My research primarily falls into two broad areas: the economics of education and child development and the economics of health. My interest in these topics is driven by substantive issues, such as the effects of attending a private high school on student achievement, but both areas have also provided the backdrop for methodological work aimed at developing and refining empirical techniques for identifying causal effects. This document summarizes my research to date in these areas, including current working papers, and briefly describes in-progress projects and future research directions.

The Economics of Education and Child Development

Economists have long been interested in the specification and estimation of education production functions, which describe how educational inputs such as school resources and teacher quality affect student outcomes. My work on education has focused on two aspects of the relationship between inputs and outcomes: the effects of a child’s kindergarten entrance age and the effects of attending a private school.

Kindergarten Entrance Age and Eligibility Cutoff Dates

“Kindergarten Entrance Age and Children’s Achievement: Impacts of State Policies, Family Background, and Peers,” written with Darren Lubotsky, uses variation in children’s birth dates and state-level kindergarten eligibility cutoff dates to identify the effects of kindergarten entrance age on outcomes such as test scores, grade retention, and diagnoses of learning disabilities. The analyses in this paper show that much of the positive association between entrance age and test scores reflects skill accumulation prior to kindergarten, rather than a heightened ability to learn in school among older children. The relationship between age and performance is strongest at the very beginning of kindergarten, before much learning in school has actually taken place. Additionally, it is much larger and more persistent among children from high socioeconomic status families, who accumulate relatively more human capital in the years prior to kindergarten entrance. These results suggest that delaying school entry until the year after a child is first eligible, popularly known as “redshirting”, does not provide a lasting boost to children’s human capital development. Instead, redshirting simply postpones learning in school, to the detriment of low-SES families who have disproportionately few educational opportunities outside of the public school system.

This paper also uncovers a novel finding related to the literature on peer effects in education: holding a student’s own age constant, an increase in the average age of his classmates increases the likelihood that he repeats a grade or is diagnosed with a learning
disability. These findings imply that high-performing peers can prove detrimental to a child’s outcomes that are determined by teachers’ comparisons of one student to another.

In “The Importance of Relative Standards in ADHD Diagnoses: Evidence Based on Exact Birth Dates,” I study the relationship between learning disability diagnoses and a child’s age relative to his classmates in more detail. Exploiting the large discontinuity in entrance ages among children born close to eligibility cutoff dates, I find that the youngest children in a classroom are 60 percent more likely to be diagnosed with one learning disability, ADHD, than their oldest classmates. There are also large discontinuities at eligibility cutoffs in teachers’ assessments of whether children exhibit ADHD symptoms, but not in similarly measured parental assessments. These patterns suggest that teachers’ opinions are a key mechanism driving ADHD diagnoses.

The central estimates imply that nearly 1 million children in the United States are potentially misdiagnosed with ADHD, with over 500,000 of these children regularly using prescription stimulants intended to treat their ADHD symptoms. Such inappropriate treatment is particularly worrisome because of the unknown impacts of long-term stimulant usage on children’s health.

A third paper related to eligibility cutoff dates, “Suburban Legend: School Cutoff Dates and the Timing of Births,” written with Stacy Dickert-Conlin, investigates whether mothers manipulate the timing of births so that they fall prior to cutoff dates. Births occurring just before cutoff dates give parents the option to enroll their child in kindergarten at a relatively young age, thereby avoiding a year of child care costs. This option bears no obligation because parents can later decide to redshirt a child who is not kindergarten-ready. Using the universe of Vital Statistics birth records from 1999 to 2004, we find no evidence that the timing of births is manipulated in response to eligibility cutoffs. The lack of a measurable effect in a sample of roughly 20 million births is surprising, given the large financial incentives involved and the fact that medical technology is increasingly used to time births for a variety of reasons, e.g., so that births fall on weekdays rather than weekends. We speculate that myopic preferences and incomplete information about eligibility cutoff laws are responsible for limiting the extent of birth timing. Importantly, the results suggest that using the timing of births as an exogenous source of variation in kindergarten entrance age is likely a sound identification strategy.

The Causal Effects of Private Schooling on Outcomes

The primary empirical challenge in assessing the effects of private schooling stems from the non-random selection of students into private schools. Most previous research has tackled this issue by assuming that some factors that affect the likelihood of private schooling are exogenous with respect to outcomes. “An Evaluation of Instrumental Variable Strategies for Estimating the Effectiveness of Catholic Schools,” written with Joseph Altonji and Christopher Taber, introduces new methods to assess the credibility of these assumptions, focusing on the effects of Catholic high schools. We find that two
popular identification strategies, based on the assumed exogeneity of religious affiliation or a child’s proximity to the nearest Catholic high school, generate estimates that are likely to be severely biased. This paper’s main contribution is methodological, in that the approach we develop to evaluating the validity of identifying assumptions can be used in a variety of settings.

Our second paper on Catholic schooling, “Selection on Observed and Unobserved Variables: Assessing the Effectiveness of Catholic Schools,” considers the problem of estimating treatment effects in the absence of valid exclusion restrictions. This paper develops new estimation methods based on the idea that the relationship between a treatment of interest (e.g., Catholic schooling) and observable determinants of outcomes can be informative about the relationship between the treatment and unobservables. We provide a way to use selection on observables to quantitatively assess the degree of bias in OLS or instrumental variables estimates, arguing that these techniques provide bounds on the treatment effects of interest. This paper’s primary contribution is again methodological, but we also have several substantive findings, namely that attending a Catholic high school increases the likelihood of graduating from high school and enrolling in college.

Along with a new co-author, Timothy Conley, we are continuing to develop and refine methods for estimating treatment effects in the absence of exclusion restrictions. In “Methods for Using Selection on Observed Variables to Address Selection on Unobserved Variables,” we develop new approaches that relax several assumptions imposed in our earlier work. These new approaches, one of which uses a factor model to model the joint distribution of observed and unobserved determinants of outcomes, generalize our earlier methodology to be applicable a wider set of applications. We construct a set estimator that bounds the treatment effect of interest under weak assumptions. We also consider statistical inference, developing the asymptotic distribution of the identified set and proposing a procedure to calculate confidence regions that cover the true parameter value with fixed probability. This paper has not yet been considered for publication, but our hope is that these methods will prove useful to a broad set of empirical researchers.

A final paper on Catholic schooling, “Historical Religious Concentrations and the Effects of Catholic Schooling,” written with Danny Cohen-Za da, returns to the substantive question of the causal effects of Catholic school attendance (rather than focusing on the development of new methodological approaches). This work proposes a new, plausibly exogenous source of variation in Catholic school attendance based on the historical distribution of religious preferences. Specifically, county-level Catholic population shares measured at the end of the nineteenth century are strongly associated with current Catholic school attendance rates but appear to have no direct association with student outcomes. Contrary to much of the previous literature, our empirical findings suggest that Catholic schooling has only modest beneficial effects on educational attainment and no discernible effect on test scores.
The Economics of Health

My second principal research interest involves the economics of health, including topics related to infant mortality, subjective mortality expectations, and the market for transplantable organs.

Racial Disparities in Infant Health and Mortality

My ongoing research with John Goddeeris and Steven Haider examines the nature of large racial disparities in infant health and mortality in the U.S. “A Deadly Disparity: A Comprehensive Assessment of the Black-White Infant Mortality Gap” separates the black-white mortality gap into three temporal components – fitness at birth, neonatal mortality, and post-neonatal mortality – and examines how these components are related to racial differences in observable characteristics. We find that almost all of the racial gap in infant mortality is due to racial differences in fitness at birth, and little of it is predicted by measures of SES. For example, death rates of white infants whose mothers are high school dropouts are substantially lower than death rates of black infants whose mothers are college graduates. Moreover, the ability of racial differences in SES to predict racial differences in infant mortality has declined over the past two decades, reflecting a decline in the ability of SES measures to predict the large racial discrepancy in the fraction of infants weighing less than 1000 grams at birth.

Our second paper, “Unexplained Gaps and Oaxaca-Blinder Decompositions,” is a methodological study that grew out of our interest in examining racial disparities. A long line of research aims to decompose differences in outcomes between groups (e.g., differences in infant mortality between races, as described above) into “explained” and “unexplained” components. This paper demonstrates that a commonly-used approach for calculating such decompositions systematically overstates the importance of the “explained” component, generating misleading conclusions. We argue that a simple approach based on an OLS regression including a group indicator variable is preferable, providing straightforward and accurate measures of the explained and unexplained components. Our suggested approach is applicable to all settings in which researchers are interested in analyzing group-level differences in mean outcomes.

Individual Subjective Mortality Forecasts

In “The Predictive Validity of Subjective Mortality Expectations: Evidence from the Health and Retirement Study,” I analyze individuals’ subjective forecasts of their own mortality. A host of recent research has analyzed subjective mortality forecasts, finding that these measures strongly predict future mortality and economic behavior, including savings, asset allocation, and retirement decisions. This paper, which considers 16 years of panel data on mortality expectations, draws quite different conclusions. First, although variation in subjective mortality forecasts does predict later mortality, forecasts based on population life tables have substantially more predictive power. Second, the relationship
between subjective forecasts and economic behavior appears to be driven entirely by unmeasured cognitive ability. As an illustration, individuals' forecasts of how long others in their age group will live predict individual behavior more strongly than forecasts of their own longevity. In combination with the strong association between forecasts and observable proxies for cognition, this pattern provides compelling evidence that cognitive skills affect how individuals form probabilistic beliefs and how they report these beliefs in household surveys.

**Organ Donors and Transplant Waiting Lists**

In “Donorcycles: Motorcycle Helmet Laws and the Supply of Organ Donors,” Stacy Dickert-Conlin, Brian Moore, and I consider an unintended consequence of motorcycle helmet laws – a reduction in the supply of viable organ donors. We match state-level data on helmet laws to Organ Procurement Organization-level data on the supply of deceased organ donors to investigate the link between helmetless motorcycling and organ donation. Using age-, gender-, and circumstance-specific organ donation rates, we find a strong negative association between the supply of organ donors and the presence of a statewide helmet law. All of this association is driven by men, who are roughly ten times more likely to die in a motorcycle accident than women, and it is especially concentrated among male donors aged 18 to 34. Helmet laws are unrelated to the supply of organ donors who die in circumstances other than motor vehicle accidents, providing further support for a causal interpretation. We estimate that nearly 5 percent of those who died while awaiting an organ in 2007 would have instead received a transplant if all helmet laws were repealed. Every death of a helmetless motorcyclist saves the lives of 0.33 people waiting on organ transplant waiting lists, but the fact that this number is substantially lower than 1 implies that helmetless motorcycling is an inefficient means of preserving life.

The market for organs is an unusual one, characterized by strict price controls and local monopolies in distribution, and very few empirical studies have analyzed the determinants of the supply and demand for organs. Studying this market will be an important part of my research agenda in the future. Stacy Dickert-Conlin, Brian Moore, and I are currently undertaking a new project in which we analyze the determinants of exits from organ transplant waiting lists. Our preliminary results suggest that traffic safety laws (including helmet laws) increase the likelihood that a person on a waiting list exits due to death or because their illness has progressed sufficiently far that they are no longer a candidate for transplant. Similarly, traffic safety laws decrease the likelihood of exiting a waiting list due to a successful transplantation.