Integrating Administrative Data with Survey Data: A Total Survey Error Case Study using Education Data from the U.S. Department of Education

Sarah Grady and Rachel Sutcliffe

National Center for Education Statistics

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Statement of the Problem

- Can we reduce burden on schools and school districts for data collection?

- Federal goal to use administrative data sources for statistical purposes

- NCES redesigning Schools and Staffing Survey (SASS) and incorporating administrative data is being studied – new survey will be the National Teacher and Principal Survey (NTPS)

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Total Survey Error Framework
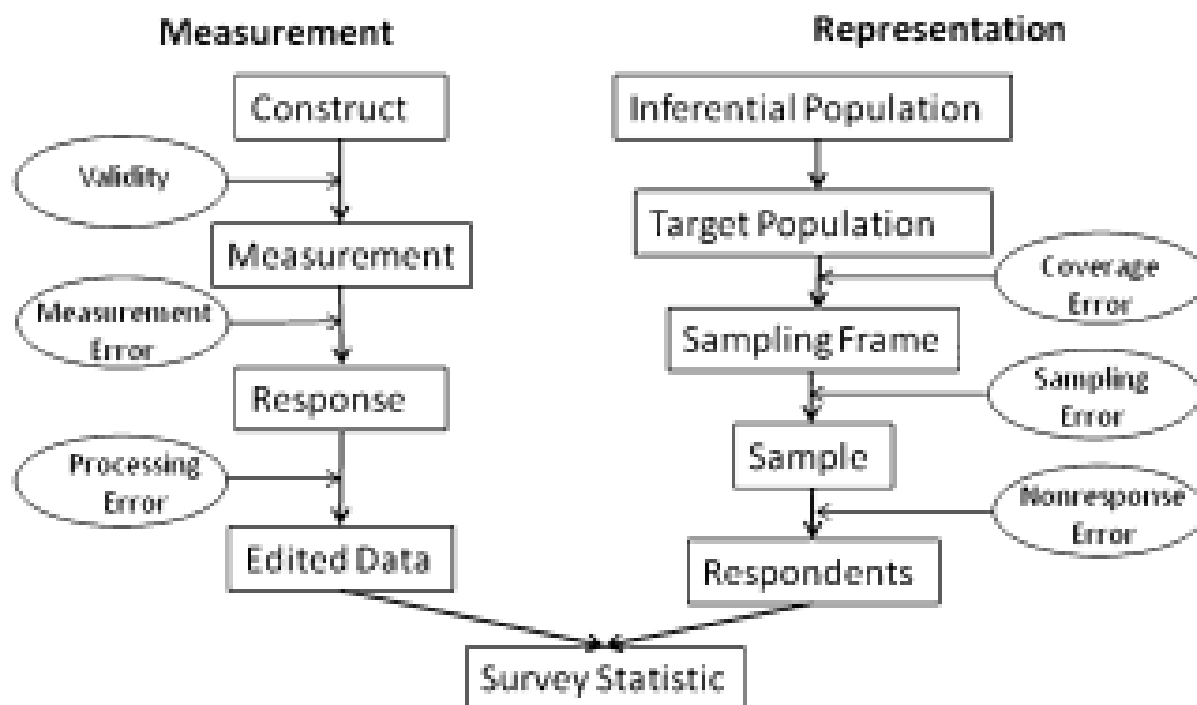
Research Questions

- How comparable are the estimates from survey data and from administrative sources for constructs measured on SASS?

- What are possible reasons for differences in estimates, if any, and how are these differences reflected in the Total Survey Error framework?

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Some Background on the Schools and Staffing Survey (SASS)

- A system of related questionnaires that provide descriptive data on the context of elementary and secondary education
  - Teacher demand, teacher and principal characteristics, school conditions, perceptions of school climate, teacher and principal compensation, teacher and principal satisfaction

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Some Background on SASS

- Respondents are schools, principals, and teachers
  - Historically also included questionnaires for school districts and library media centers
- Mail, self-administered, paper questionnaires
- Administered in 1987-88, 1990-91, 1993-94, 1999-2000, 2003-04, 2007-08, and 2011-12

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Weighted unit and overall response rates using initial base weights, by survey: 2011-12 SASS

Survey	Unit Response Rate	Overall Response Rate
Public School District	80.6	n/a
Public School	72.5	n/a
Private School	65.7	n/a
Public School Principal	72.7	n/a
Private School Principal	64.7	n/a
Public School Teacher	77.7	61.8
Private School Teacher	69.9	50.1

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Administrative Data Sources- ED*Facts*

- ED*Facts* represents a set of universe collections

- Central database that combines performance data supplied by K-12 state education agencies, financial grant information, basic characteristics of K-12 schools collected by the Common Core of Data (CCD), etc.

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Administrative Data Sources- ED*Facts*

- Over 100 different files collected annually

- State-level mandate to report to ED*Facts* for program compliance

- ED*Facts* coordinators work with offices within State Education Departments to obtain data

  - Many state DOEs use State Longitudinal Data Systems (SLDS) and liaise with LEAs and schools

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Administrative Data Sources- CRDC

- The Civil Rights Data Collection (CRDC) is a biennial survey required by the U.S. Department of Education's Office for Civil Rights (OCR)

- Since 1968, CRDC has collected data on education and civil rights issues in public schools for use by OCR for enforcement

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Administrative Data Sources- CRDC

- CRDC is also a tool for other ED offices, federal agencies, policymakers and researchers, educators and school officials, and the public to analyze student equity and opportunity

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Research Methods for Analyzing Comparability of Estimates

- Compare 2011-12 SASS survey estimates, reported by school or principal respondents, to administrative data sources from 2011-12

- Analyze collection methodology of survey and administrative sources to develop hypotheses about how differences in collection affect estimates

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2011-12 SASS Survey Items Also Collected by Administrative Collections

Public principal:

- Count of student expulsions, suspensions, and bullying incidents

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2011-12 SASS Survey Items Also Collected by Administrative Collections

District:

- Grades offered
- Enrollment by grade-level
- Teacher and principal counts

- Adjustment of school attendance boundaries
- Magnet program in district
- High school graduation requirements
- Migrant education

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2011-12 SASS Survey Items Also Collected by Administrative Collections

Public school:

- Student characteristics
- Magnet programs
- Advanced course offerings (talented or gifted / honors and AP courses)

- Special programs and services provided by the school (IEP, ELL, free or reduced price lunch, Title I)
- Alternative school status
- Special education school status
- Charter school status

2011-12 SASS Survey Items Compared to Administrative Data Sources

Public school:

- Enrollment

- Grades offered

- Magnet programs

- Advanced course offerings (talented or gifted / honors courses)

- Alternative school status

- Special education school status

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Comparison of estimates (1 of 5)

- Schools and Staffing Survey 2011-12 School Questionnaire #1: Grades offered

Does this school offer the following grades?

Please mark (X) Yes or No for each grade level.

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SASS, ED*Facts*, and CRDC estimates of the percentage of schools offering prekindergarten through 12th grade and ungraded status, by grade, SY2011-12

Grade	SASS %	(s.e.)	ED*Facts* %	CRDC %
Prekindergarten	30	0.8	30	28
Kindergarten	56	0.5	55	55
1st grade	56	0.5	56	55
2nd grade	56	0.5	56	55
3rd grade	57	0.5	56	55
4th grade	57	0.5	56	55
5th grade	55	0.6	55	54

See notes at end of table.

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SASS, ED*Facts*, and CRDC estimates of the percentage of schools offering prekindergarten through 12th grade and ungraded status, by grade, SY2011-12 — Continued

Grade	SASS %	(s.e.)	ED*Facts* %	CRDC %
6th grade	38	0.8	39	38
7th grade	32	0.7	32	32
8th grade	32	0.7	32	32
9th grade	27	0.4	27	26
10th grade	27	0.4	26	26
11th grade	27	0.4	26	26
12th grade	27	0.3	26	26
Ungraded	6	0.3	13	5

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey: 2011-12, ED*Facts:*2011-12, and Civil Rights Data Collection:2011-12

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Comparison of estimates- grades offered

- "Grades offered" may be answered differently by a principal/school administrator than by looking at student information systems maintained by the state

- SASS redesign should consider using the CRDC data for grades offered instead of ED*Facts*

    – Decrease nonresponse error without sacrificing measurement error

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Comparison of estimates (2 of 5)

- Schools and Staffing Survey 2011-12 School Questionnaire #2: K-12 enrollment

Around the first of October, how many students in grades K-12 and comparable ungraded levels were enrolled in this school?

Do NOT include prekindergarten, postsecondary, or adult education students.

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SASS, ED*Facts*, and CRDC estimates of average public school enrollment, SY2011-12

SASS	(s.e.)	ED*Facts*	CRDC
550	7.8	516	527

NOTE: SASS estimate rounded to nearest 10.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey: 2011-12, ED*Facts*:2011-12, and Civil Rights Data Collection:2011-12

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Comparison of estimates- enrollment

- NCES may want to consider continuing to ask enrollment on the SASS questionnaires.

- CRDC count lacks construct validity for measuring K-12 enrollment
  - Schools are asked to report enrollment of early childhood and prekindergarten students, too

- ED*Facts* data provides a membership count which is more useful for administrative purposes than for understanding school conditions

Comparison of estimates (3 of 5)

- Schools and Staffing Survey 2011-12 School Questionnaire #6: school type

Which of the following best describes this school?

Mark (X) only one box.

☐ *REGULAR school - elementary or secondary*

☐ *SPECIAL PROGRAM EMPHASIS school - such as a science or math school, performing arts school, talented or gifted school, foreign language immersion school, etc.*

☐ *SPECIAL EDUCATION school - primarily serves students with disabilities*

☐ *CAREER/TECHNICAL/VOCATIONAL school - primarily serves students being trained for occupations*

☐ *ALTERNATIVE/OTHER school - offers a curriculum designed to provide alternative or nontraditional education; does not specifically fall into the categories of regular, special program emphasis, special education, or vocational school - Please describe.*

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SASS, ED*Facts*, and CRDC estimates of the number and percentage of public schools classified as special education schools, SY2011-12

	SASS			ED*Facts*		CRDC	
Number	(s.e.)	%	(s.e.)	Number	%	Number	%
2,850	290	3	0.32	1,369	2	2,247	2

NOTE: SASS whole number estimate rounded to nearest 10.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey: 2011-12, ED*Facts:*2011-12, and Civil Rights Data Collection:2011-12

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Comparison of estimates- special education schools

- The definition of "special education school" varies by state, depressing the ED*Facts* numbers and introducing measurement error

- Consider using the CRDC data for school type to minimize burden on schools

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SASS, ED*Facts*, and CRDC estimates of the number and percentage of public schools classified as alternative schools, SY2011-12

SASS				ED*Facts*		CRDC	
Number	(s.e.)	%	(s.e.)	Number	%	Number	%
5,720	367.2	6	0.4	4,492	5	4,856	5

NOTE: SASS whole number estimate rounded to nearest 10.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey: 2011-12, ED*Facts:*2011-12, and Civil Rights Data Collection:2011-12

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Comparison of estimates- special education and alternative schools

- ED*Facts* introduces measurement error in numbers of special education schools because of state variation in how "special education schools" are defined and reported

- Measurement error in SASS 2011-12 makes administrative sources a better choice for alternative school estimates- CRDC may be best option

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Comparison of estimates (4 of 5)

- Schools and Staffing Survey 2011-12 School Questionnaire #16a: magnet program

Does this school have a magnet program?

(A magnet program offers enhancements such as special curricular themes or methods of instruction to attract students from outside their normal attendance area.)

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SASS, ED*Facts*, and CRDC estimates of the number and percentage of public schools with a magnet program, SY2011-12

SASS				ED*Facts*		CRDC	
Number	(s.e.)	%	(s.e.)	Number	%	Number	%
5,630	343.6	6	0.4	2,902	3	3,336	4

NOTE: SASS whole number estimate rounded to nearest 10.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey: 2011-12, ED*Facts:*2011-12, and Civil Rights Data Collection:2011-12

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Comparison of estimates (4 of 5 — Continued)

- Schools and Staffing Survey 2011-12 School Questionnaire #16b: magnet program

Is this a school-wide magnet program in which all students in this school participate in the program?

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SASS, ED*Facts*, and CRDC estimates of the number and percentage of public schools with a school-wide magnet program, SY2011-12

SASS				ED*Facts*		CRDC	
Number	(s.e.)	%	(s.e.)	Number	%	Number	%
2,750	338.8	3	0.4	—	—	1,945	2

— Data were not collected or reported.

NOTE: SASS whole number estimate rounded to nearest 10.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey: 2011-12, ED*Facts:*2011-12, and Civil Rights Data Collection:2011-12

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Comparison of estimates- magnet program

- EDFacts introduces nonresponse error in numbers of magnet schools because of state variation in how "magnet schools" are defined and reported
  - CCD reports that 4 states do not report any magnet schools
- CRDC data may be a good replacement for survey data for magnet school status because items are asked similarly to SASS items, and there is no nonresponse error

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Comparison of estimates (5 of 5)

- Schools and Staffing Survey 2011-12 School Questionnaire #17b: talented/gifted program

Does this school offer the following programs?

b. Talented or gifted programs or honors courses

(Designed for students with specifically identified talents or exceptional academic achievement)

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SASS, ED*Facts*, and CRDC estimates of the number and percentage of public schools with a gifted and talented program, SY2011-12

SASS				ED*Facts*		CRDC	
Number	(s.e.)	%	(s.e.)	Number	%	Number	%
58,560	526.4	65	0.6	—	—	55,361	59

— Data were not collected or reported.

NOTE: SASS whole number estimate rounded to nearest 10.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey: 2011-12, ED*Facts:*2011-12, and Civil Rights Data Collection:2011-12

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Comparison of estimates- gifted and talented program

- CRDC appears to be a better source of data for gifted and talented program identification than SASS because it lacks nonresponse bias and may have less social desirability

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Conclusions

- Existing information does not provide definitive reasons for differences between sources of data

  – It is not always clear which data source provides the number closest to the "true value"

  – In such cases, defaulting to the administrative sources seems most sensible in order to reduce respondent burden

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Conclusions

- Interviews with administrative data staff are essential before survey staff commit to administrative data
    - Allows for better understanding of data
- Variations in collecting and reporting practices across states are important to understand when using administrative data provided by state education agencies

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Next steps

- Compare estimates across data sources by subgroups
- Compare estimates from sources other than CRDC and the CCD component of ED*Facts*
- Do more research on data sources
- Identify methods to quantify sources of error
    - Tease out different error types by holding other error types constant

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