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TOOLS OF THE TRADE

Conducting Research in Schools: A Practical Guide

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Cognitive development unfolds in many contexts, and one of the most important of these contexts is school. Thus, understanding the school context is critical for understanding development. This article discusses some of the reasons why cognitive developmental researchers might wish to conduct research in schools, describes how to get started conducting research in schools, and offers advice to help make school-based research proceed more smoothly.

In 1977, Urie Bronfenbrenner observed that “much of contemporary developmental psychology is the science of the strange behavior of children in strange situations with strange adults for the briefest possible periods of time” (p. 513). More than 30 years later, this observation remains largely true. In response to this state of affairs, Bronfenbrenner and others have called for greater attention to studies of development in context—that is, studies of the course of development as it occurs in the actual environments in which children live and develop.

Development unfolds in multiple nested social settings (e.g., Bronfenbrenner, 1977; Rogoff, 1990), and for most children in Western cultures, school is among the most important of these settings. Children spend many hours each year in school, and their school experiences profoundly influence their development. However, a desire to understand school as a context for

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development is only one of several reasons why developmental researchers conduct research in schools. This article discusses reasons why researchers wish to conduct research in schools, describes how to get started conducting research in schools, and offers advice to help school-based research proceed smoothly.

WHY CONDUCT RESEARCH IN SCHOOLS?

Schools as a Source of Participants

Many developmental scientists wish to work in schools simply because schools are an excellent source of participants. Studies conducted in schools for this reason often do not involve observing or experimenting in classrooms, but instead involve pulling children out of class for individual testing in a separate room at the school. In this respect, such studies are like the ones that Bronfenbrenner (1977) described—they involve taking children to an unfamiliar room to do unfamiliar tasks with unfamiliar people. However, such studies can appropriately address certain types of research questions, including questions about basic cognitive and learning processes in children.

The demographics of samples obtained in schools often differ substantially from those obtained via other methods of recruitment. It is often possible to obtain more diverse samples, or samples more representative of a region, when testing participants in schools rather than in on-campus laboratories. Of course, the diversity and representativeness of any sample depends on the particular schools chosen as research sites. Further, the sample of students who participate often does not accurately represent the schools' populations, because students from different subgroups are not equally likely to provide informed consent.

In this era of increasing accountability in education, it can be challenging to obtain permission to conduct research that involves pulling children out of class. Under current federal laws, there are greater pressures regarding standardized test performance and consequences for schools that do not show adequate yearly progress. As a result, many schools do not allow students to be taken out of class for research purposes during instructional time. Researchers who desire to work in schools solely to obtain a large or diverse sample may wish to consider other ways to obtain their samples. We return to this issue below.

School as a Context for Cognitive Development

Children spend many hours in school, and the activities they engage in at school make an important contribution to their cognitive development.

Thus, it is critical to understand school as a context for development. To this end, studies of classroom instruction and social interactions as they occur naturally in school settings are essential. As one example, in our own research, we are investigating how middle-school teachers link different representations of mathematical information (e.g., equations and graphs) during classroom instruction (see Alibali & Nathan, 2007; Alibali, Nathan, & Fujimori, in press). This field-based research sets the stage for laboratory-based, experimental tests of whether variations in teachers' linking make a difference for students' learning.

It is also important to understand how variations in the school context are associated with variations in development. As one example, Coffman, Ornstein, McCall, and Curran (2008) studied relationships between first-grade teachers' use of memory-relevant language and activities in lessons and their students' memory skills. Students whose teachers used more memory-relevant language and activities (e.g., requests for remembering, structuring activities in ways that facilitate memory) performed better on memory tasks at the end of first grade and made greater improvements during the first-grade year.

Schools as a Setting for Experiments

Schools also provide an appropriate setting for certain types of experiments. Indeed, for some research questions (e.g., questions about how curricula affect learning), experimentation in school settings is the optimal methodological approach. Experiments conducted in schools include not only traditional, controlled experiments but also "design experiments" (Brown, 1992), which involve theoretically based interventions implemented in natural settings (such as classrooms), using an engineering-style approach of design-evaluate-redesign, typically without control or comparison groups. For both traditional and design experiments, teachers are essential collaborators in the research process.

As one example of a design experiment, Lehrer, Strom, and Confrey (2002) examined the feasibility of teaching mathematical similarity to third-grade students. Two polygons are similar if their corresponding angles are equal and their corresponding sides are proportional. In instructing students about similarity, Lehrer et al. used a carefully designed set of tasks and mathematical notations, in a classroom that used frequent whole-group discussion, and a mode of discourse that focused on conjecture and evidence. In this environment, third-grade students came to understand multiple senses of mathematical similarity. This design experiment showed that it is possible to successfully introduce the idea of mathematical similarity at the elementary level.

As an example of a classroom experiment with a control group, Connor, Morrison, Fishman, Schatschneider, and Underwood (2007) tested whether

individualized reading instruction, guided by a software-based algorithm, would lead to stronger reading outcomes in first-grade students. They found that students in classrooms where teachers used the software-based tools to individualize instruction showed greater gains in reading skills in first grade than students in classrooms where teachers did not use the tools.

Not all experiments conducted in school settings involve research questions about curricula. For example, in a large-scale study with 80 classrooms, Hygge (2003) investigated how different sources of noise (e.g., aircraft, traffic, train, and verbal noise) affected children's memory for texts. Aircraft and traffic noise were particularly detrimental to children's memory. Likewise, not all school-based experiments address cognitive outcomes. For example, Stipek, Feiler, Daniels, and Milburn (1995) explored effects of didactic and child-centered instructional approaches on preschoolers' motivation. Children in child-centered programs had higher expectations for success, chose more challenging tasks, displayed more pride in their accomplishments, and worried less about school. Some school-based experiments address research questions about instruction and learning but seek to contribute to other literatures as well. For example, Church, Ayman-Nolley, and Mahootian (2004) examined the role of gesture in communication for monolingual and bilingual children, using video lessons presented in classroom settings. They found that gesture contributed significantly to learning for both groups of children.

The Research Cycle

Classroom research is sometimes part of a cycle that proceeds from laboratory to classroom and back again. As one example, in a laboratory-based training study, Chen and Klahr (1999) developed a procedure for instructing elementary-school children about the control-of-variables strategy, a fundamental aspect of scientific reasoning. Based on this laboratory research, Toth, Klahr, and Chen (2000) designed a lesson plan and tested it in classrooms. The results included some surprises that suggested new directions for further lab-based and classroom research. Thus, basic research on cognition and development can inform classroom practices, and research on classroom practices and their effectiveness can guide basic research and theory.

HOW TO START CONDUCTING RESEARCH IN SCHOOLS

Obtaining Approval to Conduct Research in a School District

If you have not spent time in a school setting recently, it may be helpful to learn more before seeking approval to conduct research in a school district.

You may wish to spend some time reading recent press about current issues in local districts or volunteering in local schools.

How does one get started actually conducting research in schools? The first step is to ascertain whether a review process is required by the school district you wish to work in. Some districts have their own institutional review board (IRB) or external research oversight committee. In the school district where we conduct much of our research, this committee meets on a monthly basis to review proposals for research. The committee requires proof of IRB approval from our institution before they will consider our proposals, and we provide our university IRB with information about the research sites after we have obtained approval from the district. However, it is worth noting that some college or university IRBs require approval from schools before they will consider a research proposal.

The school district external research committee often suggests changes or revisions to our research plan or consent documents, and these then require re-review by the university IRB. In some cases, obtaining final approval takes several rounds of revisions that need to be cleared with both the university and the school district, and the process can take 2 months or more. Once approval has been granted, the district assigns the project a “liaison,” who facilitates contacts with principals and teachers who must also agree to be involved in the research.

Other districts have more streamlined processes for approving research to be conducted in schools. At one district where we worked in the past, a single individual reviewed and approved all research requests, and this approval was typically granted based on a brief telephone conversation about the proposed research. In other districts, there is no formal review process at all. In such cases, principals make decisions about whether to allow the research to be conducted in their schools.

Note that many districts require that researchers complete a criminal background check before they commence work in schools. This should be completed before contacting schools.

Obtaining Approval to Conduct Research in Particular Schools

Once district-level approval has been obtained, the next step is to obtain approval to conduct research in specific schools. It is important to recognize that schools may be differentially receptive to research, depending on the extent to which teachers and administrators are included as partners or collaborators in the research. Some schools are open to research that involves working closely with teachers or working in classrooms, but less open to research that involves pulling students out of class.

Typically, researchers must obtain approval from the school principal before contacting teachers at a school.¹ One approach is to call the principal directly and request a brief appointment in which you describe the research plan and discuss your needs for space, time with students, and teacher involvement. If your work is relevant to state standards or curriculum content, you should explain how your research could inform instruction.

It is important to either include teachers in meetings with principals or to meet with teachers separately, both to request their participation and to discuss the scientific questions and the educational relevance of the proposed research. It is always better if teachers *choose* to be involved in a research project, rather than be told by their principals that they must be involved. When teachers make the choice to be involved, they cope more easily with the inevitable disruptions that research involves. When you meet with teachers, you can discuss how best to minimize disruptions (e.g., for a pull-out study, how would the teacher like you to summon the participants? Does the teacher wish to decide the order in which students are tested, so as to insure that certain students do not miss certain lessons?). Meeting with teachers also provides an opportunity for them to offer input or ideas regarding your study design and plan for data collection.

It may be beneficial to make contact with a principal prior to scheduling an in-person meeting. Some researchers send a letter to principals describing the proposed research before contacting principals by phone. Others researchers initially contact principals by phone and request permission to send a packet of information about the research. They then phone to check whether the packet was received and schedule an in-person meeting at that time. These approaches may make principals more receptive to scheduling an appointment.

If you wish to conduct your research in schools primarily to obtain a large or diverse sample, it is essential to couch your request appropriately and cautiously with both principals and teachers. Emphasize that the instructional goals of the staff are more important than the research, and make efforts to minimize the amount of time needed per participant. In addition, be prepared to accommodate requests to carry out the research during noninstructional time (e.g., during study halls). You might consider collecting data in after-school programs, which often serve diverse populations of students and which typically have fewer constraints regarding how children spend their time.

If the research that you propose to conduct involves teachers altering their instruction in some way, then teachers are an essential part of the

¹One exception is when a district liaison facilitates direct contact between researchers and teachers.

research team. In such cases, teachers are engaged in the research and must also complete appropriate IRB training. Because such studies take place in school, one must first obtain approval from the district and from school principals as necessary, and may then request the opportunity to solicit teachers' involvement. If the district assigns projects "liaisons," these individuals may facilitate contact with teachers as well.

In some cases, teachers and/or teacher practices are the focus of the research. Being the subject of study can be enriching for teachers, but it can also be uncomfortable and challenging (French & Nathan, 2004). If your research addresses teacher practices, it is important to be mindful of teachers' experiences as objects of scrutiny and to be caring and respectful of teachers' feelings and approaches.

Obtaining Consent from Students

Once principals and teachers are "on board" with the research plan, the next step is to request consent from students. In many cases, recruitment letters and parent consent forms are sent home from school with students, and signed consent forms are collected by teachers when students return them. In other cases, it is desirable to send letters home in the mail. For privacy reasons, researchers are typically not allowed to see students' names and addresses, so school staff must be involved in this process. If this is the case, it is important to provide all the needed materials (e.g., envelopes, labels, postage) so that the research does not incur expenses for the school. It may be appropriate to offer something in return for the staff time needed to label envelopes. Researchers can offer volunteer time to offset the time they require from school staff.

If schools serve a population that includes many families where English is not spoken in the home, researchers should provide informational letters and consent forms in the other languages commonly used in the area. Such materials insure that the opportunity to participate in research is available to all students. If you do provide materials in other languages, you should also provide the phone number of a contact person who can speak with parents in their preferred language about questions or concerns about the research.

Sometimes the research plan calls for activities that involve all students in a given classroom. For example, a study in which teachers alter their instruction necessarily involves all students who are present during that instruction. If some students do not consent (or assent) to participate in the research, an alternative activity must be provided for them in another location, and this alternative activity may need to be supervised by a licensed teacher. In some cases, if a teacher adopts a new form of instruction or curriculum, then that lesson becomes the "regular instruction" provided by the teacher, and

student consent (or assent) is for the use of data collected during the lesson, rather than for participation in the lesson itself. If the research involves videotaping naturally occurring instruction, but some students do not provide consent to be videotaped, it may be possible to arrange seating and to position the cameras so that those students are not recorded.

ADVICE FOR THOSE WHO WISH TO CONDUCT RESEARCH IN SCHOOLS

From the perspective of administrators and teachers, researchers often seem to “appear” when they need something and then “disappear” without sharing results or giving anything in return. To foster better relations between researchers and school staff, we offer the following suggestions.

Be Patient

We are often very eager to begin collecting data. We have worked for weeks preparing materials and polishing protocols, and we want to move forward. However, schools and teachers operate with many constraints on their time. It is important to allow ample lead time for any project and not to be pushy about your desired timetable. There are often special events and activities (standardized testing, spirit week, etc.) that make it impossible to collect data for prolonged periods of time. School administrators may allow data to be collected only during noninstructional time (e.g., during recess or study hall or before or after school) or during certain class periods (e.g., for a mathematical reasoning study, only during math classes). Collecting data in schools is often much more protracted than researchers expect. Allow for this in your planning, and be patient.

Be Flexible

Many challenges arise in conducting research in schools. Space challenges are common. For example, the only space available may be a corridor or cafeteria, or the room next to the band room, where it is difficult to get a good audio recording. Or, the room you used to collect data for the last 2 weeks may suddenly become unavailable. You may be assigned to a room without a desk or a blackboard. In designing your protocol, you should anticipate limited space and not presuppose the availability of standard furniture.

Availability of participants during the school day can also be a challenge. You may find out when you arrive for data collection one day that the children are all on a field trip. A teacher may decide that no child can miss

a special activity. Due to spelling tests, visits from Officer Friendly, practice fire alarms, and assemblies, the time available for research in any given day is limited. Ratchet down your expectations for how many participants you can work with in a given day.

It may be helpful to survey teachers about their schedules, so they can indicate times that are generally acceptable for data collection. If you are working with multiple teachers or grade levels, you may be able to stagger data collection so that you can work with students from one classroom or grade level when other students are unavailable.

In general, the more flexible you can be, the more likely you will have a positive experience working in schools. If you are flexible about the space you use to conduct your study, you will be more likely to complete your data collection in a timely way. If you allot extra days for data collection, you will be more likely to meet your goals.

Follow Up With Results

Principals, teachers, and parents often complain that they never learn the results of the research that they are involved in. Of course, research is usually a protracted process, and it sometimes takes a very long time for the results of research to be available. However, a letter to principals and teachers that provides preliminary results is always appreciated. In some cases, it may also be appropriate to send a brief letter with findings home to parents as well, thanking them for their participation. Later, when the results of the research are published, be certain to thank school administrators, teachers, parents, and students (although you may not wish to reveal specific sites). Send a copy of the published paper to the school with a thank-you letter.

Give Something Back

Schools make much of our research possible. As researchers who draw on these contributions, it is important to give something back.

Teachers are professionals whose time, both inside and outside the classroom, is extremely valuable. Teachers often cannot be paid for research activities that take place during contract time (e.g., altering their classroom instruction in some way). However, there may be components of the study that take place outside of contract time (e.g., lesson planning, post-lesson interviews) that can be generously compensated.

Make sure to show your appreciation, both during your work at the school and when your work at the school is completed. You might express your thanks in the form of doughnuts or bagels for the teachers' lounge—every day when you come for data collection, if you can afford it, or at

the end of the study. When your study is completed, you might also send a thank-you note, a gift, or a donation to the school. We often give small gifts to schools (e.g., books for the school library) or directly to teachers (e.g., items they desire for their classrooms).

Beyond these small tokens of appreciation, researchers can also give something back by sharing their knowledge and perspectives. Some of the things that the two of us have done over the years include leading a semester-long professional development course for teachers, leading a professional development workshop on an in-service day, presenting findings at a staff meeting, serving on a district-wide task force about curricula, and serving on the district external research committee. These are ways to give something in return for the time, energy, and accommodations that administrators and teachers give us.

CONCLUSION

Conducting research in schools presents both challenges and opportunities. Some research questions can only be addressed in school settings (e.g., questions about effects of instructional practices on development). Other research questions could be addressed in a range of settings, but there may be compelling reasons for addressing them in school settings (e.g., assuring a diverse sample). Regardless of the reasons for conducting research in school settings, one key to success is positive relationships with teachers and administrators. These individuals are essential partners and collaborators in research, and their contributions make it possible for research to cycle from laboratory to classroom and back again. This cycle has many benefits, both for theory and for application. Thus, it is essential for researchers to build and maintain these relationships.

From a practical perspective, there are some guiding principles that can help school-based research proceed smoothly. In this article, we have emphasized the value of appropriate planning, the need for patience and flexibility, and the importance of consideration and respect for administrators, teachers, parents, and students. If researchers are mindful of these principles, schools will remain open to developmental research for many generations to come.

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