

*TEACHING CHILDREN WITH AUTISM TO INITIATE TO PEERS:
EFFECTS OF A SCRIPT-FADING PROCEDURE*

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A script that was systematically faded from end to beginning was used to teach peer initiations about recently completed, current, and future activities. The effectiveness of the script-fading procedure was assessed via a multiple baseline design across 4 children with autism. During baseline, the children seldom initiated to peers, although all had previously acquired some functional expressive language and sometimes spontaneously addressed adults. When the script was introduced, peer initiations increased, and as the script was faded, unscripted initiations increased. With the minimal written prompts available in the final fading steps, initiations generalized to a different setting, time, teacher, and activity; and for 3 of the 4 children, peer initiations were maintained at a 2-month follow-up. After the script was faded, the participants' levels of peer initiations were within the same range as a normative sample of 3 nondisabled youngsters. The script-fading procedure enabled children with severe social and verbal deficits to practice context-specific, peer-directed generative language that was not prompted by adults or peer confederates.

DESCRIPTORS: autistic children, peer-initiation interventions, antecedent control, prompting, script fading

A cardinal feature of autism, observed and investigated for almost 50 years, is a severe deficit in reciprocal social interaction (Kanner, 1943; Rapin, 1991; Wing & Gould, 1979). Although many children with autism acquire expressive language, they may infrequently display spontaneous speech or may engage in conversation only with significant adults and not with other children (Krantz, Ramsland, & McClannahan, 1989).

Several authors (e.g., Odom & Strain, 1986; Oke & Schreibman, 1990; Shafer, Egel, & Neef, 1984) have reviewed the course of research on peer interaction, noting difficulties encountered and problems that remain to be addressed. In brief, when socially competent peers are taught to initiate interactions with children with autism, target children's *responses* increase, but their initiations may remain unchanged or may even be suppressed (Odom, Hoyson, Jamieson, & Strain, 1985); further, maintenance and cross-setting generalization of social interaction skills have been difficult to achieve. Other complications arise because teaching strategies that include adult prompting and rein-

forcement are apt to produce atypical peer social exchanges marked by brief interaction episodes, to require the ongoing presence of an adult, or to yield decreases in social interaction when adult prompts are reduced or withdrawn. These issues led Odom and Strain (1986) to conclude that "a clear direction for future research will be establishing a procedure in which teacher prompts are not required. An approach is needed for transferring the stimulus control from the teacher to natural elements in the environment" (p. 69).

The development of a technology to enhance the social relatedness and social competence of people with developmental disabilities is receiving increasing attention (Breen & Haring, 1991), and in the case of children with autism, there is some evidence that the acquisition of social interaction skills may favorably affect inappropriate or socially unacceptable responses. For example, Oke and Schreibman (1990) reported that the disruptive behavior of a boy with autism remained unchanged when nondisabled peers were trained to initiate interaction with him, but decreased when he was taught to initiate interaction. Lee and Odom (1991) found that when 2 children with autism increased their engagement in social interaction with peers, stereotypic behavior decreased. Koegel, Koegel, Hurley

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and Frea (1992) demonstrated that when the social responsiveness of 4 children with autism increased, there were reductions in disruptive behavior. These recent studies provide additional grounds for continued exploration of procedures that will amplify the social interaction repertoires of children with autism.

Our study was designed to assess the effects of a new procedure—script fading—on the social initiations of children with autism. Loveland and Tunali (1991) discussed social scripts as “sets of expectations for human behavioral events” (p. 178), and suggested that identifying and applying scripts to relevant social situations might be especially difficult for people with autism, because to do so requires social information and understanding of cultural norms. They found that people with autism, when compared to language-matched people with Down syndrome, made fewer responses to a conversational “social script” about a stolen wallet. But what if the script had been specifically taught?

Goldstein, Wickstrom, Hoyson, Jamieson, and Odom (1988) taught typical and language-delayed preschoolers to display motor and verbal scripted responses pertaining to two dramatic play situations—a hamburger stand and a barber shop. During training, the teacher prompted children to do or say the components of the script (e.g., say “I want a hamburger”). Although some teacher prompting was necessary in the generalization setting (a free-play period), the investigators noted that script training reduced the need for intrusive prompts, and the teacher did not become an interaction partner. In addition, following training, the participants exhibited theme-related social responses that were not directly trained.

The social uses of language represent major difficulties for many people with autism (Volkmar, 1987), and we have noted that some children who experience considerable difficulty with vocal instructions and prompts are consistently able to respond to pictorial or written stimuli that remain available for review (MacDuff, Krantz, & McClannahan, 1993). Thus, in the present study, we examined the effects of a written script and a script-fading procedure on peer initiations. Because children with

autism often appear to be unable to discern appropriate conversational topics, the script identified recently completed, present, and future activities as topics for discussion. After children were observed to dependably use the script, it was faded from end to beginning in five fading steps. We also assessed unscripted peer initiations, responses, cross-setting generalization, and maintenance over a 2-month period.

METHOD

Participants and Setting

The 4 participants—Kate, Mike, Walt, and Ross—attended the Princeton Child Development Institute’s day school and intervention program for 5.5 hr per day, 5 days per week. Kate and Walt resided in a community-based group-home treatment program; Mike and Ross lived with their own families. All 4 children met the DSM-III-R (APA, 1987) criteria for autism and, in each case, autism had been diagnosed by one or more outside agencies. The parents of all 4 children gave informed consent for the youngsters’ participation in this research.

Kate, age 12, had been enrolled in the program for 8 years; at admission she was completely non-verbal and displayed tantrums and high-rate self-injurious head hitting. A Peabody Picture Vocabulary Test–R (PPVT), administered just prior to the study, yielded a receptive language age-equivalent score of 5-1. The Woodcock Reading Mastery Tests revealed a reading grade-equivalent score of 1.9. On the McCarthy Scales of Children’s Abilities, she received a score of <50, and her age-equivalent score on the Vineland Adaptive Behavior Scales was 5-2.

Mike, age 12, had been in treatment for 5 years; when first seen, he had no expressive language, frequently engaged in inappropriate laughing and crying, and systematically attempted to isolate himself from others. His PPVT age-equivalent score was 4-5, his Woodcock reading grade-equivalent score was 1.8, his score on the McCarthy Scales was <50, and his Vineland age-equivalent score was 5-1.

Walt, also age 12, had entered the program 5 years earlier with a small verbal-imitation repertoire. He had a history of aggression (e.g., hitting, biting, pinching, and kicking) and self-injury, as well as stereotyped body movements and a potentially life-threatening disregard for danger (he attempted to jump out of moving vehicles and throw flammable objects on stove burners). He achieved a PPVT age-equivalent score of 4-9, a Woodcock reading grade-equivalent score of 1.5, and a Vineland age-equivalent score of 5-4.

Ross, age 9, had been in treatment for 5 years; at program enrollment, he was echolalic and had no appropriate spontaneous speech. He actively avoided social contact and frequently displayed stereotypies. His PPVT age-equivalent score was 4-4, his Woodcock reading grade-equivalent score was 1.6, his score on the McCarthy Scales was <50, and his Vineland age-equivalent score was 4-6.

In the year preceding the study, the WISC-R was administered to each child by representatives of his or her referring agency. Kate, Mike, Walt, and Ross achieved verbal IQ scores of 50, <45, <45, and 49, respectively, and full-scale IQ scores of 49, 49, 46, and 48.

In summary, all 4 participants had histories of impaired imitation skills, severe communication deficits, and minimal or absent academic, social, leisure, and home-living skills. After 5 to 8 years of intervention, they were seldom aggressive or self-injurious, exhibited fewer ritualistic and stereotyped responses, and had acquired some early academic skills.

Before the study, the children had learned to independently follow photographic activity schedules (Wacker & Berg, 1983, 1984; Wacker, Berg, Berrie, & Swatta, 1985) and, later, written activity schedules that specified lengthy chains of academic, self-care, and leisure responses. Schedule-following skills were taught without verbal or gestural prompts; manual prompts were delivered from behind the youths in a sequence of most to least intrusive, and graduated guidance was followed by spatial fading (cf. MacDuff et al., 1993). As a result of these relatively errorless procedures, all 4 children had learned to follow written schedules

when schedule components were resequenced and when new schedule components (representing previously acquired skills) were added, and all used these schedules during the school day. Kate, for example, followed a written schedule that included components such as "book bag," "mirror," "homework," and "computer"—prompts for her to get her book bag at the beginning of the school day, look in the mirror and correct her appearance if necessary, check her homework, and practice arithmetic facts on the classroom computer.

The participants had also developed some functional expressive language, albeit atypically applied. All responded verbally when addressed by adults, and they sometimes directed spontaneous requests to teachers, therapists, and parents (e.g., "I want a cookie" or "I want to ride the bike"), but they rarely initiated conversation with caregivers other than to request items or activities.

For 9 months prior to the study, the 4 participants were classmates; their class schedule was designed specifically for them and was not shared by other children. Although their teachers modeled and verbally prompted social initiations and provided behavior-specific praise and preferred snacks, play materials, and activities contingent upon imitative or prompted initiations, these procedures were not effective in producing spontaneous peer initiations; the youngsters failed to initiate in the absence of adult prompts, although it was noted that they sometimes responded to other children's prompted initiations.

The setting was a school and research center for children with autism. Pre-session activities occurred in an outdoor play area. All sessions (except generalization sessions) were conducted in a typical classroom furnished with desks, chairs, and bookcases; generalization sessions were held in a large conference room furnished with upholstered chairs and rectangular tables.

Dependent Variables

Initiation to peers was defined as understandable statements or questions that were unprompted by an adult, that were directed to another child by using his or her name or by facing him or her, and

that were separated from the speaker's previous vocalizations by a change in topic or a change in recipient of interaction. If a child initiated and then immediately repeated the same sentence or question, the repetition was not counted as an initiation. *Scripted initiations* were those that matched the written script, with the exception that conjunctions, articles, prepositions, or pronouns could be altered or deleted (e.g., substituting "and" for "or," or dropping "the"), and verb tense could be changed. For example, "Ross, you like my picture," was coded as a scripted initiation, although the script read "Ross, I like your picture." *Unscripted initiations* were verbal productions that differed from the script by more than conjunctions, articles, prepositions, pronouns, or changes in verb tense; the question, "Would you like some more paper?" was scored as unscripted because the noun "paper" did not occur in the script. A *response* was defined as any contextual utterance (word, phrase, or sentence) that was not prompted by the teacher and that occurred within 5 s of a statement or question directed to the target child (as indicated by use of the child's name, or by facing the child who was initiating). Examples of responses were "what?" "okay," and "yes, I do."

Experimental Conditions

Vocal initiations and responses to peers were measured during baseline and script conditions in a multiple baseline design across the 4 children. Because this study focused on the use of written instructions and scripts, each child was tested on target words before the study began, and teaching was provided until all participants achieved 100% accuracy on oral reading of the individual words used during baseline and script conditions. All sessions during subsequent experimental conditions were preceded by an outdoor recess and by a brief discussion, guided by a teacher, during which the children were assisted in planning "Fun Friday," a weekly outing or special event. Subsequently, they entered a classroom where they were seated in a rectangular arrangement created by pushing their desks together, or a conference room where they were seated at a rectangular table.

Baseline. Three art activities—drawing, color-

ing, and painting—were systematically rotated across sessions. Upon entering the classroom, each child found art materials at his or her place, as well as a single sheet of paper that presented the written instructions, "Do your art" and "Talk a lot." To ensure that participants were aware of these instructions, the teacher stood behind each child and manually guided him or her to point to each instruction with a pencil and to move the pencil along beneath the text. Because of the children's prior experience with written activity schedules and manual prompts, it was anticipated that this procedure would prompt the child to read the instructions aloud; however, for Session 1 only, the teacher was asked to use a single verbal prompt (reading the first word of an instruction) if a child failed to respond to manual prompts. During Session 1, the teacher provided one verbal prompt ("Do . . .") to 1 participant (Mike). In all subsequent sessions, verbal prompts were excluded from the protocol. After prompting reading of the written instructions, the teacher moved to the periphery of the classroom; she interacted with the participants only if they directed questions to her.

Script. The same three art activities were rotated across sessions, and the two written instructions presented during baseline continued to be displayed but were followed by scripts consisting of 10 statements and questions (e.g., "[Name], did you like to [swing/rollerskate/ride the bike] outside today?" "Hey [name], would you like some candy or chips?" "[Name], do you want to use one of my [pencils/crayons/brushes]?" "[Name], won't it be fun to go to the [park/store/farm] on Fun Friday?"). Scripts were constructed so that their content reflected (a) activities the children had recently completed (e.g., using playground equipment), (b) activities the children were planning (i.e., "Fun Friday" activities that included parties and trips to a park, a nearby farm, or a local convenience store), and (c) objects in the school environment (e.g., candy, bowls of potato chips, and materials on their desks). Blank sections of the scripts were completed by the teacher [immediately before each session, so that scripts reflected activities that the children had recently completed or discussed. Scripts were individualized, so that each participant's script

included the 3 other children's names. In addition, three different versions of the script were created by randomly assigning the 10 questions and statements to Positions 1 through 10; these versions were systematically rotated across children.

Standing behind a participant, the teacher manually guided him or her to pick up a pencil, point to an instruction or a scripted statement or question, and move the pencil along below the text. If necessary, the teacher also manually guided the child's head to face another child to whom a statement or question was addressed. If the child did not verbalize the statement or question within 5 s, the manual guidance procedure was repeated. If the child read or said a statement or read or asked a question, the teacher used the same type of manual guidance to ensure that the child placed a check mark to the left of that portion of the script.

Manual prompts were faded as quickly as possible; no prompts were delivered to Kate, Mike, Walt, and Ross after Sessions 15, 18, 23, and 27, respectively, and the teacher remained at the periphery of the classroom throughout subsequent sessions. After manual guidance had been faded for a target child, fading of the script began. Scripts were faded from end to beginning, in five phases. For example, the fading steps for the question "Mike, what do you like to do best on Fun Fridays?" were (a) "Mike, what do you like to do best, (b) "Mike, what do you, (c) "Mike, what, (d) "M, and (e)".

Follow-up. At a 2-month follow-up, all participants used fading Step 5 (one pair of quotation marks). The follow-up session was separated from Sessions 1 through 42 by 1 month of vacation and 1 month of a new school year. The teacher did not deliver prompts during this session.

Generalization. Generalization sessions (which occurred on the same days as Sessions 34 through 39 of the script condition) were conducted in a different setting (a conference room), with a different teacher, at a different time of day, and with different materials (puzzles). During the first three generalization sessions, a single piece of paper placed on each child's work surface contained the instructions "Do your puzzle" and "Talk a lot," and the teacher manually guided each participant to point

to these instructions with his or her pencil and to move the pencil from left to right along the bottom of the text. Subsequently, the teacher moved to the edge of the activity area, and provided no further prompts.

During Generalization Sessions 4 through 6, the children found not only the written instructions but also the faded script as it was then being presented to them during the script condition. Thus, Kate, Mike, and Walt encountered Fading Step 5 (quotation marks), and Ross encountered Fading Step 4 (quotation marks and one upper-case letter). In these sessions, no prompts were delivered by the teacher.

On the same day as Session 9, 3 children without disabilities, ages 9, 10, and 12, were invited to visit the school. These children were previously acquainted, having met at social gatherings attended by their parents. Before this visit, their parents provided consent for observation and measurement of their interactions with one another. During their visit, they were scheduled to spend some time together in the same classroom used by the 4 participants while the latter pursued their activities in a different area. On their desks, the nondisabled youngsters found art materials and single sheets of paper bearing the instructions "Do your art" and "Talk a lot." The teacher was present at the periphery of the classroom but provided no verbal or manual prompts.

Measurement Procedures

Each observation period began immediately after the last child was seated and continued for 10 consecutive minutes. Two observers (or pairs of observers) were stationed at the periphery of the classroom; each observer or observer pair collected data on 2 participants, and observers' assignments to target children were rotated across sessions. A continuous event recording system (in 1-min intervals) was used to score sequentially scripted and unscripted initiations and responses to peers; an audible signal from an Apple IIe® classroom computer marked the end of each 1-min interval.

In three sessions for each participant during the script condition and before the first fading step, additional observers scored whether the target child

Table 1

Interobserver Agreement Percentages on Total Number of Initiations, Number of Scripted and Unscripted Initiations, and Number of Responses by Child during Classroom and Generalization Sessions

Child	Total initiations		Scripted initiations		Unscripted initiations		Responses	
	Mean	Range	Mean	Range	Mean	Range	Mean	Range
Classroom sessions								
Kate	97	86–100	97	83–100	98	75–100	90	89–100
Mike	98	84–100	98	75–100	98	82–100	98	86–100
Walt	96	88–100	98	86–100	96	92–100	98	83–100
Ross	91	0–100	99	75–100	91	0–100	90	33–100
Generalization sessions								
Kate	99	94–100	100	—	94	88–100	100	—
Mike	100	—	100	—	100	—	100	—
Walt	100	—	100	—	100	—	100	—
Ross	100	—	97	86–100	93	67–100	100	—

Note. Data on classroom sessions do not include follow-up.

said or read each statement or question included in his or her script. The order of questions and statements was not assessed; observers measured only whether the components of the script were used by the child during the observation period. These data, as well as other observations by the experimenters (e.g., whether Kate was self-restraining), were used in determining when to begin script fading.

Interobserver Agreement

Observers sequentially recorded the initial of each child who initiated or responded; scripted and unscripted initiations were coded minus and plus, respectively. Agreements were scored only if both observers coded the same child initial, in the same column, and in the same sequence, and used the same symbol to designate a scripted or unscripted initiation. Percentage agreement on each of the dependent variables was calculated by dividing total number of agreements by total number of agreements plus disagreements, and multiplying by 100%. Interobserver agreement was obtained during 80% of classroom sessions, in the 2-month follow-up session, in five of six generalization sessions, and in the session conducted with nondisabled children. Mean agreement and ranges of interobserver agreement on the occurrence of total initiations, number of scripted and unscripted initiations, and number of responses during classroom and generalization sessions are shown in Table 1.

For the follow-up session conducted in the classroom, interobserver agreement on total peer initiations was 100%, 94%, 100%, and 100%; agreement on scripted initiations was 75%, 100%, 100%, and 100%; and agreement on unscripted initiations was 88%, 90%, 100%, and 100% for Kate, Mike, Walt, and Ross, respectively. Agreement on responses was 100% for each of the 4 participants. For the 3 nondisabled children, interobserver agreement on initiations was 85% for Child 1, 100% for Child 2, and 100% for Child 3 ($M = 95%$).

The primary independent variable, use of the script, was assessed three times for each participant, during classroom sessions that occurred after the script was introduced but before fading began. Two observers scored whether a target child read or said each sentence or question included in the script. During these sessions, both observers scored every scripted sentence or question as present for all 4 children. Thus, agreement on children's use of the script was 100%.

RESULTS

Figure 1 displays the number of peer initiations and responses exhibited by each child during baseline and script conditions in the classroom. In baseline, neither Kate nor Mike initiated, but during the script condition their mean initiations were 15 and 13, respectively (not including follow-up). The

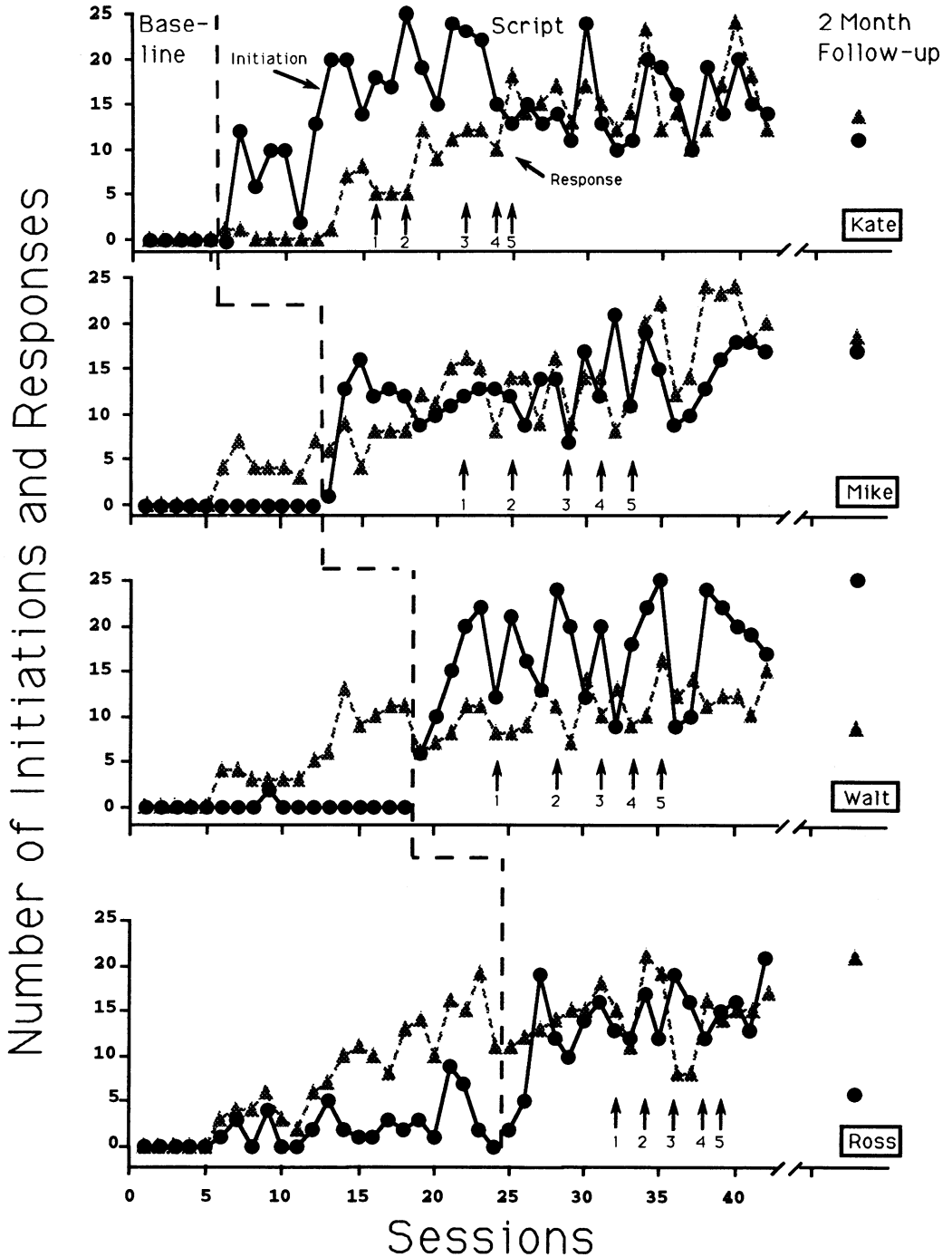


Figure 1. Number of initiations and number of responses by Kate, Mike, Walt, and Ross during baseline, script, and follow-up sessions in the classroom. Arrows indicate the introduction of fading steps.

mean number of initiations for Walt increased from 0.1 during baseline to 17 during the script condition. Ross's means were two during baseline and 14 during the script condition.

At the 2-month follow-up, when all 4 participants were on the fifth fading step (quotation marks), Kate, Mike, and Walt continued to initiate to their peers at about the same levels as previously

(11, 17, and 25 initiations during the session). Although Ross displayed fewer initiations at follow-up, his score of 6 was above his baseline mean.

Because there were no initiations in Sessions 1 to 5, none of the participants responded. But in Session 6, when Kate entered the script condition, all 3 of the other youngsters made some responses. In general, children's responses increased as each successive youngster began to use the script; after Kate left baseline, mean responses to peers were five for Mike, six for Walt, and nine for Ross; during the script condition, mean responses were 10, 14, 11, and 14 for Kate, Mike, Walt, and Ross, respectively.

Figure 2 shows the number of scripted and unscripted initiations during classroom sessions. After Fading Step 5 was introduced, mean scripted and unscripted initiations were two and 13 for Kate, seven and seven for Mike, six and 12 for Walt, and six and 11 for Ross. With the exception of Ross, who was the last to encounter the fifth phase of script fading, scripted initiations decreased as unscripted initiations increased. During follow-up, the number of unscripted initiations was maintained at about the same level for Kate, Mike, and Walt, but decreased for Ross.

During the first three generalization sessions, when the children received only the instructions "Do your puzzle" and "Talk a lot," Kate made 10 initiations in Session 1 (three scripted and seven unscripted) but subsequently ceased to initiate. Mike made three unscripted initiations in Session 1 but did not initiate in Sessions 2 and 3. Walt did not initiate during the first three generalization sessions, and Ross made only one unscripted initiation in Session 3. But when the faded script was reintroduced (Sessions 4 through 6), the number of peer initiations increased. During these sessions, Kate made 16, 20, and nine initiations (all unscripted) and Mike made nine, eight, and nine initiations, of which three, seven, and five were unscripted. Walt made three, 11, and six initiations; two, 10, and five of these were unscripted. Ross initiated two, zero, and 14 times during Sessions 4 through 6, making one, zero, and six unscripted initiations.

Thus, for all of the participants except Ross, most initiations observed during Sessions 4 through 6 were unscripted.

During Session 42 of the script condition in the classroom, observers scored a total of 14 initiations for Kate, 17 for Mike, 17 for Walt, and 21 for Ross. It is interesting to note that the participants' scores are representative of the range of peer initiations exhibited by the nondisabled children—13 for Child 1, 20 for Child 2, and 24 for Child 3.

DISCUSSION

People with autism characteristically display deficits in social competence, and that was true of the participants in this study. During baseline in the classroom, the children followed the written instruction "Do your art," pursuing coloring, drawing, and painting activities; they did not, however, follow the written instruction to "Talk a lot." Further, Mike did not display peer initiations after Kate entered the script condition, nor did Walt's initiations to peers increase when both Kate and Mike had begun to use the script. Videotapes of Sessions 13 and 21 showed that Ross's initiations during baseline were efforts to prevent peer interaction, e.g., "I don't like to talk," and "I don't want to talk." Thus, none of the participants appeared to imitate his or her peers' initiations.

The introduction and systematic fading of the script significantly increased social initiations; it may be noted that, although there were only 10 scripted sentences and questions, the children typically made far more than 10 initiations per session. Sentences and questions were deliberately not numbered in order not to convey any numeric criterion. As fading proceeded, the participants continued to "check off" scripted initiations, as had been manually prompted before fading began; by Fading Step 5, they placed multiple check marks beside the quotation marks or started new columns of check marks.

Placing check marks adjacent to completed tasks was a familiar response—the children also made check marks beside items on their written activity schedules. The schedules were arranged so that less

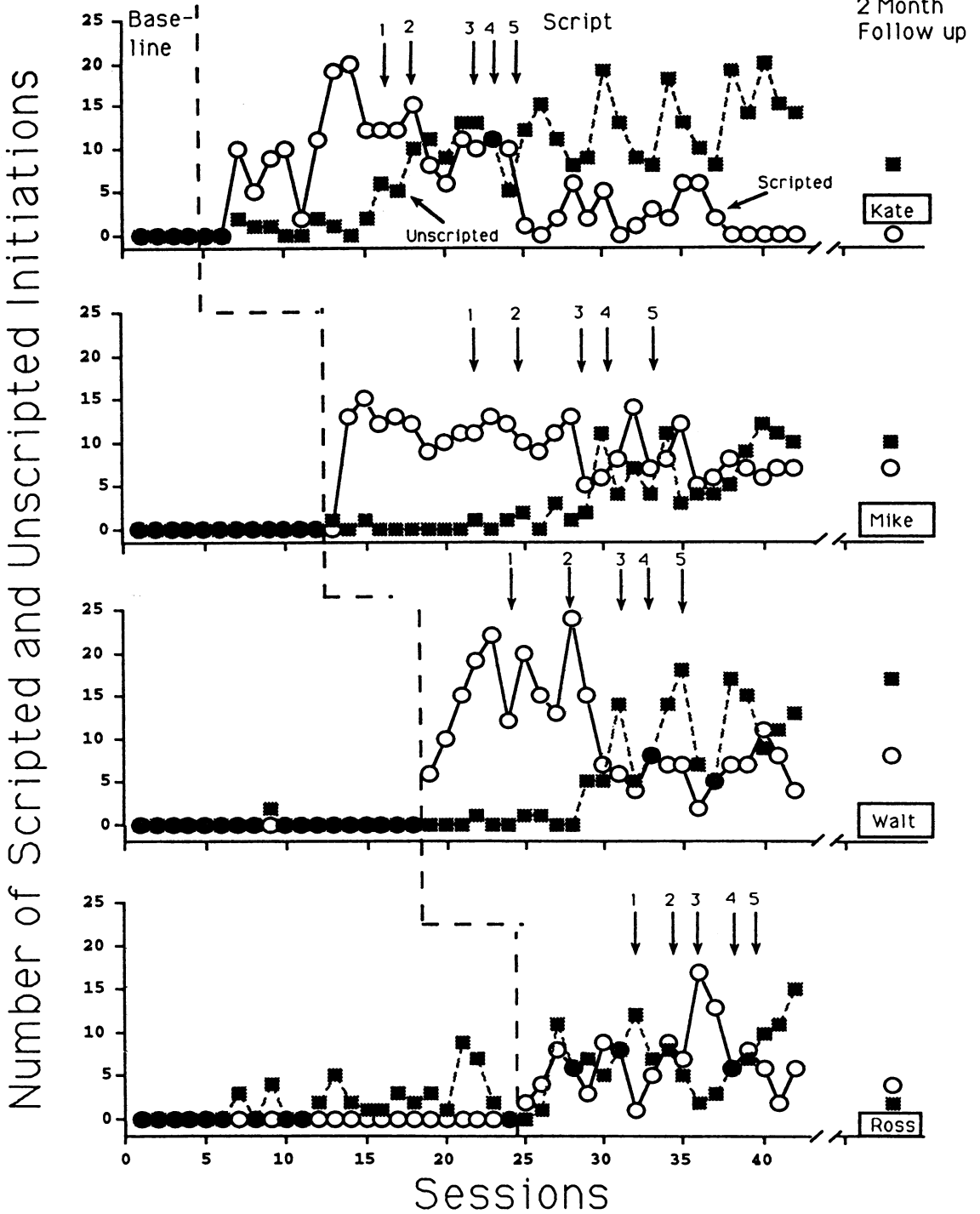


Figure 2. Number of scripted and unscripted initiations by each participant during baseline, script, and follow-up sessions in the classroom. Arrows 1 through 5 indicate the introduction of fading steps.

preferred activities were typically followed by preferred activities, and rewards were delivered by adults for schedule completion. This prior experience with written activity schedules may have accounted for their use of scripts in the absence of rewards from the teacher.

As the script was faded, unscripted initiations increased. Videotapes of Sessions 37, 39, and 41 in the classroom indicated that initiations scored as unscripted included use of adjectives (e.g., "Walt, would you like some salty vinegar chips?"), introduction of new nouns (e.g., "Mike, would you like more Tootsie Rolls®?") and "Won't it be fun to go to the seashore?"), and combination of scripted sentences and questions to form new productions (e.g., "Did you like to swing on Fun Friday?" and "I like to talk to you on Fun Fridays"). Still other unscripted initiations were completely novel (e.g., "Kate, can I use your water?" [for a paint brush]). After Session 37, Kate exhibited only unscripted initiations.

The videotapes also documented that Mike, Walt, and Ross appropriately used scripted statements and questions after Fading Step 5 (quotation marks); perhaps the use of three different versions of the script contributed to their varied selections of content and recipients of interaction and prevented repetitive or stereotyped initiations.

Although peer initiations did not generalize in the absence of the script, the prompts provided in Fading Steps 4 (Ross) and 5 (Kate, Mike, and Walt) were sufficient to promote transfer to a new setting, time, teacher, and activity. These minimal written prompts not only produced cross-setting generalization (which is often difficult to achieve for children with autism; Oke & Schreibman, 1990), but did so in the absence of teacher intervention, so that teachers did not become key interaction partners. Further, the children adapted the content of their initiations to the new situation; they did not say "I like your picture," but instead said "I like your puzzle."

Peer initiations taught with the script-fading procedure proved quite durable for 3 of the 4 participants. After 1 month of summer vacation and 1 month of a new school year, Kate's, Mike's, and Walt's performances were quite similar to their

initiations in the last phase of script fading in the classroom. Only Ross, who had attempted to prevent or terminate peer interactions throughout the study, displayed a decrement in unscripted initiations at follow-up.

As the children practiced peer initiations during script fading, some recurrent interaction patterns took on the characteristics of teasing: Ross, who repeatedly tried to end social interaction, became the recipient of a large number of questions; Mike, who was often given a treat that he did not prefer, became increasingly specific about his candy preferences, sometimes to no avail. The experimenters viewed these recurrent interactions as reminiscent of the teasing behavior of nondisabled children.

The numbers of peer initiations made by the participants during Session 42 (14 to 21) were not outside the range of initiations (13 to 24) made by the 3 nondisabled children when they engaged in the same art activity. The participants' script was designed to include content relevant to current, recently completed, and future activities. Content analysis of the nondisabled children's videotaped session indicated that they also discussed recently completed, current, and future activities (one, five, and nine peer initiations, respectively). However, the majority of their initiations were either requests for personal information (e.g., "When is your birthday?" "What school do you go to?" "What's your favorite TV show?") or elaborations on a topic introduced by a previous speaker (e.g., "My favorite subject is science," "I met *my* best friend at Scouts"). Analysis of their initiations offers a basis for designing future scripts.

It should be noted that, although peer initiations were very infrequent during baseline in the classroom, the participants were not silent—they were responding to other children's initiations. Illustrative responses were "Yes it will," "No," "Yes, I want a potato chip," "Thank you," and "Don't talk."

Before Kate entered the script condition, there were no peer initiations and no responses. As each successive child began to use the script, responses by children still in baseline increased. Other investigators (cf. Odom et al., 1985) have noted increases in the social responding of children with

disabilities who were the recipients of initiations from nondisabled peers, but increases in responses have not been dependably associated with increases in social initiations. In the present study, accelerated peer initiations resulted in gains in responses to peers, although responses were never rewarded by the teacher. It may be noted, however, that some responses were followed by snacks; an affirmative response to the scripted question "Would you like some candy or chips?" usually resulted in delivery of these items.

After learning the script, the participants recombined elements of scripted sentences and questions and drew on their existing verbal repertoires to add new words and phrases (i.e., they exhibited generative language). Additional research is needed to determine whether script-fading procedures can achieve increases in the length and complexity of children's verbal productions, whether the use of multiple scripts will promote conversational variety, whether initiations taught with a script-fading procedure will generalize to more remote settings (e.g., home and community), and whether written prompts can ultimately be faded to the single written instruction, "Talk a lot."

A particular strength of the script-fading procedure is that it diminishes the involvement of adults and confederates in the social interactions of children with autism. Adult prompts have often been seen as intrusive, resulting in atypical social exchanges, and initiations by peer confederates have been difficult to maintain. In this study, a script that was faded to minimal written prompts enabled the participants to engage in contextual social exchanges; peer initiations generalized to a different setting, time, and activity, and were maintained over a 2-month period.

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