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THE ORGANIZATION OF DAY-CARE ENVIRONMENTS: "ZONE" VERSUS "MAN-TO-MAN" STAFF ASSIGNMENTS[1]

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In a large day-care center, measures of group participation were used to compare how much of a child's time is lost from planned activities during the daily transition from lunch, through the bathroom and dressing areas, to the nap area. Participation measures were taken using the "Zone" and "Man-to-Man" staffing procedures, two typical methods for dividing responsibility among teaching staff. In the "Zone" procedure, each teacher was assigned responsibility for a particular area, and for all children who passed through that area. In the "Man-to-Man" procedure, each teacher was assigned responsibility for shepherding a group of designated children through all activity areas during each transition. The Lunch-to-Nap transition using the Zone staffing assignment was accomplished with a smaller decrease in child participation in planned activities than the transition utilizing the Man-to-Man procedure. Thus, other things being equal, it is recommended that the Zone procedure be used in group-care programs with more than one staff member, with each teacher being responsible for specific activity areas, rather than specific children.

There are many theories concerning preschool education, most of which vary along the dimension of the degree of structure in the preschool setting. Montessori schools (Orem, 1966) offer a totally planned environment, as do the Bereiter/Englemann (1966) classrooms for the disadvantaged child. Others (Moore and Richard, 1959; Read, 1960; Robinson and Spodek, 1965) emphasize a planned setting (*i.e.*, materials and activity-specific areas purposefully arranged), but encourage utilization of the child's natural interests and spontaneity as a guide to teacher structuring.

One dimension of preschool planning that most authors do not discuss is the way in which children move from one activity to another. The child in the Montessori classrooms moves individually and freely from one activity to another, receiving supervision when needed (Orem, 1966). The Bereiter/Englemann method implies that children move in groups from one task to the next (Bereiter and Englemann, 1966). Though some authors do not specifically discuss this aspect of the preschool, they seem to indicate that individual children are relatively free to leave one area as they tire of it and go to the next, (Moore and Richards, 1959; Read, 1960; Reynolds and Risley, 1968; Hart and Risley, 1968; Risley and Hart, 1968). Jacobson, Bushell, and Risley (1969) discussed a Head Start classroom in which individual children were free to move from one supervised area to an-

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other upon completion of a task in the previous area. Gump (1969) discussed problems that occur as children move from one activity to another. He stated that during such preschool transitions, pupils are without strong behavior guides and often emit behavior divergent from that desired by the teacher.

The present study compared two typical staff assignments that move children between activities: (1) Common to most primary and secondary schools, and many preschools, is a method in which the teacher is responsible for the supervision of one group of specific children who participate in a variety of activities, likened to a "man-to-man defense" in sports. The children are kept together in each activity, so the first child done must wait for the last to finish. When the last child is finished, the teacher presents the next activity. Whether this requires movement to a new area or just an exchange of materials, all the children face the new activity at the same time. This again means another waiting period; the teacher has to present materials, instructions, suggestions and prompts to each child in turn before all become engaged in the activity. (2) Contrasted with the man-to-man procedure is a method typical of most professionally staffed preschools and ungraded primaries. Here, teachers are assigned the responsibility for a particular activity area, and assume responsibility for those children passing through it, similar to a "zone defense" in sports. As each child finishes one activity, he can be sent directly to another activity area and another teacher. Since children arrive singly, the new teacher can immediately provide materials and individual attention to engage them in the new activity.

These two methods were compared in terms of the amount of time that children were not engaged in teacher-planned activities during the transition from lunch-to-nap activities each day.

METHOD

Setting

The day-care center in which the present study took place is part of a community service center in Kansas City, Kansas. The center is not affiliated with the Juniper Gardens Children's Project, but is located in the Juniper Gardens neighborhood. The neighborhood is a predominantly black, lower socioeconomic area. Fees for the children enrolled are adjusted according to the yearly family income.

Day care facilities are housed in one large room, approximately 50 by 50 ft with 12-ft ceilings. The room is divided into a number of areas by movable partitions 5.5 ft high. A row of waist-high, movable partitions divides the room lengthwise. The activity areas include a TV area, manipulative toy area, creative area, music area, role-playing area (housekeeping, dolls, *etc.*), large motor area (blocks, trucks), and an eating area. To one side of the eating area is the kitchen and on the other, the bathroom.

As depicted in Figure 1, this study involved the following areas:

(1) The lunch area is 21 by 21 ft, with seven low children's tables arranged in somewhat of an open U-shape, with the opening facing the kitchen. An average of six children sit at each table.

(2) The bathroom has four sinks in an area of 10 by 5 ft, and four stools behind closed doors off of a narrow hall. There is one entrance from the eating area and an exit into the large room.

(3) The shoe area is a semi-enclosed space that contains a low bench on which the children sit to remove their shoes. Shoes are placed against a waist-high (adult) partition dividing the center of the room.

(4) The bed area is divided into three basic sections. Immediately adjacent to the shoe area, but separated from it by a low partition, is a table with six chairs at which the children sit with their heads down before being taken to bed. The beds (child-size canvas cots) are located in rows on either side of the room divider (in the large motor and TV areas).

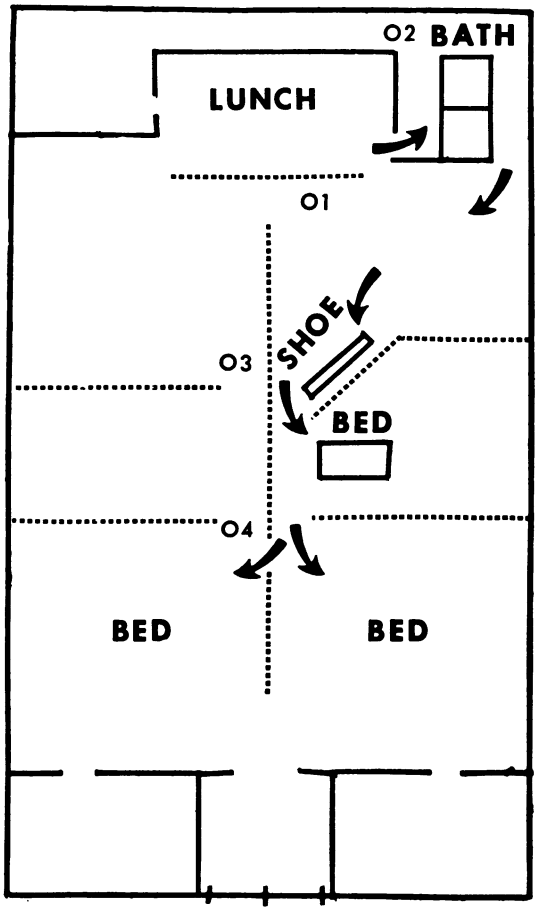

Fig. 1. The day care center is divided into areas by permanent (——) and low moveable partitions (- - - -). During the lunch-to-nap transition the children move from the lunch area, through the bathroom and shoe areas, to the bed area, as depicted by the arrows. Observers ("O") are positioned near each area.

Subjects

All children enrolled in the day-care center were used in the present study. The age range was from 3 to 5 yr. Length of enrollment ranged from less than a month to seven months. Daily attendance ranged from 36 to 43 children with an average of 39. Several children were enrolled after the study had begun and were immediately included in the subject population.

Teachers

The teaching staff of the center included three full-time teachers and one head teacher/administrator. The three teachers are Project Mainstream employees (a federal project providing on-the-job training and wages for the chronically unemployed), and had received no special training as teachers until coming to the center. Length of employment at the center ranged from two to five months (at the beginning of the study); educational range was from grade school to several years of college. This study was conducted during a limited program of consultation and in-service training for this staff by the authors.

Recording

Five trained observers were used for the duration of the study.

As shown in Figure 1, an observer was located in: (1) lunch area, (2) bathroom, (3) shoe area, and (4) bed area. One observer took reliability observations in one randomly assigned area each day throughout the study. After synchronizing their stop watches, such that each started observing at precisely the same time, observers first counted the total number of children, recorded it, then counted the total number of children engaged in activities, and recorded it. Counts were begun at the beginning of each 60-sec interval.

Engagement behavior for each area was defined by the teachers as follows:

(1) Lunch: chewing, swallowing, food in mouth, food on fork, food on fork being placed in mouth.
(2) Bathroom: washing hands, drying hands, throwing away paper towels. (Due to the construction of the bathroom, it was impossible for the observer to see inside the toilet rooms, so only hand-washing behavior was recorded).
(3) Shoe: untying shoes (self or teacher assisting), taking off shoes.
(4) Bed: head down either at table or on a cot.

For purposes of reliability, observers counted in a direction agreed upon beforehand (*i.e.*,

from left to right, clockwise, *etc.*). At all times, observers were free to move about their area in order to see the children clearly.

Reliability was calculated in three ways: (1) Average discrepancy per observation, which was calculated by taking the engagement score at each interval (per observer), and dividing the high score into the low, then obtaining the average for the day from these figures. (2) Total discrepancy per day, calculated by obtaining the sum of the number of children engaged across intervals for each observer and dividing the larger number into the smaller. (3) Degree of correlation coefficient between pairs of engagement scores for each observer.

Averages and ranges of measurement reliability calculated by each method are respectively: 0.79 (0.74-0.88); 0.89 (0.79-0.94); 0.77 (0.68-0.88) for the lunch area; 0.70 (0.68-0.71), 0.79 (0.72-0.85), 0.72 (0.62-0.82) for the bathroom; 0.71 (0.71-0.72), 0.91 (0.90-0.92), 0.70 (0.70) for the shoe area; and 0.85 (0.83-0.88), 0.95 (0.92-0.98), 0.77 (0.74-0.79) for the bed area. (Note: a much higher degree of reliability has since been obtained by having one observer point to each child as she counts, with the second observer also counting that child at that instant. This indicates that most of the variance in measurement reliability in the present study is attributable to discrepancies in the order and instant each child was observed, rather than disagreement as to the definition of engagement).

Procedures

Arrows in Figure 1 indicate the movement of children through the areas during the lunch-to-nap transition. Teachers assisted the children in eating (by providing additional servings, or helping cut meat, *etc.*) with hand-washing, with shoe-removal, and by tucking them in when they reached the bed area. At all times, they attempted to praise appropriate behavior.

The only difference between the two procedures, then, is in how the teachers moved the children between the areas.

Zone Procedure

The basic characteristic of this method was that as the child finished one activity, he was sent to the next, where another teacher waited to receive him. At the beginning of the lunch period, all four teachers were in the lunch area and assisted all children in that area who required it. When the first child had finished dessert, two teachers left, one going to the bathroom, and the other to the shoe area, to assist the children who would pass through there. The teacher in the shoe area often initially supervised the first children to arrive at the heads-down table and helped put them to bed. As children continued leaving the lunch area, a third teacher went to the bed area and began putting children to bed, leaving the fourth teacher to assist those children remaining in the lunch area. As the last child finished at lunch, the fourth teacher moved to the bed area as did the teachers in the bathroom and shoe areas when their areas became empty.

Man-to-Man Procedure

With this method, each teacher was responsible for one group (6 to 12 children). The entire group had to finish before anyone in that group could proceed to the next area. At lunch, the last child in a group had to replace his dishes and be seated at the table before the whole group could go. After the children formed a line, the teacher led them to the bathroom. Here, when they had all finished and formed a line, they moved *en masse* to the next area. As they left the shoe area, they went directly to bed. Since it was feasible for more than one group to enter or leave an area at one time, it was theoretically possible for all of the children to be in any one area at once.

The staff of this day-care center had used the man-to-man procedure since the center had opened in September of 1969. During the last week in March, 1970, they were assisted by the authors in instituting the zone procedure within their already existing activity structure. After the

procedure had achieved an apparent increase in efficiency, "baseline" data were taken during the lunch-to-nap transition for six days (April 27 through May 4). Then the staff returned to the man-to-man procedure for the lunch-to-nap transition for five days (May 5 to 11), and later for two additional days (May 28 and 29).

RESULTS

Zone Procedure

Figure 2 shows the typical transition pattern using the zone procedure. When the number of children engaged in lunch activities started to decline, there was a corresponding decline in the total present as children began leaving for the bathroom. This exodus usually began about halfway through lunch (around the twelfth minute). Per cent engagement for the bathroom and the shoe areas remained fairly high, there was rarely a great discrepancy between the number present and number engaged, in either area. In the bed area, the number engaged rose closely parallel to total present.

As illustrated in Figure 2, there was also a great deal of overlap between areas with the zone procedure. That is, the first child entered an area while many others remained in the preceding one(s). Some children first entered the bathroom when lunch was only half over, and were into the shoe area within two more minutes. By the time the last child had left the lunch area, more than one-half of the children were in the bed area engaging in that "activity".

Man-to-Man Procedure

Figure 3 shows the typical transition pattern using the man-to-man procedure. In the lunch area, there was a steady drop in the number of children engaged in activities, but the total number present remained high until late in the period. In the bathroom and shoe areas, there was a marked discrepancy between the number of children present and the number engaged in those activities. In the bed area, the discrepancy between number present and number engaged decreased each time one group had time to settle down, but increased as the next group entered, in step-wise fashion, until all entered the area.

As Figure 3 clearly demonstrates, the general characteristics of this procedure were the excessive length of time it took (compare with Figure 2), the low average per cent engagement with activities, and the absence of much overlap between areas.

Perhaps the clearest way to compare the two procedures is in terms of how many minutes of

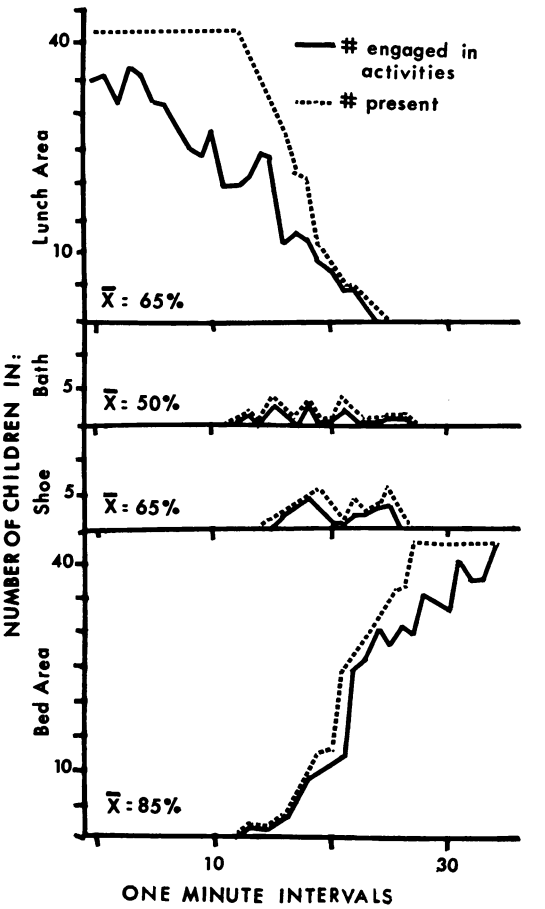

Fig. 2. May 15, 1970—Zone Procedure: shown are total present and total engaged in planned activities in each area of the transition in a typical day of zone procedure. Planned activities are, respectively, eating, washing hands, removing shoes, and heads down. Note that the number of children engaged closely parallels the number present in each area, and there is a good deal of overlap between areas (*i.e.*, children enter one area while there are still many in the preceeding one).

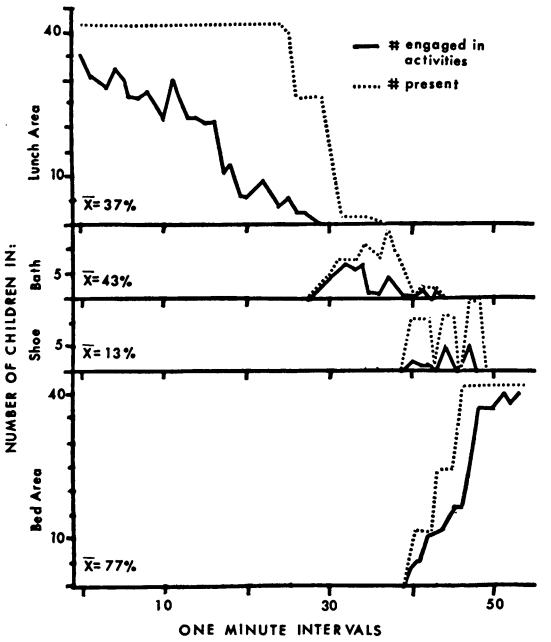

Fig. 3. May 11, 1970—Man-to-Man Procedure: shown are total present and total engaged in planned activities in each area of the transition. Total number engaged is greatly discrepant from total number present and there is almost no overlap between areas.

the child's time are lost from planned activities during the transition. Figure 4 illustrates a sample day from each procedure (the zone a composite of Figure 2, the man-to-man a composite of Figure 3). This comparison reveals that transitions of short duration and a high level of participation were characteristic of the zone method, while long duration transitions with a low level of participation were characteristic of the man-to-man.

The heavy black line in each graph of Figure 4 represents the total engaged for all four activities (lunch + bathroom + shoe + bed) for that day, while the open circles connect the highest points of participation in the lunch and nap areas. The area enclosed by these lines represents the total amount of time that day that all children were not participating in any planned activities during the transition. This sum, divided by the average number of children present results in a daily average amount of time lost per child.

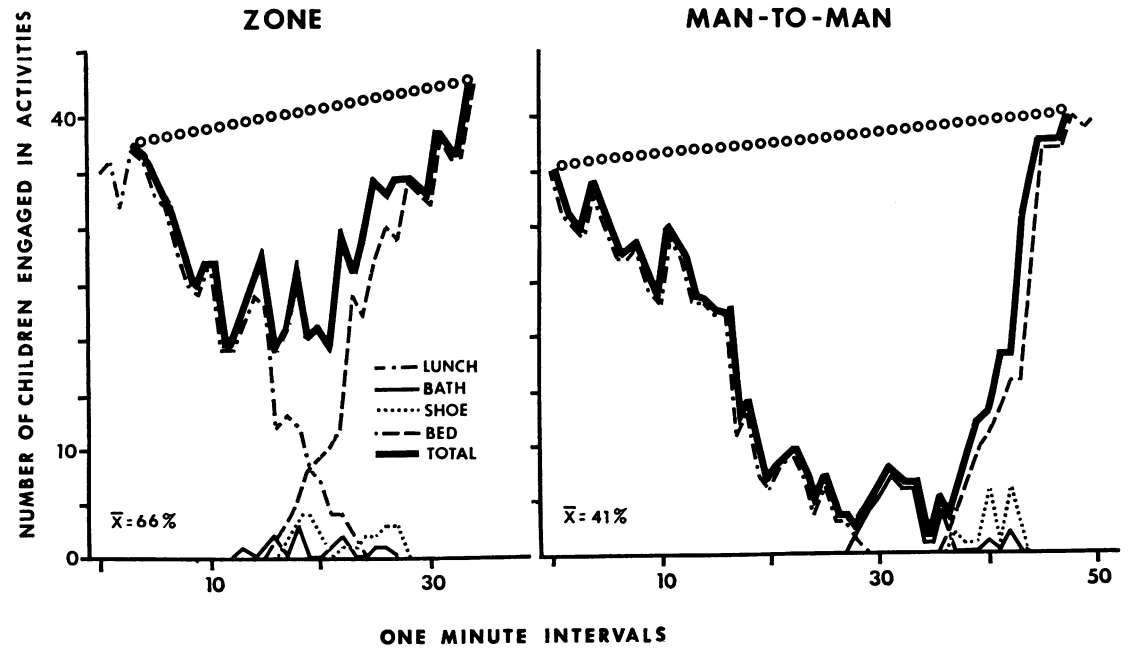

Fig. 4. Shown on the left is a composite of Figure 2 (Zone Procedure) and on the right, a composite of Figure 3 (Man-to-Man Procedure). The heavy solid line in each figure represents the number of children engaged in any of the planned activities at each observation interval throughout the transition during these sample days of each procedure. The open circles connect the highest points of participation in the lunch and nap periods. The area between the open circles and the heavy soil line represents the amount of "child time lost" from planned activities during these transitions.

As shown in Figure 5, the average number of minutes lost per child was 8.52, 9.81, and 8.72 respectively, for the three zone conditions, and 22.98 and 17.50 for the two man-to-man conditions. Average number of minutes lost per child during all days of the zone procedure was 9.91 (range = 7.92 to 14.04). Average lost during all days of the man-to-man procedure was 20.74 (range = 17.00-32.57).

DISCUSSION

This study has clearly demonstrated the effectiveness with which the zone procedure accomplished a lunch-to-nap time transition. It should be noted that a skillful teacher may achieve a similarly high per cent engagement using the man-to-man procedure (by, for example, providing additional activities for the children who are waiting). However, the recent upsurgence of day-long child-care centers staffed by relatively untrained personnel has shown the need to provide specific guidelines for activity structuring and organization, selection and presentation of materials, and design of facilities, in addition to our usual prescriptions of teaching techniques. Empirical evaluation of such guidelines, then, must logically follow.

Since attention to or interaction with materials is generally considered to lead to knowledge and skill, a measure of the amount of attention to or engagement with activities should provide a highly functional evaluate device. The present study demonstrated the use of such a measure, which is simple enough for a teacher herself to use continuously or intermittently throughout the day. She can survey an activity area and immediately determine the amount of engagement. With such a method at hand, we can proceed toward more complete evaluation of any and all aspects of day-care programs, even gross aspects of organization and routines as demonstrated in

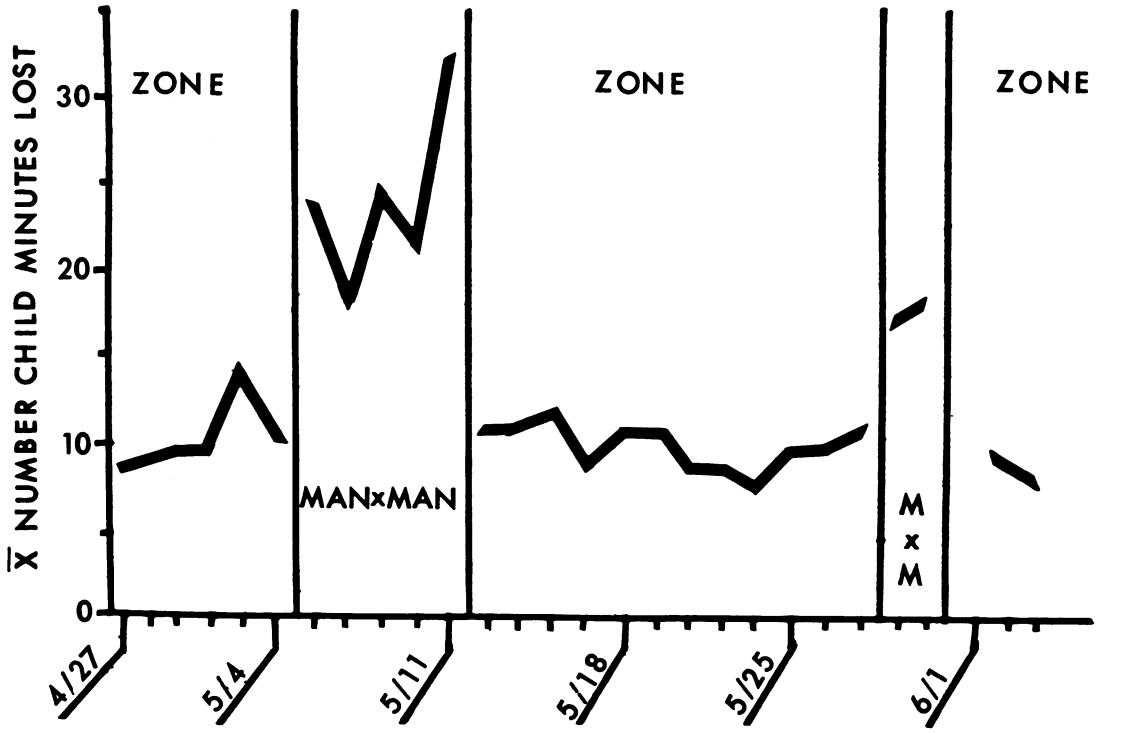

Fig. 5. Shown are the average number of minutes a child was out of contact with planned activities during the lunch-to-nap transition. The average number of minutes lost per child (computed by dividing the total amount of "child time lost" from appropriate activities by the number of children each day) for the zone procedure was 9.91 and 20.74 for the man-to-man procedure.

the present study. A comprehensive educational and child-care technology requires that the emphasis on "personalized" teaching techniques be supplemented by empirical evaluations of the organization, equipment, architecture, and other similarly "impersonal" variables in educational settings.

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