

ASSESSING AND IMPROVING CHILD CARE: A PERSONAL APPEARANCE INDEX FOR CHILDREN WITH AUTISM

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An index of children's physical appearance and personal care was developed and used to assess youngsters with autism who lived (a) at home, (b) in an established group home, (c) in new group homes, and (d) in a large institution. Subsequently, a multiple baseline design across participants documented major changes in personal appearance and cleanliness when children moved from an institution to community-based, family-style group homes. Finally, data-based feedback generated by the appearance index was used as a training tool enabling group home staff to further improve child appearance. This research demonstrates how an evaluation instrument can be used to obtain comparative data, measure some effects of different residential placements, and provide ongoing feedback to caregivers to promote high standards of personal care among persons with severe developmental disabilities.

DESCRIPTORS: assessment, autistic children, evaluation, feedback, social validation

Assessment of the properties of group care environments is an applied behavior analysis tradition. Investigators have developed procedures for evaluating infant and toddler centers (O'Brien, Porterfield, Herbert-Jackson, & Risley, 1979; Twardosz, Cataldo, & Risley, 1974), day-care settings (Doke & Risley, 1972; LeLaurin & Risley, 1972), classroom arrangements (Krantz & Risley, 1977; Greenwood et al., 1984), recreation programs (Pierce & Risley, 1974), nursing homes (McClannahan & Risley, 1974, 1975), institutions (Cataldo & Risley, 1974; Homer, 1980; Repp & Barton, 1980), and group homes (Kirigin, Braukmann, Atwater, & Wolf, 1982; McClannahan, Krantz, McGee, & MacDuff, 1984; Rotholz, MacDonald, & Foster, 1988). Overall, these investigations suggest that some very powerful interven-

tion strategies may result from the manipulation of antecedent variables (e.g., physical and interpersonal environments).

Even a casual observer may note that the personal appearance of people with severe developmental disabilities varies considerably across environments. Although children in some settings have clean fingernails and buttons on clothing, in other settings youngsters with similar disabilities appear dirty and unkempt. Findings from the developmental literature suggest that these differences are important because physical attractiveness can influence acceptance by peers, adults, and teachers (Dion, 1972; Felson, 1980; Lerner & Lerner, 1977). Furthermore, Nutter and Reid (1978) noted that type of clothing, style of dress, and physical appearance may have a major impact on handicapped persons' opportunities for community participation. Physical appearance may also contribute to perceptions of social acceptability, thus influencing whether people with developmental disabilities are targets for prejudice and discrimination (McClannahan & Krantz, 1985). As a result, it may be important to include

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assessment of appearance and cleanliness in evaluations of programs for persons with severe disabilities.

Unfortunately, little has been written about the personal appearance, clothing, or cleanliness of clients with developmental disabilities. Doke (1976) provided an example of an appearance checklist that could be used to assess children's self-care skills. Horner (1980) examined self-directed adaptive behaviors (including buttoning, snapping, brushing, combing, and dressing) of 5 women with profound retardation and found no differences between an austere dayroom condition and a condition in which the dayroom was enriched with materials. Repp and Barton (1980) measured eight clusters of staff behavior in institutions for persons with retardation; their categories of physical assistance and custodial guidance included instructing or guiding clients through tasks such as dressing and shoe tying. Physical assistance occurred infrequently and was no more likely to be observed in licensed than in unlicensed facilities.

The research reported here was conducted in three phases. First, an observational procedure for assessing personal appearance was developed and used to evaluate children with autism who (a) lived in a large institution and were later moved to new group homes, (b) lived in an established group home, and (c) lived at home with their own families. Second, repeated measures of child appearance were obtained as institutionalized children moved from a large residential facility to newly developed community-based group home programs. Finally, the appearance index was used as a feedback tool to determine whether further improvements in child appearance could be achieved for the youngsters in the new community placements.

COMPARATIVE DATA

METHOD

Participants

Children who moved from the institution to group homes. This group was comprised of 12 children who, before the study began, had received

medical diagnoses of autism and were in a special autism unit in a large institution. They had been in this setting for 2 to 9 years ($M = 6$ years). At the outset, the 9 boys and 3 girls ranged in age from 8 to 16 years ($M = 13$ years). Formal assessment data in their case records showed moderate to profound retardation, with Vineland Social Quotient Scores ranging from 20 to 45 ($M = 32$). Selection of these children for group-home placement was a state administrative decision, prompted by a class-action suit that led to a court order for deinstitutionalization. By Session 2, 2 of the 12 participants had moved to the new homes; by Session 9, there were 10 children in the homes and 2 remaining in the institution. These transitions were not gradual; rather, on a scheduled day, a child and his or her personal effects were moved from one setting to another. Decisions about when children moved and which home they entered were made by the administrators of the new group homes and were based upon considerations of staff availability, staff training, and the status of necessary home renovations.

These participants displayed multiple, severe skill deficits and behavior problems. Six were not toilet trained, 6 were aggressive, and 8 were self-injurious. Nine of the children had no functional speech; the others used a few words or phrases. Like many youngsters with autism, they displayed tantrums; noncontextual laughing, crying, and vocal noise; and a broad range of stereotypies, including rocking, hand flapping, and finger play. Unprompted social interaction was limited mainly to requests directed to caregivers (e.g., "I want _____"), and appropriate peer interaction was absent.

Children who lived in an established Teaching-Family Model group home. The 5 boys who lived in the established group home ranged in age from 8 to 16 years ($M = 14$ years). When this research began, the home had been in operation for 3 years, and children and youths had been in residence for 1 to 3 years ($M = 2.8$ years).

Prior to group-home entry, the children's referral agency arranged medical evaluations that resulted in diagnoses of autism and moderate to severe retardation. Their Vineland Social Quotient Scores

at the beginning of the study ranged from 36 to 68 ($M = 56$). Like the institutionalized youngsters, these children exhibited severe skill deficits and behavior problems. Prior to program admission, all 5 were aggressive, 4 were self-injurious, 2 were not toilet trained, 3 had no functional expressive language, and 2 displayed delayed echolalia and perseverative noncontextual speech. At the time of the study, most social communication was prompted by caregivers; appropriate spontaneous interactions were limited to mands such as "candy" or "I want juice," or to responses that had been specifically taught (e.g., "Hi," "thank you"). Their individualized programs at the time of the study targeted self-care skills, speech, and home-living and leisure activities, as well as problem behaviors such as hitting and kicking, destructive behavior, and stereotypes.

Children who lived with their natural parents. The 4 boys and 1 girl in this group lived at home with their own families but attended the same school program as the children and youths who lived in the established group home. They ranged in age from 7 to 12 years ($M = 9$ years) and had been enrolled in the day school and treatment program for 1 to 5 years ($M = 3$ years). Prior to enrollment, medical diagnoses of autism had been conferred pursuant to evaluations arranged by their referral agencies. They were randomly selected from a pool of 10 students who were 7 years or older and were not group-home residents. Their most recent Vineland Social Quotient Scores ranged from 52 to 116 ($M = 75$). At admission, 3 of these children were not toilet trained, 3 were aggressive, 3 were self-injurious, 2 had no speech, and 3 engaged in perseverative or noncontextual speech. Their individualized programs focused on visual attending, expressive language, social approaches, self-care, and leisure skills, as well as aggression, self-injury, and stereotypes.

Written informed consent was obtained from the parents or guardians of all participating children; consent forms stated that children's appearance would be periodically evaluated, but details about personal appearance index items and days of observation were not specified. Institutionalized

children whose parents could not be located were not included in the study.

Settings

Schools. Initially, the 12 institutionalized children attended school at their residential facility. As they were moved to the group homes, they were enrolled in a state-operated community-based school. Their classrooms were located in a public school building that also contained separate space for typical children. By the end of the study, the community-based school served all 12 target youngsters, as well as 8 other children with autism.

The 5 participants who lived in the established group home and the 5 youngsters who lived with their parents attended a private, nonprofit, community-based school. During the period of study, the private school served an additional 9 children with autism ($M = 19$).

Residences. Initially, the 12 institutionalized participants shared their living quarters with 7 other youths. Their locked ward included a dayroom, a small number of play materials, a nurses' station, communal bathrooms with multiple toilet stalls and semienclosed showers, and shared bedrooms located along a hallway. Personal possessions and decorative furnishings were absent. The children were assisted with bathing and dressing by shift-staff child-care workers. They went to a dining hall at mealtimes, where they were draped with sheets, seated at cafe-type tables, and provided with spoons while kitchen workers served food to each youngster.

The established group home was based on the teaching-family model (Maloney, Fixsen, & Phillips, 1981; Phillips, Phillips, Fixsen, & Wolf, 1974; Watson, Maloney, Brooks, Blase, & Collins, 1980). Bedrooms, bathrooms, kitchen, dining room, living room, and recreation room contained typical home furnishings. The boys received instruction in table setting and meal preparation, and family-style meals were served at the dining room table. Staff members ate meals with the children, helped them engage in personal hygiene activities, and assisted them with dressing. Art work, personal belongings, holiday decorations, pictures, and plants were in evi-

Table 1
Personal Appearance Index

Item/Definition	
1. Hair clean	Hair is free of lint, foreign materials, and excessive oil. Exceptions: Dry scalp, dandruff, barrettes, hairbands.
2. Face clean	No dirt, food, or mucus is visible on face. There is no more than one piece of lint or "dust" on face. No body secretions, either wet or dry, are visible on face (e.g., no saliva around mouth, no secretions around eyes or in corners of eyes). Exceptions: Do not score chapped lips, chapped skin, or sores as dirt on face. Do not score mucus in or on nose in this category.
3. Nose clean	Nose is not running. No wet or dry mucus is on nose or visible inside nostrils.
4. Clean shaven	No beard, beard "shadow," mustache, or long facial hairs are visible. Exceptions: Score NA if the participant is female, a male too young to have a beard, or a male whose beard or mustache appears "planned."
5. Hands clean	No dirt or other foreign matter is visible on palms, backs of hands, or fingers. Exceptions: Do not score stained hands or dirty fingernails in this category.
6. Hands unstained	No patches of brown or orange stain are visible on palms, backs of hands, or fingers. Exceptions: Do not score sores, scar tissue, chapped skin, or dirt in this category.
7. Nails clean	No dirt or foreign matter is visible under or on fingernails.
8. Nails clipped	Fingernails are of approximately the same length, measured in relation to one another. Edges of nails are smooth.
9. No sores	There are no sores, cuts, scratches, abrasions, lesions, scabs, or bruises on face, head, or portion of neck that is visible. Exceptions: Do not include sores on any part of the body other than face, head, and neck. Do not include chapped skin (but do include lesions that appear to result from chapped skin). Do not include the sequela of tuberous sclerosis, birthmarks, moles, or warts.
10. Shoes tied	Laces pass through every eyelet to the tops of both shoes, and are tied in bows. Exception: Score NA if shoes do not require laces.
11. Socks match	Both socks are present, and are of identical color, weave, and style. Score NA for girls wearing tights or panty hose.
12. Clothing dry	No wet spots are visible in crotch of pants or on front or back of dress or skirt. (Score only on the basis of visual examination.)
13. No rubber pants or diapers	The presence or absence of rubber pants or diapers is determined by turning down 1 inch of a waistband at a side seam. If a garment has no waistband (e.g., a dress or robe), score NA.
14. Belt present	A real belt (not a substitute such as twine or rope) is present, is inserted through all belt loops, and is buckled or appropriately fastened. Score NA if clothing has no belt loops.
15. Clothing fastened	All buttons, snaps, hooks, buckles, and zippers are completely fastened. Zippers are zipped to within one-half inch of the top and locked. Safety pins substituted for fasteners are closed, and the edges of the pinned clothing overlap. Exceptions: Do not score decorative buttons (i.e., buttons that have no matching button holes). Two buttons at the front neck of a shirt may be unbuttoned. Score NA if clothing has no fasteners.
16. Fasteners present	All buttons, snaps, hooks, buckles, and zippers that were originally present are still present and functional; there are no broken buttons, zippers, or other fasteners. No safety pins, rags, or other objects are substituted for fasteners. Score NA if clothing has no fasteners.
17. Clothing untor	There are no tears, rips, holes, or fabric pulls on clothing or shoes. Pant legs are not frayed.

Table 1
(Continued)

Item/Definition
18. Clothing unstained No dirt or stains are visible on clothing. Exceptions: Do not score stains on shoes. Do not score urine stains in this category.
19. Clothing fits Length: Skirts, dresses, and pant legs do not touch the floor, and there is no more than a 3-inch gap between pant legs and tops of shoes when the wearer is standing. Width: The waistband of the garment completely encompasses the wearer's waist. Note: If the waistband is elastic, score length only.
20. Clothing matches Items of clothing have no more than one pattern (e.g., plaid, paisley, stripes), or two or more patterns are coordinated in terms of color and/or design.

dence, and leisure materials were readily accessible, as in most families' homes.

As the 12 residents of the institution were relocated, they sequentially entered three family-style, community-based group homes that were also based on the Teaching-Family Model. Their living environments were similar to the established group home described above.

The 5 children who lived with their own parents resided in single-family dwellings in medium-income neighborhoods. Parent liaisons, who regularly visited the homes, reported that each of the youngsters had his or her own bedroom or shared a bedroom with one sibling. Parents and children ate meals together around a single table, and parents helped children with bathing and dressing tasks.

Observation rooms. All observations occurred in children's school settings (the residential school, the public school, or the private school) during the first 90 min of the school day (9:00 a.m. to 10:30 a.m.). This time limit on observation was designed to minimize changes in child appearance that might occur during the day as a result of events such as fingerpainting, lunchtime spills, or toileting accidents. In each school, a well-lighted, enclosed, and otherwise unoccupied office was selected as an observation room, so that teachers and care providers would remain uninformed regarding the purposes and procedures of the study.

Measurement Procedures

The Personal Appearance Index (PAI). A 20-item observation instrument was developed for the

purpose of assessing children's appearance. This index was designed to evaluate cleanliness, clothing adequacy, and personal care. During a pilot phase, definitions were constructed, observations were made on children with autism other than those who would later serve as participants, examples of inclusion and exclusion were developed, definitions were refined, and additional data were collected. The final items were selected because pilot data indicated that independent and uninformed observers could obtain acceptable levels of interobserver agreement. The 20-item index is shown in Table 1.

Observation procedures. When a child's appearance was to be assessed, an observer escorted the youngster from the classroom to the observation room. During the evaluation, which lasted 5 to 10 min, two observers placed their clipboards and covered data sheets at opposite ends of the observation rooms (the smallest of which was approximately 8 m by 11 m). The primary observer invited the child to "Sit down" in a chair placed in the center of the area (Items 1 through 11); to imitate the primary observer's models of "palms up" and "palms down" (Items 5 through 8); and to "Stand up" in front of the chair (Items 12 through 20). Children who did not follow these instructions received graduated physical prompts and/or guidance, and behavior-specific praise was delivered for both prompted and unprompted responses. No other instructions or consequences were delivered, and observers made no alterations in child appearance.

The order of observations was determined by the order of items on the appearance index. After

a visual examination, observers walked to opposite ends of the room, scored their data sheets, and returned to the center of the room to observe the next item. The primary observer determined the length of observation for each item (approximately 5 s) and ended each observation period by walking to his or her side of the room to mark the covered data sheet. Observation continued until all items were scored, after which an observer returned the youngster to the classroom or activity area and accompanied another child to the observation room.

Approximately half of the participants in each setting were observed each week. Thus, 2 weeks of observation constituted a "session" in which all participants were observed. Day of observation was systematically rotated across school days, but if holidays, weather conditions, or child absences prevented observation, extra sessions were scheduled to ensure that every child would be observed every other week. The order in which children's appearance was evaluated was randomly varied across sessions in order to distribute the effects of time at school and to prevent teachers and caregivers from becoming knowledgeable about observation schedules.

Scoring procedures. Each checklist item was scored plus, minus, or not applicable (NA), on the basis of the definitions provided (see Table 1). Observers were instructed to use personal judgment in scoring borderline cases, e.g., "hair clean" might rest on the observer's opinion of whether a youth's hair was "too oily" and needed to be washed.

After observing a child, a personal appearance score (the percentage of appearance items scored positive) was obtained by dividing the number of items scored plus by the total number of items scored plus or minus and multiplying the quotient by 100.

To permit comparison of four groups of children (children who remained in the institution, had moved to the new group homes, lived in the established group home, and lived with their parents), the personal appearance scores for children in each group were averaged for each session. Over the 10 sessions, the number of children in the institution decreased and the number of children

in new group homes showed a commensurate increase.

Interobserver Agreement

Two primary observers were assisted by five other observers. All observers received prior training and practice in data-collection procedures. Item-by-item interobserver agreement was obtained and percentage of agreements was calculated by dividing number of agreements by total number of agreements plus disagreements and multiplying by 100.

Interobserver agreement was assessed for each participant during at least 20% of the sessions. Mean interobserver agreement for children who lived with their parents was 88% (range, 85% to 92%); mean agreement for the boys in the established Teaching-Family Model group home was 91% (range, 86% to 95%); and mean agreement for the originally institutionalized children and youths was 93% for the pretransition group (range, 75% to 100%) and 94% for the posttransition group residing in the new group homes (range, 75% to 100%).

RESULTS

Figure 1 displays mean personal appearance scores for each group of participants. The grand mean score for children living at home with their own parents was 69% (range, 62% to 78%); the grand mean for children living in the established Teaching-Family Model home was 73% (range, 56% to 85%); and the grand mean for children who had moved to the new group homes was 65% (range, 62% to 73%). The mean appearance scores for these three groups showed considerable overlap. In contrast, the grand mean appearance score for participants who continued to reside in the institution was 45% (range, 37% to 57%); only one mean appearance score for this group overlapped with a mean score for any other group.

DISCUSSION

It is interesting that the scores of children living with teaching parents in the group homes were similar to the scores of children living at home; natural parents offer one standard for appropriate

physical care. It may be noted that the highest mean score for the institutionalized participants occurred at the outset of data collection, beginning on the first school day after the winter holidays. Many youngsters appeared to be wearing new clothing, although subsequent observation suggested that the impact of the new garments was temporary for the institutionalized youngsters.

Measurement procedures recorded the presence or absence of specific characteristics but did not address other qualitative differences in the appearance of children in the institution and in the group homes. For example, Item 14 (belt present) was scored minus if a participant was wearing a rag or a length of twine as a substitute for a belt, but was also scored minus if a belt was not inside a belt loop. Similarly, Item 17 (clothing untorn) was scored minus because of large holes in a garment, as well as because of small tears in seams. Nevertheless, the index differentiated among groups of children in different residential placements.

As children moved from the institution to group homes, the number of child care workers in the institution remained constant. Changes in the ratio of clients to care providers at the institution did not affect mean personal appearance scores for children not yet moved.

EXPERIMENT 1

In the initial study, mean PAI scores differed systematically across living environments. It was also important to determine whether the index would measure changes in individuals' personal appearance. In the course of obtaining comparison data on groups of children, PAI scores for individual participants were also obtained before and after each youngster moved from the institution to the group home. Because observation of children in the institution began prior to observation of children in community placements, Experiment 1 preceded and extended beyond the initial study.

METHOD

Participants and Settings

Participants in Experiment 1 were the 12 insti-



Figure 1. Mean personal appearance scores for children who lived at home, in an established group home, in three newly developed group homes, and in a large state institution. During the 10 sessions, 11 participants moved from the institution to the new group homes. Thus, for the institutionalized children in Sessions 1 through 10, $n = 11, 10, 8, 8, 5, 3, 3, 3, 2,$ and 1. For children in the new group homes, group numbers increased commensurately, from 1 in Session 1 to 11 in Session 10.

tutionalized children described previously, who had moved from the institution to newly developed community-based group homes. Observations continued to occur in the school at the institution and in the state-operated community-based school.

Experimental Design

Repeated measures of personal appearance were obtained for each of the 12 youths prior to and after their transitions to new group homes. The court-ordered deinstitutionalization provided a naturally occurring multiple baseline design. Because some children moved to group homes at the same time, there were seven time-lagged replications, three of which included one or more simultaneous replications.

Interobserver Agreement

The same observers (in variable combinations) continued to score each appearance item simultaneously and independently for each participant. In-

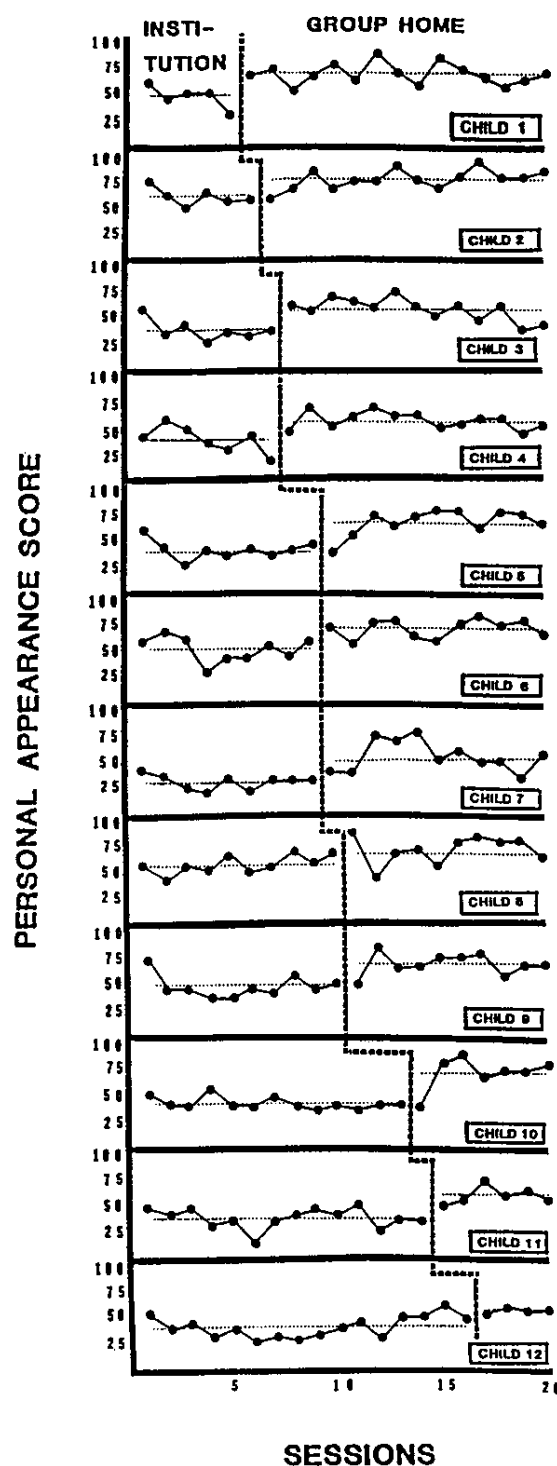


Figure 2. Personal appearance scores for Children 1 through 12 in the institution and after transition to a newly developed, community-based group home. (Sessions 6 through 15 correspond to Sessions 1 through 10 in Figure 1.)

terobserver agreement was assessed in 39% of sessions and calculated in the manner described previously. Mean interobserver agreement for Participants 1 through 12 in the institution was 93% (range, 75% to 100%); mean agreement after they had moved to group homes was 94% (range, 75% to 100%).

RESULTS

Figure 2 shows personal appearance scores for each participant before and after transition from the institution to the group home. Mean personal appearance scores increased for all children after they took up residence in the community-based programs. Child 10 had the largest mean increase after moving from the institution ($M = 44\%$) to the group home ($M = 72\%$). Child 8 showed the smallest increase in mean appearance score, with means of 58% in the institution and 67% in the group home; her institutional mean was the second highest of any youngster. The grand mean appearance score was 45% for children in the institutional environment and 64% for children in the new group homes.

DISCUSSION

The changes in personal appearance that occurred after children moved to group homes did not appear to be related to the availability of grooming supplies (available in all settings) or wardrobes. As noted earlier, the impact of new clothing for institutionalized children was transient; further, group-home personnel reported that youngsters' clothing allowances were typically received several months after they arrived in the community-based programs.

Experiment 1 demonstrated the validity of the PAI, because posttransition increases in appearance scores were recorded for every participant. It may be noted, however, that a few youths' mean scores after moving to the group home (Children 3, 4, 7, and 12) were not far above the mean PAI score of the institutionalized children (see Figure 1).

EXPERIMENT 2

Although all 12 children showed higher mean personal appearance scores after moving to group

homes, some young people's appearance improved more dramatically than others', some appearance data were rather variable (Child 8), and 1 youngster's data appeared to display a descending trend (Child 3). Because of this variability, we assessed whether data-based feedback to group-home personnel could be used to enhance children's personal appearance. This approach has been used by others to produce improvements in a variety of behaviors (e.g., Ivancic, Reid, Iwata, Faw, & Page, 1981; Page, Iwata, & Reid, 1982).

METHOD

Participants and Settings

Children 1 through 12 continued to participate. Five target children moved to Home 1, 3 target children moved to Home 2, and 4 target children resided in Home 3. Ultimately, each of the group homes served 5 children, not all of whom had previously lived in the institutional setting. Only the original 12 participants were included in this study.

Additional subjects in this investigation were the teaching parents (3 married couples) assigned to the above group homes. Before they began to provide services to children, all of the teaching parents had successfully completed a 5-day preservice workshop that included instruction in applied behavior analysis skills, such as developing response definitions, observing and measuring behavior, and graphing and interpreting data. After the group homes opened, teaching parents received ongoing hands-on training and consultation. Written informed consent was obtained from each teaching parent. As before, consent forms did not specify when observation would occur, nor did they provide information specific to index items. The settings for Experiment 2 were the group homes and the community-based school described in Experiment 1.

Experimental Design and Measurement Procedures

A multiple baseline design across Homes 1, 2, and 3 permitted examination of the effects of feedback to teaching parents on personal appearance scores. Measurement procedures were unchanged

from Experiment 1; the PAI continued to be used in the children's school setting during the first 90 min of the school day.

Procedures

During baseline, teaching parents continued to be unaware of any details about the measurement of child appearance. An initial feedback session with each couple was conducted by an experimenter after baseline data were stable. During this meeting, the PAI was explained, and the couple were shown graphs (from Experiment 1) showing posttransition improvements in the appearance of children in their group home. The experimenter congratulated them on the youngsters' appearance and discussed the importance of good hygiene and personal care.

At the end of this meeting, the couple received a written program for each target youth in their home. These programs included definitions of each item in the PAI, a description of the measurement procedure, and a graph of each child's personal appearance scores (from Experiment 1). It was explained that observation would continue, and the teaching parents were asked to add new data points on each child's graph whenever their trainer/consultant provided them with scores; thus, teaching parents received both verbal feedback and ongoing written (data-based) feedback on children's personal appearance.

Although couples knew that data would be collected at the children's school, they did not know when a youngster's appearance would be measured. Day of observation continued to be systematically rotated across school days, but data on child appearance were conveyed to the couple's trainer/consultant at the end of the week, rather than on the day following observation. Only total personal appearance scores were provided to teaching parents, and trainer/consultants were asked to give only positive feedback regarding children's appearances (e.g., "You're doing a great job—Lyle looks great!" or "This is a terrific score for Rosalee.").

Interobserver Agreement

Procedures for assessing and calculating interobserver agreement were identical to those de-

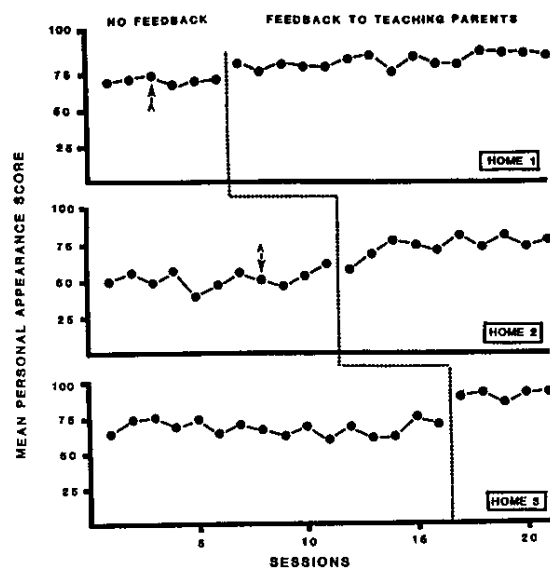


Figure 3. Mean personal appearance scores for posttransition children in Homes 1, 2, and 3 during no feedback and feedback to teaching parents. Ultimately, each of the three group homes served 5 children; the marker (A) indicates when Homes 1 and 2 were at capacity. Home 3 served 5 children throughout this portion of the research.

scribed earlier. Mean interobserver agreement was based upon the personal appearance scores of the target children in each home. During the no-feedback (baseline) condition, mean interobserver agreement was 95% for Home 1 (range, 85% to 100%), 94% for Home 2 (range, 75% to 100%), and 92% for Home 3 (range, 80% to 100%). In the feedback to teaching parents condition, mean interobserver agreement was 92% (range, 85% to 98%), 90% (range, 88% to 93%), and 93% (range, 80% to 100%) for Homes 1, 2, and 3, respectively.

RESULTS

The effects of data-based feedback to teaching parents are shown in Figure 3. For Home 1, mean personal appearance scores were 71% during no feedback and 84% in the feedback to teaching parents condition. In Home 2, mean personal appearance scores increased from 51% in the absence of feedback to 74% with feedback. In Home 3, mean appearance scores were 67% prior to feedback and 87% during the feedback condition.

DISCUSSION

Data-based feedback was effective in improving children's appearance. It is not known whether teaching parents graphed the personal appearance scores they received from their trainers/consultants. However, each of the 3 couples made telephone calls to the experimenters to request additional data, and several teaching parents expressed concern upon receiving data points that were lower than a child's prior scores. It may be noted that mean personal appearance scores were lower and more variable in Home 2 than in Homes 1 and 3 during both the no-feedback and feedback conditions. The child population of this home did not appear different from the other two group homes.

Teaching parents in Homes 1 and 3 attempted (without success) to obtain more information about the observation schedule and about which items were scored minus for target children. These same teaching parents expressed concern about possible deterioration in child appearance during the bus ride to school or after children arrived at school. They noted their desire for "perfect" child appearance scores (and some children did occasionally receive scores of 100%). These unsolicited conversations with teaching parents indicated that they attended to the data-based feedback and were concerned about child appearance.

GENERAL DISCUSSION

The PAI showed substantial differences in the mean appearance scores of children living in the institutional environment compared to children living in Teaching-Family Model group homes or living at home with their own parents. The appearance scores of 12 youngsters systematically increased after they moved to three newly developed community-based group homes. Additional gains in mean personal appearance scores were achieved as a result of data-based feedback provided to the teaching parents (their primary caregivers).

Social Validity

We conducted two assessments of the social validity of the PAI. The first was designed to ascertain

how personal appearance scores of children with autism compared to scores of typical children. A sample of 4 boys and 1 girl, ages 7 to 12 ($M = 9$ years) was drawn as a comparison for the 5 children with autism who lived at home. The typical children attended public schools and lived with their parents in single-family dwellings in medium-income neighborhoods. They were observed at home, immediately before departing for school. Their personal appearance scores were 69%, 80%, 89%, 89%, and 94% ($M = 84\%$); interobserver agreement ranged from 88% to 100% ($M = 95\%$).

The mean appearance scores for the nonhandicapped children exceeded mean scores for the children with autism who lived at home, in the established group home, and in the new group homes (see Figure 1), confirming the social significance of improvements in personal appearance that were achieved when feedback was provided to teaching parents. Indeed, during the feedback condition of Experiment 2, participants' mean scores closely approximated the mean scores for the nonhandicapped children.

It is interesting that the youngest of the typical children received the lowest score. She received minus scores on items such as face clean, nose clean, nails clean and clipped, and fasteners present. Observers reported that the older children (particularly the 12-year-old) responded to scrutiny by remediating certain aspects of their appearance before the relevant items were scored.

A second social validity measure was obtained by inviting community members to evaluate the personal appearance of people with developmental disabilities. Ten community members of varying ages and backgrounds (college students, homemakers, a secretary, a retired business person, and several professionals) were asked to participate in a project that "could contribute to the quality of self-care and grooming for persons with disabilities"; they were unacquainted with the persons they evaluated.

During the first 90 min of the program day, observers assessed the personal appearance of 10 males with developmental disabilities, ages 18 to 30, who lived in group homes. Their appearance

scores ranged from 50% to 95% (mean interobserver agreement, 91%; range, 80% to 100%). On the basis of their PAI scores, the participants were divided into a high-score and a low-score group. Scores within each group were rank ordered and dyads were identified (i.e., the person with the highest score in the high-score group was matched with the person with the highest score in the low-score group, and so on). This procedure resulted in 5 pairs of participants with scores of 95% and 75%, 95% and 68%, 94% and 63%, 89% and 53%, and 83% and 50%.

Immediately after data on personal appearance were collected, the community members arrived and were taken to two waiting rooms. In each waiting room, chairs were arranged in a circle, occasionally separated by low tables that displayed magazines. After 5 community members were seated, two unoccupied chairs (marked A and B) remained. Each pair of participants with developmental disabilities circulated through both waiting rooms, occupying randomly assigned Chairs A and B. When participants arrived in a waiting room, the staff members accompanying them handed them magazines and asked, "Would you like to look at a magazine while you wait?"; staff members then retired to the periphery of the waiting area. Rating of each pair continued until (a) all raters had turned their rating sheets face down on clipboards or (b) 5 min had elapsed.

The raters' first task was to respond to the question, "Which person has better self-care, hygiene, and grooming? The person in each dyad with the higher appearance score was selected in 98% of all choices. Community members next rated both members of each pair on two additional questions, using a 7-point Likert-type scale (7 = completely satisfied; 1 = completely dissatisfied). The first item asked, "How satisfied are you with Person A/B's self-care, hygiene, and grooming?" Members of the high-score group received mean ratings of 6.4 to 6.7 (grand $M = 6.5$, "satisfied"), whereas members of the low-score group received mean ratings of 3.2 to 6.0 (grand $M = 4.9$, "neutral"). In response to the question, "How satisfied are you that Person A/B reflects your family's norms about

Table 2
Mean Percentage Interobserver Agreement by Personal
Appearance Index Item

Item	Occur- rence	Nonoc- currence	Over- all
1. Hair clean	81	82	90
2. Face clean	61	82	85
3. Nose clean	82	85	91
4. Clean shaven	74	84	95
5. Hands clean	82	78	89
6. Hands unstained	86	71	91
7. Nails clean	61	87	90
8. Nails clipped	62	82	86
9. No sores	85	80	90
10. Shoes tied	92	78	94
11. Socks match	96	72	96
12. Clothing dry	99	NA	99
13. No rubber pants	98	NA	98
14. Belt present	91	92	97
15. Clothing fastened	86	90	94
16. Fasteners present	96	78	94
17. Clothing untorn	70	78	85
18. Clothing unstained	61	81	84
19. Clothing fits	88	65	91
20. Clothing matches	98	NA	98

Note. Nonoccurrence reliability was not established for Items 12, 13, and 20; these items received minus scores only one, two, and three times, respectively.

self-care, hygiene, and grooming?", community representatives assigned mean ratings of 6.4 to 6.8 (grand $M = 6.6$, "satisfied") to individuals in the high-score group; mean ratings for people in the low-score group ranged from 2.8 to 5.8 (grand $M = 4.6$, "neutral"). On these two questions, there was no overlap between mean ratings assigned to people in the high- and low-score groups, and only 1 participant in the low-score group received a mean score of 6.0, or "satisfied" on one item. It may be noted that, on this instrument, a rating of 4 ("neutral") indicates that the rater is less than "slightly satisfied."

Community members' responses to all three questions indicated that their perceptions of others' self-care, hygiene, and grooming were congruent with differences in PAI scores. Further, their mean ratings suggested that they were less than satisfied with personal appearance scores of 50% to 75%. In Experiment 2, participants' mean personal appearance scores in Homes 1 and 3 during the feed-back to teaching parents condition were in the same

range as the scores associated with community members' ratings of "satisfied."

Index Reliability

In addition to the interobserver agreement data reported earlier, occurrence, nonoccurrence, and overall agreement were calculated for each item on the PAI by dividing the total number of agreements by the total number of agreements plus disagreements and multiplying by 100. These data are shown in Table 2. These percentages of interobserver agreement are based on 177 uses of the PAI (100% of the reliability estimates obtained for comparison groups and for Experiments 1 and 2).

Nonoccurrence reliability was not established for Items 12, 13, and 20 (clothing dry, no rubber pants, and clothing matches); they were scored minus only one, two, and three times, respectively. Apparently, target children had clothing changes when necessary or were toilet trained, and their caregivers in all settings attended to the compatibility of clothing patterns and colors. Additional research with other participants in other settings is needed to determine nonoccurrence agreement on items related to toilet accidents and to assess whether clothing coordination receives uniform attention.

On Items 2, 7, 8, and 18, observers had greater difficulty ascertaining occurrence than nonoccurrence (i.e., there was more agreement on dirty faces than clean ones, more agreement on dirty and unclipped nails than clean and clipped nails, and more agreement on stained than unstained clothing). Perhaps occurrence agreement on these items could be improved by specifying the dimensions of dirt and stains or specifying a tolerance level for differences in fingernail length.

There are few benchmarks for appropriate levels of occurrence/nonoccurrence agreement. We have not used calculations that "cook numbers to produce highly abstract outcomes" (Baer, 1977, p. 117) but rather straightforward estimates that suggest areas of future investigation.

Some Final Remarks

The PAI was relatively unintrusive and time efficient. Further, many children with autism ap-

peared to enjoy the opportunity to leave their classrooms and "take a walk," and the nonhandicapped children seemed to enjoy the adult attention associated with observation.

The definitions of items in the PAI are stringent; some typical children do not wear socks with tennis shoes or belts with jeans, and they do wear frayed pantlegs and display mustache shadows. Nevertheless, the typical children received higher appearance scores than children with autism until teaching parents received data-based feedback on child appearance.

Among the participants with autism, personal appearance scores did not appear to be related to level of disability. But it did appear that, in some residential settings, caregivers seem to provide additional assistance and make extra "quality checks," whereas in others they do not. In this regard, it is important to note that the PAI is not biased toward any specific type of residential setting. Although in this study children in an institutional environment received lower scores than children in community placements, this finding is not inevitable. Favell, Favell, Riddle, and Risley (1984) have noted that without appropriate staff training, management, and support systems, and without adequate treatment programming, facilities of any size may have little impact on clients' lives. The index is designed to assess one aspect of the quality of life, regardless of size of service facility.

Subsequent to this research, the investigators have continued to use the PAI; a trainer/consultant now provides data-based feedback to teaching parents in the established group home. During a recent assessment, the mean personal appearance score for 5 young people in the established group home was 91% (range, 84% to 100%). This score is similar to the mean scores during the feedback to teaching parents condition of Experiment 2 and the mean scores for the typical children. Although natural parents offer one standard for appropriate physical care, even higher standards may be important for persons whose severe behavior problems require residential placement. If behavior problems are likely to occur in community settings, it may be helpful if people with disabilities look "better" than others.

As treatment technology for persons with severe developmental disabilities advances, there is increasing attention to the quality of life of the recipients. Empirical responses to quality-of-life questions necessitate the development of relevant assessment methodology, including longitudinal, repeated measures, and appropriate comparison groups (Emerson, 1985). A methodological contribution of this research is its demonstration of the utility of comparative data in conjunction with functional analyses. PAI scores discriminated among institutionalized participants, children who lived at home or in group homes, and typical children, and revealed that the youngsters in the institution were most in need of improvements in appearance and personal care.

Personal appearance may be one indicator of the quality of care. The PAI does not, of course, replace currently available measures of the quality of life in specific environments, but it may be an important component of comprehensive program evaluation systems. It can be used to monitor the appearance and hygiene of individuals, to evaluate the adequacy of personal care routines in a variety of residential settings, and to measure the effects of data-based feedback when remediation is necessary. It offers a reasonably reliable, socially valid, time-efficient, and cost-effective means of assessing personal appearance, thus permitting intervention that may contribute to the social acceptance of people with severe developmental disabilities.

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