# CERTAIN FACTORS AFFECTING INDOOR FLOOR SPACE REQUIREMENTS FOR TWO-YEAR-OLD CHILDREN IN A COLLEGE LABORATORY NURSERY SCHOOL

by

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# INTRODUCTION

The need exists at Kansas State College and at other colleges for well planned efficient nursery schools used as laboratories for college students. Apparently few nursery schools are housed in buildings planned for them; most nursery schools have adjusted their needs to the existing space. Haskell (1938) issues this statement in regard to nursery schools.

> From the architect's standpoint, the modern nursery school is different from a kindergarten; it cannot be planned as a grade school; it represents a new problem to be freshly solved. Merely reducing the dimensions of grade school or kindergarten equipment produces a caricature similar to the primitive painters' representations of children as dwarfed old men.....The special nature of the small child is of utmost importance in the planning of individual nursery rooms in relation to the school as a whole....The world of so small a child must not be too complex, must be compact and in a large part familiar.

According to Foster and Mattson (1939),

> The mature individual is the product of that much discussed pair: heredity and environment. Heredity is settled once and for all at the very beginning of life; but the influence of environment never ceases....and at no age is the influence of environment more marked than it is in the very early years of childhood; at no age is the provision of a good environment more imperative.... The nursery school is one of today's answers to the search for a good environment for very young children.

Studies concerned with general characteristics of nursery school children, and the implications for educational procedures have dealt primarily with three- or four-year-old children rather than two-year-olds. Joel (1936) devised a set of scales by which he attempted to rate behavior maturity, which he defined as grown-up-ness or the degree of independence and

self-control of a group of 467 nursery school children. The mean age of the children in this study was 47.2 months. Only five points in his entire scale were found to be characteristic of children under 36 months. In a study of group play and quarrelsomeness in 40 nursery school children conducted by Green (1933) it was concluded that two-year-olds play with three or more children only 2 percent of the time, and that they played alone 62 percent of the time. Hattwick and Saunders (1938) conducted a study concerned with age differences in behavior at the nursery school level which included 555 nursery school children, 23 of whom were two-year-olds. They devised a rating scale to be used by teachers which included eating, sleeping, elimination, nervous tendencies, speech, fears, relation to adults, relationships with other children, emotional reactions and general personality. Their findings would seem to substantiate the opinions of others who have attempted to characterize the two-year-old.

Little research is available concerning the relationship of a group of two-year-olds' characteristics and needs to the space required for them in a laboratory nursery school. Several authorities have based their opinions upon many years' experience in working with two-year-olds in a nursery school. All of them agree that a group of two-year-olds must have ample space to carry out their activities and that too much space is as harmful to worthwhile learning and development as is too little. However, they give very few specific details about the activities a group of two-year-olds are likely to be engaged in rela-

tive to the amount of space they will need to carry out their ideas. Johnson (1936) says, "Environment planning in the schools of which we are writing is done with specific provisions in mind, beyond and besides those necessary for health." Foster and Mattson (1946) say,

> In no way does the nursery school break more sharply from the traditional school than in its physical set-up and equipment. Combining as it does many of the functions of both home and school, it takes on some of the characteristics of each....every effort is made to give it a cheerful, homelike atmosphere, to make it, as it were, a daytime home for a large family of children who never grow old.

The bulletin published by the California State Department of Education (1943) states, "Education at two, three, or four years is primarily a physically active process. There must be ample space for learning by doing, both in routine and play situations." In the bulletin published by the National Association for Nursery Education (1941) the characteristics of a nursery school are presented.

> The nursery school that best suits the needs of the children and those of the usual small staff of teachers may be pictured as a rather compact, yet spacious, self-contained unit for each group; all facilities are either directly in the one main room or in subsidiary areas.

Woodcock (1941) says of groups of children,

> A group of two-year-olds in nursery school presents a composite picture of behavior that is characteristic for their stages of maturity and different from that of children of other stages....Certain arrangements of their physical environment serve as unfailing stimuli to their activity.

Not only is it important to have ample space for the children, but for the adults as well. If the student in the laboratory is to learn through her experience of working with

young children, she must have her space requirements amply met. Little consideration has been given the observing student in many of the college laboratory plans examined by the investigator. Read (1942) says,

> The need for better mental hygiene is everywhere disturbingly evident. The challenge to develop a good laboratory for learning in the area of human relationships is great enough to warrant much more study and critical evaluation of the ways it can be achieved. When the nursery school laboratory succeeds in making the best use of its opportunities to teach human relationships, it should have a significant contribution to make to the learning of both men and women in our colleges.

It is the purpose of this study to ascertain what factors are basic in determining space requirements including the characteristics and needs of children and adults and the use of the space as a laboratory. On the basis of these requirements the investigator will design and plan indoor floor space in a college laboratory nursery school for a group of two-year-old children.

## PROCEDURE

Questionnaires (Appendix, Form I) concerning factors affecting indoor floor space requirements for two-year-old children in a college laboratory nursery school were prepared by the investigator and sent to 35 nursery school teachers and administrators. A specific criterion was that people to whom the questionnaires were sent have at least a Master's degree in the field of Child Development. Twenty-six questionnaires were returned, nine of which included floor plans.

Respondents who replied to the questionnaires were as follows:

| | |
|---|---|
| Miss Beatrice Bull | Harriet Johnson Nursery School<br>New York City, New York |
| Dr. Gertrude Chittenden | Iowa State College<br>Ames, Iowa |
| Dr. Helen C. Dawe | University of Wisconsin<br>Madison, Wisconsin |
| Miss Edith Dowley | Stanford University<br>Stanford, California |
| Miss Mary Ellen Durrett | University of Tennessee<br>Knoxville, Tennessee |
| Mrs. Louella M. Foster | University of Kansas<br>Lawrence, Kansas |
| Miss Roberta C. Frasier | Washington State College<br>Pullman, Washington |
| Dr. Elizabeth M. Fuller | University of Minnesota<br>Minneapolis, Minnesota |
| Miss Charlotte Gies<br>Mrs. Marjorie Paisley | Montana State College<br>Bozeman, Montana |
| Miss Winifred M. Lewis | University of Michigan<br>Ann Arbor, Michigan |
| Mrs. Mary G. Lowe | University of Utah<br>Salt Lake City, Utah |
| Miss Sallie Beth Moore | University of Texas<br>Austin, Texas |
| Dr. Winona L. Morgan | Pennsylvania State College<br>State College, Pennsylvania |
| Miss Shirley Newsom | Michigan State College<br>East Lansing, Michigan |
| Miss Helen L. Porter | Utah State Agricultural College<br>Logan, Utah |
| Dr. Katherine H. Read | Oregon State College<br>Corvallis, Oregon |
| Miss Winifred Reynolds | Colorado A & M College<br>Fort Collins, Colorado |

| | |
|---|---|
| Miss Eleanor L. Robinson<br>Miss Helen H. Johnson | Rhode Island State College<br>Kingston, Rhode Island |
| Miss Dorothy Russell | Antioch College<br>Yellow Springs, Ohio |
| Mrs. Jacqueline Bowen Smith | Former nursery school teacher<br>Kansas State College |
| Dr. Ruth Staples | University of Nebraska<br>Lincoln, Nebraska |
| Dr. Kathryn Warren | Louisiana State University<br>University, Louisiana |
| Dr. Opal Wolford | Berea College<br>Berea, Kentucky |
| Miss Cynthia Wooster | Kansas State Teachers College<br>Emporia, Kansas |
| Miss Helen Wulf | Kansas State College<br>Manhattan, Kansas |
| Miss Helen Young | South Dakota State College<br>Brookings, South Dakota |

The investigator also prepared questionnaires (Appendix, Form II) to be filled out by students in courses in Child Guidance I and II in the Department of Child Welfare and Euthenics at Kansas State College. The questions pertained to the location and space needed for the observation of the children by the students, a student locker room and a student entrance. Thirty-nine students filled out questionnaires. Answers to all the questionnaires were tabulated and the comments were summarized.

Floor plans of other nursery schools were collected and examined. The details of five floor plans returned with the questionnaires were summarized.

Literature in the field was explored and compiled into summaries of (a) specific recommendations as to space requirements,

(b) the specific developmental characteristics and needs of two-year-old children related to indoor space requirements, and (c) educational procedures based on these characteristics and needs, and their implications for space requirements.

The ideas, suggestions and comments gained from all of these sources were combined and used as the basis for a design of a floor plan of a college laboratory nursery school.

## DATA

### Results of the Questionnaires

Only 5 of the 26 nursery schools reported in the questionnaires were actually housed in buildings planned for nursery schools. The other 21 schools have been adapted from other buildings.

The following statements represent majority opinions of those who responded to the questionnaire.

Indoor Space. Indoor space for a group of two-year-old children should be planned on the first floor. The play area should have a southeast exposure, but the exposure is, of course, influenced by the locality. The indoor space should be arranged in more than one room or in one room with alcoves. Two exits are necessary from each room. Thirty-five to 45 square feet of floor space per child exclusive of built-in equipment is necessary.

Use and Arrangement of Rooms. The most important determinant in the location of the bathroom is that it be near the

playroom. There should be from 2 to 3 toilets and lavatories for a group of 10 to 12 children. Both teachers and students should be given health inspection in a room used only for inspections. Children of this age rest most successfully on cots, with a quiet atmosphere prevailing, or with occasional quiet music, in a separate room planned for resting. It is preferable to have a separate room for the noon meal even though it is somewhat of an extravagance. Open lockers in a separate room best suit the clothes storage needs of children of this age. An isolation room should be available and be used for various solitary activities.

Storage. Two square feet of shelf space for each child is ample for materials accessible to the children. Surplus equipment, cots, sheets and blankets should be stored near the place of first use.

Tables. Non-folding rather than folding tables are preferred. Preferences for sizes and shapes of tables were varied.

Student-Teacher-Child Ratio. One teacher can successfully handle as many as 8 children in a group. One fulltime teacher with one assistant can successfully supervise 10 to 12 children. If there is only one teacher there should be two students observing and two students participating. From one to eight students can both observe and participate. From two to four students can observe and two can participate in a group of 10 to 12 children with one teacher and an assistant. Many of the comments stated that no matter what the size of the group there should always be two fulltime teachers. One teacher can super-

vise as many as eight children in the resting area. One teacher can eat with three or four children and supervise that number successfully.

Child Groupings. There can be from four to eight children in the story and music groups. The children should be seated informally on rugs rather than on chairs when engaged in activities of this kind. All of the comments brought out the fact that it is unwise to regiment children of this age. When and how they sit and how they participate depends upon how they feel. They should be allowed freedom to choose whether or not they want to enter the group.

Students. The student locker room should be located near an outside entrance separate from that used by the children, and it should include a bathroom, a cot, space for writing, and make-up facilities. Students when observing should be completely concealed from the children and their trafficways should be separate from those of the children if possible.

Parents. Parents' reception space should be located where the parents can see the playroom and should also be near the cloakroom. This space should include book shelves, chairs, space for writing, space for a bulletin board, and a bathroom. Some of the comments indicated that parents might use the same facilities as the students.

Student Questionnaires. The 39 students questioned wanted a locker room with a separate entrance adjacent to the playroom. They preferred to have a bathroom and make-up facilities included in the room as well as space for their wraps and books and

space for writing. A majority of the students felt that unless they were participating they should be completely concealed from the children.

## Summary of Details of Floor Plans of Five Nursery Schools

Table 1 is a summary of certain specific details concerning the location and arrangement of the rooms of five buildings originally planned for nursery schools. These details were contained in the floor plans of five nursery schools returned with the questionnaire sent to nursery school teachers and administrators.

The number of rooms used by the children varied from three to eight. The number of floors used by the children varied from one to two. Each of the five nursery schools had a playroom. One nursery school had a playroom on first and one on second floor. Two of the nursery schools had separate bathrooms, two had combination locker and bathrooms, and one had both a separate bathroom and combination locker and bathroom. Three of the five nursery schools had separate isolation rooms. One nursery school had a separate dining room. The number of observation booths for students and parents varied from none to four. Each nursery school except one had an observation booth adjacent to the playroom. Two nursery schools had observation booths adjacent to the bath and locker rooms. Three nursery schools had bathrooms directly adjacent to the main floor playroom; three had bathrooms adjacent to and combined with the locker room.

Table 1. Some details of floor plans of five buildings originally plann ed for nursery schools.

| Institution | Number and name of rooms used by children | Number of floors used by children | Number and location of observation booths | Location of bathroom | Location of inspection room | Location of locker room | Provision for students | Provision for parents | Provision for staff |
|---|---|---|---|---|---|---|---|---|---|
| Pennsylvania State College Nursery School | 4: bath, coat, playrooms, and nurse's office | 1 | 3: adjacent to playroom, nurse's office and bathroom | Adjacent to coat room | Adjacent to playroom | Adjacent to outside entrance and bathroom | Observation booths | Observation booths | Offices |
| University of Nebraska Nursery School | 7: 5-first floor, (play, isolation, waiting, bath and coat rooms) 2-second floor, (bath and play rooms) | 2 | 1: adjacent to first floor playroom | 1 adjacent to playroom on first floor 1 adjacent to resting room on second floor | Adjacent to entrance | Adjacent to playroom | First floor: vestibule, waiting room, observation booth Second floor: coat and bath rooms | Same provision as for students | First floor: offices Second floor: offices and bathroom |
| University of Tennessee Nursery School | 6: 2-ground floor, (dining and bathrooms) 4-first floor, (play, isolation, inspection, bath and locker rooms) | 2 | 3: 1 adjacent to dining room 1 adjacent to playroom 1 adjacent to bath and locker room | 1 adjacent to stairway on ground floor 1 adjacent to playroom on first floor | Adjacent to lobby on first floor | Combined with bathroom on first floor | First floor: lobby Second floor: Observation booths and locker-bath room | Same provision as for students | First and second floor: offices and bathroom |
| Oregon State College Nursery School | 4: 3-first floor, (play, locker, bath and isolation rooms 1-second floor, (resting room) | 2 | Observation device on second floor. Window "peep holes" enable students to observe children on first floor | Combined with locker room, adjacent to entrance | Combined with locker-bathroom on first floor | Combined with bathroom | First floor: entrance, coat and bathrooms Second floor: observation booths | Same provision as for students | First floor: staff room and bathroom |
| University of Michigan Nursery School | 3: play, resting and locker-bath rooms | 1 | ----- | Adjacent to playroom combined with locker room | Adjacent to entrance | Combined with bathroom | Student entrance | Lobby and conference room | Second floor: offices |

Two nursery schools had inspection rooms adjacent to the entrance used by the children. Three nursery schools had locker and bathrooms for the observing students. Parents used the same facilities as the students in these three nursery schools. All of the nursery schools had offices for the staff members.

It is evident, when results of the questionnaire are compared with Table 1, that the indoor space arrangement in the buildings planned for nursery schools was for the most part in agreement with the majority opinion of nursery school teachers and administrators. However, there were some outstanding discrepancies. The majority of nursery school teachers and administrators preferred that the indoor space for a group of two-year-old children be planned on first floor. Yet, three of the five nursery schools were using more than one floor. The majority opinion of nursery school teachers and administrators was that the resting space should be in a room apart from the play area. Only one of the five nursery schools had a room used only for resting. The results of both questionnaires indicated that it was preferable to have a student locker room near an outside entrance separate from the entrance used by the children. The student locker room should include a bathroom, space for writing, space for outside wraps, a cot, and make-up facilities. The majority opinion was also that the students be completely concealed from the children when not actually participating in the group. Three of the nursery schools had student facilities comparable to those described in the questionnaires. The other two nursery schools made no provision for space required by students other than an observation booth and a student entrance.

## Indoor Space Requirements Recommended by Authorities

Table 2 is a summary of certain specific indoor space requirements recommended by authorities. The results of the questionnaires used in this study are also included for purposes of comparison. These requirements were selected because they are particularly helpful in designing indoor floor space.

The National Association for Nursery Education is the professional organization exclusively for those in the field of nursery education. This organization has published in pamphlet form, revised from time to time, the factors to be considered in establishing and operating nursery schools. It is from one of these pamphlets, Essentials of Nursery Education (1941), that the recommendations for this table were obtained.

N. L. Engelhardt, Jr., and his assistants compiled data concerning nursery school space requirements from the recommendations of designers and educators from all parts of the country. These data were published in the Architectural Record (1938). Parts of these data were entered in Table 2.

Guides for Establishing Nursery Schools and Child Care and Development Centers (1942) is a bulletin prepared in 1942 by the staff of the Bureau of Child Development and Parent Education in the Division of Elementary Education of the New York State Education Department. The purpose of the bulletin was to set up minimum standards for day care facilities for the children of families in defense areas. The standards in this bulletin that

Table 2. Certain indoor space requirements recommended by authorities.

| Sources | Minimum indoor space requirements per child exclusive of built-in equipment | Number of rooms necessary for a group of two-year-old children in a college laboratory nursery school | Bathroom facilities required for two-year-old children in a college laboratory nursery school | Number of exits necessary | Window area necessary | Minimum indoor space required for play equipment used by a group of two-year-old children | Storage space required for clothing worn by the child |
|---|---|---|---|---|---|---|---|
| National Association for Nursery Education (1941) | 35 sq. ft. per child | 2 rooms | 1 toilet and 1 lavatory for eight children | 2 per room | Glass area 20 percent of floor area | 15 sq. ft. per child | ---- |
| Architectural Record (1938) | 50 sq. ft. per child | A minimum number of rooms | 1 toilet and 1 lavatory for 4 children | 2 per room | ---- | 14 sq. ft. per child | 13 sq. ft. per child |
| New York State Education Department (1942) | 35 sq. ft. per child | More than 1 room | 1 toilet and 1 lavatory for 10 children | 2 per floor | 1/6 of floor area | ---- | ---- |
| Foster and Mattson (1946) | 35 sq. ft. per child | ---- | ---- | ---- | Window area kept to a minimum | ---- | ---- |
| Landreth (1942) | Each subdivision of play space and grouping of equipment such as to make for child's most productive use of it and the adult's most effective supervision | Large playroom with subdivisions | ---- | ----- | ---- | Adapted to the equipment, both functional and decorative | ---- |
| California State Department of Education (1943) | 40 sq. ft. per child | ---- | 1 toilet and 1 lavatory for 8 children | ---- | Low windows | ---- | ---- |
| Questionnaire (this study) for Nursery School Teachers and Administrators | 35-40 sq. ft per child | More than 1 room | 2 toilets and 2 lavatories for 8-10 children | 2 per room | ---- | ---- | 3 sq. ft. per child |

are applicable to college laboratory nursery schools have been entered in Table 2.

Foster and Mattson (1946) and Landreth (1942) are well known authorities in the field of child development. Their recommendations dealing with indoor space requirements for nursery schools have been entered in Table 2.

The staff of the Division of Elementary Education of the California State Department of Education prepared a bulletin (1943) in an attempt to establish certain standards concerning child care centers for children of working parents during the war emergency. Some of the standards established by these people have been entered in Table 2.

Table 2 shows that in a college laboratory nursery school 35-45 square feet is the minimum space required per child exclusive of built-in equipment. More than one room is necessary for a group of two-year-old children in a college laboratory nursery school. There should be at least two exits per room. There should be at least one toilet and one lavatory for eight two-year-old children in a college laboratory nursery school. No conclusions can be drawn from this table concerning the window area necessary, the minimum space required for play equipment, or the storage space required for clothing worn by the child.

## Characteristics of Two-year-olds Influencing Indoor Space Requirements and Some Educational Procedures Implied

The statements in Table 3 were derived from Johnson (1936), Updegraff (1938), Baruch (1939), Foster and Mattson (1946), Woodcock (1941), Landreth (1942), Gesell and Ilg (1943) and Rand, Sweeny and Vincent (1947). The table shows some aspects of development, behavior and physical characteristics of two-year-old children including motor performance and social and emotional behavior. Because of these characteristics, certain educational procedures are implied as well as implications concerning the space needed by the two-year-old in a college laboratory nursery school.

Table 3. Some specific developmental characteristics and needs of two-year-old children influencing their indoor space requirements and the educational procedures based on these characteristics and needs.

| Some outstanding specific characteristics of two-year-old children influencing space requirements. | Educational procedures implied. | What the two-year-old needs in relation to space because of these characteristics. |
|---|---|---|
| Ability to choose an occupation and to work at it with a minimum of dependence upon adults or other children. | Provide play materials suited to child's stage of development; placed where they are accessible to child. Adult must give enough supervision to child that he gains satisfaction from activity, yet does not have feeling that adults and adult direction are essential features of play. | Adequate play space to carry on activities. Space for extra adults out of the way of children. |

Table 3 (cont.)

| Some outstanding specific characteristics of two-year-old children influencing space requirements | Educational procedures implied. | What the two-year-old needs in relation to space because of these characteristics. |
|---|---|---|
| Period of concentration relatively short, easily distracted, emerging from solitary into parallel play and occasionally cooperative play in small groups for brief periods of time. | Suggest need for solitary play or take child to another room or area if necessary. | More than one room desirable or if using one room sepa- areas by screens or low partitions. |
| Ability to calm down, or "let go", to rest or sit quietly, very poor. | Plan short time for quiet activities. Allow for individual differences. | Enough space conveniently arranged so that during a quiet activity a child, if he prefers, may leave and go on to another activity without disrupting the entire group. |
| Words alone not enough, must organize experience through touching, handling, holding, and clasping. Intrigued by water and washing. | Allow freedom for touching, feeling, water play and other activities of similar nature. | Space planned for these activities. |
| Ability to share own possessions very poor. Is learning property rights. | Help child to share his toys, but keep in mind that his concept of "mine" is at its peak when child is two. Provide many similar toys. | Space in child's locker for toys he brings from home. Storage space in playroom for many toys of a similar kind. |
| Self-assertion becoming evident, often negativistic to adult suggestion. | Have as few adult-dictated interludes as possible but complete adult control. | Space which contributes to self-activity and self-help. |

Table 3 (cont.)

| Some outstanding specific characteristics of two-year-old children influencing space requirements. | Educational procedures implied. | What the two-year-old needs in relation to space because of these characteristics. |
|---|---|---|
| Too large a group of two-year-olds may over-stimulate each other. | Keep groups small. | Space ample for size of group. |
| Ability or willingness to leave parent varies with each child | Let child do his own breaking away from parent. | Suitable space provided for parent. |
| At first, some unawareness of other children as persons, yet increasing enjoyment of other children. | Help child to differentiate between inanimate objects and other children. Help child enjoy other children. | Space planned so that children have ample opportunity to associate with each other without having the feeling of being overcrowded. |
| Running, jumping, romping, pushing, pulling, climbing, favorite activities. | Provide opportunity for child to exercise feelings, i.e., punching bags, tumbling mats, etc. | Space to carry out these activities indoors especially on rainy days. |
| Action toys such as trains, cars, telephones, trucks, etc. preferred. | Plan time so that child gets maximum enjoyment from toy. | Space to utilize toy to fullest extent. |
| Drive to achieve high places. Goes up and down stairs in mark-time fashion. | Provide ample opportunity for child to learn to go up and down by himself. | Few stairs, handrailed, scaled to his size. Plan for space for indoor climbing apparatus. |
| Eyes move freely and are sensitive to marginal fields. Child stops and engages in long periods of looking. | Provide child with things to look at. | Low windows so that child can see outside. Bulletin boards low where he can enjoy pictures. |

Table 3 (concl.)

| Some outstanding specific characteristics of two-year-old children influencing space requirements. | Educational procedures implied. | What the two-year-old needs in relation to space because of these characteristics. |
|---|---|---|
| Objects manipulated freely with one hand and alternated from one hand to the other. | Space children widely enough apart so that they don't accidentally hit each other when sitting. | Ample space for sitting activities in order to avoid child-to-child conflicts. |
| Forearm rotates which enables child to turn doorknob. | Provide opportunity to open doors. | Few rooms with doors leading to them to avoid constant opening and possible smashed fingers. |
| Knee joints become flaccid and rubbery when he tries to put on leggings. | Let child do as much of the dressing as possible, but realize that he does need some help. | Space to sit on floor near locker when removing and putting on clothes. Space for teacher to help without bumping into others. |
| Complete control lacking of sphincter muscles of bladder and bowel. | Realize that accidents will happen now and then, and be ready to accept them calmly. | Bathroom easily accessible to child from play area. |

The child between the ages of 24 and 36 months has the ability to choose an activity by himself. However, the articles needed to carry out the activity must be easily accessible to him, for he prefers to be self-dependent. He becomes upset if too many adults or children try to help him. Provision of enough space for self-help and self-activity helps to reduce unnecessary adult interference which may lead to negativism. The two-year-old has a relatively short period of concentration, and stays with an activity for only a short time before he wants to go on to a new activity

in another area. He is emerging from solitary into parallel and occasional cooperative play in small groups for brief periods of time. Therefore, space needs to be provided both for group play and solitary play. Separate play areas, divided either by walls or screens, seem to provide space apart from the group when it is necessary.

The two-year-old is learning property rights and has difficulty sharing his possessions as well as those he is using in the nursery school. He needs to have space in his locker for personal belongings. Space needs to be provided in the nursery school for many toys of similar kinds. There should be room for two or three children to be engaged in a similar activity even though they are not playing together.

The two-year-old is physically very active, and has a difficult time quieting himself after a period of active play. His ability to rest or sit quietly is limited and varies with the individual child. Indoor space should be arranged so that the child can be physically active especially on rainy days. Space should also be planned for quiet activities even though they are engaged in only for short periods of time. Because there are individual differences in the ability and willingness to participate in quiet activities the space should be arranged so that some children can be physically active while others are participating in a quiet activity.

The two-year-old child is eager to learn about his surroundings and does this best by actually experiencing new activities through physical contact. He needs to have space to work with many

kinds of art media, with water and with other activities of a similar nature.

There are wide and varied individual differences in the ability to leave parents, but if the parent needs to stay at the nursery school a comfortable convenient space should be provided for him.

It is evident from Table 3 that more research is needed concerning characteristics and needs of two-year-old children.

## Discussion of the Application of the Data

The investigator attempted to incorporate the ideas and suggestions from all the sources of data into the design of a floor plan (Plate I) for a college laboratory nursery school. The building might be constructed as a building by itself or as a part of another building.

This floor plan is designed to meet the needs of 10 to 12 two-year-old children with one teacher and one assistant. There is room for six students, two participating and four completely concealed from the children in the observation booth in the west end of the building. The observation booth opens from the student locker room, thus eliminating any unnecessary student contact with children. The booth is large enough to hold seven or eight adults, enabling parents or other adults to observe the children if they wish. Most of the play space is observable from the booth. The only area that would be out of range of vision to the observer would be the bathroom and the south end of the play area.

The student locker room is large enough to include all of the facilities the students desired. These were: space for wraps,

## EXPLANATION OF PLATE I

Nursery School for 10-12 Children
(24 to 36 months)

2 teachers

6 students
(2 participating)

A . . . . .Student Bathroom

B . . . . .Student Locker Room

C . . . . .Lobby

D . . . . .Teachers' Office

E . . . . .Teachers' Bathroom

F . . . . .Inspection Space

G . . . . .Observation Booth

H . . . . .Isolation Space

I . . . . .Dining Area

J . . . . .Storage Counter

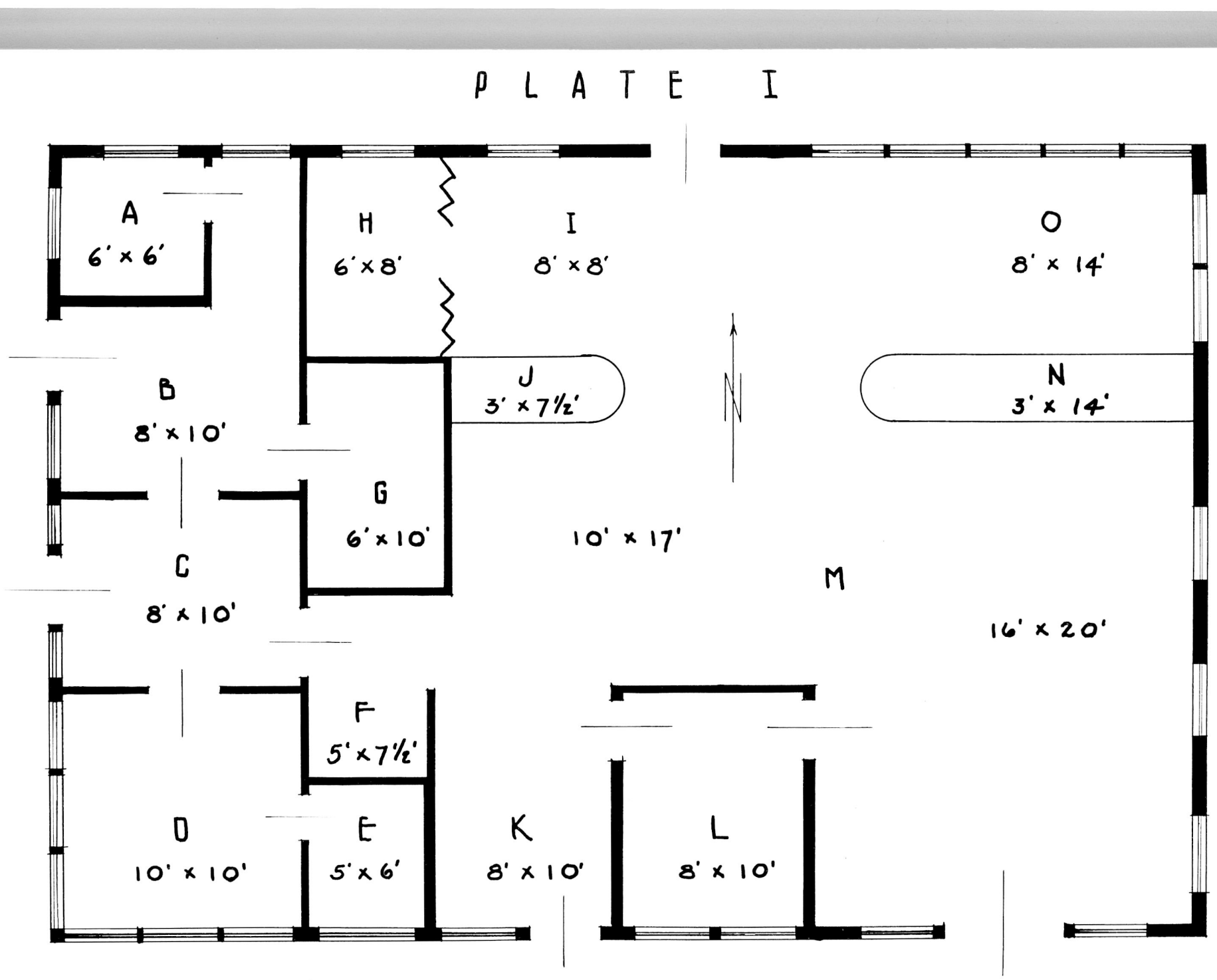
K . . . . .Children's Locker Room

L . . . . .Children's Bathroom

M . . . . .Play Area

N . . . . .Storage Counter

O . . . . .Resting Area



a cot, space for writing and make-up facilities. The parents may also use this space.

The building is 48 feet long and 32 feet wide. It faces west; the playroom has a southeast exposure. The play space has an area of 320 square feet. However, the resting and dining areas can also be used for play most of the time. This would enlarge the play space to 674 square feet, an ample amount for a group of 10 to 12 two-year-olds.

The storage counters serve two purposes. They divide the resting and dining areas from the rest of the play space, and they provide ample space for the storage of equipment used in the nursery school. Because they are approximately 42 inches in height, the teachers would be able to see into all the area occupied by the children. The curved ends might be used for decorative purposes. Low cupboards under the east windows could hold the equipment used daily by the children. The east counter could be divided in such a way that half of it would hold the easel and finger painting equipment and the other half the cots for resting. The west counter could be used largely for the dining area storage needs.

The space at the west end of the dining area could be used for isolation purposes by pulling the sliding doors together. This area or the resting area might well be used for music, stories and other quiet activities. A piano would fit into either the resting or dining area.

The lobby would serve as a trafficway for parents and children. Students on their way to be inspected would need to use this area

for a trafficway. There is also space in this area for chairs and a bulletin board.

The inspection space would need to be artificially lighted. Because of its central location it would serve both students and children.

The children's locker room and bathroom are adjacent to each other as well as easily accessible from the indoor and outdoor play space. The north wall of the bathroom on the playroom side might be used for shelves for storage or a bulletin board for the display of the children's work or both. If the students were to observe and participate outdoors, they would need to use the children's locker room as a trafficway. However, there are two exits to the outdoor play area for the children, one through the locker room and one through the main play area.

There is ample space in the teacher's office for two desks. A bathroom large enough for a stool and lavatory is directly adjacent to the office.

The exit on the north wall of the building was intended to lead to a kitchen. The plan of the kitchen was not included in this study.

## IMPLICATIONS OF THE STUDY

It is evident from this study that much additional research needs to be done on the characteristics and needs of two-year-old children. It is also apparent that more research needs to be done concerning the indoor space needs of a group of two-year-old

children in a college laboratory nursery school. More consideration obviously needs to be given to the housing needs of college laboratory nursery schools.

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# APPENDIX

Form I

# QUESTIONNAIRE FOR NURSERY SCHOOL ADMINISTRATORS AND TEACHERS

I am a graduate student in the Department of Child Welfare and Euthenics at Kansas State College. For the title of my research problem I have chosen, "Certain Factors Affecting Space Requirements for 2-year-old Children in a College Laboratory Nursery School." I am interested, therefore, in collecting your opinions and ideas concerning certain of these factors affecting the indoor space requirements. I should greatly appreciate the return of this questionnaire by January 30, 1950.

Some of the information asked for in this questionnaire will depend upon the way the first two questions are answered. If there is any doubt as to the number of children or group as a whole please refer to your first answers.

1. Should the indoor space for the two-year-old group be located:
   On first floor_____
   On second floor_____
   Both_____
   Other_____
   Comments:

2. (a) What is the optimum number of children from two to three years of age that can be successfully handled by one full time teacher:
   Less than 8_____
   8-10_____
   10-12_____
   More than 12_____

   (b) By a full time teacher with one assistant:
   Less than 8_____
   8-10_____
   10-12_____
   More than 12_____

3. What is the maximum number of students who should be present in above group (a) at one time:
   Observing_____
   Participating_____
   Observing and Participating_____
   above group (b) at one time:
   Observing_____
   Participating_____
   Observing and Participating_____

4. Should students be concealed from the children:
   Partially_____
   Completely_____
   It doesn't matter_____
   Comments:

5. How should student traffic be regulated:
   Passageways entirely separate from area occupied by the children_____
   Passage directed through play area at specified times and places_____
   No specifications as to when and where students may walk_____
   Comments:

6. Should the play area have:
   South-east exposure_____
   Other_____
   Comments:

7. Should indoor space be arranged:
   In one room_____
   In one room divided by screens_____
   In one room with alcoves_____
   In more than one room_____
   Comments:

8. How many square feet per child need there be in the free play indoor area exclusive of built-in equipment?
   25-35_____
   34-45_____
   45-55_____
   Other_____

9. How many exits are necessary:
   One_____
   Two_____
   Three_____
   Other_____
   Comment:

10. What should be the maximum number of children in a story group:
   Less than 4_____
   4-8_____
   8-12_____
   Other_____
   Comment:

11. In a story or conversation group should the children be seated:
   Formally (on chairs, circle or other)_____
   Informally on rugs_____
   Comment:

12. Should the music and story area be:
   Combined_____
   Separate_____
   Comment:

13. How should the music activities be handled:
Individually_____
In a formal group_____
In an informal group_____

14. What should be the maximum number of children in a music group:
Less than 4_____
4-8_____
8-12_____
More than 12_____
Comments:

15. What are the most important determinants in the location of the bathroom:
Adjacent to playroom_____
Adjacent to inspection room_____
Adjacent to cloakroom_____
Other_____
Comments:

16. What is an adequate number of toilet stools for a group of:
Less than 8 children_____
8-10 " _____
10-12 " _____
More than 12 " _____
Comments:

17. What is an adequate number of lavatories for a group of:
Less than 8 children_____
8-10 " _____
10-12 " _____
More than 12 " _____
Comments:

18. Should the inspection space be combined with:
The bathroom_____
The playroom_____
The cloakroom_____
Entirely separate_____
Comments:

19. Should the inspection area include:
Space for inspection of children only_____
Space for inspection of students and teachers_____
Comments:

20. Do children of this age rest most successfully:
(Allow for naps at home and a short rest period at N. S.)
On cots_____
On rugs_____
Other_____
Comments:

21. Do children of this age rest most successfully:
With stories_____
With music_____
Quiet atmosphere_____
Other_____
Comments:

22. What area should be planned for resting:
Part of playroom_____
Separate room_____
On another floor_____
Other_____
Comments:

23. How many children can be successfully supervised by one teacher in the resting area:
Less than 8_____
8-10_____
10-12_____
More than 12_____
Comments:

24. Where should the noon meal be served:
In a separate room_____
In a part of the playroom_____
Comments:

25. What should be the maximum number of children per teacher during the noon meal hour:
1-2_____
2-3_____
3-4_____
Other_____
Comments:

26. How much shelf space in the playroom per child need be available for toys accessible to him:
1½' x 1'_____
2' x 1'_____
Other_____
Comments:

27. Where should the storage space be located:
(a) For cots if used
Teacher's office_____
Play area_____
Separate room_____
Other_____
(b) Sheets and blankets
Teacher's office_____
Play area_____
Separate room_____
Other_____

28. Where should surplus equipment be stored: (Extra materials not used daily).

| | Teacher's office | Play area | Separate room | Other |
|---|---|---|---|---|
| Easel & finger painting paper | | | | |
| Crayons, paints, scissors, clay | | | | |
| Wearing apparel | | | | |
| Blocks, cars, trains, boats, etc. | | | | |
| Children's books | | | | |
| Phonograph records, musical instruments | | | | |
| Miscellaneous equipment & supplies | | | | |

Comments:

29. What kind of tables are most satisfactory:
    Folding_____
    Stationary_____
    Drop table attached to wall_____
    Comments:

30. What shape of tables is most satisfactory:
    Square_____
    Round_____
    Oval_____
    Rectangular_____
    Hexagonal_____
    Comments:

31. What size of table is most satisfactory:_____

32. What kind of clothes storage space best suit the needs of children of this age:
    Open lockers_____
    Drawers_____
    Shelves_____
    Hooks_____
    Other_____
    Comments:

33. Should the space for children's wraps be:
    Combined with the inspection room_____
    Combined with the playroom_____
    Entirely separate_____
    Comments:

34. Should an isolation space be planned for:
    Sick children only_____
    Solitary play_____
    Occasional story and
      music groups_____
    Combination of these_____
    Other_____
    Comments:

35. Should the parents' reception space be:
    Near the cloakroom_____
    Where parents can see the playroom_____
    Comments:

35. (cont.)
Should this space include:
Bookshelf_____
Chairs_____
Bathroom_____
Space for writing_____
Bulletin board_____
Other_____
Comments:

36. Should the student locker room be located:
Near the playroom_____
Near outside entrance_____
Other_____
Comments:

37. Should the student locker room have:
Separate entrance_____
Same entrance as children_____
Other_____
Comments:

38. Should the student locker room include:
Make-up facilities_____
Bathroom_____
Cot or couch_____
Space for writing_____
Other_____
Comments:

39. Would it be possible to include a floor plan of the nursery school unit with which you are now connected? If so, would you point out both the satisfactory and unsatisfactory aspects of the space arrangement.

40. In your nursery school was the space:
Originally planned for a nursery school_____
Adapted from another building_____
Comments:

Name_____ Date_____

Position_____

University or College_____

Form II

QUESTIONNAIRE FOR STUDENTS IN CHILD GUIDANCE I AND II

I am attempting to get information on student needs in the Nursery School Laboratory.

Please check each and also fill out the blank spaces for comments. --Dorothy White

1. In the nursery school a student locker room should be adjacent to: (check one)
   Entrance_____
   Inspection room_____
   Playroom_____
   Other:

2. Students should enter the nursery school: (check one)
   Through a separate entrance_____
   Through same entrance as children_____
   Comments:

3. The student locker should include: (check as many as you think necessary)
   Bathroom_____
   Make-up facilities_____
   Space for wraps and books_____
   Space for writing_____
   Other:

4. Unless the students are participating they should be: (check one
   Completely concealed from the children_____
   (observation booths)
   Partially concealed from the children_____
   (behind screens)
   Other:

5. If you were planning a nursery school what other suggestions have you for making the student facilities more convenient and satisfactory: