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Stimulus Control of Personally Intrusive Behavior

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This investigation examined the use of a nonaversive stimulus control procedure to manage the personally intrusive behavior of a male, adolescent student with mental retardation. Prior to intervention, the student touched and moved very close to other people, whether invited to do so or not. When treatment began, the student was allowed to touch and in other ways "invade the space" of a staff person in the classroom who wore a "touch button." If he tried to move closer than an arm's length to a person who was not wearing the button, that person moved away with minimal contact. An A A' B A' design and Precision Teaching were used to assess intervention effects. Results indicated a reduction in the frequency with which the student invaded the space of non-button wearers and an increase in the frequency with which he invaded the space of individuals who wore the button. Implications are discussed.

In recent years, means for controlling challenging behaviors which attempt to minimize aversive treatment components have received increasing attention in the behavior management literature (e.g., Carr, Robinson, Taylor, & Carlson, 1990; Donnellan, LaVigna, Negri-Shoultz, & Fassbender, 1988; Meyer & Evans, 1989). Social skills instruction, functional communication training, curriculum revisions, and differential reinforcement paradigm are methods that have been the subject of considerable scrutiny and recommended for potential application (cf. Helmstetter & Durand, 1991; LaVigna, Willis, & Donnellan, 1989). In addition, several stimulus control procedures have been described (Carr, Newsome, & Binkoff, 1976; Carr, Robinson, & Palumbo, 1990; LaVigna & Donnellan, 1986). Those procedures capitalize on the behavioral control exerted by a specific discriminative stimulus (SD) or by a stimulus class.

Two general categories of stimulus control procedures have been identified. The first is an "SD-introduction" method in which stimulus conditions associated with low levels of challenging behavior are identified. Those conditions are then introduced within problem situations (cf. Carr, Robinson, Taylor, & Carlson, 1990; Touchette, MacDonald, & Langner, 1985). The intent of the method is to reduce the probability that target behaviors will occur when SD's for low rates or intensities of those behaviors are present.

The second category of procedures involves the development of stimulus control rather than the identification and introduction of existing SD's. The power of an SD is initially established from the reliable reinforcement or punishment of behaviors which follow SD presentation (Malott, 1991; Sulzer-Azaroff & Mayer, 1991). Intervention, therefore, consists of reinforcing or punishing challenging behaviors when those behaviors occur in the presence of specified SD's, but not in the presence of other stimuli. Where the behavior is reinforced in the presence of the SD, the goal is to increase the frequency of the response in the presence of that stimulus and decrease it under all other conditions (cf. Terrace, 1966). An example of such an "SD-development" procedure was described by LaVigna and Donnellan (1986). In that example, stimulus control was successfully used to bring public masturbation by a five-year-old girl under the control of an SD using reinforcement strategies. The girl frequently masturbated in her classroom, and other students were beginning to imitate her behavior. Instead of using a punishment procedure to decrease the behavior, the teacher simply moved her to the bathroom and provided differential reinforcement for private masturbation. The bathroom became an SD for that behavior, while masturbation in the classroom was eliminated.

Donnellan, LaVigna, Negri-Shoultz, and Fassbender (1988) and LaVigna and Donnellan (1986) have noted a number of advantages associated with the SD-development approach described above. They indicated, for example, that:

1. It is a relatively unobtrusive technique that does not require the use of aversive treatment to establish control over the behavior.

2. It has the ability to control behaviors without eliminating them. Behaviors can then be directed to appropriate settings or limited in

scope. Such a limitation may act to reduce the impact of the undesirable behavior on others and control the inadvertent reinforcement which may have acted to maintain the behavior at a high rate. In addition, procedures can be applied to systematically shape unacceptable response forms into acceptable forms, while challenging behaviors are under reliable stimulus control.

3. It can facilitate generalization when the SD is introduced in various settings and with various people.

In spite of such potential benefits, it has been suggested that this category of stimulus control procedures represents "one of the most overlooked, understudied and underutilized strategies available to us today" (LaVigna & Donnellan, 1986, p. 101). With the exception of two data-based case studies (Donnellan & LaVigna, 1986), development of stimulus control to manage challenging behavior of individuals with developmental disabilities in applied settings is limited to anecdotal accounts (e.g., LaVigna, Willis, & Donnellan, 1989). In the case study, demonstrations presented by Donnellan and LaVigna (1986), stimulus control techniques were used either singly, or as part of a treatment package, to manage the inappropriate verbalizations of a student with post-encephalitic brain damage and echolalia of a student with autism.

The purpose of this investigation was to examine the use of a positive stimulus control method to reduce undesirable and stigmatizing social behaviors. Specifically, we attempted to determine whether stimulus control could be effectively used to decrease the frequency with which a student with mental retardation touched other people, blew in their hair, and in other ways "invaded their space." In addition, an attempt was made to determine whether decreases in challenging behaviors would be accompanied by increases in social interaction and to assess generalization of stimulus control from a classroom setting to vocational training sites.

Method

Participant

Dan was a 16-year-old male high school student in a class for students with moderate to severe disabilities. He was diagnosed with moderate mental retardation, mild cerebral palsy, ataxic hemiplegia, and a seizure disorder. His height and weight were normal for his age.

Dan had a history of interacting with others by moving within 15 cm of them, touching various parts of their body, blowing in their hair, and articulating in a way that caused him to spit in their faces. Such behavior was a severe liability to Dan's ability to develop friendships, interact with clerks and restaurant workers in the community, or work in a permanent job setting. On the occasions when he did not exhibit those behaviors, interactions with Dan were described as friendly and enjoyable.

Settings

Dan's instructional program occurred in both the school and the community. Vocational training was provided at two different job sites. Functional academics, domestic, and recreational instruction was conducted in the school and other community sites. The stimulus control intervention was applied in his classroom which contained 22 students, two teachers, and four instructional assistants. There were rarely more than 10 people in the room, however, because many students and staff were in the community at any given time.

Generalization probes occurred at both the job sites. One job site was a nursery school in the basement of a church. Dan and one or two other students cleaned the basement one day a week for two hours under the supervision of a classroom assistant. There were no other people at the site while they cleaned. The other job site was a large meeting hall of another church. Dan, six other students, a teacher, and a volunteer collated, taped, and labeled newsletters for two hours once a week. Some, but not all, components of the stimulus control procedure were designated for application in the generalization settings during the intervention phase of the investigation.

Materials

A small white button measuring 7 cm in diameter was used as the discriminative stimulus. The button had one small red dot (5 mm in diameter) 1 cm from the top of the button and another red dot 1 cm from the bottom. The two dots were 5 cm apart. Dan had not been exposed to the button prior to the investigation.

Movement Definition

Originally, "invading another's space" was defined as Dan moving closer than one arm's length (approximately 70 cm) to another person. There were occasions, however, when others came closer than an arm's length to Dan (e.g., to sit beside him and help him with school work), and Dan appropriately talked to them or continued his on-task behavior. In addition, there were occasions when

people came into his space, and he inappropriately touched them or moved his face to within 15 cm of theirs. For those reasons, the definition of "invading another's space" was revised after one week of baseline assessment. Following that revision, invasion of another's space was scored if Dan moved closer than one arm's length to others, touched others in any way, blew in their direction, or moved his face within 15 cm of their face if they came closer than an arm's length to him.

Appropriate interactions were defined as Dan's either responding to a question at a greater-than-arm's length distance or initiating verbal interaction directly to another person without invading his or her space. Appropriate interactions began when he started speaking and ended when either the other person began talking or Dan stopped talking for more than two seconds. Talking out loud without directing his conversation to any particular person was considered an inappropriate interaction.

Design and Procedures

The experiment used an A A' B A' design and Precision Teaching to evaluate the effects of intervention. The design was an adaptation of the standard A B A withdrawal design. The adaptation included two baseline conditions, so that the behavior could be measured in the absence of the stimulus button (the A phase), as well as in the presence of the button before the stimulus had acquired control over the behavior (the A' phase). A second adaptation was that the replication phase reintroduced the A' phase rather than the A phase in order to examine maintenance of stimulus control.

Baseline

During the first baseline condition (A), data were collected in the classroom and two job sites to determine the normal frequency and duration of Dan's intrusive behavior. Following that condition, an A' phase was introduced in which a staff member wore the button, but continued to respond to Dan in a typical manner. For example, if the button-wearer had always ignored Dan invading his or her space, he or she ignored him in the A' phase as well. Assistants and teachers took turns wearing the button, but no single person wore it for longer than 30 minutes at a time.

The purpose of the first A' phase was to ensure that the button did not initially possess stimulus control properties for Dan. It was hypothesized that the button would not possess such properties and, therefore, that there would be no difference between the A and A' phase in the frequency with which Dan invaded the space of others. The A' phase was also initiated to provide a baseline measure both for people wearing the button and people not wearing it. During A and A' phases, staff members and students behaved in a variety of ways when Dan invaded their space, including pushing him away, telling him to stop, ignoring him, and moving away from him. Informal observation and self-report data indicated that their behavior toward Dan during these phases were similar to how they behaved around him before the study began.

There was limited access to the generalization sites by observers, so the A' phase was not assessed in those settings. It seemed reasonable, however, to presume that if the button did not possess discriminative stimulus characteristics in the classroom, it would be unlikely to possess such characteristics in the community.

Intervention

Treatment consisted of allowing Dan to come within approximately an arm's length and touch, and/or blow at, the person wearing the touch button, but no one else. The person wearing the button was permitted to move more than one arm's length away if Dan touched that person continuously for more than 15 seconds or if Dan hurt him or her. After breaking for one second, however, Dan was allowed to re-initiate contact.

In order to decrease the reinforcement density for participating in inappropriate interactions with non-button-wearers, those individuals (including classroom peers) were asked to interact with Dan only when he stood more than an arm's length away. They were instructed to move away from Dan with minimal physical contact or verbal interaction when he came within an arm's length of them. If Dan attempted to chase someone, the button-wearer physically stopped Dan and told him that he was only permitted to touch the person wearing the button.

In the generalization settings, staff members wore the stimulus button, but other components of the intervention were eliminated. Conditions, therefore, were equivalent to those which existed during the A' phase within the classroom.

Replication

Following intervention, the A' phase was reintroduced. During that phase, staff members took turns wearing the button, but Dan was not unconditionally permitted to invade their space. Everyone, including the individual wearing the button, was instructed to attempt to react to Dan

the way he or she had before the intervention phase began.

Data Collection
One of the investigators and a high school student assigned as a peer tutor in the classroom collected data. The investigator collected data alone on Tuesdays and the student collected data alone on Wednesdays and Fridays of every week. They both collected data at the same time on Thursdays, with the student serving as primary observer, to measure interobserver reliability. Data were not collected on Mondays due to Dan's schedule, nor were they collected during the last five Tuesdays of the study due to a schedule change. In addition, data were not collected on some days due to absences, schedule changes, or school holidays and cancellations. The data collectors sat in the room at desks and recorded data on tally sheets.

After testing different durations of time for the first four recorded days, continuous recording for 30 minutes was employed. During the data collection interval, the frequency with which Dan invaded the button-wearer's and other people's space was recorded, as was the frequency with which Dan talked to other persons at a distance of greater than one arm's length. As Dan decreased invading other people's space, he was expected to increase appropriate interactions.

The investigator collected data at the job sites alone to assess generalization. Those data related only to Dan's invading the space of the button-wearers and others. Appropriate interaction data were not collected because interaction with others at job sites during work time was often considered inappropriate. Three probes were taken at each site in the baseline phase and in the intervention phase, and two probes were conducted at each site during the replication phase.

Interobserver Agreement
As mentioned previously, the investigator and a high school peer tutor collected data in the classroom on the same day once a week to assess interobserver reliability. They sat at least five meters from each other and usually on the other side of the room (i.e., approximately 10 meters apart). Interobserver reliability was measured during 24% of all sessions. A frequency ratio, calculated by dividing the smallest of the two frequency counts by the largest, was determined after each interobserver session.

Reliability scores were calculated for three behaviors: invading the button-wearer's space; invading non-button-wearers' space; and appropriate interactions. The median reliability score for invading the button-wearer's space was .93, with a range of .65 - 1.0. There was only one case in which reliability was below 80%. The median reliability measure for invading non-button-wearers' space was .91 with a range of .67 - 1.0. Reliability between .70 and .80 was obtained in two instances. The median reliability score for appropriate interactions was .87, with a range of .29 - 1.0. Three scores below .80 were obtained.

Because reliability was unacceptably low in several instances, data obtained by the reliability observer were included in the data display for the Results section of this investigation and are represented by asterisks (*). A point on which only an asterisk can be seen indicates 100% agreement. Those data were presented in order to determine whether scores obtained from the reliability observer would suggest substantially different conclusions than those based on the scores of the primary observer. An examination of reliability observer data suggested that conclusions would not differ and provided support for the findings discussed in the Results section.

Procedural Reliability
During the treatment phase, the investigator measured procedural reliability of the entire program and calculated a procedural reliability ratio in a manner similar to that described in Billingsley, White, and Munson (1980). The entire program was written on a program plan sheet listing the set-up required, materials needed, and the arranged events or consequences for Dan's behavior. For example, the plan stated that if Dan moved within an arm's length of another person, that person was to move away from Dan immediately with minimal interaction. The procedural reliability ratio was calculated by dividing the number of times people moved away from Dan by the total number of opportunities (i.e., the number of times they moved away plus the number of times they did not). The ratio was calculated for set-up, touching the button-wearer, and touching non-button-wearers . Set-up was either correct or incorrect, based on whether someone wore the button at the beginning of class. Touching the button-wearer was counted if the person allowed Dan to touch him or her for at least 15 seconds.

Procedural reliability was measured during 38% of the intervention sessions. The set-up was correct every time. Procedural reliability for touching the button-wearer ranged from .93 to 1.0 with a median of 1.0.

Procedural reliability for touching non-button-wearers was extremely variable and required instructional intervention. All other students in the classroom had mild to severe mental impairments and often, when Dan touched them during the intervention phase or other times, they would ask him to stop or not respond at all. For the first five sessions of the intervention phase, instructions were provided to students and staff before the period began. Students were occasionally verbally reminded to move away from Dan, but that prompt alone produced low reliability ranging from .20 to .89 with a median of .55. After the 12th recorded day, students were physically moved away from Dan if he touched them and if verbal prompts were not successful after one second. That change is reflected in data displays by a dashed vertical line. With physical prompts, perfect procedural reliability (i.e., 1.0) was obtained during sessions 13 -15 of the intervention phase.

Results

Chart 1 depicts the frequency with which Dan invaded the space of people other than the button-wearer. The frequency of inappropriate movements during baseline phase A ranged from .28 per minute to 2.23 per minute (67 times during the half-hour assessment period). Phase A' frequencies fell within the range obtained during phase A and accelerated across the three sessions of that phase. The frequency of challenging behaviors decelerated rapidly during the first six recorded days of phase B; however, acceleration of those behaviors was noted across the six recorded days which followed, concurrent with decreases in reliability of treatment application. Following the implementation of practices which increased procedural reliability, low levels of inappropriate behavior were once again obtained. During the last three days of phase B, the frequency with which Dan invaded the space of others ranged from .07 per minute to .13 per minute, which was never more than four times during the half hour of assessment. Frequencies of invading the space of others when the A' phase conditions were reinstated increased to levels similar to those observed during the original baseline phase.

Chart 2 indicates the extent to which Dan invaded the space of button-wearers. Intervention phase data suggested that, although considerable variability existed in Dan's challenging behaviors, levels of responding were typically above those during baseline assessments and indicative of the development of stimulus control. Relative stability was achieved during the final seven assessment sessions of the phase and, in the last three sessions, the median frequency showed an increase of x3.4 over that of the three baseline datum points. In addition, an increase of x2.3 was noted over the median frequency with which Dan invaded others' space during corresponding intervention sessions illustrated in Chart 1. During the second phase A', responding was characterized by a high degree of variability, suggesting a breakdown of stimulus control.

Chart 3 indicates that appropriate interactions with others accelerated during the baseline phase. Once treatment began, however, the frequency with which Dan interacted with others steadily decelerated, eventually falling below the counting period floor toward the end of the phase. During the reinstatement of phase A' conditions, however, frequencies of appropriate interaction once again accelerated.

Data that were collected at the two generalization sites are displayed in Chart 4. Those data reflected general patterns of behavior which were consistent with those observed in the classroom. Invading the space of those not wearing the button substantially decreased during the treatment phase, but returned to baseline levels during the last phase (A'). During intervention, Dan invaded the space of the button-wearer at frequencies comparable to those with which he invaded everyone else's space during baseline. Invading the button-wearer's space decreased in the last phase.

Discussion

This study demonstrated that a nonaversive stimulus control procedure could successfully decrease inappropriate invasions of others' space. The frequency with which Dan displayed challenging social behavior decreased substantially when he was permitted to invade the space of the person wearing the discriminative stimulus button. Dan learned that he could come near and touch others, but only in certain contexts. Future steps planned by Dan's classroom staff include reestablishing stimulus control and using that control to provide a basis for shaping the behavior into socially appropriate forms of touching (e.g., shaking hands) and teaching Dan appropriate occasions and persons for touching. As Donnellan and LaVigna (1986) have noted regarding socially stigmatizing behaviors, "Ultimately, the solution is to develop effective social interaction skills ... Even when such training is underway, however, these behaviors must be addressed, as they may have serious consequences for individuals and programs" (p. 25). The current investigation indicated that stimulus control procedures can be an effective initial means

for addressing such behaviors.

Data obtained in the study also illustrated the importance of relating frequent, direct, measures of target behaviors to assessments of the extent to which procedures were applied as planned. By noting that an undesirable acceleration of the data was accompanied by decreases in procedural reliability, it was possible to conclude that the problem was not one of treatment failure, but of implementation. Steps could then be taken to remediate that problem in a timely manner.

An unexpected result was that the frequency with which Dan interacted, with persons other than the button-wearer, decelerated during the intervention phase. During the baseline phase, Dan would often begin a conversation with a person at an appropriate distance and then get very close to that person. In the intervention phase, people ignored him and moved away when he came too close. It is possible that Dan failed to discriminate that social interactions could be maintained, as long as he stayed at arm's length and that the act of moving away by others served as an unplanned punisher for the entire unit of interaction. Dan, therefore, may have simply reduced the frequency with which he began conversations at an arm's length distance, rather than increasing the frequency with which he started conversations and maintained them at that distance thereafter. In any case, it seems that additional program components would be necessary to ensure an increase in Dan's appropriate conversational behaviors.

Generalization of stimulus control was observed at the two job sites as shown in Chart 4. While few trials were administered during each phase, the data effectively support the findings in the classroom. It is important to note, however, that since no reliability data were collected in generalization settings, conclusions must be considered tentative. The possibility of achieving generalized outcomes, however, seems deserving of research efforts in the future.

Limitations

At least initially, the staff in the classroom were reluctant to try this program for more than one period per day. This is testimony to the cooperation, involvement and dedication required by positive programming. Rather than simply requiring teacher-administered punishment, Dan's program involved the entire classroom -- staff and students alike. Staff time and energy were required to help train other students to move away from Dan, which added to their reluctance, and procedural reliability difficulties were noted.

On the other hand, many "traditional" behavior management programs may appear relatively simple on their face, but present a variety of difficulties and/or disadvantages during implementation. For example, overcorrection may produce strongly resistive behaviors on the part of learners, negative reactions from staff members (Miltenberger & Fuqua, 1981) and time-out may result in students being excluded from educationally important situations.

Educators who desire to use stimulus control or other positive approaches to behavior management should, therefore, be prepared to meet practical challenges. However, they need not presume that such challenges will necessarily be greater than those generated by many alternative methods which have frequently characterized programs for individuals with moderate to severe disabilities.

Implications for Educators: Developing and Applying Positive "SD-Development" Behavior Management Programs

1. Determine whether it is appropriate to reinforce the performance of target behaviors in the presence of specified SD's. Some indicators:

   a. The target behavior is considered challenging simply because it occurs in inappropriate context (including settings, persons, etc.).

   b. The target behavior is considered undesirable, but can be tolerated if it occurs primarily in the presence of only a very limited range of stimuli.

   c. Training in alternative, appropriate behav ior forms can be facilitated if performance of the target behavior is limited to specific, teacher-selected conditions.

   Some contraindicators:

   a. Performance of the target behavior presents a danger to the learner or others.

   b. Conditions under which performance of the target behavior would be acceptable or tolerated cannot be identified or arranged.

2. Specify an appropriate stimulus or set of stimulus conditions in the presence of which performance of the target behavior

will be followed by reinforcers.

3. If it is desired that the target behavior be performed in the presence of specified SDs under nontraining conditions (i.e., when access to reinforcers is not under strict manager control), identify circumstances under which generalization probes will be conducted.

4. Implement training and assess performance of target behaviors in instructional and generalization settings. An effective stimulus control program will be indicated by increases in the frequency of the target behavior in the presence of SD conditions and a decrease in its frequency in the absence of such conditions.

5. Collect frequent procedural reliability data to ensure that reinforcers follow performance of the target behavior only in the presence of specified SDs.

References

Billingsley, F., White, O. R., & Munson, R. (1980). Procedural reliability: A rationale and an example. *Behavioral Assessment*, 2, 229-241.

Carr, E. G., Newsome, C. D., & Binkoff, J. A. (1976). Stimulus control of self-destructive behavior in a psychotic child. *Journal of Abnormal Child Psychology, 4*, 139-153.

Carr, E. G., Robinson, S., & Palumbo, L. W. (1990). The wrong issue: Aversive vs. non aversive treatment. The right issue: Functional vs. nonfunctional treatment. In A. C. Repp & N. N. Singh (Eds.), *Perspectives on the use of nonaversive and aversive interventions for persons with developmental disabilities* (pp. 361-379). Sycamore, Il: Sycamore.

Carr, E. G., Robinson, S. R., Taylor, J. C., & Carlson, J. I. (1990). *Positive approaches to the treatment of severe behavior problems in persons with developmental disabilities: A review and analysis of reinforcement and stimulus-based procedures* (The Association for Persons with Severe Handicaps Monograph No. 4). Seattle: The Association for Persons with Severe Handicaps.

Donnellan, A. M., LaVigna, G. W., Negri-Shoultz, N., & Fassbender, L. L. (1988). *Progress without punishment: Effective approaches for learners with behavior problems*. New York: Teachers College Press.

Donnellan, A. M., & LaVigna, G. W. (1986). Nonaversive control of socially stigmatizing behaviors. *The Pointer, 30* (4), 25-31.

Helmstetter, E., & Durand, V. M. (1991). Nonaversive interventions for severe behavior problems. In L. H. Meyer, C. A. Peck, & L. Brown (Eds.), *Critical issues in the lives of people with severe disabilities* (pp. 559-600). Baltimore: Paul H. Brookes.

LaVigna, G. W., & Donnellan, A. M. (1986). *Alternatives to punishment: Solving behavior problems with non-aversive strategies*. New York: Irvington.

LaVigna, G. W., Willis, T. J., & Donnellan, A. M. (1989). The role of positive programming in behavioral treatment. In E. Cipani (Ed.), *The treatment of severe behavior disorders: Behavior analysis approaches* (pp. 59-83). American Association on Mental Retardation Monograph, 12. Washington, DC: American Association on Mental Retardation.

Malott, R. W. (1991). Reader reactions to notes from from a radical behaviorist. *The ABA Newsletter, 14* (3), 10.

Meyer, L. H., & Evans, I. M. (1989). *Nonaversive intervention for behavior problems: A manual for home and community*. Baltimore: Paul H. Brookes.

Miltenberger, R. G., & Fuqua, R. W. (1981). Overcorrection: A review and critical analysis. *The Behavior Analyst, 4*, 123-141.

Sulzer-Azaroff, B., & Mayer, G. R. (1991). *Behavior analysis for lasting change*. Fort Worth: Holt, Rinehart, and Winston.

Terrace, H. S. (1966). Stimulus control. In W. K. Honig (Ed.), *Operant behavior: Areas of research and application* (pp. 271-344). New York: Appleton-Century-Crofts.

Touchette, P. E., MacDonald, R. F., & Langer, S. N. (1985). A scatter plot for identifying stimulus control of problem behavior. *Journal of Applied Behavior Analysis, 18*, 343-351.

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Plan Sheet

Plan Sheet Number: 1 Student: Dan Date: 3/90 Movement Cycle: Appropriate interactions with others

Location: Class Advisor: Andrews Managers: All Staff Desired Rate: C: _ E: _ Target Date ___

Program & Date	Programmed Event	ACCELERATION OR MONITOR			DECELERATION OR MONITOR		
		Movement Cycle	Arrange-ment	Arranged Event	Movement Cycle	Arrange-ment	Arranged Event
3/12/90 Time: Two to three 1-hour school periods per day Locations: classroom Materials: button, data sheets, stopwatch People: Dan, all staff and students around him	During designated periods, different staff members who are in the same room as Dan take turns wearing the button for up to 30 minutes at a time. Dan follows his normal daily schedule. The button-wearer is visible to Dan at all times and allows his/her space to be invaded when Dan desires The button-wearer intervenes when Dan attempts to chase a non-button-wearer in an effort to invade that person's space <u>Procedural Reliability Intervention</u> Students who do not move away from Dan when he invades their space are physically moved away from him if verbal prompts are not successful	Dan seeks out button-wearer to initiate contact Dan responds to a question at a greater-than-arm's length distance Dan initiates a verbal interaction directly to another person without invading his/her space	1:1 1:1 1:1	Dan can invade person's space continuously for at least 15 sec. Full attention of questioner is given for as long as Dan continues interaction at a greater-than-arm's length Full attention of other person is given for as long as Dan continues interaction without invading person's space	Dan moves closer than an arm's length, touches, blows at, or moves his face within 15 cm of any non-button-wearer Dan invades button-wearer's space for more than 15 seconds	1:1 1:1	Person immediately moves away from Dan with minimal interaction Button-wearer permitted to move away from Dan (after 1 second, though, Dan can re-initiate contact)

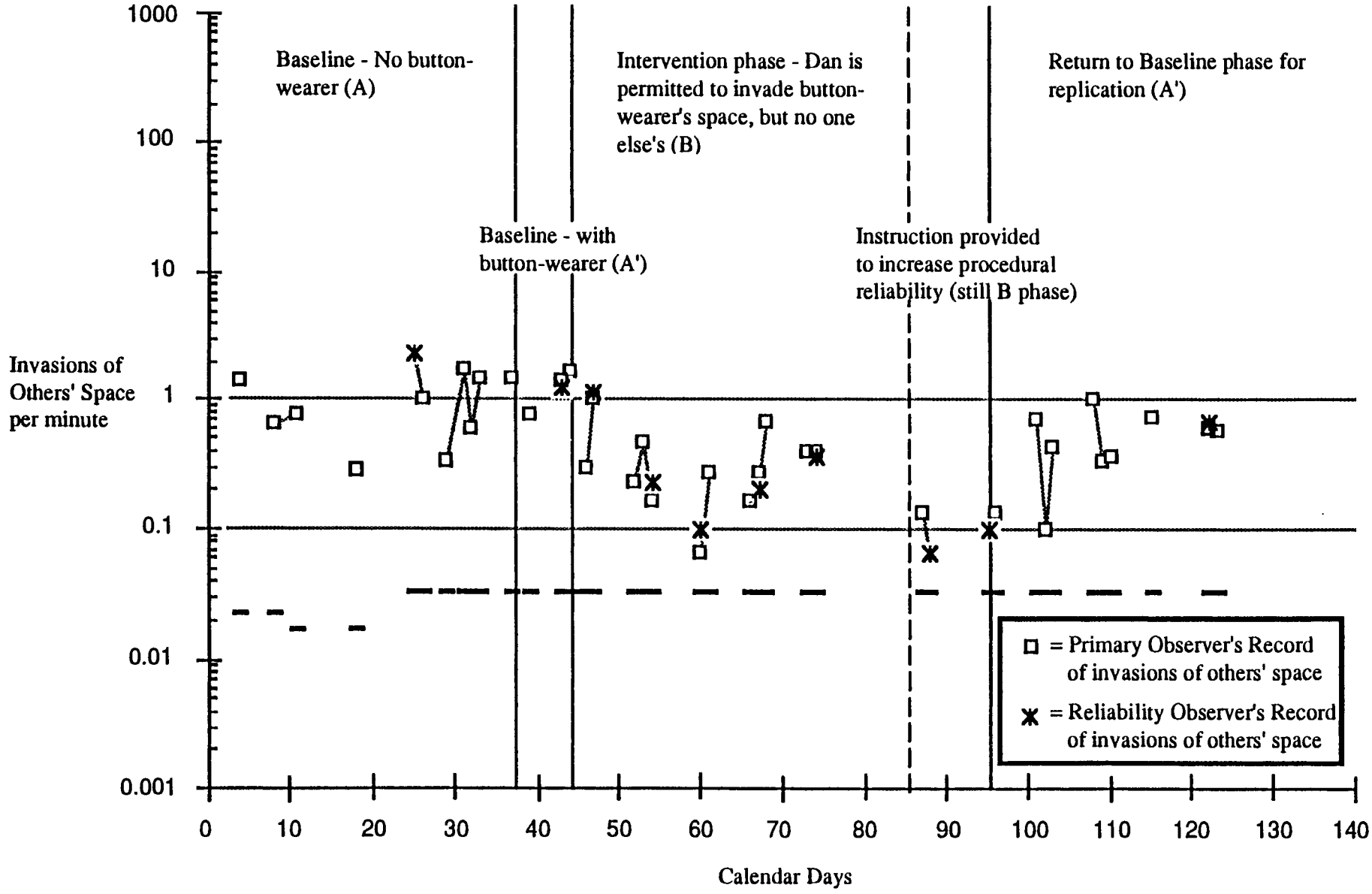
1000
100
10
1
0.1
0.01
0.001
Invasions of Others' Space per minute
Baseline - No button-wearer (A)
Intervention phase - Dan is permitted to invade button-wearer's space, but no one else's (B)
Return to Baseline phase for replication (A')
Baseline - with button-wearer (A')
Instruction provided to increase procedural reliability (still B phase)
□ = Primary Observer's Record of invasions of others' space
✱ = Reliability Observer's Record of invasions of others' space
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Calendar Days

CHART 1

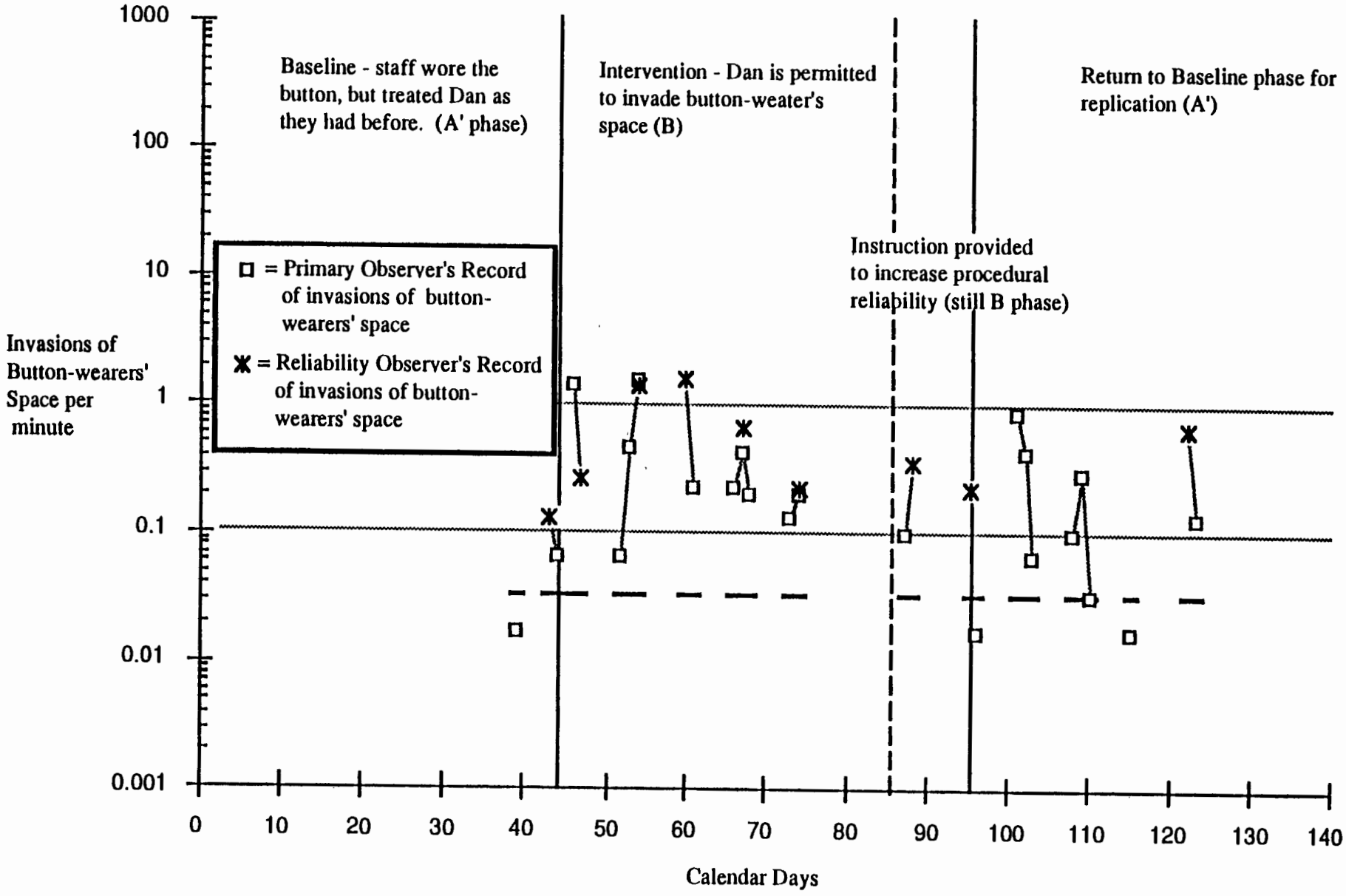
1000
100
10
1
0.1
0.01
0.001
Invasions of Button-wearers' Space per minute
Baseline - staff wore the button, but treated Dan as they had before. (A' phase)
Intervention - Dan is permitted to invade button-weater's space (B)
Return to Baseline phase for replication (A')
Instruction provided to increase procedural reliability (still B phase)
□ = Primary Observer's Record of invasions of button-wearers' space
✱ = Reliability Observer's Record of invasions of button-wearers' space
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Calendar Days

CHART 2

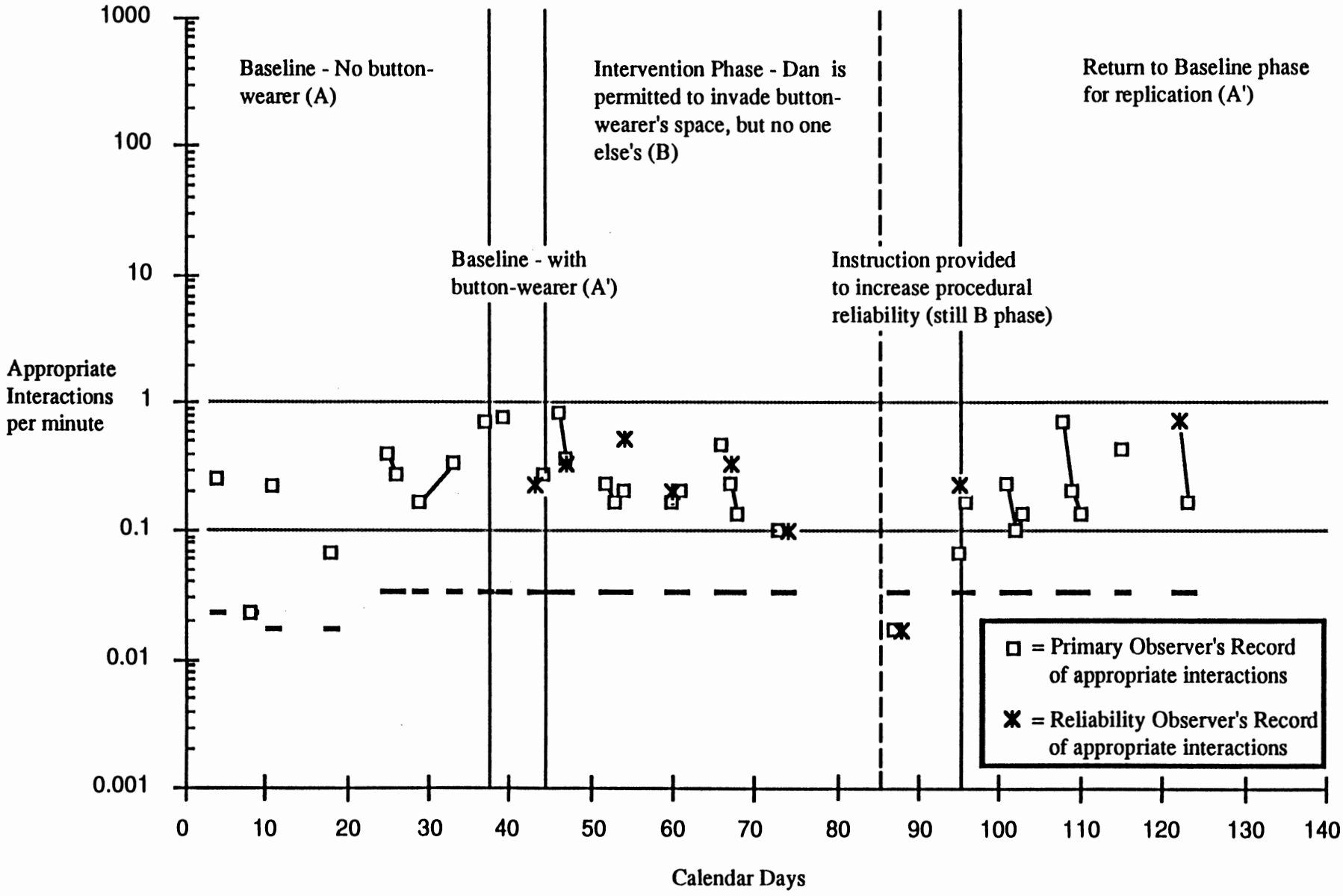
1000
100
10
1
0.1
0.01
0.001
Appropriate Interactions per minute
Baseline - No button-wearer (A)
Intervention Phase - Dan is permitted to invade button-wearer's space, but no one else's (B)
Return to Baseline phase for replication (A')
Baseline - with button-wearer (A')
Instruction provided to increase procedural reliability (still B phase)
□ = Primary Observer's Record of appropriate interactions
✱ = Reliability Observer's Record of appropriate interactions
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Calendar Days

CHART 3

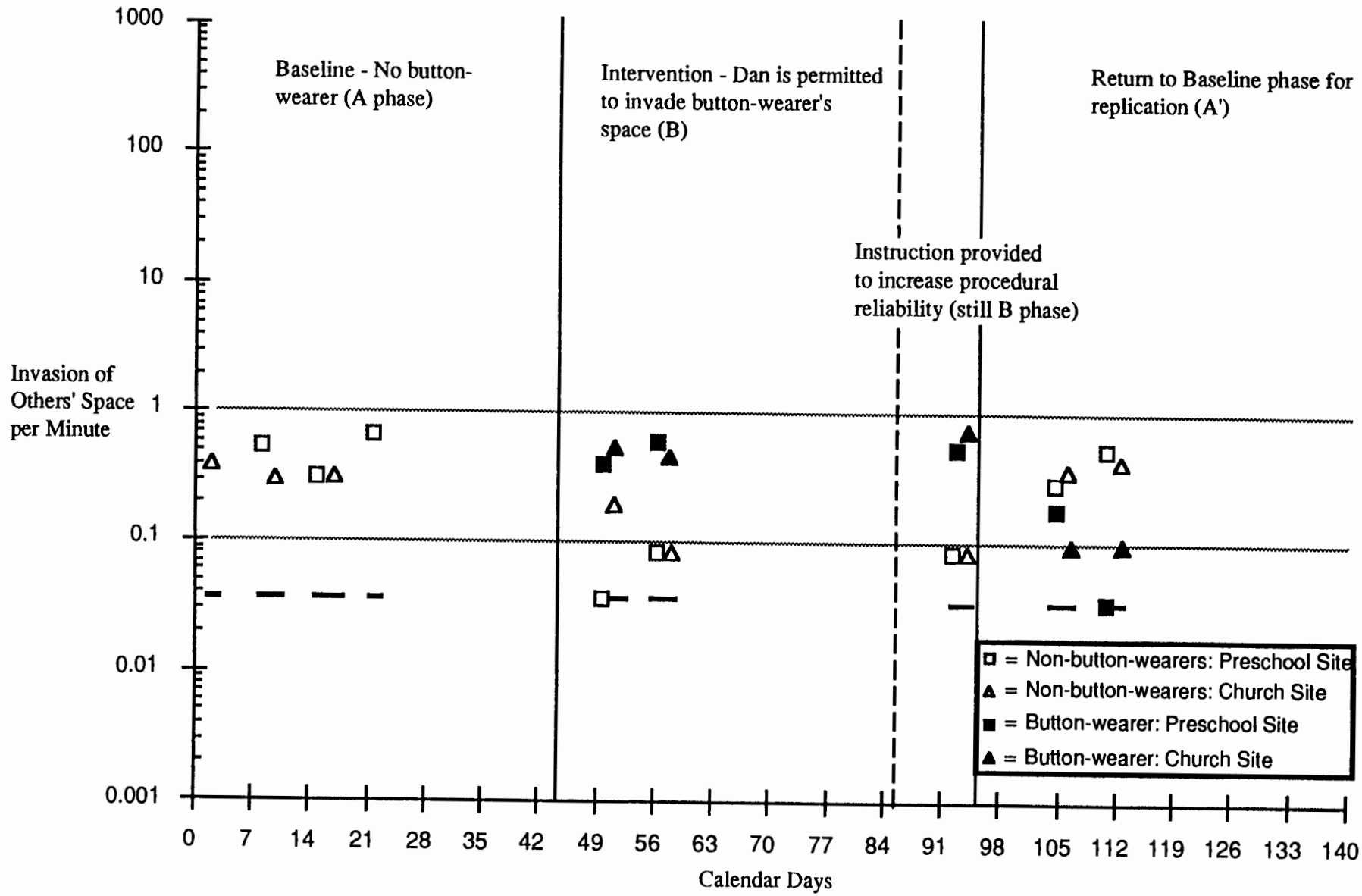
1000
100
10
1
0.1
0.01
0.001
Invasion of Others' Space per Minute
Baseline - No button-wearer (A phase)
Intervention - Dan is permitted to invade button-wearer's space (B)
Instruction provided to increase procedural reliability (still B phase)
Return to Baseline phase for replication (A')
□ = Non-button-wearers: Preschool Site
△ = Non-button-wearers: Church Site
■ = Button-wearer: Preschool Site
▲ = Button-wearer: Church Site
0 7 14 21 28 35 42 49 56 63 70 77 84 91 98 105 112 119 126 133 140
Calendar Days

CHART 4