he put so much "pressure" on her (by alternating between crying and aggressing at her) to reinstate the attention, that we had to terminate the session and ask Kraig to leave for a minute. Before sending Kraig back to the playroom, we reassured the mother empathetically that she was doing the right thing and was doing it well, and that we would continue to be available in the observation room to assist her.

Generalization sessions. After six consecutive therapy sessions, we ran two types of generalization sessions in which the child played alone and in adult-attending conditions on the Dress-Up and Affect Tables. This test provided a measure of the extent to which the treatment had changed the child's behavior when he was alone with similar, but different, toys.

Reversal sessions. After the generalization sessions, Kraig and his mother were placed back into the therapy environment (with the Therapy Table), but the reinforcement contingency was removed. The mother was told to attend to all of her son's behavior indiscriminately. This allowed us to determine if the changes brought about by treatment were permanent or if they depended on continuing reinforcement. If the masculine behavior failed to extinguish after a criterion of seven of these sessions, we terminated

this treatment phase, being satisfied that the behavior change was reasonably durable. On the other hand, when the child's masculine behavior did extinguish, we reintroduced another set of therapy sessions. After retraining, generalization sessions and reversal sessions followed again.

Treatment in the Home

Before and during the treatment in the clinic, Kraig's feminine behaviors were recorded in the home with the daily behavior checklist described above. This time-sampling procedure provided a baseline before clinic treatment and provided a means to test for generalization of treatment effect from the clinic to the home. These measures taken in Kraig's home indicated that the clinic treatment did not generalize to the home, even though the mother was the therapist in the clinic. Therefore, we started a treatment program at home.

Kraig's mother was trained to mediate a token reinforcement system for her son at home. Both parents were asked to read Patterson and Gullion (1968), a programmed booklet for laymen explaining the application of reinforcement principles to childhood behavior problems. More detailed instruction on the administration of a token system was provided by the investigator. To assure that our instructions were accurately carried out by the parents, a research assistant was sent to the home for 45-min sessions at least three times weekly for four months to observe the parent-child interaction, and to answer questions regarding the practical "day-to-day" operation of the token system. In addition, the investigators met with the parents together twice each month, assuring them that we would be "on-call" at all times if any questions arose concerning Kraig's home treatment. We also assured the mother that she had treated Kraig well in the clinic, and that we had great confidence in her ability to serve as Kraig's primary therapist at home, which is the role she was in fact assigned.

The mother selected, with our consultation, a set of "back-up" reinforcers (*cf.* Sherman and

Baer, 1969) according to her boy's unique preferences for certain candies and rewarding activities (*e.g.*, TV time). Red and blue standard poker chips were used as "tokens". The blue tokens, which came to serve as secondary positive reinforcers (S^{r+}), could be directly exchanged by Kraig for the "back-up reinforcers" according to a "price list" set by the mother (*e.g.*, five blue tokens were required for a candy bar). The red tokens (S^{r-}) were discriminative for (a) a response-cost condition (*i.e.*, red tokens were subtracted from accumulated blue tokens), (b) a timeout procedure (*e.g.*, sitting isolated in a corner, being deprived of TV time), or (c) physical punishment by spanking from the father.

Before introducing the token economy system to the feminine behaviors, it was judged "clinically safer" to apply it initially to nongender behaviors in the home. This procedure had three purposes: (a) to test the mother's capability to manage the contingencies consistently, (b) to establish a clear discrimination between S^{r+} and S^{r-} contingencies for the child, and (c) to determine the strength of the S^{r-} contingency necessary to suppress an undesired behavior in this child.

The token system on nongender behaviors involved both S^{r+} and S^{r-} contingencies. Blue (S^{r+}) tokens were awarded for helpful, desired behaviors (*e.g.*, brushing teeth, washing hands before eating, eating all food on plate, chores). Red (S^{r-}) tokens were given for tantrums and disobedient behaviors (*e.g.*, slamming doors, "cursing" at mother, tracking dirt on carpet, disturbing baby sister, and breaking household objects). The mother was instructed to verbalize the contingencies to her son and to make careful daily records of the occurrence of both the desired behaviors and the disobedient behaviors, on special mimeographed forms we provided. Reliability of the mother's records was checked by comparing her records to those of a research assistant who made two visits weekly to the home. The mother was required to sign a written contract with the investigators that specified that continued treatment was contingent upon the

mother's success in carrying out two instructions: to take reliable observational data in the home, and to gain control over a nongender-related behavior.

After the token reinforcement system had been successfully applied to the child's nongender behaviors in the home, it was extended to gender-related behaviors. The mother introduced red tokens (S^r) for one particular kind of feminine behavior for a period of weeks. She was told to verbalize the new contingency and then apply it on a continuous schedule. We chose to apply the contingency to only one feminine behavior at a time because we wanted to avoid the possibility of "overwhelming" Kraig with too many aversive consequences at any one time. After the first feminine behavior had been suppressed for several weeks, the S^r contingency was then introduced to a second feminine behavior, in addition to the first. Similarly, the S^r contingency was extended to a third feminine behavior after the second had been suppressed. These successive interventions permitted a replication of the S^r contingency across behaviors in a multiple baseline design.

RESULTS

The treatment results on Kraig may be summarized as follows. Kraig's sex-typed behaviors in the clinic were strongly controlled by his mother's attention; his mother was trained to use her attention successfully in a therapeutic manner, so as to decrease feminine and increase masculine behaviors in the clinic. More than one feminine behavior had to be suppressed and more than one masculine behavior increased. Similarly, it was necessary to treat his behavior in more than one environment in order to observe the generalized change across situations found in the follow-up reports. When differential reinforcement was discontinued early in the treatment, Kraig quickly reverted to feminine behavior. With the continuation of treatment, the change in Kraig's behavior became more permanent. Follow-up data 3 yr after the treatment began

suggest that his sex-typed behaviors have become normalized. Since we treated Kraig first in the clinic and subsequently in the home, the results are presented separately by setting.

Treatment in the Clinic

The reliability data for the dependent measures were obtained from the recordings of independent observers in two procedures. A comparison of the recordings across observers indicated a high degree of observer reliability, whether calculated from the data obtained *in vivo* by two trained observers (procedure 1) or calculated from data obtained by "naive" observers viewing videotaped sequences (procedure 2). In both procedures, the Pearson "r" correlation coefficients were calculated for the categories of masculine and feminine behaviors separately between each pair of observers. For the purposes of calculation, the 10-min sessions were divided into ten 1-min segments, and the score for each consecutive 1-min segment was the number of seconds that the given behavior was recorded.

For observer reliability procedure 1, the correlation coefficient between observers one and two was 0.98 for masculine behaviors across sessions, and 0.99 for feminine behaviors; between observers two and three, the correlation was 0.99 for masculine behaviors and 0.94 for feminine behaviors. For reliability procedure 2, the correlation coefficients between "informed" observer three and "naive" observers four, five, and six ranged from 0.93 to 1.00, with a median of 0.97, indicating a high degree of agreement between pairs of observers.

The detailed results for Kraig's treatment in the clinic are presented in Figure 1, which shows sex-typed play and verbal behavior. Results are presented in groups of sessions by experimental condition.

Baseline: Sessions 1 to 16. In all types of baseline sessions, Kraig's play behavior was almost exclusively feminine. Figure 1 shows his feminine behavior to be at 100% in almost all sessions, while his masculine behavior lies around

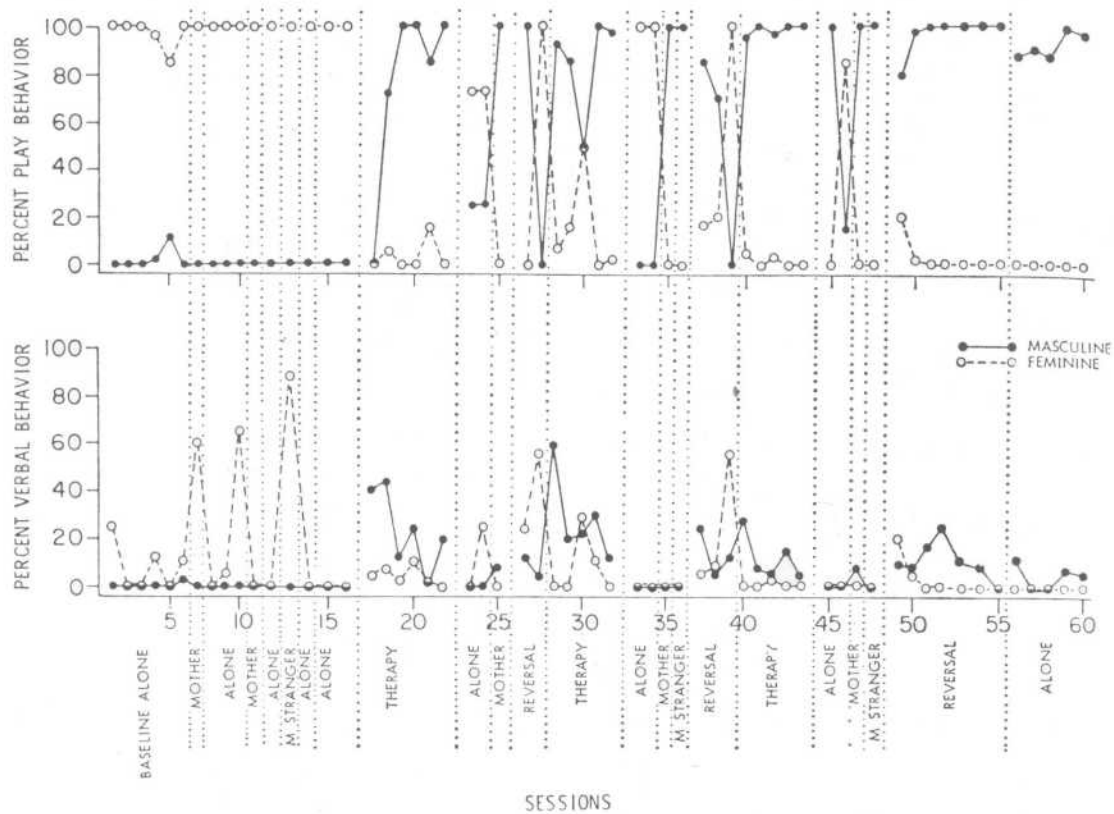


Fig. 1. Per cent feminine and masculine play and verbal behavior as a function of mother's social reinforcement contingency in the clinic playroom.

0%. As is given on the abscissa, the baseline consisted of three types of conditions: (1) alone condition, (2) play with mother present, and (3) play with male stranger present. No differences were found in Kraig's play, whether he was alone or with either of the adults, or whether he played on the Dress-Up or Affect Tables. The data for the two generalization tables (Dress-Up and Affect Tables) were averaged together for each session (1 to 16).

Therapy: Sessions 17 to 22. When the mother introduced the differential reinforcement with Therapy Table toys, an immediate decrease in Kraig's feminine play and an immediate increase in masculine play was observed.

Generalization test: Sessions 23 to 25. We withdrew the Therapy Table and introduced the generalization toys (Dress-Up and Affect Tables). We ran two kinds of generalization

test sessions with the new set of toys: (a) play alone (Sessions 23 and 24), and (b) play with mother present (Session 25). We found some, but limited, generalization during the alone conditions. (These sessions were different from treatment in that he was both alone and with different toys.) The treatment effect *did* generalize completely when the mother was present, even though the toys required a different set of behaviors. Kraig's masculine behaviors in Session 25 contrast markedly to the pretreatment baseline (Sessions 7 and 11) where his play was feminine.

Reversal: Sessions 26 and 27. We placed Kraig and his mother back into the room with the Therapy Table toys and withdrew the therapeutic contingency. In this condition, the mother was instructed to attend to all of her son's behaviors indiscriminately. By Session 27,

Kraig's masculine play behavior had extinguished. His feminine behavior rose to the baseline level.

Second set of therapy sessions: Sessions 28 to 32. When the reinforcement contingency was introduced by the mother for the second time, Kraig resumed masculine play behavior. This finding does, of course, provide the additional evidence needed to infer the effectiveness of the treatment variable.

Second set of generalization test: Sessions 33 to 36. After the second set of therapy sessions, we tested for generalization a second time. The findings in the second set of generalization tests (Sessions 33 to 36) exactly replicated the findings in the first set (Sessions 23 to 25). Specifically, Kraig's play was totally masculine with the generalization toys in his mother's presence, but his play was exclusively feminine with those toys when alone. Again, the treatment was found to be specific to the mother's presence, showing the situational nature of the treatment effect.

After obtaining this evidence that the treatment effect had generalized to play on a different set of toys in the mother's presence, we tested for generalization of treatment effects to the presence of a male stranger. In the baseline (Session 13), Kraig's behavior was exclusively feminine in the company of a male stranger. This time, however, when a male stranger was introduced (Session 36), Kraig's play was exclusively masculine. This indicated generalization of the treatment effect across two stimulus variables: (a) to a different set of toys than used in therapy, and (b) to a different adult figure than the therapist. At this point in his treatment, however, he remained feminine when alone.

Second set of reversal sessions: Sessions 37 to 39. During the second set of reversal sessions, Kraig's masculine behavior extinguished when the reinforcement contingencies were withdrawn, and his feminine behavior increased. This replicated the first reversal sessions (26 and 27). In the absence of continued differential reinforcement, Kraig's behavior returned to the baseline level of feminine play.

Third set of therapy sessions: Sessions 40 to 44. This third set of therapy sessions resulted in a quick return to predominantly masculine behavior.

Third set of generalization test: Sessions 45 to 48. After the third set of therapy sessions, generalization tests were reintroduced. After previous treatment sessions, we had found generalization of treatment effects to play in the presence of the mother and male stranger, but not in the alone condition. Replicating previous generalization tests, Kraig's behavior was exclusively masculine in the presence of the mother and male stranger (Sessions 47 and 48 respectively). Unlike previous generalization tests, however, Kraig's play was now totally masculine when alone with the generalization toys (Session 45). However, his play returned to feminine in Session 46.

Third set of reversal sessions: Sessions 49 to 55. Kraig had had three sets of treatment sessions to this point. Now, when his mother withdrew the differential reinforcement contingency, the appropriate masculine behavior persisted, being evidently resistant to extinction. At this point, the clinic treatment was terminated because we had sufficient evidence to conclude that (a) the changes in Kraig's sex-typed behavior were a function of the reinforcement contingency, and (b) the behavior change had some permanence in the mother's presence after removing the treatment conditions.

Final generalization test: Sessions 56 to 60. Through the course of treatment, the data indicated strong generalization of treatment effects to play with the generalization toys in the presence of adult figures. In contrast, we had only weak evidence for generalization to those situations where he was alone. This, of course, may suggest that he was "going underground" with his deviance, suppressing femininity in the company of adults. However, with increasing treatment there appears to be increasing generalization of the treatment effects. We can observe the beginning of such behavior by the third set of generalization test sessions. By the

fourth set of generalization sessions, his play was exclusively masculine (Sessions 56 through 60).

On the basis of our data alone, we cannot determine the causal factors involved in this generalization effect. We could, in fact, have found the opposite—namely, increasingly quick behavioral reversals (decreasing generalization) with increasing number of reinforcement reversals. A partial explanation for the generalization effect may be derived from Kraig's verbal statement at the beginning of Session 56; upon entering the room, Kraig said aloud, "I wonder which toys I will play with. Oh, these are girls' toys here, I don't want to play with them". Then Kraig commenced to play with the masculine toys. This spontaneous verbal labelling may, in part, account for Kraig's masculine play from that time on. However, in order to claim increasing generalization as a function of additional therapy, we need further replication across other subjects.

We are confident that the changes in sex-typed play were a function of our treatment variable, since we replicated the effect of the treatment in our experimental, intrasubject reversal replication design. It is concluded that Kraig's sex-typed behavior was a function of the differential reinforcement contingency that constituted the treatment.

Control over sex-typed verbal behavior. We made a transcript of Kraig's verbal behavior from the complete audio tape recordings made for each experimental session. Since sex-typed verbal behavior was minimal or absent in many sessions (particularly in the "alone" condition), no formal analysis of these data is offered here. While the verbal behavior generally tended to follow the qualitative changes occurring with the nonverbal play behavior (*i.e.*, with respect to the masculine-feminine dichotomy), the positive correlation between masculine nonverbal and masculine verbal behavior was weak; the correlation between feminine nonverbal and feminine verbal behavior was also weak. Perhaps the variables that control verbal behavior in this

setting were too numerous and complex for systematic investigation with the present experimental procedure.

Treatment in the Home

A high degree of observer reliability was obtained for the dependent measure involving the daily behavior checklist. To determine the level of observer reliability, a comparison was made of the data obtained from independent time-sampled recordings on the home behavior checklist made by Kraig's mother and a research assistant. The percentage of agreement on the occurrence of checklist behaviors was calculated weekly between the mother and research assistant. (Agreement on the nonoccurrence of checklist behaviors was *not* included in the calculation, in order to obtain an accurate measure that would not be artificially inflated in cases where the behaviors occurred at extremely low frequencies.) The percentage of agreement between Kraig's mother and the research assistant ranged from 87 to 100%, with a median value of 94%.

Figure 2 indicates the baseline rate of four separate feminine behaviors at home for four weeks before he received any treatment. During this baseline period, "play with girls" and "feminine gestures" occurred at a relatively high frequency (between 18 and 70%), while "play with dolls" and taking "female role in play" occurred at a more moderate frequency (between 0 to 12%). These four activities were the most pronounced feminine behaviors that Kraig displayed at home.

Beginning with week number five, the token reinforcement system was applied to nongender behaviors. Beginning with week number seven, the clinic treatment for feminine behaviors was applied. Both of these interventions continued through the eleventh week. Figure 2 indicates that no systematic change in feminine behavior at home could be attributed to either one of these interventions.

The token system did increase Kraig's helpful, desired behaviors (*e.g.*, brushing teeth, washing

hands before eating, eating all food on plate, chores). But his tantrums and disobedient behaviors were not significantly suppressed with the application of red tokens (S^{r-}), which were backed up by the response-cost condition, the timeout procedure, or both. The disobedient behaviors *did* sharply decrease, however, when the red tokens were backed up by spanking. Kraig was told that he would get one "swat" from his father for each red token he collected. After receiving two swats in this manner for red tokens he had received while engaged in nongender-related behaviors, Kraig carefully avoided receiving but a few red tokens from that time on, even though the treatment was to persist for more than half a year.

After the clinic treatment had been completed (at the end of the eleventh week), the token system at home was extended to gender-related behaviors (in the twelfth week) with the

introduction of red tokens (S^{r-}) for Kraig's "play with dolls". As indicated on Figure 2, "play with dolls", which had varied between 0 and 15% during baseline, decreased completely and remained at the zero rate every week after this contingency was introduced. However, "feminine gestures" and "play with dolls" continued at a rate comparable to the baseline weeks. Apparently, we could suppress feminine doll play without affecting other feminine behaviors. "Female role play" decreased to zero during baseline (at week 10), two weeks before the S^{r-} contingency for "play with dolls" was introduced. It is unclear why "female role play" ceased; the data are inconclusive and no firm conclusion may be drawn regarding the variable controlling "female role play".

At week 21, red tokens (S^{r-}) were introduced for "feminine gestures". Feminine gestures had varied between 0 and 50% during baseline, and

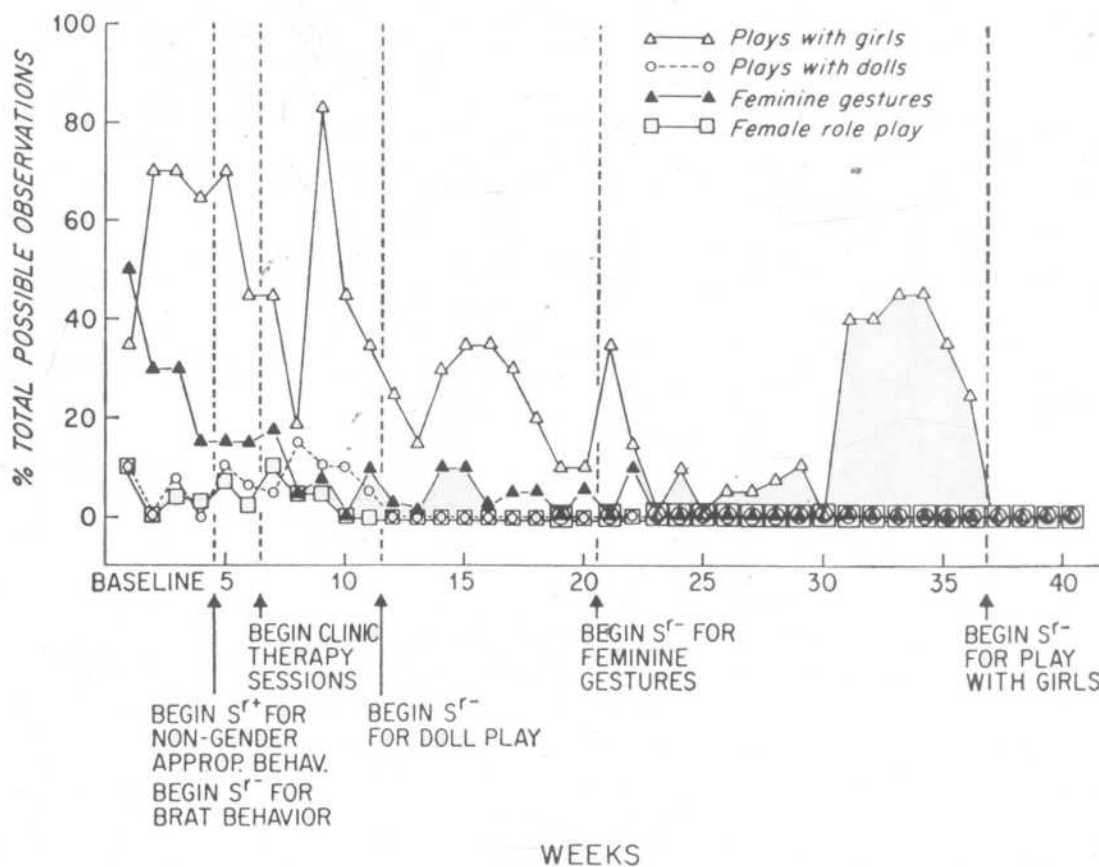


Fig. 2. Per cent feminine behavior per week as a function of token reinforcement intervention in the home.

although they may have been gradually decreasing in frequency, they persisted after 20 weeks of observation. When we applied the red tokens to the feminine gestures, they dropped to zero and, with the exception of week 22, stayed at zero in subsequent observations. Before the introduction of red tokens, there were only two isolated weeks out of 20 in which feminine gestures were not observed; in contrast, feminine gestures were at zero for 20 of the 21 weeks after the intervention. Note that "play with girls" was unaffected by the contingencies for "doll play" and "feminine gestures".

The final S⁻ intervention began at the thirty-seventh week, with the introduction of red tokens for "play with girls". Kraig responded quickly to the new contingency and ceased to play with girls for the remaining weeks with this contingency. Because of the replication of treatment effects across behaviors, we are reasonably sure that our reinforcement contingency was the variable responsible for the suppression of the feminine behaviors.

Informal Clinical Observations

At the end of the formal 10-month treatment program, and 26 months after termination of the formal treatment, reports from Kraig's parents, neighbors, and school teacher concurred that he was indistinguishable from any other boy in terms of gender-related behaviors. We also sent one research assistant to Kraig's home environment and another assistant to his school to make recorded observations of his sex-typed behavior. The assistants were total strangers to Kraig, thus eliminating any possibility that they would be associated by him with our treatment program. The observations of the assistants concurred with the reports of the teacher and parents, providing evidence for the stability of the therapeutic effects. None of Kraig's pre-treatment feminine behavior was reported in these follow-up observations.

Improvement was also reported in Kraig's relationship with his father, brother, and male peers. Before treatment, Kraig would passively

allow his brother to tease him without asserting himself in return; in contrast, follow-up observations indicated that Kraig now regularly returned aggressiveness in his male peer interaction. Before therapy, Kraig was a "crybaby", being afraid to hurt himself in rough games; after the reinforcement therapy, Kraig was playing with "rough-neck" Kenny next door to the extent that Kraig was acquiring Kenny's mildly destructive and reckless behaviors. Interestingly enough, Kraig's mother began to complain to us that her son had become a "rough-neck" and was thereby in danger of getting hurt in reckless play as well as endangering furniture and other household items. We reassured the mother that such "mildly delinquent" behavior was much easier to correct in future years than feminine behaviors would be. Before treatment, Kraig and his father did not enjoy each other's company, but after treatment, Kraig became interested in weekend camp-outs and weekly "Indian Guide" club meetings with his father. His mother reports that Kraig now looks "more like a typical boy" in his appearance, since he is no longer "fussy" about color-coordinating his clothes and keeping his hair neat; unlike his behavior before treatment, Kraig now likes to wear bluejeans, tennis shoes, and boots, and he no longer complains when his hair is messed up. Kraig's feminine behaviors have apparently ceased entirely, and he has developed some masculine behaviors in their place. However, our clinical impression is that he may still be less skilled in some desired masculine play behaviors (*e.g.*, throwing, catching, and batting a softball) than his same-aged peers.

The durability of the treatment effects (the effects gave every evidence of being permanent some 26 months after treatment was formally terminated by us) was probably a function of the mother's acquired skills in behavior modification, which extended the treatment program indefinitely on an informal basis throughout Kraig's environment. Before therapy, the mother had felt personally responsible for Kraig's pathology and she reported considerable

guilt feelings, worthlessness as a mother, and confusion about what to do. After the treatment, however, she felt as though she had been able to help actively by being the therapist, and acted with considerably more confidence and assurance.

DISCUSSION

There is no doubt that our treatment intervention produced a profound change in Kraig. When we first saw him, the extent of his feminine identification was so profound (his mannerisms, gestures, fantasies, flirtations, *etc.*, as shown in his "swishing" around the home and clinic, fully dressed as a woman with long dress, wig, nail polish, high screechy voice, slovenly seductive eyes) that it suggested irreversible neurological and biochemical determinants. At the 26-month follow-up he looked and acted like any other boy. People who view the videotaped recordings of him before and after treatment talk of him as "two different boys". We will offer some specific evaluation of our data in terms of their contribution to the treatment of severe deviance in childhood sex-role behavior. Then we will conclude by indicating the limits of current understanding regarding the treatment of profound gender role problems.

Treatment Data

From the social learning framework, it might be expected that the therapeutic reinforcement contingency would result in an acquisition learning curve for masculine behavior, with an extinction curve for feminine behavior. The long clinical history of Kraig's cross-gender behavior suggests that the acquisition of masculine behaviors and the extinction of feminine behaviors might be a very gradual process, necessitating complex shaping procedures to establish a verbal repertoire of predominantly masculine themes and to establish masculine patterns of play behavior. This would hold true if the boy had, in fact, a genuine *behavioral deficit* in the area of

gender-appropriate play and verbal responses. The clinic data for Kraig suggest, in contrast, that some appropriate masculine play and verbal behaviors existed in the child's behavioral repertoire before treatment began. The immediate change to gender-appropriate responses with the instatement of the therapeutic reinforcement contingency most likely represents Kraig's discrimination of the reinforcement contingency. The immediate reversal to feminine responding with the removal of the contingency is more characteristic of stimulus control rather than reinforcement control.

We found relatively little evidence for response generalization. The treatment was largely specific to the behavior to which it was applied. There were two possible exceptions to our data: (1) "Female role play" for Kraig might have been suppressed by our treatment of "doll play". The evidence is equivocal, however, since "female role play" occurred so infrequently during the initial baseline period and actually ceased for the two weeks immediately before treatment for "doll play". We have no real evidence, therefore, for any generalization of treatment across behaviors in the home. (2) In the clinic, we found some generalization across behaviors, as that which occurred from the Therapy toys to the Affect and Dress-Up toys. However, only weak generalization, if any, was found to these (Affect and Dress-Up) toys in the "alone" play condition. This suggests that it was the mother who facilitated response generalization. Additional research is needed to determine the treatment conditions under which maximal response generalization may be obtained.

Just as we observed limited response generalization, we also found limited stimulus generalization. For example, even though the mother became discriminative for his masculine behavior in the clinic, this stimulus control did not generalize to the mother's presence in the home. In one situation, we did find evidence for generalization of treatment effects across stimulus environments: within the clinic, across social stimulus conditions, from the mother to strangers.

In general, it may be concluded that the treatment effects tended to be narrowly specific to the particular stimulus environment in which they were introduced. When generalization did occur, however, it was where it would be most expected: where the stimulus environments were quite similar. These findings are consistent with Wahler's (1969) study (among several others) which found the effects of child behavior therapy to be setting-specific; Wahler reported that treatment effects in the home did not generalize to the same behaviors in the school.

To facilitate optimal therapeutic effects, therefore, it became necessary to treat each feminine behavior individually in the major settings in which they occurred. This implies that the traditional delivery model of psychological services, that limits itself to "office visits" by the patient, ought to have only limited effects on childhood cross-gender problems. For optimal effects, aspects of the young child's entire environment must be changed; this consideration makes it necessary for parents to serve as the therapeutic agents in the natural environment. In Kraig's case, treatment was very extensive, involving numerous home visits by clinic staff and the maintenance of a "24-hour" therapeutic environment over an extended period of time. This unusually intensive treatment required the sustained efforts of the mother, active cooperation from the father, and frequent home consultation from the clinic staff.

It is possible that the amount of response generalization obtained (like the amount of stimulus generalization) is a function of which particular response in treated and the particular treatment setting selected. For example, treating peer-play at home might produce more generalization than treating doll-play in the clinic. Our treatment of Kraig raises these issues for further research.

Clinical Implications

At this time, we have similar boys in treatment with similar therapy outcomes (*cf.* Rekers, unpublished; Rekers and Lovaas, 1971, *unpub-*

lished). Therefore, we have some confidence that our treatment results will generalize across children, particularly if these children are quite young (less than 7 yr of age).

However, it is wise to entertain two reservations. We do not know yet the extent to which we have produced changes in future preference for sex mates. Perhaps preference for sex mate is a response that is independent of the ones we treated. Only follow-up evaluations on these children at 15th to 20 yr of age will help to determine that. Only such data will allow us to claim a preventative treatment for extreme adult sexual deviations of transvestism, transsexualism, or some forms of homosexuality.

One should also be aware that there exists at present no other objective or systematic work on environmentally induced changes in childhood sex-role behavior that could serve to replicate our findings, although these are case histories of such changes (Bentler, 1968; Green, Newman, and Stoller, 1972; Myrick, 1970; Stoller, 1970). The sparsity of controlled research on the subject led Mussen (1969) to observe that "... there are no definitive studies relating reliable and objective observations of parental rewards and punishments to children's sex-typed behavior" (pp. 714-715). The present investigation of reinforcement control over cross-gender behavior in a male child appears to be the first experimental study on the subject of childhood cross-gender problems. The only study that parallels it was published recently (Barlow *et al.*, 1973), and relates a behavioral treatment approach that successfully changed the sex-role behavior and gender identity of an adult transsexual. This study is apparently the first successful treatment of adult transsexualism, and the intrasubject replication design employed provided conclusive evidence that the treatment procedures were responsible for the recorded changes. One can entertain some optimism about behavioral treatment of gender role problems, but until more cases are reported, one can only entertain the most tentative hopes that such an effective treatment has been isolated.

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