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Generalization and Maintenance of Social Skills of Children with Visual Impairments: Self-evaluation and the Role of Feedback

Divya Jindal-Snape

Abstract: A multiple baseline design across behaviors was used with two visually impaired girls to establish the effectiveness of self-evaluation and the role of feedback. In both cases, self-evaluation was effective in increasing the girls' social skills and social interaction. Implications of the role of significant others in providing feedback are discussed.

Research on the social interaction of children with visual impairments (that is, those who are blind or have low vision) has suggested that these children may have difficulty interacting with significant others, especially their peers (McGaha & Farran, 2001). The social skills of children with visual impairments may not be developed fully because of the children's difficulty in acquiring social behaviors through visual cues,

modeling, or feedback (Kekelis, 1992; McGaha & Farran, 2001) or difficulty in locating others in unstructured settings, such as peers in a playground (MacCuspie, 1996). Their social skills also may not be fully developed because of the lack of opportunities to interact with others because of the reactions of others to individuals with disabilities in general (Hodges & Keller, 1999; Rosenblum, 1998; Van Hasselt, 1987).

Social skills are typcially learned during day-to-day interactions through observation (Michelson, Sugai, Wood, & Kazdin, 1983). Most children learn them naturally by observing their parents and other people in the environment. However, children who are visually impaired are restricted in learning through observation (Raver, 1984). They are unable to learn and practice social skills through visually mediated processes like social referencing and imitation (Bandura & Walters, 1963). Since most social skills are acquired through communication with visual cues, learning or modifying these skills is difficult for children who are visually impaired (Farkas, Sherick, Matson, & Loebig, 1981). Therefore, smiling or looking in the direction of others, which may be natural actions for sighted children, may be absent (Warren, 1984) and have to be taught to children with visual impairments.

In addition, visually impaired children find it difficult to imitate many nonverbal gestures, such as facial expressions and expressive gestures. Similarly, receiving or sending cues for initiating a conversation,

responding appropriately, finishing a conversation, and the like are not easily available to them. These children may find it difficult to receive and produce nonverbal behaviors that usually support and even replace verbal behavior and to use visual cues or facial expressions (Van Hasselt, Simon & Mastantuono, 1982) and hence find it difficult to initiate, respond to, or finish a conversation at the appropriate time. Furthermore, even when social interaction does occur, these children often engage in much shorter interactive sequences and have little chance of successfully sustaining occurrences of social contact (Markovits & Strayer, 1982) and are generally recipients, rather than initiators, of interactions (D'Allura, 2002). Therefore, it is necessary to intervene and facilitate the development of the social skills of children with visual impairments.

Research has suggested that a decrease in challenging behaviors (Jindal & Kato, 1994), an increase in levels of adequate and meaningful feedback (Jindal-Snape, Kato, & Maekawa, 1998), and an increase in reinforcement and opportunities for interaction can lead to the development of high levels of social skills. In turn, higher levels of social skills may lead to high levels not only of social competence and interaction but of achievement. Some social skills interventions have been found to be effective during training conditions, but there was a gap between the increase in desirable interactions with peers and the generalization and maintenance of these skills across settings or subjects (Chandler, Lubeck, & Fowler, 1992; Gumpel

& Nativ-Ari-Am, 2001; Jindal & Kato, 1994), perhaps because most studies have not included generalization as a goal or component of social skills interventions (Chandler, 1992). It has been suggested that treatment cannot be considered to be successful unless the gains are generalized and maintained (Gresham, 1981).

It has been observed that self-evaluation plays an important role in the generalization and maintenance of social skills of children with visual impairments (Jindal-Snape et al., 1998). However, these studies included an initial phase of external reinforcement, which could have had some influence on the effectiveness of self-evaluation. To determine the effect of self-evaluation clearly, I considered it necessary to encourage self-evaluation without any initial phase of external reinforcement. I also observed that for accurate self-managing skills that require visual cues, feedback from the environment seemed essential. To verify the necessity of feedback for such behaviors, I considered a subsequent phase of self-evaluation with feedback to be desirable. Thus, in this study, I investigated whether self-evaluation could increase appropriate social behavior without any initial external reinforcement and whether feedback is necessary for self-evaluation.

Method

Setting

The study was conducted in an integrated school in New Delhi, India. The classroom consisted of 30 students (6 of whom were visually impaired) and one teacher. The teacher had no formal qualifications for teaching children with visual impairments. However, she had the support of the school's resource person, who was qualified to do so.

Participants

Two girls with visual impairments, one who was totally blind (Kate) and one who had light perception (Anne), participated in this study. The study was undertaken in two groups, each consisting of one visually impaired child and two sighted children (with no reported disability). Kate, Anne, and the sighted children ranged in age from 9 to 11 years. Kate and Anne both resided in a hostel (known as a "residential preparatory school") that provided accommodation to children with visual impairments whose families did not live in New Delhi but wanted their children to study there. The hostel provided a minibus to take the children to and from their schools. The hostel staff helped the children with their schoolwork and life skills. Kate visited her family nearly every weekend, and Anne visited her family once or twice a month. Informed consent to participate in the study was obtained from all the children, their parents, the teacher, and the head teacher. The names of the children have been changed to protect their identities.

Kate

Kate's chronological age was 10 years and 7 months. Her social age was 5 on the Vineland Social Maturity Scale (Indian Adaptation by Malin and Raj, 1992). Kate came to school looking untidy, suggesting that she had difficulty with taking care of her clothes and with personal hygiene.

The teacher reported that Kate was aggressive and hit her peers. Kate also interrupted when somebody else was answering in class, but when she was asked a question directly, she never responded. Furthermore, she was off task most of the time and fidgeted with her braille pen or stylus. In addition, Kate was seen to leave her seat to go and chat with her friend (who was also visually impaired), whom she would then hit. She returned to her seat only when the teacher repeatedly asked her to do so.

Kate's family consisted of her parents and two elder sisters, aged about 12 and 14. No other family member had any impairment. Kate's mother was interviewed and reported that although Kate had always been close to her sisters, she was aggressive with them as well. Despite her family's efforts, Kate always interrupted the conversations of people other than her family members and became aggressive if she did not gain their attention immediately. Her mother suggested that this behavior may have been due to the fact that other people did not realize that Kate was speaking to them

because she did not turn her face or body in their direction. The mother reported that Kate was always excited about going home on the weekends and enjoyed talking and playing with her family. During the weekends, her sisters tried to help her with her studies. However, even though they asked her to do her homework, she did not do it. No family problems were reported.

When Kate was observed, she was found to be aggressive and tended to hit her classmates if they did not respond immediately or did not agree with her views. She interrupted her classmates' conversations and demanded immediate attention. She fidgeted with whatever object she had in her hand, especially her braille pen. She usually looked away from her peers when she conversed with them. This behavior was observed to have a negative effect on the sighted classmates, who started conversing the same way; that is, they turned away from Kate and focused their attention on the other sighted classmates who were present in that setting. This change in the direction of the sighted classmates' gaze seemed to serve the function of letting the other sighted classmates know that they were interested in the conversation, especially when Kate's interruptions may have suggested otherwise.

Anne

Anne's chronological age was 9 years and 10 months.

Her social age on the Indian adaptation of the Vineland Social Maturity Scale was 4.8. Like Kate, Anne dressed untidily. The teacher reported that although Anne was always smiling, she did not respond to any conversation from the teacher or her sighted classmates. Anne stayed on her own unless she was approached by others. The teacher also reported that she was not sure whether Anne was paying attention in class because Anne neither looked toward her nor initiated any answers.

Anne's parents could not be interviewed because they lived in a distant town. Instead, the director of the hostel where Anne had lived for the past five years was interviewed. The director reported that Anne had always been a helpful girl. Although Anne did not initiate any conversation with her peers, she always responded if she was approached. However, at times her answers were irrelevant, or she would just smile and say nothing.

Anne was observed to be a nonassertive girl who usually did not speak with others unless she was specifically asked a question. Even when she tried to speak and somebody interrupted, she just stopped talking completely. In the playground, although her peers played nearby, she never asked them to let her join in their games. Like Kate, she usually looked away from her peers with a similarly negative effect.

Target and nontarget behaviors

Social validity refers to societal judgments about the social significance of the goals, social appropriateness of the procedures, and social importance of the effects (of an intervention) (Wolf, 1978). Therefore, on the basis of observations of video recordings in different settings and interviews with the teachers, parents, and the director of the hostel (significant others in these children's environment), I chose two target behaviors for Kate: modification of the direction of her gaze and conversational skills (see Box 1). On-task behavior and a decrease in fidgeting were observed as nontarget behaviors for Kate, specifically to see the generalization across behaviors. For Anne, I chose modification of the direction of her gaze and an increase in conversation as target behaviors (see Box 2). Play behavior was observed as a nontarget behavior for Anne, to see the generalization across behaviors. Although conversational skills were a target behavior for both children, the components were different because of the children's different learning needs (see Boxes 1 and 2). Also, in Anne's case, one of the components that was observed was whether the conversation (initiated or prompted) was original (something new emerging from her) or copied (repeating the same question or response as the peer).

Design and experimental procedures

A multiple baseline design across behaviors was used. The total duration was measured for appropriate

direction of gaze, conversation, on-task behavior, and positive play. Total duration is the summation of the time the targeted behavior was emitted during the observed 5 minutes of every 20-minute session. Therefore, the maximum possible duration for any session was 300 seconds.

Kate

There were three phases of intervention— self-evaluation, self-evaluation with feedback, and self-evaluation. In the first phase, no feedback was provided on the accuracy of the self-evaluation. Each session lasted 20 minutes. Kate and the two sighted children were asked to sit and chat or play freely. Every 2 minutes, I cued Kate to self-evaluate by tapping softly on the ground. In the first intervention session, Kate sometimes did not respond to the tap. I then cued her by saying "Well?" implying that she should tell me what happened in the previous 2 minutes. At the beginning of the session, Kate was required to set the criteria for the next 2 minutes. After 2 minutes, she was required to tell whether she could actually meet the criteria she had set. Kate then set the criteria for the next 2 minutes, and so on. Then the session was carried out without any comment from me. The criteria were related to the direction of Kate's gaze and conversation. For example, Kate would say, "I will take turns at talking and will not interrupt when 'X' or 'Y' are talking." This phase lasted four sessions for direction of gaze and three for conversation. After this

phase, training for that behavior was stopped, and on subsequent days (following the same pattern as the training sessions), a generalization probe (across setting and individuals) was carried out for one session for direction of gaze and for two sessions for conversation in another setting with two new sighted children.

In the second phase (self-evaluation with feedback), I provided feedback about the accuracy of the self-evaluation in five sessions for the direction of gaze and three for conversation. Again, a generalization probe was conducted for two sessions.

In the third phase, the same procedure was followed as in the first phase, except that Kate was asked to self-evaluate every 5 minutes. This phase was carried out during four sessions for each behavior. A generalization probe was conducted for four sessions. On-task behavior was observed as nontarget behavior to see the generalization across behaviors.

Anne

The procedure was similar to that used with Kate. However, only the last two phases were replicated. The first phase (self-evaluation with feedback) was carried out for four sessions each, for direction of gaze and for conversation. Two sessions of the generalization probe followed. The second phase (self-evaluation only) was carried out for four and three sessions respectively, for

direction of gaze and conversation. Five sessions of the generalization probe followed. Positive play was observed as a nontarget behavior. However, for administrative reasons, the children were not allowed to leave the classroom for their "game period" on most of the days. Therefore, positive play could be observed only sporadically.

The maintenance probe was carried out six months later for both Kate and Anne. Four sessions each were conducted for both target behaviors.

Videotaped observations

All the sessions were videotaped. With the help of a video timer, minutes and seconds were also recorded. Two special education graduate students and I later observed the videotapes. Since 5 minutes of every 20-minute session were observed, the maximum possible duration for a behavior to occur in a session was 300 seconds. In Session 1, the first 5 minutes were observed; in Session 2, the second 5 minutes (that is, from 5 minutes to 10 minutes of Session 2) were observed; and so on, with the first 5 minutes of Session 5 being observed. Interobserver reliability was calculated using the formula: number of agreements, divided by number of agreements plus disagreements, multiplied by 100. The interobserver reliability for Kate was 86% during the baseline and 86%, 84%, and 90% during the three phases, respectively, and was an average of 88% during the probes. For Anne, the

interobserver reliability was 88% during the baseline and 91% and 86% during the two phases, respectively, and was an average of 89% during the probes.

Results

Kate

Direction of gaze

As shown in Figure 1, at the baseline, an appropriate direction of gaze occurred for a total of 12 seconds out of a maximum of 300 seconds but reached an average of 208 seconds during the first phase (self-evaluation only). During the generalization probe, the appropriate direction of gaze dropped to 133 seconds, but it increased again to an average of 226 seconds during the second phase (self-evaluation with feedback) and lasted an average of 200 seconds during the generalization probe. During the first session of the generalization probe, the appropriate direction of gaze lasted 264 seconds (in the session before that, it lasted 266 seconds), but it decreased to 136 seconds in the second session. In the third phase (the self-evaluation-only phase), it lasted an average of 270 seconds, whereas during the generalization probe, it lasted an average of 242 seconds.

Conversation

At the baseline, Kate conversed for an average of 35

seconds. However, she did so for an average of 288 seconds during the first phase (self-evaluation only). In fact, from the second session of this phase, she conversed for the maximum of 300 seconds. During the generalization probe, she conversed for an average of 295 seconds. Again, during the second phase (self-evaluation with feedback), Kate conversed for an average of 299 seconds. During the generalization probe, she conversed for an average of 300 seconds. In the third phase (self-evaluation only), her conversation went down slightly to an average of 296 seconds, and during the generalization probe, it was at an average of 275 seconds.

On-task behavior and fidgeting

Kate's on-task behavior increased from the first-session total of 40 seconds to 300 seconds by the end of the study. Although some fluctuations were observed, Kate was observed to be on task from Session 15 onward.

Although fidgeting was at a high level of 135 seconds in the first session, it dropped to 0 from Session 13 onward and was maintained at this level. As can be seen in Figure 2, social interaction reached a high level with the introduction of the intervention for social skills.

Anne

Direction of gaze

As can be seen in Figure 3, at the baseline, Anne's appropriate direction of gaze was at an average of 21 seconds out of a maximum of 300 seconds. It increased remarkably and reached an average of 260 seconds during the first phase (self-evaluation with feedback). However, during the generalization probe, it dropped to 177 seconds, but it rose again to an average of 243 seconds during the second phase (self-evaluation only) and then dropped to an average of 238 seconds during the generalization probe.

Conversation and positive play

At the baseline, Anne's conversation was low at an average of 13 seconds. However, it reached an average of 271 seconds during the first phase (self-evaluation with feedback). During the first session, Anne conversed for 65 seconds, but by the third session and during the generalization probe and the second phase (self-evaluation only), she did so for an average of 300 seconds. Anne also conversed for the maximum of 300 seconds during Session 3 of the intervention and maintained this level till the last session of the generalization probe.

Anne's play behavior could not be observed for more than 5 sessions in all. However, a definite increase was observed in positive play from the time Anne started self-evaluating. Her social interaction reached a high level with the introduction of the intervention for social skills (see Figure 4).

Follow-up

Both girls were followed up after six months, and the class teacher confirmed the results. As can be seen in Figure 1, Kate's direction of gaze was maintained for an average of 248 seconds, and her conversation was maintained for an average of 293 seconds. As can be seen in Figure 3, at follow-up, Anne's direction of gaze was maintained for an average of 234 seconds, and her conversation was maintained for an average of 288 seconds. Hence, good maintenance was observed in both cases.

Discussion

Self-evaluation helped to improve Kate's use of the appropriate direction of gaze. However, at times, Kate was found to self-evaluate inaccurately. When I gave her feedback about the inaccuracy, she always denied it and maintained that she had directed her gaze toward her peers. This denial could have been due to two reasons: either Kate was overassertive and did not like to be told that she was wrong or she actually assumed that she had turned toward her peers, which was confirmed by the peers continuing to converse. Thus, the peers' behavior may have acted as feedback that suggested to Kate that she was looking in the right direction and may have become the basis of her self-evaluation. This possibility suggests that before self-evaluating, a person needs to look for cues in, or

feedback from, the environment on which to base his or her self-evaluation. It also implies that feedback from the environment actually comes (or should come) before a person self-evaluates. That is, the consequences of the behavior becomes a basis for the self-evaluation. However, it is to be noted that Kate's peers stopped looking at Kate, started looking only at each other, and started conversing among themselves when Kate stopped looking at them. It can be assumed that feedback would have been more effective had it come naturally, that is, from the peers as part of the conversation, rather than as a seemingly judgmental statement from me. However, it was observed that feedback subsequently helped to increase the accuracy and duration of Kate's direction of gaze, which were maintained even when there was no feedback in the third phase.

Once the duration of Kate's conversation increased during the first phase (self-evaluation only), it was maintained at high levels throughout. The self-evaluation was also accurate. Hence, it can be assumed that for skills that do not require visual feedback and for which the other person's behavior acts as a direct means of feedback or reinforcement, no outside or planned feedback is necessary.

Furthermore, it was found that the effects were generalized to on-task behavior, with Kate working continuously in the class. Kate also stopped fidgeting (shaking her pen vigorously). Although Kate was

sometimes observed to take out her pen, fidget for no more than a second, and put it away, by the end of the training, she had stopped fidgeting entirely.

The direction of Anne's gaze was observed to improve in the first phase (self-evaluation with feedback). Although, it initially declined after the removal of feedback, it was observed to return to the high levels of the first phase. Again, as was the case with Kate, once the duration of Anne's conversation increased, it was maintained at that level, irrespective of feedback. This finding further supports the assumption that direct feedback related to behavior is essential only for skills that require visual cues and is required before self-evaluation. Once Anne started conversing freely with her peers, she was found to be a good storyteller and soon became popular with them. In fact, other peers from outside the training setting were also observed to approach her, asking her to tell them similar stories. Anne's play behavior also increased significantly, and she actively participated with her peers.

However, Anne, who seemed to be a nonassertive child, did not seem to want to establish high-level criteria for self-evaluation. Even when she performed the appropriate behavior, she hesitated to say so. This observation points to the relationship between self-efficacy and criteria setting, as Bandura (1977) suggested.

Asking the girls to self-evaluate every two minutes was

necessary because a longer time frame might have affected the accuracy of their self-evaluations. However, this frequency of cuing for self-evaluation is not recommended because it may obstruct the flow of conversation between children, especially in the later stages. It may be worth trying to increase the duration in the later stages of the intervention and basing the duration on the needs of each individual.

Conclusion

For the two girls in the study, feedback was found to be necessary to facilitate their self-evaluation and to develop their social skills. For most behaviors, when the consequences are clear, no verbal feedback is necessary for children with visual impairments. However, when the consequences are not clear, feedback that is understandable and meaningful to them is necessary. Therefore, this study expanded the concept of self-evaluation. Researchers have thought that self-evaluation provide feedback per se (see, for example, Cartledge & Milburn, 1986). However, the findings of this study suggest that although self-evaluation may help children to become more aware of the feedback and may help them to pick up on it, for some social skills it is difficult for children with visual impairments to pick up on feedback or to understand the consequences by themselves. That is, it is difficult for them to judge by themselves whether a behavior was actually emitted or not. The findings also suggest that feedback is initially provided by the environment

as the consequences of a behavior and that self-evaluation makes a child aware of this feedback and helps him or her to pick up on it.

However, it was observed that the significant others in the environment usually fail to give this feedback, and they have to be trained to do so. Such feedback can be provided by a researcher or other external agents and can be effective in bringing about positive changes in behavior. However, when feedback is given in this way, it may not only obstruct generalization and maintenance, but be considered unfavorable by the child. Therefore, feedback will be more effective when it is provided naturally by the significant others in the environment. Furthermore, both the role of the significant others (Jindal, 1996) and the importance of reconstructing the environment need to be explored further (MacCuspie, 1996; Warren, 1994).

Therefore, it can be concluded that self-evaluation is effective in generalizing and maintaining social skills and in enhancing social interaction. However, it is necessary to increase adequate and meaningful feedback from the environment and to provide such feedback through natural contingencies and by the agents who are already present in the child's natural environment.

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Divya Jindal-Snape, Ph.D., *lecturer, Faculty of Education and Social Work, University of Dundee, Gardyne Road Campus, Dundee DD5 1NY, Scotland; e-mail: <d.jindalsnape@dundee.ac.uk>.*

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