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Workshop to Examine Current and Potential Uses of
NCES Longitudinal Surveys
by the Education Research Community

Linking NCES Surveys to Administrative Data

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This paper was prepared for the National Academy of Education's *Workshop to Examine Current and Potential Uses of NCES Longitudinal Surveys by the Education Research Community*, held on November 5-6, 2013, in Washington, DC. The workshop was organized to provide input to the National Center for Education Statistics (NCES) on how its longitudinal survey program could be enhanced to serve the changing needs of the education research community in light of (1) changing technological opportunities, (2) changing data availability (with an increasing focus on the classroom and learning outcomes), and (3) a changing U.S. population. The collection of commissioned papers reflects the views of the authors and not necessarily those of the National Academy of Education or the U.S. Department of Education. This paper was supported with funding from the Institute of Education Sciences.

The last 20 years has seen a change in capacity for collecting and using data, as well as a change in the breadth and depth of data available for researchers and other data users. The longitudinal surveys, such as those that NCES collects, had been the primary source of data on student outcomes including coursework, knowledge, skills, and educational attainment. Today, there is a diverse range of sources for these outcome measures including state and district administrative data that provide standardized test scores for students over time, and the National Student Clearinghouse data, that can be linked to other data to measure students' progress in institutions of higher education.

In light of these and many other changes, NCES's traditional approach to survey design and collection may not be as advantageous as it could be. First, NCES data, particularly the longitudinal survey data, are generally not designed to link directly to other existing data. By having such a link, NCES data users could supplement the NCES data with other data, allowing for a richer set of measures with which to work. Similarly, users of the other data sources could make use of the NCES data, which often provide unusually rich data on respondents. Second, the existence of these alternative data sources may reduce the need for NCES to collect some data that have traditionally been part of the program, and increase the benefits of collecting other data because of the potential linkages that can be made. At the same time, relying on other data collection efforts for information central to the goals of NCES has drawbacks, most simply because NCES does not control these other efforts.

The purpose of this paper is to highlight issues for NCES to consider in redesigning its data collection efforts in light of data available from other sources. In particular, the paper focuses on the potential for NCES to build on administrative data from government sources. I start by summarizing current data collection efforts by NCES and then addressing potential linkages to administrative data from schools and school districts, often collected by state governments.

NCES DATA

As a base for the discussion of possible changes to NCES data collection, I start by reviewing current data collection efforts. On its website, NCES categorizes these programs into Early Childhood, Elementary/Secondary, Postsecondary, International, and Assessments. They include national longitudinal studies of children and youth as well as nationally representative cross-sectional surveys of students, teachers, schools, districts, households, and states.

NCES data on **early childhood** comes from Early Childhood Longitudinal Study (ECLS) program, which is a set of nationally representative longitudinal surveys, and the National Household Education Survey (NHES), which is set of a cross-sectional surveys of U.S. households. ECLS includes longitudinal surveys starting at birth for 14,000 children born in the United States in 2001 and followed through kindergarten, as well as longitudinal surveys of entering kindergarteners in 1998 (21,000 students followed through eighth grade) and 2010. These surveys include a range of measures including those addressing child development, school readiness, and early school experiences. The kindergarten cohorts provide data on elementary school experiences as well as early childhood. NHES is set of surveys of nationally representative samples of households from 1991, 1993, 1995, 1996, 1999, 2001, 2003, 2005, and 2007, which include

measures of educational activities concerning early childhood education as well as elementary, secondary, postsecondary, and adult education.

At the **secondary level**, NCES also provides both longitudinal and cross-sectional data. The High School Longitudinal Study of 2009 (HSL:09), the Education Longitudinal Study of 2002 (ELS), the National Education Longitudinal Study of 1988 (NELS:88), and High School and Beyond of 1980 (HS&B) all provide data on high school students, starting in 9th grade, 10th grade, 8th grade, and 10th grade, respectively. They include data from families and teachers as well as from the students. The National Longitudinal Study of the High School Class of 1972 (NLS:72) collected data on high school seniors in 1972 and followed up in 1973, 1974, 1976, 1979, and 1986. These longitudinal surveys also include linked High School Transcript Studies, which provide among other measures, courses taken while attending secondary school, credits earned, year and term a specific course was taken, and final grades.

Many other NCES data efforts provide information on elementary and secondary schools. The Common Core of Data (CCD) annual data collection from states covers the population of schools and districts. It includes addresses as well as finances and demographic composition. Data from the CCD can be linked to other NCES data. The Private School Survey (PSS), collected every two years, provides basic information such as the number of students and teachers in all private schools to use for sampling for the longitudinal surveys and also providing a list of private schools in the United States. The recently discontinued Schools and Staffing Survey (SASS) collected nationally representative data on teachers, principals, schools, and districts in 1987–1988, 1990–1991, 1993–1994, 1999–2000, 2003–2004, 2007–2008, and 2011–2012. The surveys followed a subsample of teachers for one year in the Teacher Follow-Up Surveys. The latest wave of SASS included a principal follow-up survey as well. The Beginning Teacher Longitudinal Study (BTL) is a new study of a cohort of beginning public school teachers initially interviewed as part of the 2007–2008 Schools and Staffing Survey and followed up each year for five years. NCES also collects data on crime and safety in schools primarily through two sets of surveys. One, the School Survey on Crime and Safety (SSOCS), is a survey of approximately 3,500 public school principals collected in 1999–2000, 2003–2004, 2005–2006, 2007–2008 and 2009–2010. The second is the School Crime Supplement (SCS) to the National Crime Victimization Survey (NCVS), a survey of students ages 12 through 18 collected in 1989, 1995, 1999, 2001, 2003, 2005, 2007, and 2009. NCES collected two one-time surveys to supplement these data, the Principal Survey on Safe, Disciplined, and Drug-free Schools of 1990–1991 and the Principal/School Disciplinarian Survey on School Violence of 1996–1997.

NCES also runs a series of data collections for **postsecondary education**. The high school longitudinal surveys described above provide information on the respondents' experiences in higher education. In addition, the Beginning Postsecondary Students Longitudinal Study (BPS) follows four cohorts of students who started postsecondary education in 1989–1990, 1995–1996, 2003–2004, and 2011–2012. The first cohort was followed up in 1992 and 1994; the second, in 1998 and 2001; and the third, in 2006 and 2009. The surveys focus on experiences during postsecondary education and transition into the labor force. The Baccalaureate and Beyond (B&B) studies are longitudinal surveys that begin with a sample of students completing their last year of undergraduate education and focus on transitions into the workforce and employment experiences. The

samples began in 1992–1993 (followed in 1994, 1997, and 2003), 1999–2000 (followed in 2001), and 2007–2008 (followed in 2009 and 2012–2013, with a plan to follow in 2018). Within the sample, respondents expressing interest in teaching were asked additional questions about the process and, if teaching, about their teaching position. In keeping with the approach to high school surveys, NCES also collects undergraduate education transcripts as part of the Postsecondary Education Transcript Collections (PETS), linked to BPS (2004/09) and B&B (2008) as well as ELS:02 and HSLS:09.

In addition, NCES runs series of cross-sectional studies that supplement the longitudinal data and provide nationally representative and population data on postsecondary education. The Integrated Postsecondary Education Data System (IPEDS) collects data from all colleges, universities, and technical and vocational institutions that participate in federal student financial aid programs. IPEDS includes data on enrollments, program completions, graduation rates, faculty and staff, academic libraries, finances, institutional prices, and student financial aid. The National Postsecondary Student Aid Study (NPSAS)—collected in 1986–1987, 1989–1990, 1992–1993, 1995–1996, 1999–2000, 2003–2004, 2007–2008, and 2011–2012—provides information on student financial aid and is based on information from institutional records, government databases, and student interviews. NPSAS provides the base samples for the BPS and B&B. The National Study of Postsecondary Faculty (NSOPF) was a nationally representative survey of full and part-time faculty and instructional staff conducted in 1987–1988, 1992–1993, 1998–1999, and 2003–2004. There currently are no plans to continue this program.

NCES is perhaps best known for its **assessment programs**. Within the United States, NCES assessments include the National Assessment of Education Progress (NAEP) and the National Assessment of Adult Literacy (NAAL). NAEP is a set of assessments based on nationally representative samples that has been collected since 1969. It includes measures of reading, mathematics, science, writing, U.S. history, civics, geography, and the arts. A series of nationally representative cross-sectional samples track achievement over time, while state representative samples of most states and district representative samples of some large urban districts provide data in more recent years. NAEP includes high school transcript studies as well. NAAL measures English language literacy skills of a nationally representative sample of American adults. It was collected in 1992 and 2003. For the purpose of international comparisons, NCES also runs its International Activities Programs, which coordinates participation in the Trends in International Mathematics and Science Study (TIMSS), the Progress in International Reading Literacy Study (PIRLS), the Program for International Student Assessment (PISA), the Program for the International Assessment of Adult Competencies (PIAAC), and the Teaching and Learning International Survey (TALIS).

In addition to collecting data, NCES administers a number of other data systems and surveys, including the Statewide Longitudinal Data Systems (SLDS) Grant Program, which has awarded grants to help states design and implement longitudinal data systems for education. In addition, it runs the Fast Response Survey System (FRSS), which collects nationally representative elementary and secondary data quickly to support the data needs of the Department of Education. The Postsecondary Education Quick Information System (PEQIS) similarly collects information for the Department as well as for assessing the feasibility of large-scale data collection. It uses a standing sample of approximately 1,600 postsecondary institutions.

As is evident, NCES collects a wide range of data, with a wide range of sampling approaches. It is beyond the scope of this paper to address each survey program or even each survey area. Instead, I broadly discuss considerations for future data collection in light of the changes in data availability from sources outside of NCES, focusing particularly on linking NCES data to these other sources.

BENEFITS OF DATA LINKAGES

Linking NCES data to other data is only worthwhile if data users benefit from linkages. Current and potential NCES data users are clearly one stakeholder set worth considering. In order to implement linkages, the holders of the administrative data to be linked (e.g., state decision makers) also need to see the linkages as worthwhile. The availability of administrative data linkages not only supplements NCES data but may also affect the types of data collection that NCES chooses to pursue in order to meet its goals. To address these issues I ask the following four questions:

1. How might NCES data *users benefit* from linkages?
2. How might *states benefit* from linkages to NCES data?
3. How might NCES *data collection change* in light of new data availability?
4. What are *practical barriers* to implementing linkages?

How Might NCES Data Users Benefit from Linkages?

There are at least six ways NCES data users might benefit from linkages to state administrative data on students, educations, schools, and districts: (1) prior information, (2) post information, (3) additional concurrent respondent data, (4) peer characteristics, (5) context information, and (6) policy or event measures.

It is clearly impractical to start all NCES cohorts at birth. Some NCES datasets ask respondents about prior experiences. For example, the ECLS Kindergarten cohorts fill in information about their child's childcare experience. However, these self-report data will be sparse and subject to imperfect recall. By linking to administrative data, NCES data users could have much richer data on prior experiences. For example, users of BPS, as well as those of any of the high school longitudinal studies such as ELS and HSLS, currently have little information on students' earlier school experiences and performance. If NCES were to link administrative data to these surveys, then researchers would be able to ask questions such as, "how do grades and test scores in elementary and middle school affect high school, college and career opportunities?" We cannot address this question with currently available data.

Similarly, it is impractical, generally suboptimal, and costly for NCES to follow its survey cohorts indefinitely. Yet, some of the most important education issues involve understanding long-run effects on students. The birth cohort of ECLS (ECLS-B) provides a clear example. This dataset provides the most detailed data available on early childhood experiences and development for a large, nationally representative sample. Yet, the data end in kindergarten so they do not allow researchers to assess the implications of these experiences and developments on long-run outcomes such as success in elementary and secondary schools. By linking ECLS-B students to their student identi-

fication number in state administrative data, NCES would provide the opportunity for researchers to link ECLS-B to administrative data and answer these and other questions.

Administrative data can also provide concurrent measures of students and educators that NCES is not collecting. NCES, of course, cannot collect all possible information. In choosing questions, research designers need to balance the cost of collection with the benefits. Some extra data may be considered too costly to collect validly and reliably relative to their potential uses. Other concurrent data may not have been recognized as useful at the time of design but become central to answering important questions with the data post collection. Teacher performance measures are one example. With extant SASS data, for example, it is not possible to ask whether districts with mentoring and induction programs see greater improvements in teacher performance over the first year. However, more and more state and district administrative datasets include measures of teacher performance such as principal evaluations, value-added to student achievement on standardized tests, or regular attendance at school. Similarly, administrative data on students may include program participation measures—such as specific programs or designations for special education or English learner status—that are specific to the state or district. The national longitudinal datasets often identify programs and designations in generic ways that can apply nationally but that may not provide the detailed information needed to assess assignment or the implications of participation.

A fourth benefit of linking the NCES national longitudinal data, teacher data, and assessment data to administrative datasets is the potential to calculate and include analyses of peer measures. Most NCES survey data, as described above, cover relatively small samples while administrative data target the full population. From population data, researchers can measure a broad range of peer characteristics including demographics, behavior, performance, and program participation. Researchers can look at average peer characteristics as well as at the distribution of peer characteristics such as the heterogeneity of peer's prior performance and where the target student falls on this distribution. As one example of many, with existing NCES data, data users would not be able to ask whether mid-year movers (i.e., students entering or leaving the classroom during the school year) affect student learning and engagement. With links to some state and district administrative data researchers would be better able to do so. Administrative data also allow for context measures in addition to peer characteristics to be included in analyses using NCES data. For example, access to the population of teachers allows for many measures of school context and the characteristics of the teaching force. Without linking NCES data to administrative data, researchers cannot use the NCES data to answer questions like: Do students learn English more quickly in schools with more ESL-certified teachers or with more classroom integration of English-learners and non-English learners? While NCES data provide details on some of a student's teachers, they do not provide information on other teachers that the target student has or teachers in the school as a whole.

Finally, links to administrative data would allow users of NCES data to bring in policy and event measures not currently part of NCES data collection. Measures in state data may be used for policy decisions in ways that allow the direct assessment of policy effects. For example, with data links researchers could address questions such as: Do students who just make or miss high-stakes benchmarks experience changes in self-concept and engagement in school? Without linkages this question cannot be

answered because researchers do not have the test measures that are used to assess whether students reach the benchmark. If researchers have access to the state data but not NCES, they would not have measures of self-concept or engagement.

In summary, there are many benefits to researchers of linking NCES data to administrative data. However, in order to achieve the linkages, coordination must be useful for the public agencies that control the administrative data as well.

How Might the Holders of Administrative Data Benefit from Linkages to NCES Data?

There are at least four ways holders of administrative data such as state departments of education could benefit from links to NCES data: (1) additional measures that are expensive to collect at a large scale, (2) data from nonschool sources, (3) comparisons over time, and (4) comparisons to other jurisdictions (e.g., states). In this section I discuss these possible benefits. However, these benefits require some changes to NCES sampling and, even with these changes, may not be enough to encourage participation of these agencies in the coordination needed to link the data.

NCES data are well known for the richness of their measures. The national longitudinal studies of high school students collect many measures of academic achievement as well as social-emotional health. In contrast, districts and states often only have measures of performance on a small number of relatively high-stakes exams. Similarly, the early childhood studies collect measures of development that are far too costly to collect on all students. Among the many measures available in NCES data but not in most administrative data are student test performance on low-stakes exams, student social-emotional development, student program participation (e.g., extracurricular activities), student motivations, student and parent expectations, teacher job responsibilities, and teacher motivations and expectations. These measures can provide useful information to decision makers even though the information is not worth their own data collection efforts.

NCES linkages would also provide access to data from nonschool sources that are difficult for government agencies to get access to. Parent-reported information is one example of this. State policy makers, for example, may worry about the political consequences of collecting detailed data on students' home lives for administrative data. However, NCES data would allow them access to some of this information that could then be the basis for better understanding their students' needs. Similarly, NCES is able to collect private school information that would not be appropriate for administrative data yet could provide useful information to policy makers. For example, states may be interested in better understanding why some teachers teach in private schools instead of in the public sector and how this has changed over time. NCES data would allow for this analysis.

A third potential benefit for states of linking to NCES data is the potential to compare over time. The measures available in administrative datasets are largely the result of reporting requirements, not necessarily designed for research purposes. By linking NCES data to state data, state researchers can calibrate their own data to measures that are both more consistent and less likely to be subject to manipulation due to incentives. For example, if states put in a new exam or create incentives for performance on an

existing exam, researchers could use links to NCES data to see whether the relationship between test performance and NCES measures of achievement or engagement changed as a result.

Finally, linkages to NCES might encourage cross-state comparisons. With restricted NAEP data it is already possible to compare across states in NAEP datasets that are state representative. NCES already reports differences across states for NAEP results and some NCES datasets, such as the SASS surveys which have state-representative samples. States can thus compare student test performance, teacher satisfaction, and other measures not available in administrative files. Not all NCES data, however, are state representative. In order to be useful for states and other jurisdictions that NCES would link to, the NCES data would need to provide a representative sample of that jurisdiction's students and schools. This requirement is one of a series of factors suggesting that coordination with holders of administrative data would likely lead to changes in sampling and other features of data collection.

How Might NCES Data Collection Change in Light of New Data?

In reconsidering data collection efforts in light of the potential to link to administrative data, NCES might start by articulating more clearly the goals of the data collection. As the primary collector of education data in the United States, NCES likely aims to describe the education landscape and how that changes over time, as well as to provide data for answering key questions for educational improvement. These key questions likely change over time, as does the technology for measuring phenomena of interest. NCES needs to balance the use of best measures with the benefit of accurate comparisons across time, and the benefits of collecting given data with the opportunity costs of doing so. Thus, importance, measurement quality, consistency, and cost are key considerations in NCES data collection.

In light of these considerations, linkages to administrative data could change NCES approaches in a number of ways. The first impact relates to some current data collections being unnecessary in light of available data. That is, the benefits decline in light of existing data and so the opportunity costs outweigh the benefits. As an example, many NCES surveys rely on survey responses for the demographic composition and enrollment of schools and classes in elementary and secondary schools. Administrative data could provide this information, freeing up space in the NCES surveys for other questions. Reporting in the administrative data is likely to be as accurate as it is in the NCES surveys, in this case, though clearly not in all cases. However, state measures can change over time and be subject to incentives. For example, state exams for students likely would not be good substitutes for the achievement measures currently collected by NCES because they are not consistent across states or over time, and state exams are subject to incentives as part of state accountability systems. Linking to administrative data then has some direct implications for which measures are collected within currently existing surveys but this change may be relatively small.

A second impact of linking NCES data to state administrative systems is that NCES may realize larger benefits if it is willing to consider the availability of state data in its survey designs more generally. First, as discussed above, states will benefit far more from NCES data if those data are representative of its population. This need increases

the benefits relative to the costs of NCES collecting representative data in those jurisdictions willing to link. Second, one drawback of administrative data is that they are inconsistent across jurisdictions. NCES could incentivize some coordination or run some data collection for jurisdictions so that the data collected are comparable. For example, an increasing number of states and large districts are designing and implementing school climate surveys for teachers, parents, and students. NCES could create and validate measures for these surveys so that administrative datasets have comparable measures. While NCES may not hold these data, it could help coordinate the collection so that the surveys are well implemented. Similarly, NCES could incentivize similar data collection through programs such as the SLDS Grant Program if a similar program were to reoccur. These programs provide substantial sums to administrative units, providing an unusually strong leverage point for coordination and improvement. Third, NCES may also be able to encourage state coordination at the individual identification level so that states could track students and educators across state lines. Such tracking would improve understanding of the forces driving mobility and of the effects of mobility on educational outcomes. Fourth, NCES could encourage coordination across data sources within states that already share identification linkages but often do not pool information. School systems, juvenile justice systems, teacher preparation programs and coordinating boards, social service systems, etc., all have useful information for understanding students' educational opportunities. Few states have invested in this coordination, yet NCES may best achieve its informational goals by leveraging these existing data.

A third impact of the potential linking with state data highlights the importance of many features of NCES data that distinguish them from administrative data. NCES can collect politically sensitive data and data from sensitive sources such as income data from families of students or measures of depression or behavior that are difficult for administrative units to collect. NCES can preference long-term benefits of consistent measures over information for immediate decision making, allowing the collection of measures that can track changes over time, especially for key measures of student outcomes and educational opportunities. NCES can also collect measures that are costly to collect for the full population—for example, those that require in-person one-on-one interviews and observations such as measures of early education quality and child development. This last feature of NCES collection also points to an important role that NCES has played in measurement development. NCES is more likely to invest in the development of good measures than are state agencies or other holders of administrative data for a number of reasons, among which are that NCES has a longer timeframe when considering the costs and benefits of its data collection.

The availability of linkages would provide opportunities for NCES to better achieve its goals, especially if it is able to alter measure selection, sampling, and coordination efforts to make the best possible use of these linkages. Even with the linkages, many of the distinguishing features of NCES data will remain.

Can Linkages Be Accomplished in Practice?

Clearly linkages between NCES data and existing administrative data have benefits. I outlined many benefits to NCES users as well as some benefits to states and other

administrative data holders. The benefits to this latter group are substantially greater when NCES data are representative of their jurisdiction. Thus, such linkages may rest on NCES's willingness and capacity (especially cost considerations) to sample for representation. Additional funding or a reduction in the number of survey collections would likely be necessary to allow for this change in sampling.

With representation, NCES data linkages will allow states to answer a range of questions that they currently cannot about students, teachers, and schools. However, this information gain may not be enough of an attraction to lead states to voluntarily participate, particularly policy makers driven by short-run returns. Participation may require direct incentives or requirements. Again, this will take additional funds and a change in the political will at the national and state levels.

Finally, a federal law currently prohibits the collection of national longitudinal data on students by NCES. This law in combination with the Family Educational Rights and Privacy Act (FERPA) limits NCES's ability to collect and house data. Full consideration of these laws is beyond the scope of this paper, but given current data collection and use, there is every indication that NCES could work within the limits of the law to support coordination that would greatly increase the ability of data users as outlined above.

SUMMARY

There are many reasons why NCES users would benefit from links to administrative data. They would gain information on the prior experiences and performances, as well as future experiences and performances, of the students and educators in the NCES surveys. In addition, they would have access to additional measures of survey respondents, their peers, their educational contexts, and the policies and events to which they are subject. There are fewer reasons, but nonetheless some reasons, for states and other administrative data holders to benefit from linkages including access to many additional measures and data from nonschool sources. NCES data would also allow these users to make comparisons over time and to other jurisdictions. However, implementing these linkages will not be costless, largely because it is likely to take substantial investments to incentivize state participation including making more NCES data state representative. As NCES considers the costs and benefits of these investments, it is likely worth starting with a clear articulation of its data collection goals as well as a clear understanding of both the benefits and limitations of administrative data.