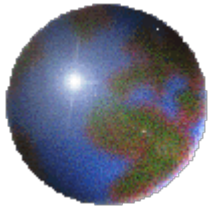
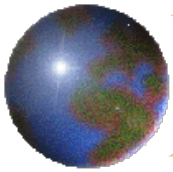


Longitudinal Study Design and Choices: Lessons from the U.S. Experience; Prods for Japanese Design

Clifford Adelman, Institute for Higher Education Policy; March 2013



What will we do today? Review and offer options for:

- U.S. longitudinal studies
- Education to labor market design
- Sampling options and weighting
- Logistics of longitudinal studies
- Labor market variables
- Issues for the release of data and findings

For the U.S., "longitudinal" means *nagai aida*

- Labor Department studies:20 years
- NCES grade-cohort studies: 10-14 years
- NCES event-cohort studies: 6-10 years

The length of the study depends on both the population and what you want to know about them—and why?

It also depends on how much money you have and are willing to spend of this type of inquiry, and the infrastructure necessary to execute the study.

NCES Grade Cohort Studies

Study	Beginning Grade	Years	Number of Surveys	Median Age at Conclusion
NLS-72	12	1972 – 1986	5	32
High School and Beyond/So	10	1980 – 1993	4	29
NELS-88	8	1988 - 2000	4	26
ELS-02	10	2002 - 2012	4	26

In all of these cases

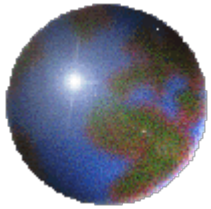
- Secondary school and college transcripts are included, which means course taxonomies and student-level analysis files.
- Parents and teachers are interviewed in the base year.
- Sampling is based on the census of schools and school populations, yielding a Stratification Cell and Primary Sampling Unit with which to weight.

Inconsistent inclusions

- Roughly the same (equated) “enhanced mini-SAT” given to students in grade 10 (and sometimes grade 12). Guarantees that all students in the study participate in the same test.
- Parents interviewed a 2nd time in grade 12
- School administrators interviewed in the base year

Labor market histories

- Very good for NLS-72 at age 32/33 and for the HS&B/Sophomores at age 29/30. Occupation codes, industry codes, spells of employment versus school periods versus other activities.
- Not very good for the NELS-88 at age 26, and unlikely convincing for the ELS-02 at age 26.



These studies are not *yasui*

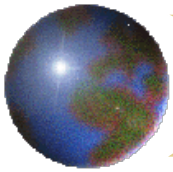
In current dollars, a 12-year longitudinal study with 4 student surveys, and transcripts will cost $80-$100 million, depending on your other specifications.

Completed NCES Postsecondary Event-Cohort studies

Study	Years	Number of Surveys	College Transcripts	Age Range
Beginning Postsecondary Students	1989-1994	3	No	16-68
Beginning Postsecondary Students	1995-2001	3	No	15-76
Beginning Postsecondary Students	2003-2009	3	Yes	15-79
Baccalaureate and Beyond	1993-2003	4	No	18-74

Common and distinctive characteristics

- The sampling source for all of these studies was the National Postsecondary Student Aid Study (NPSAS), an undertaking mandated by law.
- NPSAS is a full universe, hence weighting is determined by participant history in the surveys subsequent to the initial event (starting any kind of college in the BPS; earning a bachelor's degree in the B&B).
- Imputation procedures began only with the BPS 1995-2001.
- College transcripts were collected for a different B&B in 2000, but that study was dropped after one year. A new B&B started in 2008, with completed surveys in 2009 and 2012, but how long it will continue depends on funding. It must be judged, at present, as incomplete.
- None of these studies include secondary school records.

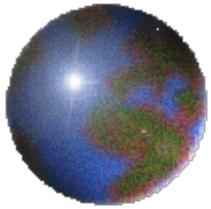


Study design for “Education to Labor Market”

- **WORK BACKWARDS!!!!**
- **Assume that your universe is 28 or 30 years old.**
- **What do you want to know about their current status?**
- **What do you want to know that brought them to their current status?**
- **Ask those questions first, and then design the study so that it produces the variables you need for analysis.**

Grade-cohort study: what do you want to know at the beginning?

- Secondary school academic records (Since Japan cannot get these, ask the students what they studied)
- Family composition, parental education (from parents) which is far more powerful than income!!!
- Intended future academic path (from students)
- Intended future career (from students)



Why samples? Japan is a big country! You cannot follow a full universe!

Other longitudinal studies from smaller countries---UK, France, Netherlands---do not require samples.

Use an external contractor: criteria for selection of contractor

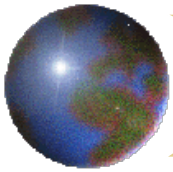
- Experience in survey design and execution
- Statistical expertise in sampling and weighting of samples
- Experience in large-scale data set construction
- Organizational stability for a 10-year period
- Persuasive estimates of time-lines and labor effort necessary to produce both individual survey and cumulative data at 4 points in time over a 10-year period.
- Convincing data security procedures and facilities.

Grade-cohort study sampling, Option 1

- School sampling by either Region (8) or Prefecture (47)
- Within Region/Prefecture, school sampling by urbanicity
- Total sampled school population in the target Grade is your weighting reference point, with each sampled school assigned its proportion of that population
- Choose a robust number of students for your initial cohort (you will lose some over the years, so anticipate that loss); U.S. studies start with 25,000 and finish with 12,000 – 15,000.
- Determine gender distribution in the selected grade in each participating school.
- Divide your chosen number of participants by school weight, and randomly select within schools by gender ratio.

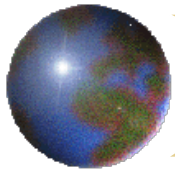
Grade-cohort study sampling, Option 2

- Again, school sampling by either Region or Prefecture
- Again, within Region or Prefecture, sampling by urbanicity (dense urban, suburban, rural)
- Within this group of *schools*, select a set of those that (a) will reflect their national distribution by Region/Prefecture and urbanicity, and that (b) when *all* students in the target grade participate, will yield a robust national sample, for example, 15,000
- Total national school population in the target grade is your weighting reference point.
- The initial student weight is determined by the ratio of the sample to the national school population.
- In other words, a limited number of schools, but all students in the target grade in each school.



All subsequently required weights to reflect "true populations" are based on this initial weight, but try to limit the number of weights, for example:

- a weight for students who have provided information on what they studied in secondary school;
- a weight for students who entered higher education (as some students may not enter);
- a weight for students with college records (if you can get them);
- a weight for students who participated in all surveys (and another for students who participated in only 2 of the 4 surveys);
- Combinations of the above, but all of these built from the initial weight.



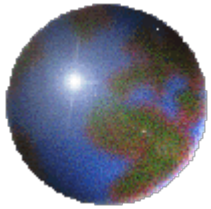
Grade-cohort study: what you need in the base year

- Agreement of the school for student selection and to provide current academic records
- Agreement of parents of selected students
- Agreement of students to participate for years to come
- Assignment of a random tracking ID, and signed assurance of privacy indicating that neither the school, the family, or the student will ever be identified. . .
- And that all data will be perturbed (scrambled), a procedure that guarantees anonymity

Grade Cohort Study: tracking for future surveys and unobtrusive data

- **Parent as the default for student's location;**
- **Student's e-mail address;**
- **Student's social media addresses;**
- **Student's mobile phone number;**
- **Commercial locating systems.**

These are part of the student's agreement to participate



A critical question for you: will you provide a nominal payment to students. . .

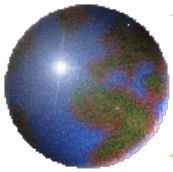
If “yes,” then for all surveys?
for selected surveys?

For survey engines: Internet, telephone.

- Internet is the preference for students in all surveys.
- Internet is also preferred for parent in the base year, but if no response, one can follow by telephone.
- Internet requires more careful advanced preparation, but execution is cheap. Telephone and in-person interviews are obviously more expensive to execute, but offer greater flexibility.

Then, labor market experience: What do you want to know?

- **Primary point of labor market entrance**
- **Monthly (or annual or quarterly) primary employment history: employed, unemployed, in-school, other. From this, Continuity of Primary Employment and continuity of *all* employment.**
- **For employment periods, average hours per week (in a range)**
- **Contiguity of primary employment, that is, to what extent is the job related to the student's primary field of study?**



What do you want to know? Primary Employments Only, Part 1

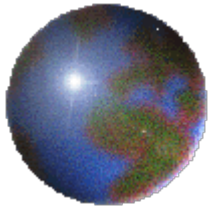
- Occupation (recommended taxonomy: about 50)
- Duties (short answer open-ended question)
- Industry (recommended taxonomy: about 25)
- Principal tools/software/etc. used in the primary position (see ONET)
- Nature and extent of employer-provided training

What do you want to know? Part 2

- Annual wages in the most recent year
- Annual total income in the most recent year
- Satisfaction with primary employment/career path
- Assessment of opportunities for advancement in primary employment/career path
- Assessment of need for further education and/or training
- Intention to change either primary employment or location of employment

Then, it depends what else you want to know, for example:

- Secondary employment, second jobs, internships while enrolled in school or college.
- Family status (definitely, “yes”!): marriage, partners, children, whether spouse/partner is also employed.
- Student assessment of the extent to which the primary workplace encourages innovation, creativity, entrepreneurialism
- A separate question stream for those who are self-employed (for example, artists, small business owners, consultants, etc.)
- A separate question stream for those who have been in the same occupation for 5-6 years, with attention to observes changes in skill and knowledge requirements



You may be doing all these things today---I do not know, but you will tell me.

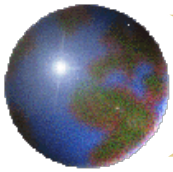
. . .but you may not, and our discussion should bring light to the positive and negative aspects of longitudinal design.

Release of data in 2 forms: public aggregate data and restricted. Require a license for the use of raw data (restricted)

- **Even for Ministry employees**
- **And the license stipulates the same penalties for disclosure as noted for the external contractor.**
- **At the request of the Ministry (and as an option in the initial contract), the Contractor should produce public use versions of the data set composed entirely of aggregate derived variables, and following each of the scheduled surveys. There are no raw data in these releases.**

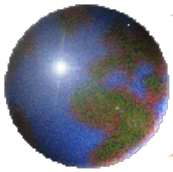
Examples of public and restricted data

- **Public: percentage of former students who had children during their first spell of employment: by gender, by undergraduate field of study, by type of industry in which former student was employed.**
- **Restricted: creation of an index of the academic intensity of undergraduate experience (credits in mathematics, extra enrollment sessions, culminating project, etc.) by independent researchers.**



Let me stop here, and listen to you.

- I am asking you, first, to work backwards, and tell each other what you want to know at the projected end of this study, when your subjects are 30 years old.
- Then build lists of education, labor market experience, and allied variables, that would help you answer those questions, and
- Then determine what survey questions would be asked at different stages of the longitudinal study, and at what points unobtrusive data would enter.



And as you ask your questions and build your lists, remember:

- **The data sets you produce will have a "descriptive window" for every variable that tells the user (along with the numerical distribution of values, whether continuous or categorical) how that variable was constructed, and provides advice on its use.**