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ABSTRACT

School districts are reluctantly paying for repairing damage to their properties that might not have occurred had the buildings and sites been better designed. A study to determine what designers and owners can do to prevent or diminish damage to schools through more careful planning and design reveals five major design issues pertinent to the problem of property damage in schools. The first three, access to roofs, entrances, and predictable rough play spaces, relate to the question of access and the proximity of rough activities to unprotected windows and fragile hardware. The other two design issues relate to the damage-ability of walls and ground materials. This report deals with one aspect of the solution -- what to watch for when designing new schools. (Author/MLF)

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Schoolhouse

Designing schools to minimize damage from vandalism and normal rough play

School districts are reluctantly paying for repairing a lot of damage to their properties that might not occur if the buildings and sites were better designed. Some of the damage is accidental, some is unavoidable wear and tear, and some is malicious. All these forms of damage are usually lumped together and called vandalism and blamed upon kids who use or hang around schools. The Public Facilities Department of the city of Boston—Robert J. Vey, Director—financed a study to determine what designers and owners can do to prevent or diminish damage to schools by more careful planning and design. This issue of *Schoolhouse* is based on the study that was directed by John Zeisel, a sociologist in the Department of Architecture at Harvard University. This report only deals with part of the solution—what to watch for when designing new schools. Further work is underway on a second-stage study jointly supported by EFL and PFD (see page 8).

School buildings provide a challenge to kids—a test of their ingenuity to enter or scale the building, and these actions may lead to damage. In law, facilities that invite destructive or dangerous misuse--such as unattended swimming pools—are termed "attractive nuisances." Responsibility for misuse, as well as use, of an "attractive nuisance" legally rests with the owner. Since schoolhouses can be viewed as attractive nuisances, school districts and their architects must provide buildings that are not easy and inviting targets for would-be vandals.

In addition to wanton damage, property is damaged through normal rough play when students are unsupervised or when school is not in session. Rough informal play should be anticipated when planning facilities and specifying the materials used in construction, hardware, and equipment.

The need to design facilities that will obviate the attractive nuisance and the rough play damage emphasizes the importance of being able to predict how school buildings will be used. Such predictions can be based on how students use present facilities and can be applied to the use of improved facilities when they become available. If such predictions are reasonably accurate,

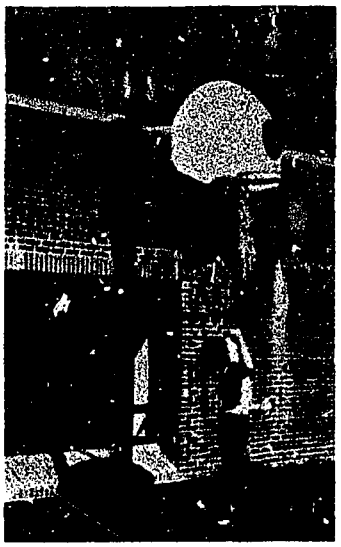
planners can respond to the needs of school users and take responsibility for their decisions instead of blaming the users.

Four categories of property damage

Vandalism popularly means breakage, defacement, and theft of property. Custodians in some cities include theft of typewriters, food, and other valuable items from schools in official vandalism reports. The Boston study found that people who most frequently deal with vandalism tend to use the term to describe many acts which they either don't understand, which they see as threatening, or which they don't know how else to label. In this report vandalism means damage to property, and it is divided into four categories.

Malicious vandalism: A principal gives a student a stern lecture. The student wants to retaliate so he breaks a window in the principal's office. The motive is conscious and the consequence is a broken window which needs immediate attention.

Malicious acts, as the above mentioned, are primarily social, educational, or legal problems and must be dealt with accordingly. In most cases the designer can do little except provide more protective screening and stronger locks on doors. It is not primarily a design problem.



Misnamed vandalism: A basketball court is located next to windows in a school hallway. Neighborhood teenagers break a window while playing ball. It is an unintentional act, but nevertheless the window must be repaired immediately to keep out intruders and weather.

This type of damage is often called vandalism by those who repair windows, but it could be avoided by predicting the activity and by planning walls and windows (or sometimes omitting windows) that can withstand legitimate rough use.

Non-malicious property damage: Boys playing street hockey spray paint a goal on a school wall.

They are providing something necessary to their game. People walking by, however, see the lines as graffiti and vandalism. Although the boys are conscious that their action might be considered destructive to property, they paint to meet what they see as a legitimate need. The consequence does not demand immediate repair. Design responses to damage of this kind include painting lines on the wall in the first place or helping the children paint their lines neatly.

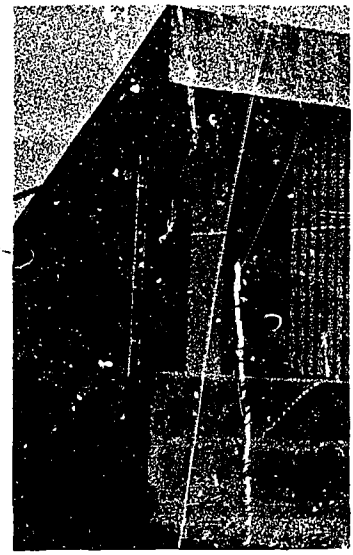
Hidden maintenance damage: A designer specifies a strip of low bushes to soften the edge between a pathway and the school building. At first the bushes look attractive, but in time they catch debris that is cleaned only when the custodian finds time to wade among the bushes.

Such problems are seldom, if ever, called vandalism, and hardly ever included in calculations of damage costs. To avoid such problems means not using surfaces and plantings which show slight damage, and increasing the use of easily maintained surfaces. Some researchers have found that poorly maintained areas are more frequently vandalized than those that are cared for.

Design issues

Five major design issues pertain to the problem of property damage in schools. The first three—access to roofs, entrances, and predictable rough play spaces—relate to the question of access and the proximity of rough activities to unprotected windows and fragile hardware. The other two design issues relate to the damageability of walls and ground materials.

Roof access



Many children see the entire school building as an attractive nuisance—roofs in particular are enticing places to play, to be alone, to break into doors, or to play with and damage hardware. One countermeasure is to make access to roofs from the ground as difficult as possible.

Possible design responses:

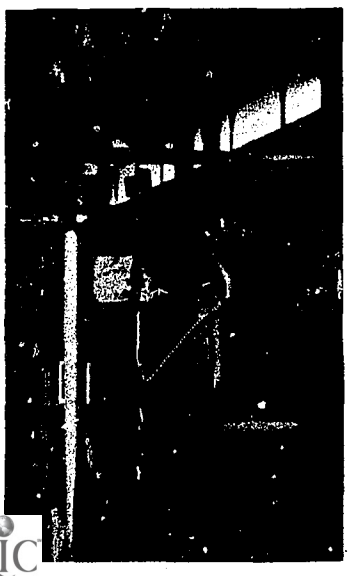
- Ensure there are no footholds on exterior surfaces.
- Avoid placing hardware where it provides footholds.
- Plant unclimbable trees and bushes close to a building.
- Locate climbable planting far from walls.
- Remove built-in footholds from nearby utility poles.
- Plan walls too high to climb with accessible ladder substitutes such as a 12-ft-long piece of lumber.
- Avoid installing unnecessary doors and windows. Use the same glazing and hardware as on the ground floor.

Where access to one part of a roof is unavoidable because of the landscaping, or is desirable because the roof is to be used as a play area, take special care to avoid easy access to other more vulnerable roof areas.

Possible design responses:

- Plan differences in roof heights greater than can be reached with a 12-ft length of lumber.
- Avoid hardware on walls—such as lamps—that can be used for footholds.
- Do not install permanent custodial ladders between roofs. Provide secure storage for portable ladders.
- Avoid parapets and rails that provide easy jumping off points to adjacent roofs.

Entrances



Wherever there is an entrance into a school, there is a potential problem in keeping people out. Four specific issues stand out when designing school entrances. Does the doorway clearly indicate "stay out" when the school is closed; is the exterior door hardware really needed; does the panic hardware keep people from getting into the building; and, do the doors facilitate shared use of the building by community groups and the students?

Doorways can be designed to be inviting and open, to be closed and foreboding, or to convey either meaning at different times. Some school architects feel that major doorways present the "face" of the school toward the community. Therefore, to involve the community in the life of the school, they design entrances with glass doors through which the interior of the building is clearly visible. Unfortunately, inviting doorways are often seen as inviting even when the school is closed. Easily broken glass panels are the only barrier to the interior hallway. Inviting entrances are often covered with chain-link fencing, plywood, or locked with chains. To avert this eventuality, designers should plan the building to clearly indicate when it is open or closed.

Possible design responses:

- Provide sliding or pull-down grilles that cover transparent doorways when the building is closed.
- Avoid large areas of glass on entrance doors and around entry areas.

Architects frequently specify locks and handles for all doors in one entrance although only one door needs to be unlocked from the outside. Also, secondary exit doors need not be accessible from the outside.

Possible design responses:

- Eliminate exterior hardware on all doors used primarily for exits.
- Eliminate exterior hardware on all but one door in a multiple door entrance. A custodian can unlock one with a key and open the rest from the inside.

There is a conflict between the need for school users to get out in case of fire, and the need to keep everyone out when school is closed. Panic hardware usually meets the first need, but fails dismally in meeting the second. A coat hanger can often be used to open panic hardware from the outside.

Possible design responses:

- Avoid glass panels on and near doors that give a clear view of accessible panic hardware. Glass enables anyone trying to get into the school—either maliciously or playfully—to see the easily overcome panic lock.
- Specify astragals on all doors with panic hardware to prevent anyone forcing a piece of wire through the crack at the edge of the door. If these strips of metal covering the cracks are not attached when doors are installed, custodians will put on a padlock and chain to lock the fire exits at night.

When schools are shared with communities in the evenings and on weekends, it becomes necessary for both sets of users to separate some sections of the building. Unless this is planned ahead, custodians may resort to putting chains through door handles to maintain security in their buildings.

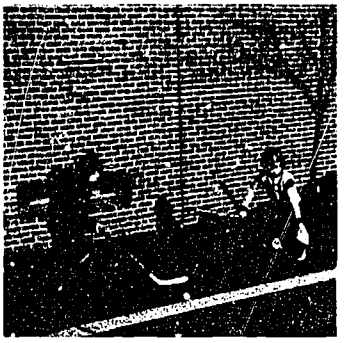
Possible design responses:

- Provide flexible built-in interior gates that can selectively close corridors or parts of a school while other parts, e.g., the auditorium, remain open.
- Locate offices near entries so that the staff can see who is going in and out of the school.
- Provide places for informal meetings and activities near entrances and exits. People gathering at these places serve as "human locks" for the school.

Rough play places

Some open spaces around schools are officially programmed as basketball courts or baseball fields. Although walls near such areas should withstand stray balls, schools often have breakable windows within easy reach of a home run. Similarly, play equipment is often not designed to withstand the use to which it is put. Architects seldom realize that a series of badly placed dunk shots can rip a basketball net and bend the hoop.

Outside school hours, teenagers gather around the



school building for informal games with equipment they bring from home. All they need is a hard surface large enough to throw a ball and a wall to serve as a backstop.

Possible design responses:

- Minimize glass around play areas.
- Provide surfaces that will bounce balls back.
- Specify equipment that can withstand rough play.
- Install play equipment properly. Improper installation invites damage, e.g., a basketball hoop set on an angle can be broken when players try to adjust it.
- Avoid play areas that are not level and have insufficient room around them.
- Specify lines on walls and on ground to accommodate all local street games; or, work with kids to get the lines painted.

Adjacent to many formal and informal play areas are places where people sit to watch games, be seen by passers-by, and talk to one another. These areas are distinguished by having benches, walls, steps or tree stumps to sit on, by being points from which to observe and comment on games nearby, and generally by being visible to adjacent public areas.

Property damage occurs in these areas because kids play with nearby hardware, throw cigarettes and soda cans on the ground, and climb on young plants. Such places look vandalized, but in actuality they simply reflect the planning for an incomplete range of activities—walking up stairs but not sitting on them, looking at planters but not putting out cigarettes in them. Realizing that such activities take place, school planners can design predictable hanging-out areas to minimize damage and litter.

Possible design responses:

- Avoid hardware and glazing that can be easily removed or damaged by kids sitting nearby.
- Plant trees and bushes that cannot be easily scratched, burned, or broken.
- Avoid plant containers that can be used as trash baskets.
- Provide convenient trash containers that do not make burning rubbish attractive. Empty them regularly.

School buildings often provide hidden places that kids use as informal clubhouses. Sometimes they just sit and

talk there, sometimes they drink beer (hence the name "watering hole"), or smoke. These places are not officially sanctioned play areas and are often considered trouble spots by custodians and school administrators.

Property damage in these places includes graffiti, broken bottles, hardware, trees, windows, and breaking and entering. To avoid these consequences, watering holes should be identified early during the design of a school and detailed to withstand sustained and often destructive use and abuse.

Possible design responses:
- Treat watering holes the same as hanging-out areas.
- Avoid accessible hardware and fenestration.
- Provide wall and ground surfaces that can be written on but can be cleaned and withstand other abuse.

Around schools are many small spaces just large enough for one or two people. Such niches are created by fire stairs adjacent to walls, depressed entrances, or delivery docks, etc. Niches are used for, among other things, prying at windows or picking locks, smoking or drinking.

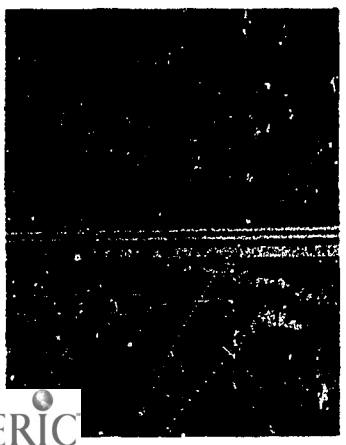
Possible design responses:
- Avoid unnecessary niches wherever possible.
- Specify as little accessible hardware and as few windows in niches as possible.

Graffiti

Graffiti has long appeared modestly on the walls of public buildings, but it got out of hand when spray paint and magic markers came on the market. The war between graffiti artists and graffiti removers is escalating, but designers should try to understand the types, locations and likely surfaces for graffiti so that they can develop architectural responses that are not completely defensive.

Self-expressive graffiti takes the form of names and street numbers, love declarations, or verbal attacks. Some self-expressive graffiti are meant to be offensive, while some are an attempt by teenagers and children to communicate with friends, just as adults do through more acceptable channels. New teachers see their names in school papers, administrators speak over the public address system, and custodians have their names on doors. But when students advertise themselves they are called vandals.

Decorative graffiti are similar to the self-expressive type but are usually more elaborate, colorful, and often do not contain words. Graffiti on New York City subway cars is a combination of decorative and self-expressive.



Possible design responses:
- Plan some walls in appropriate places to attract self-expressive and decorative graffiti.
- Specify materials for such graffiti walls that can be easily painted or washed.
- Remove only abusive graffiti during maintenance.

Legitimate graffiti are the simplest, yet most often overlooked types of markings. When lines are painted neatly on paving or on a wall, and when they have a purpose such as a basketball foul line or stripes in a parking lot, they are considered legitimate. But when children paint a hockey net in the schoolyard it is called vandalism. This

type of graffiti can only be dealt with if planners first acknowledge its legitimacy.

Possible design responses:
- Provide local street groups with stencils for neatly painting strike zones, goals and other game lines.
- Paint game lines on walls and ground surfaces after consultation with local game players.
- Acknowledge and accept legitimate graffiti by children.

A lot of self-expressive and decorative graffiti appears in areas with high visibility to the general public and neighborhood street groups. Graffiti for the general public is usually on walls near front and back entrances which would be considered prime commercial advertising space. Graffiti for street groups generally occurs near where they meet: in pick-up game areas, hanging-out areas, watering holes, and in niches. Graffiti here serves as both territorial markings and as a means of identifying group members. Legitimate graffiti occurs primarily in pick-up games and formal play areas.

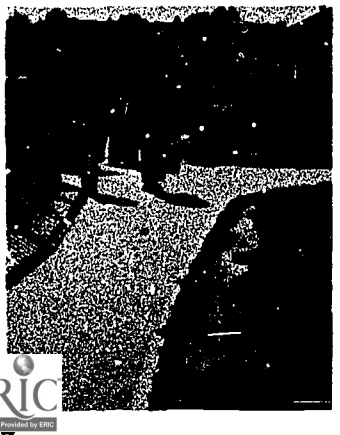
Generally, graffiti occurs on light, smooth, symmetrically blocked-out surfaces, rather than on dark, rough, jagged surfaces. Unfortunately, this does not mean that if all walls in a watering hole are dark and rough there will be no graffiti.

Possible design responses:
- Plan graffiti walls around front and back entries and in watering holes.
- Plan for legitimate graffiti in both official and potentially informal play areas.
- Provide smooth, light, symmetrically blocked-out wall surfaces where graffiti are predicted.

Surfaces

Many wall and ground surfaces in and around schools are extremely difficult to maintain. A large part of the problem comes from not predicting the normal use and abuse such surfaces will receive. Walls and ceilings are highly prone to the "epidemic effect" of vandalism. If one scratch is left for a long time, one pane of glass left broken, or one ceiling panel left pushed in, there is a high probability that further damage will occur around the same spot. On the other hand, quickly repaired damage is less likely to re-occur.

Possible design responses:
- Specify easily and inexpensively repaired surfaces.
- Use small wall and ceiling panels and keep replacement panels in stock.
- Avoid easily damageable wall and ceiling materials.
- Keep quick drying touch-up paint in stock.
- Use washable surfaces wherever children can reach.
- Put ceilings out of reach of kids jumping or poking with sticks.



Ground surfaces are prone to three problems: Shrubbery collects debris; soft materials next to heavily used paved areas are easily damaged; and people would rather walk on grass than on a badly placed pathway.

Possible design responses:
- Specify planting that does not collect litter and is easy to clean, such as trees or bushes without thorns.

- Near active areas specify resilient planting such as bushes instead of stiff, breakable planting like young unprotected trees.
- Avoid soft materials such as grass or flowers immediately adjacent to narrow paths or parking lots.
- Provide subtle but real barriers, like a change in level, between hard surface and adjacent grass.
- Accept naturally made shortcut paths.

Readers invited to tell how they minimize damage

Owners and architects have to respond to the five design issues—roof access, informal rough play places, entrances, graffiti, walls and surfaces—so that property damage in schools can be limited. However, in addition to design methods, there are also administrative and social programs that have been used to reduce property damage and EFL and PFD would like to know more about these activities. Readers are invited to send descriptions of designs and programs that are concerned with school damage problems.

Write to Professor John Zeisel, Harvard University, Graduate School of Design, George Gund Hall, 48 Quincy Street, Cambridge, Mass. 02138.

A bibliography compiled by Zeisel will be sent upon request at the same address.

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DOCUMENT RESUME

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AUTHOR Durkin, Dolores
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DESCRIPTORS *Beginning Reading; Language Arts; *Prereading Experience; Preschool Programs; Primary Grades; *Reading Achievement; Reading Instruction; *Reading Programs; *Reading Research

ABSTRACT

This paper discusses a six-year study, the first of which was a two-year language arts program that began with four year olds, and the second part of which was a four-year effort to trace the progress made in reading by children who participated in that program as compared with the reading achievement of classmates who had not been participants. The chief aim of the two year preschcol program was to provide participants with enjoyable language arts experiences from which they might or might not learn to read. The only requirement of this group was that they be four years old by December of the school year. Findings showed that when differences in intelligence test scores were accounted for, children in the experimental program obtained higher mean scores on reading tests during grades one through four. At the end of grades one and two, differences were large enough to merit statistical significance, but at the end of grades three and four, this was not the case. (HCD)

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A SIX-YEAR STUDY OF CHILDREN WHO LEARNED TO READ IN SCHOOL AT THE AGE OF FOUR*

Dolores Durkin
University of Illinois

The six-year study to which the title of my paper refers divided into two parts. The first part was a two-year language arts program that began with four-year-olds. The second part of the research, which is what I'll be describing today, was a four-year effort to trace the progress made in reading by children who participated in that program and, secondly, to compare it with the reading achievement of classmates who had not been participants. Because the whole of the six-year study stemmed from some earlier research I had done, I would like to refer to the earlier studies just briefly.

From 1958 until 1963, years that now seem like the dim past, I conducted two studies of children who learned to read at home before they entered school. The first study traced the achievement of one group of early readers until they finished third grade; the other followed a second group's progress until sixth grade (1).

Two findings from these studies prompted the research I'll summarize this afternoon. The first finding was that the early readers maintained their lead over comparably bright non-early readers. The second finding had to do with how the children acquired reading ability at home. According to parent-interview data, it was achieved in ways that were both interesting and enjoyable for the children.

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*A detailed report of this study, which was funded by Carnegie Corporation of New York, will appear in Reading Research Quarterly in the Fall Issue, 1974.

With this combination of findings, it was natural to contemplate a school program that would try to duplicate what I had learned from studying out-of-school accomplishments in reading. Eventually, in the fall of 1967 to be exact, I initiated such a program for four-year-olds. The two-year program began with fours because that had been the age most commonly cited by parents of early readers as the time when their children began to show an interest in reading.

What participants learned in the two-year program was described in a report published in the summer of 1970 in the Reading Research Quarterly (2). Consequently I'll not repeat that description today. In fact, all I want to say today about the two year pre-first grade program is that maximum achievement in reading was never its goal. Rather, the chief aim was to provide participants with enjoyable language arts experiences from which they might or might not learn to read. To be noted, too, is that children were not selected for the program on the basis of their being formally assessed as "ready" to read. Actually, the only requirement was that a child would have a fourth birthday by December; the program itself started in September.

Today, my purpose is to summarize reading achievement data for program participants during grades one to four and, secondly, to report on their progress as it compared with that of classmates who had not been participants. Before I do this, however, I need to comment about these classmates; that is, about the control group for the grade-one to grade-four comparison.

Although members of the control group had not been in my experimental program, all of them did attend kindergarten in the community in which the program took place. Earlier, when this community was selected for

the research, its single elementary school held to a highly traditional policy regarding readiness; that is, all entering first graders were started on a readiness rather than a reading program. This, actually, was one reason for choosing the community. Its policy, or so I thought, would let me compare the reading ability of children who had a chance to learn at the age of four with that of classmates who were not taught to read until first grade. Certain things happened, however, that altered research plans.

About a month after my experimental program got underway, some parents in the community who had children in first grade complained to the principal and then to the superintendent about the fact that four-year-olds in my program were learning to read whereas their first-grade children were not. By the following fall, to make a long story short, the readiness program in first grade was abandoned. In addition--and this affected my research--kindergarten teachers were directed to give some attention to numeral, letter, and word identifications. The change in kindergarten made for a change in the nature of the control group for my research. Now my study would compare the reading achievement of children who had been in my experimental program with that of classmates who had attended a kindergarten in which numeral, letter, and word identifications received attention.

Limited as I am today by a twelve-minute summary, I decided the best way to report on findings is through tables, which I'll distribute shortly. In essence, the tables say this: When differences in intelligence test scores are accounted for, children in the experimental program obtained higher mean scores on reading tests during grades 1-4. At the end of grades one and two, differences were large enough to merit statistical significance. At the end of grades three and four, this was not the case.

In the time that remains, I'd like to mention a few of the other things I learned while conducting the study.

What was learned very quickly has relevance for other researchers. I refer to the fact that it is not possible to assess with any accuracy the future value of pre-first grade starts in reading until schools are both able and willing to build on and thus extend the earlier achievement. In the case of my own study, I learned immediately--that is, at the start of first grade--that the changes required by this accommodation would not be forthcoming. More specifically, even though detailed descriptions of pre-first grade accomplishments were made available both to teachers and to the administration, research subjects still were given preprimers at the start of first grade. As a matter of fact, two weeks after they entered first grade, they were even given a readiness test. Why? In essence, the explanation for this and other observed practices was: tradition dies hard. It dies hard even when someone (myself, for instance) offers to help with the changes that must be made in traditional reading programs if earlier starts are to be taken advantage of and eventually appraised.

That we now know almost nothing about the possible value of earlier starts in reading is not exclusively accounted for, I must hasten to add, by the failure of schools to take advantage of pre-first grade reading ability. What must also be recognized is that researchers who have developed earlier school programs and, I might add, have extensively publicized them, have not always done the kind of longitudinal work that ought to be a part of their research efforts. Last summer, when I was preparing a detailed report of my own study, I wrote to everyone I knew or had heard about who had some connection with early school programs.

In my letter I requested information about the long-term effects of their programs. There were two disappointments in connection with this request. The first was the number of unanswered letters. The other disappointment was that most of the responses that did arrive were comprised not of longitudinal data but of advertisements for materials connected with a program that were now commercially available. It would seem, I'd like to suggest, that programs ought to be evaluated over a reasonable period of time before anything is done to advertise and sell them.

The other and final observation I want to make has to do with the national move toward earlier starts in reading--for instance, in the kindergarten. From the many contacts I've had with schools, I have arrived at this conclusion: why many schools are now teaching reading in kindergarten has nothing to do with what we actually know about earlier starts. As I mentioned before, we know practically nothing about them insofar as their long-range effects are concerned. Why, then, are schools quickly moving toward kindergarten reading? For reasons like: parental pressure; a desire to keep up with the Joneses, that is, with other schools that are teaching reading earlier; the availability of materials said by their publishers to be designed for the kindergarten; and finally, because of a dissatisfaction with the more traditional kindergarten curriculum.

If anyone asks, "Are we now teaching reading in kindergarten because of what has been uncovered by research?" I would have to say, "No. It is being taught for reasons that have little connection with research and, in some cases, for reasons that would be easy to describe but very difficult to defend."

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2. _____. "A Language Arts Program for Pre-First Grade Children: Two-Year Achievement Report," Reading Research Quarterly, V (Summer, 1970), 534-565.

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