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Baltimore Polytechnic Institute students work together on a math problem while a substitute teacher teaches the class

Tales of Teacher Absence

New Research Yields Patterns that Speak to Policymakers

Raegen Miller October 2008

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Executive summary

Public school teachers in the United States are absent between nine and 10 days per year, on average. In other words, between kindergarten and 12th grade, a typical student is taught by someone other than the regularly assigned teacher for the equivalent of two-thirds of a school year. Students experience teacher absence in bursts of time, ranging from a few hours to a few months, and this fractured exposure may help deflect policymakers' attention. Yet there are three good reasons to revisit policies around teacher absence:

- **Teacher absence is expensive.** With 5.3 percent of teachers absent on a given day,[1] stipends for substitute teachers and associated administrative costs amount to $4 billion, annually.[2]

- **Teacher absence negatively affects student achievement.** Researchers have found that every 10 absences lowers mathematics achievement by the same amount as having a teacher with one year to two years of experience instead of a teacher with three years to five years of experience.[3]

- **Teacher absence disproportionately affects low-income students.** Students in schools serving predominantly low-income families experience teacher absence at higher rates than students in more affluent communities.[4] Part of the achievement gap is thus due to a teacher attendance gap.

This report provides new analyses of data from an anonymous, large, urban school district in the northern United States. The data include dates and "excuse" codes for 130,747 absences taken by 5,189 teachers in 106 schools over four years. Patterns teased from the data put the spotlight on discretionary absences—those due to personal days or short-term illnesses. Discretionary absences comprise 56 percent of all absences and tend to occur on days adjacent to non-instructional days, such as weekends. This suggests that teachers have room to respond to incentives that discourage avoidable absences and encourage excellent attendance.

Analyses of the data corroborates previously documented relationships between absence and observed characteristics of teachers, such as gender, experience, tenure, and commuting distance, as well as school characteristics such as enrollment, grade configuration, and average student attendance rate. The data also create profiles of average teacher absence behavior for each of the 106 schools. The profiles share an underlying seasonal trend, with rates of discretionary absence rising from September to December, falling until February, and then rising again to their highest levels in June. Differences between profiles show that schools operating in the same policy jurisdiction can have surprisingly different absence profiles, even after accounting for characteristics of teachers in the schools. This suggests that absence culture—the building-level professional norms around absence—may merit future study. A typology of absence culture and a well-known description of how new teachers' moods change over the course of a school year furnish vocabulary that can facilitate further inquiry by researchers.

The report aims to inform and stimulate policy debate, and makes policy recommendations for each level of government:

- **Federal policymakers should amend No Child Left Behind to require information on teacher absence on school report cards.** School districts already collect data on teacher absences, and sharing it publicly—already the practice in some states—will give parents a more nuanced picture of school quality.

- **State policymakers should re-examine and justify statutes governing teachers' leave privileges.** Not enough is known about the appropriate level of leave privileges. Those in some states may be excessively generous, elevating rates of absence and incurring the financial liability of accumulated, unused leave. This liability represents a source of leverage for reducing privileges, where needed.

- **Local policymakers should encourage experimentation with and evaluation of incentive policies designed to reduce levels of teacher absence.** Many examples of such policies exist, and teachers respond to them. However, little is known about the optimal characteristics of bonus schemes, buy-back provisions, or co-payment programs.

Teachers' presence in school is a fundamental prerequisite of student success. Some teacher absence cannot be avoided, but patterns of absence like those documented in this report suggest that students' exposure to teacher absence can be reduced. These recommendations give policymakers at every level an entry point toward better understanding this issue, prompting researchers to generate new, relevant knowledge informing the re-allocation of existing resources in ways that better meet the combined needs of teachers and their students.

Why does teacher absence matter?

Financial cost

The direct financial costs of teacher absence are not trivial. Stipends for substitute teachers and associated administrative costs amount to $4 billion, annually. This figure, which represents roughly 1 percent of federal, state, and local spending on K–12 public education, represents an untapped resource. Combinations of incentives could reduce levels of teacher absence enough to pay for themselves. In fact, creative local examples of this kind of thinking have yielded net financial savings. Teachers in Aldine, Texas, for example, receive a bonus for excellent attendance. Savings that result from paying fewer stipends to substitutes more than offset the cost of the bonuses, netting the district $5 per student per year.[5] The right combination of policies could free-up part of this $4 billion to meet other needs while reducing students' exposure to teacher absence.

Lost learning

Research shows that teachers are the most important factor determining student achievement.[6] It follows that if what teachers do when they are present matters a great deal, then teachers' absences must also affect student learning. Yet detecting the effect of teacher absences is a tall order since information on teachers' absences and student achievement usually live in different operational silos within a school district. Teams of researchers from Duke and Harvard independently overcame this obstacle recently and found that teacher absences significantly reduce student achievement.[7] To put the detrimental effects of teacher absence in terms of the well-documented relationship between initial teaching experience and effectiveness, every 10 absences achievement lowers mathematics achievement by the same amount as having a teacher with one year to two years of experience instead of a teacher with three years to five years of experience.

Teacher absences hinder learning in important ways. Substitute teachers, the principal means by which schools cope with teacher absences, are less qualified, on average, than regular teachers.[8] In fact, 37 states do not require a bachelor's degree for at least some substitute teachers, and only North Dakota requires substitutes to have the same credentials as regular teachers.[9] This fact is astonishing to observers from similarly industrialized countries. In Australia and Canada, for example, substitutes must hold proper licenses to teach, and a stint serving as a relief teacher is commonly viewed as a right of passage into the profession.

Substitutes' modest qualifications prevent them from commanding higher stipends but also reduce the odds that they will have the instructional know-how to match regular teachers. When the regular teacher is absent, academic instruction is almost always simply less intense. In fairness, substitutes are often constrained by low expectations and weak organization on the part of the regular teacher. Emergency plans for when the regular teacher's absence is unanticipated, for example, often feature review activities that place little instructional burden on the substitute.[10] Even less constructive plans may involve showing videos.

Teacher absences also disrupt the routines and relationships that support learning. A teacher may need to reallocate instructional time to review classroom rules and procedures upon returning from an absence, perhaps in addition to having to perform a full re-teaching of the lesson that was meant to occur on the day of the absence. Teachers may also have to deal with emotional fallout. Very young students or those with few examples of adult stability in their lives may need some type of reassurance that their teachers' absences are not a sign of indifference or flakiness.

Achievement gaps

There is a pronounced inequity in the distribution of effective teachers between schools.[11] It is therefore unsurprising that students in schools serving concentrations of low-income families endure more teacher absences than their more affluent peers given the relationship between teacher absence and effectiveness. Nationally, teachers at schools with fewer than 24 percent of students from low-income families are absent at a rate of 5 percent or less,[12] while teachers at schools serving higher percentages of students from low-income families are absent 5.5 percent of the time, on average.[13]

Researchers at Duke University found that this relationship between teacher absence and school poverty is more than superficial. Even after accounting for a host of teacher and school characteristics, each 10 percentage point increase in a school's low-income population was associated with an additional 10th of a day of absence by its teachers.[14] Teachers in schools with high poverty rates appear to be absent about one day more per year than teachers in low-poverty schools—a factor which, while small, contributes to the achievement gap.

What causes teacher absence?

On average, 5.3 percent of public school teachers in the United States are absent on a given day.[15] These rates are low when compared to the developing world, where it's common for absence rates to reach 20 percent.[16] But teachers in highly industrialized countries are absent less often than their American counterparts. Only 3.2 percent of teachers in the United Kingdom and 3.1 percent of teachers in Queensland, Australia are absent on an average day.[17]

A variety of factors leads to increased absence rates. Female teachers and those who have longer commutes tend to be absent more often, as are those with middle ranges of experience. School environment also affects absences; elementary schools, larger schools, and higher-poverty schools tend to have higher teacher absence rates. And teachers are more likely to have more absences if their colleagues are absent more often. The job is not without occupational hazards; frequent exposure to sick children may cause higher illness rates, and other on-the-job factors may lead to needed sick time.

Yet research shows that teacher absence behavior appears to be related to policies and susceptible to incentives. Teachers are absent more frequently when their contracts furnish them with more days of paid leave for illness or personal reasons.[18] They are absent less often when bonuses are given for exceptionally high attendance or schemes in which districts buy back unused sick leave are available.[19] And teachers respond to changes in absence-control policies. For example, teachers who are required to report absences directly to their principal by telephone are absent less often than teachers using impersonal reporting systems.[20] These insights show that while the causes are multidimensional, policymakers do have the power to reduce absence rates.

Teacher traits

Some teachers are absent more often than others. Female teachers tend to be absent more often than male teachers.[21] Of course, this finding may highlight the lingering effects of historical gender roles in the United States, which still expect women to act as the primary caretakers for sick children and family members and to take off more time than men for the birth of a child. Teachers who commute long distances—and are therefore more susceptible to bad weather and other obstacles—also tend to be absent more often than other teachers.[22,23]

The relationship between absence and experience is less straightforward. Teachers with the most or least experience tend to be absent less often than other teachers. An important driver of this pattern may be that teachers in the middle experience range are more likely to have young families. Also, once teachers gain tenure, they may be more aggressive about exercising leave privileges.[24] Over a 10-year span in North Carolina, teachers with four years to five years of experience used 29 percent more sick and personal days than teachers with two years to three years of experience.[25] By law, teachers in the latter group are not tenured.[26] A plausible reason that teachers nearing retirement are absent less frequently is that they have a heightened awareness of the value of accumulated, unused leave in terms of cash payouts or pension enhancements.

School traits

There are several easily observed school characteristics that help explain teacher absence. Teachers in elementary schools tend to be absent more often, on average, than teachers in other schools, even after controlling statistically for gender.[27] The poverty level of a school is also associated with teachers' rates of absence. And large schools, in terms of student enrollment, experience higher rates of teacher absence than small schools, other things being equal.[28] The size of a workplace seems to matter outside of education, too, and researchers believe that the extent of interdependence among workers, which falls with the size of a workplace, explains this relationship.

Absence culture

The professional culture of a school—the norms, formal and informal, that guide teachers' behavior—is difficult to pin down. One common norm, for example, goes something like this: If you notice that the copier is broken, then hang the "out of order" sign on the machine and notify the school secretary. As with all community norms, enforcement is difficult and the degree to which individuals heed the norms can vary widely, even between schools that are similar in many other ways.

A school's absence culture comprises the norms dealing specifically with absence. It is difficult to study its effects since absence culture is largely an informal, undocumented phenomenon. Nevertheless, researchers in Australia recently found that a one-day increase in a teacher's colleagues' average absence rate would increase the teacher's own absence tally by a 10th of a day.[29] Norms and policies around teacher absence are somewhat different in Queensland, Australia than they are in the United States, but studies based in the United States have shown that collusive behavior among teachers in one school can explain consistently high rates of absence, relative to rates found in neighboring schools.[30] This paper does not use a lens of absence culture directly. It does employ vocabulary from the literature on absence culture, however, and may provide further impetus for researchers and policymakers to take an interest in the phenomena associated with it.[31]

Timing

Researchers consistently find two patterns in the timing of teachers' absences. First, teachers are absent most frequently on Mondays and Fridays.[32] Second, a high proportion of absences due to illness occur in blocks of time short enough that no medical certification is required.[33] These findings are hardly surprising as they are consistent with findings from studies of employees in other fields.

Illness and occupational hazards

Folk wisdom portrays classrooms as cauldrons of infectious disease. The sheer number of students, hands-on activities, snacks or meals, facilities and equipment that are less than sparkling clean, and juvenile hygiene issues may cause teachers to be sick more often than similar adults working in less gooey settings. Anecdotal reports suggest that new teachers are particular susceptible to student-borne illnesses,[34] and the notion that teachers' immune systems require a period of adjustment is intuitively compelling. Experimental evidence does not refute these notions.

School-wide use of hand sanitizer reduces rates of teacher absence,[35] but no one has yet conducted a careful study documenting a particularly strong benefit for new teachers. The immunity-building theory would be difficult to test using absence data, since new teachers tend to be absent less often than teachers with several years of experience and, supposedly, well-adapted immune systems. The theory would, however, be supported by evidence that new teachers work through illnesses at higher rates than their more experienced colleagues.[36]

Teachers may be especially prone to certain non-infectious health problems. There is some evidence that classroom amplification systems may prevent teacher absence due to symptoms and complications of vocal strain,[37] arguably an occupational hazard, and multiple studies have linked teacher absence with job-related stress.[38]

A closer look at teacher absence data

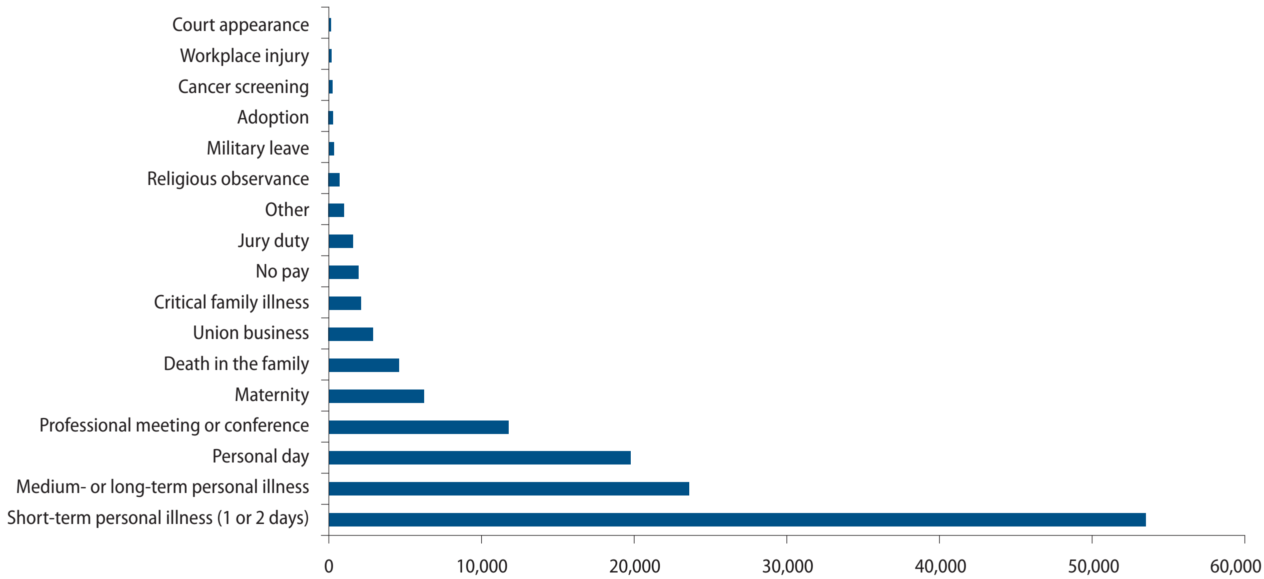
Analysis of a previously untapped dataset that includes detailed information on the timing and justification of teachers' absences as well as important characteristics of teachers and their schools provides valuable insight into patterns of teacher absence, bolstering the case that efforts to curb teacher absence are worthwhile. The dataset was constructed from electronic files supplied by a large urban school district in the northern United States.[39] It contains information on 5,189 unique teachers represented in one or more of the years from school year 2002 (2001–02) to school year 2005 (2004–05) for a total of 14,648 teacher-years.

The teaching workforce is rather typical of urban districts, judging from its gender and racial breakdown: 75 percent of the teachers were female, and 60 percent identified as white. The average teacher had over 15 years of experience teaching in the district,[40] experience being a reasonable proxy for age. The average teacher commuted 7.5 miles from home to school.[41] Over 80 percent of these teachers held tenure, a figure that points to chronic turnover of the least experienced teachers (see Appendix A, Table A1 for more information on teachers).

The average school had 486 enrolled students and a student attendance rate of 94 percent. Over 85 percent of the students in these schools were students of color, and 76 percent of students qualified for free or reduced-price lunch. Sixty-six of the 106 schools served students from kindergarten through 5th grade; nine schools served students from kindergarten through 8th grade; and 16 middle schools and 15 high schools were represented (See Appendix A, Table A2 for more information on schools).

The school years represented in the dataset combined contained 719 instructional days and 11 days dedicated to district-wide professional development activities. Saturdays, Sundays, holidays, and snow days were omitted from the dataset, but information on whether each of the 730 workdays was adjacent to a non-instructional day was retained to analyze trends in the timing of teacher absences. Among the 2,673,772 teacher-day records in the dataset, 130,747 corresponded to absences, each coded as one of 17 types.[42] The 11 most common types of absence covered 98 percent of all absences. Personal illnesses accounted for 59 percent of all absences, and short-term personal illnesses—those occurring in blocks of one or two days—accounted for 41 percent of all absences. Personal days, with 15 percent of the total, were the next most common type of absence.

Frequency of absence, by type



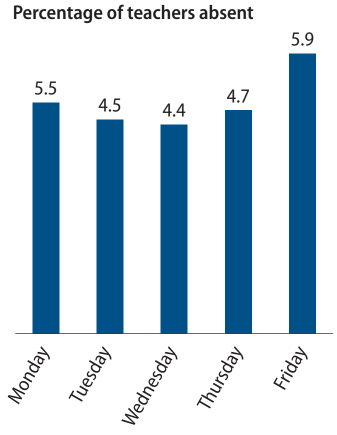
Discretionary absence trends among teachers

Discretionary absences include personal days and absences due to one day to two days of personal illness.[43] By design, discretionary absences do not include those that militate against the idea of discretion, such as jury duty or a death in the family. Some discretionary absences are, of course, absolutely essential and legitimate. Yet the data show that the largest number of potentially preventable absences—those involving deliberation and volition—is concentrated in this area.

The discretionary designation has a number of advantages. It prepares the way for fairly comparing schools, since long-term illnesses, which can inflate school-wide averages for smaller schools, are excluded. It makes identifying trends more apparent since the types of absences labeled here as discretionary are easy to identify in most school districts' records. And most importantly, it can inform policy solutions for reducing teacher absence rates since discretionary absences comprise 56 percent of all absences.[44]

It will be useful for policymakers to establish baseline expectations for which kinds of information may be useful in predicting discretionary absence. Monthly rates of discretionary absence can vary over time, between teachers, and between schools. The extent of each kind of variation matters because a given characteristic or indicator can only help to explain one kind of variation. Knowledge of which month it is may explain varying levels

Teacher absence rates by day of week



Note: Days of the week do not appear in the dataset uniformly. The use of rates offers a fairer comparison across days than would the use of absence counts.

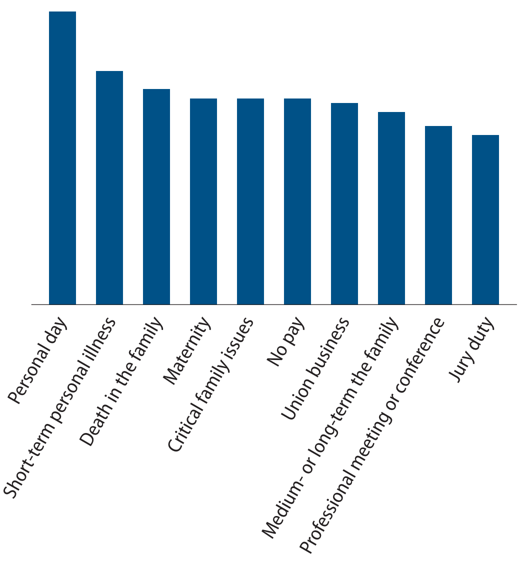
of absence over time, but it cannot explain differences in average levels between teachers or schools. Similarly, an indicator of school enrollment may help explain variation between schools but not variation over time or between teachers. (See Appendix B for a formal partition of variance).

Teachers were absent at higher rates on Fridays (5.9 percent) and Mondays (5.1 percent) than on other days of the week. Statistical tests suggest that these elevated rates are not due to chance alone. The true motivation of some of these absences may have been to stretch out a weekend, a pattern of behavior familiar to most employers.[45]

Discretionary absence rates are also higher on days adjacent to non-instructional days.[46] Fridays and Mondays are always adjacent to non-instructional days, but sometimes other weekdays are, too. The Wednesdays before Thanksgiving are a good example. During the school year, 45 percent of all days are adjacent to a non-instructional day, yet 51 percent of days taken off for short-term personal illness, and 64 percent of personal days, were adjacent to a non-instructional day.

Non-discretionary absences do not tend to fall any more than expected on days adjacent to non-instructional days. Jury duty and professional meeting absences are instructive examples. The research site is located in a county where jury duty never falls on Friday, thus eliminating the possibility that such absences would be adjacent to non-instructional days, namely Saturdays. Also, district officials often hesitate to schedule professional development activities on Fridays because they are wary of the scarcity of substitutes.[47]

Percentages of absences occurring on days adjacent to non-instructional days for the 11 most common types of absence



Notes: The 11 most common types of absence comprise 98 percent of the 130,747 absences present in the data. Of all instructional days, 45 percent were adjacent to non-instructional days (Saturdays, Sundays, snow days, and district-wide professional development days). T-tests confirm that the percentages for short-term personal illness and personal days were significantly different than expectation (p<.001 in both cases).

Discretionary absence rates also vary depending on the season, while non-discretionary absence remains relatively stable throughout the year. This pattern makes sense because the timing of many non-discretionary absences is beyond teachers' control, suggesting a somewhat uniform distribution across the months. Clearly, discretionary absences capture most of the seasonal volatility shown by all absences.

A teacher's past behavior is the best indicator of future absence behavior, which highlights how important individual incentives targeted at these absence patterns will be in absence policy discussions. Explanations and policies oriented toward groups of teachers make sense, too, since a small but statistically significant portion of the variation in discretionary absence can be attributed to schools.

Part of this variation can be explained by observable differences between schools (enrollment, grade configuration, percentage of low-income students), but part of it may have to do with the school-level professional norms that encourage or discourage discretionary absences. As shown below, the small amount of variation in available data for this explanation understates its potential interest to researchers and policymakers.

School-wide discretionary absence trends

Analysis of school-wide discretionary absence trends over time makes it possible to develop a method of profiling school-level absence behavior. School profiles are important for understanding absence behavior because they are fair in the sense that important aspects of schools and the teachers working in them are accounted for statistically, and because they respect the fact that absences unfold over time.

When discretionary absence data is examined by month and year, a striking level of similarity appears. In each year, the discretionary absence rate rise steeply throughout the fall, peaking at least temporarily in December before dropping by a substantial margin in January. As the winter turns into spring, rates wobble back up to December levels, more or less.

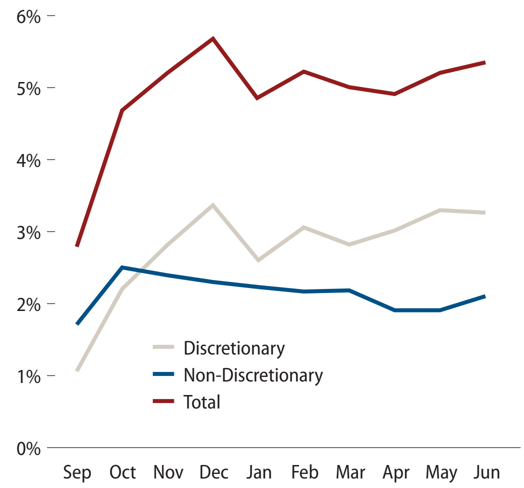
The differences between years are reasonably stable across months. The year with the lowest monthly rates was school year 2002, followed by school year 2003. Higher rates in school year 2004 and school year 2005 were nearly equal to each other, especially when averaged over all months.

One reasonable explanation for these year-to-year differences is that teachers gained access to an additional personal day in school year 2004.[48] The elevated rates of discretionary absence in school year 2004 and school year 2005 may reflect individual responses to the change in policy, exactly as the literature suggests.

The time of year partly predicts teachers' monthly rate of discretionary absence, but the rate is also influenced by characteristics of the teacher, school, and school year. This combination of factors, supported by statistical findings from this dataset, creates a school profile. The relationships documented in this report corroborate ones found in previous studies. Yet because the relationships analyzed here pertain to discretionary absences, this report adds to the knowledge base and hones in on those trends that will likely best inform the policy debate.

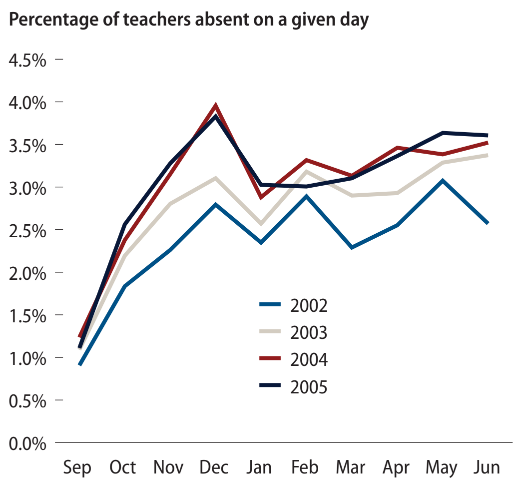
As anticipated, female teachers were absent more often than male teachers, and the length of a teacher's commute was positively related to the absence rate. Experience is also related to absence, namely that

Percentages of teachers absent on a given day by month, and percentages corresponding to discretionary and non-discretionary absences



Note: Discretionary absence defined as an absence attributed to personal day or a personal illness in blocks of one day or two days or "personal leave." Rates calculated as means of dummy variables indicating absence. Thus, rates represent observed percentages of teachers absent, by month.

Observed rates of discretionary absence by month and school year



teachers with the least or most experience were absent less often, on average, than teachers with intermediate levels of experience, other things being equal. Discretionary absence rates tended to rise with school enrollment. And elementary schools had the highest rates; high schools had the lowest rates (See Appendix C, Table C1 for detailed results).

Two other relationships documented here highlight policy issues and directions for future research. First, teachers' monthly rates of discretionary absence were negatively related to schools' average rates of student attendance. Put another way, when students attended school more often, teachers were absent less often, and vice versa. This makes sense if student attendance is thought of as a barometer of teachers' working conditions. It also makes sense in that the student absence rate is standing in for an indicator of school poverty.[49] Furthermore, this relationship suggests the potential of unearthing relationships between an individual student's attendance and the absences of his or her teacher, an important direction for future research.

Second, teachers with tenure tend to be absent more often than teachers without tenure, controlling for other school and teacher characteristics, including experience. The magnitude of this relationship is relatively large, suggesting that tenured teachers take about 0.8 more days of discretionary absences per year than their un-tenured colleagues. Such concrete evidence may help secure a place for tenure policies in discussions about strategic management of human capital in education.

The final step involved in creating school profiles of discretionary absence behavior is a small one. The idea is to allow each school to have a unique average rate. This step is equivalent to controlling statistically for all school characteristics, observed and unobserved, that do not vary over the school years. This approach is a powerful one, but it does not account for potentially important school-level characteristics that do vary over time such as who the principal may be. It does, however, allow profiles to more accurately reflect the chronic effects of absence cultures.

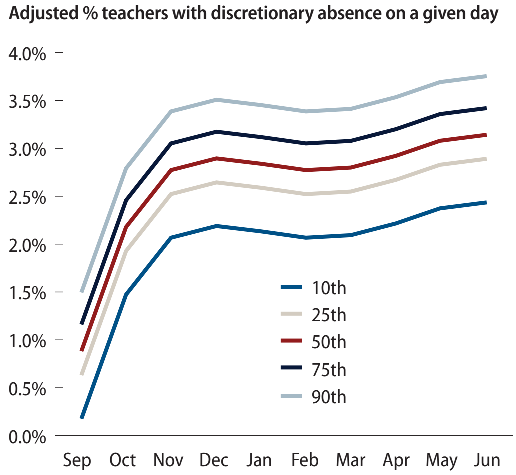
Once teacher characteristics and school years are controlled for, interesting patterns emerge. Comparing a selection of five of the 106 school profiles at the 10th, 25th, 50th, 75th, and 90th percentiles of discretionary absence rates shows stark gaps between the profiles. This leads to the conclusion that there are meaningful differences between schools when it comes to teachers' discretionary absence behavior. Ad hoc statistical tests offer evidence consistent with this belief.

This selection of school profiles generates two overarching points: certain schools foster a culture of absence, and discretionary absence rates vary considerably depending on the month.

The distribution of schools' adjusted average monthly rates of discretionary absence is wide. In the peak absence months, a school at the 90th percentile has a rate roughly 75 percent higher than a school at the 10th percentile. This suggests room for improvement in some schools, and grounds for commendation in others. Four types of absence cultures have been theorized and studied: defiant, constructive, calculative, and deviant.[50] Defiant and constructive absence cultures are characterized by having strong norms around absence. Put another way, these are schools where peer pressure strongly encourages or discourages frivolous absences. Schools where peer pressure has little effect have calculative or deviant absence cultures. Absence cultures break down along another dimension, too. Schools with defiant or calculative absence cultures are characterized by having low levels of trust between teachers and administrators, this trust being a measure of professional autonomy. Schools with high levels of trust tend to have constructive or deviant absent cultures.

Researchers have laid the groundwork for measuring the strength of a school's absence culture or its level of trust, but it is difficult to figure such measurement into policy. It is feasible, however, to create policies that draw public attention to school-wide absence behavior by collecting better data on teacher absences. The typology of absence culture offers a vocabulary to facilitate the conversations that such attention could generate.

Profiles of discretionary absence rates for schools at the 10th, 25th, 50th, 75th, and 90th percentile, adjusted for teacher characteristics and school year



The distribution of discretionary absence rates also varies considerably over the months of the year. A reasonable conjecture is that illness and allergy rates are important. The Centers for Disease Control make influenza surveillance data available to the public, and there are clearly sources for highly detailed data on allergen concentrations. But researchers may not want to knock themselves out exploring this idea before considering a well-used heuristic around the emotional stages traversed by first-year teachers.

Following the chronology of a school year, teachers go through five stages: anticipation, survival, disillusionment, rejuvenation, and anticipation, again.[51] First-year teachers struggle famously with the most basic aspects of effective practice, but they tend to start the year anticipating that they will make a positive difference in the lives of children. They quickly retreat into a survival mode, which decays into disillusionment. Extended breaks from work and relief afford first-year teachers a rejuvenating second wind, and their moods elevate further as they anticipate the end of the school year.

Teachers' rates of discretionary absence seem to follow an inverted version of this mood progression. When spirits are high, in September, absence rates are low. As the months roll along, survival and disillusionment drag down the mood and drive up absence rates. December's role as the nadir in mood and zenith in absence rates is probably related to cultural and family demands around holiday preparation. A mood-boosting rejuvenation accompanies a lull in absence rates around President's Day. Toward the end of the school year, moods are high in anticipation of summer, but absences fail to drop off. Anticipation is clearly the wrong name for the last absence stage. Perhaps a better name would be relief, especially in an era of accountability-driven testing.

The correspondence between the emotional trajectories of new teachers and rates of discretionary absence is not a perfect one, but it does seem useful to link intuitive, meaningful terms to the prominent geometric features seen in the profiles presented above. Some of the policy recommendations below leverage these terms.

Policy recommendations

This report offers striking evidence that students stand to benefit from combinations of policies designed to reduce levels of teacher absence. Teacher absence creates large expenses for districts and states in the form of substitute teacher salaries; it hampers student achievement; and it disproportionately affects low-income and minority students. There are federal, state, and local roles to play in an overall effort to reign in teacher absences. Each level of government can work in concert to implement policies and allocate resources to better ensure that all students experience fewer teacher absences at no additional cost.

Federal role: Include teacher absence information on school report cards

A hallmark of No Child Left Behind Act is its mandated school report card. It would not be too intrusive or onerous to require that school report cards include information on teacher absence. At least one state, Rhode Island, already includes a teacher attendance rate on its school report cards, a sign that the necessary data can flow between schools, districts, and state departments.

What would be even more useful, perhaps, is a graphical profile of teacher absence in a school. A simple bar chart showing monthly rates of teacher absence, perhaps adjusted for key characteristics of teachers and schools, would afford parents a glimpse into the absence culture of a school. Furthermore, such information could help district officials better understand local obstacles to implementing school improvement strategies, and it could lead eventually to school accountability requirements around teacher absence. Such requirements would promote equity, since students in high-poverty schools currently experience more teacher absences than their peers in more affluent areas.

State role: Justify statutory leave privileges

Although teachers' employment contracts include language about their leave privileges, states typically set a floor for how generous local privileges must be. The statutory minimum in Ohio, for example, is 15 days for personal illness and three days for personal necessity. The analogous values in Washington are 10 days and two days.[52] Thus, teachers in Ohio can take 50 percent more paid leave than teachers in Washington. Should this be the case?

Answering this question should be a priority, but serious tampering with the relevant statutes may be premature. For instance, it is not known how a change in leave provisions may affect the supply of new teaching candidates. Legislatures could, however, lay the groundwork for the research necessary to inform changes. The key obstacle to conducting such research is the availability of appropriate data. Clearly, the same infrastructure that would support a federal requirement for teacher absence information on school report cards could also facilitate research on the costs and benefits of changing statutory floors on leave provisions or other state-driven policies around teacher absence.

Local role: Experiment with co-payments and incentive schemes

Contractual provisions guaranteeing paid leave for various reasons represent a type of social insurance. Discretionary absence trends, however, bolster the case that an entitlement mentality tends to prevail. One way to help reorient thinking about leave provisions is to introduce a co-payment scheme. Politically, the introduction of co-payments is something of a non-starter. However, evidence from North Carolina, where teachers pay co-payments for absences over and above the standard allocation, suggests that a more complete implementation of co-payments could reduce students' exposure to teacher absences without costing districts more and without taking money out of the average teacher's pocket.

The key idea is to increase teachers' salaries to account for a reasonable need to make co-payments. In North Carolina, a $400 increase in teachers' salaries would ensure that the average teacher does not have to dip into his or her own pocket to handle co-payments. And students would experience 1.1 fewer teacher absences per year, on average.[53] Clearly, experimentation with co-payments should be encouraged, where it suits local tastes.

Another category of local policy initiatives centers on rewards for excellent attendance. In contrast to co-payment schemes, many examples of reward schemes exist. In Aldine, Texas, for example, a teacher who maintains an excellent attendance record over a school year, defined as two or fewer days of absence, receives a bonus equivalent to 0.5 percent of his or her annual gross compensation in the form of a deposit to a 401(a) retirement plan. This bonus amounts to somewhere between $200 and $400, depending on a teacher's experience and credentials. The districts' costs are more than offset by the reduction in substitute stipends corresponding to lower levels of teacher absence—savings amount to roughly $5 per pupil, per year.

This and other bonus schemes are vulnerable to criticism. Female teachers, for instance, are less likely than male teachers to qualify for bonuses because they tend to be absent more often. Yet programs like the one used in Aldine are legal, and the sums of money involved are relatively small. Moreover, reducing students' exposure to teacher absence is a social benefit that may outweigh identified drawbacks.

Conclusion

The direct costs of teacher absences amount to $4 billion, annually. New and improved policies around absence could reduce students' exposure to teacher absences while generating a net savings for employers. Teacher absences also have a negative effect on student achievement, and students in high-poverty schools—the very students in need of the most potent instruction—are the ones most likely to experience more teacher absences.

The research base on employee absence in general and teacher absence in particular offers real guidance for policy innovation. The research presented in this report expands the knowledge base and offers guidance for further inquiry in two overlapping areas: how policies and incentives can break patterns of discretionary absences, and how teacher absence patterns can help inform other education policy discussions such as the expanded learning time debate.

By teasing patterns of absence out of data, two particular types of absence emerge—discretionary absences, which are the personal days and short-term illnesses that are most common and most avoidable, and non-discretionary absences, which are usually longer-term and less preventable. The data show that discretionary absences vary over time, between teachers, and between schools, which focuses policymakers on the need to enhance accountability around absences in ways that target teachers and schools.

Teacher absence also informs broader education policy discussions. Expanded learning time, in particular, focuses on lengthening the school day or year to allow students more time with their teachers or in extracurricular programs, but a secondary focus for these initiatives could be aligning policies so as to reduce levels of teacher absence so that students gain back learning time in that manner. The literature on expanded learning time is relatively immature, and this work signposts a messy and unexplored direction for future research. Furthermore, this report showcases analytic methods and surfaces vocabulary that may facilitate inquiry and dialogue around teacher absence.

The research presented in this report has an important limitation. The data were drawn from a single school district, albeit a large, urban one. Its teachers enjoy more generous leave provisions than teachers in most other districts, but previous research would lead one to expect that the same patterns discussed here would emerge elsewhere. That is, even with fewer absences per teacher, one would expect to see evidence supporting a focus on discretionary absences and seasonal variation in such absences.

The empirical results presented above punctuate key findings from previous work and offer clear directions for future research and policies that could begin reducing teacher absences. Stark differences between schools in average rates of discretionary absence suggest that school accountability report cards, a cornerstone of federal efforts to bring attention to schools in need of improvement, should include information on teacher absences. Refining existing procedures for collecting data on teacher absence would facilitate useful research, particularly regarding the appropriate amount of paid leave provided to teachers. And experimentation with local policies directed at dissuading teachers from taking time off or encouraging exemplary attendance would offer first-hand evidence about what strategies are most effective in curbing teacher absence patterns.

Technical appendices

Appendix A: Data

The analytic dataset contains information on 5,189 unique teachers represented in one or more of the years from school year 2002 (2001–02) to school year 2005 (2004–05) for a total of 14,648 teacher-years. Teachers represented in the dataset worked in one or more of 106 schools scattered across the district. Only schools that had one of four conventional grade configurations (K–5, K–8, 6–8, 9–12) were retained in the analytic dataset. Schools also had to be represented in all four years from school year 2002 to school year 2005.

Table A1. Teacher characteristics

Variable	Mean	Std. Dev.
Teaching experience (yr)	15.5	11.8
Home-to-school distance (mi)	7.5	7.6
Female (percent)	74.9	-
Tenured (percent)	82.8	-
White (percent)	60.4	-
Black (percent)	25.7	-
Hispanic (percent)	9.3	-
Asian (percent)	4.3	-
Native American (percent)	0.2	-

Note: Not all teachers appear in each of four school years. For a limited number of teachers appearing only in school year 2005, values of experience were imputed from information on payroll (step and grade) and ethnicity. Teachers with faulty or missing values on home Zip code had values imputed for home-to-school commuting distance. Raw data sets provided by the district included substantially fewer teachers in the latter two years than in the first two years, especially in school year 2004. A fiscal crisis in 2003 and falling enrollment may explain part of this. An examination of the numbers of teachers associated with each school and mean values on teacher characteristics, by year, suggests that the latter years lack some of the least experienced teachers who may have been in the district. This fact motivated a set of sensitivity analyses, not presented, which provide assurance that the findings are not driven by this data issue.

Table A2. School characteristics

Variable	Mean	Std. Dev.
Enrollment (students)	485.8	366.4
Student attendance rate (percent)	93.4	3.1
External suspension rate (percent)	5.7	6.7
Retention rate (percent)	5.8	3.9
Free-or-reduced price lunch rate (percent)	76.2	13.3
Black students (percent)	48.1	23.1
Hispanic students (percent)	29.8	19.6
White students (percent)	14.8	13.3
Asian students (percent)	6.9	9.6
Native-American students (percent)	0.5	0.5
Female students (percent)	48.2	4.3

Note: Student enrollment, student attendance, and retention rates were not available for school year 2002. Mean values for the other years, by school, were used to replace these missing values.

Appendix B: Partition of variance in discretionary absence

In the unconditional means model shown in Equation B1:

$$D_{ijt} = \mu + \gamma_j + \zeta_i + \varepsilon_{ijt}$$

D_{ijt} represents an average rate of discretionary absence for teacher i working in school j during a specified time period t. The period can be arranged to be a day, week, month, quarter, semester, year, or some other interval of interest (e.g., fortnight, trimester). The μ represents the unconditional grand mean of D_{ijt} in the population. The remaining terms represent residuals, components of a complex error term. The γ_j and ζ_i allow for variation around the grand mean at the school- and teacher-level, respectively, and ε_{ijt} represents an individual error term. Estimates of the variance of these three stochastic components of the model can be used to address these questions: what fraction of the variance resides within teachers across days, and what fraction lies within or between schools on an average day? Answers to these questions drive analytic decisions to follow.

Fitting this unconditional means model to data involves several practical concerns. First, while it is tempting to use a short interval of time, such a choice restricts the number of discrete values that D_{ijt} can take on and makes non-zero values rather rare. In the extreme case, where the period is a day, D_{ijt} represents a dichotomous indicator of discretionary absence (1 for discretionary absence, 0 otherwise), and where the period is a week, only a few non-zero values of D_{ijt} are possible. For example, most weeks in the dataset contain

4 or 5 days, but some shorter weeks are represented. Thus, the theoretical list of values of D_{ijt} is $\{0, .2, .33, .4, .5, .6, .66, .75, .8, 1\}$. Discrete outcomes with skewed distributions can lead to large numbers of predicted values falling outside the range of possible values. Second, fitting the unconditional model requires the use of iterative estimation procedures. Lack of balance in the data—not all teachers appear in all four years represented in the data—can frustrate convergence of Maximum Likelihood Estimation (MLE) procedures (Singer & Willett, 2002, p. 153). Third, obtaining correct standard errors for estimates of σ^2_γ, σ^2_ζ, and σ^2_ε, the variance components of interest, is complicated by inter-school transfers of teachers between years. Theoretically, the unconditional means model can be modified to accommodate the failure of nesting, but this is computationally burdensome, if not untenable. Because teachers change schools, a single teacher-level residual does not suffice to account for the true structure of the data. However, supplying teachers as many different residuals as schools they teach in would entail the estimation of vastly more model parameters, namely variance components. Thus, below the seeming simplicity of even an unconditional means model lurk onerous, often impossible computational challenges.

Two strategies are used here to address these concerns. First, by choosing a month as the period of time, D_{ijt} obtains a reasonably continuous nature while preserving variation within teachers across periods. Second, fitting the model, successively, to versions of the dataset in which only information on one school year is retained renders the issue of teachers changing schools moot. There were doubtless some teachers in the district who did change schools during a school year, but such switches do not register in the data. It is also true that some teachers who appear to be assigned to a particular school actually work at multiple schools. Many itinerant teachers—those identified with a department (e.g., special education) instead of a school—were omitted from the analytic dataset.

Applying these strategies yields four partitions of variance, summarized in Table 4. It is noteworthy that the estimated unconditional mean of discretionary absence is not stable across school years. Higher rates of discretionary absence in school year 2004 and school year 2005 may be partly due to a change in the teachers' collective bargaining contract effective in those years; teachers gained access to an additional personal day. Although this report has no strategy to draw causal connection between the increase in privileges and rates of absence, the trend in unconditional means suggests that it may be important to control statistically for school years in any analysis focused on multiple years.

The main purpose of fitting the unconditional means models is to obtain estimates of the variance components. In each school year, the standard errors associated with the estimated variance components are relatively small. Individual t-tests offer evidence that there is non-zero variance in discretionary absence at all three levels. This means that it is worthwhile exploring which school- and teacher-level predictors may play a role in explaining the variance. Such predictors, however, can only explain variance at their own level. For example, the percentage of low-income students attending a school can only explain variation between schools, or a teacher's gender can only explain variation between teachers.

Table B1. Parameter estimates, (standard errors), and intraclass correlations for a series of unconditional means models fit to datasets in which the unit of analysis is a teacher-month and the outcome is the rate of discretionary absence, by school year

Estimates	Description	Parameter	School Year			
			2002	2003	2004	2005
Fixed Effects						
	Grand mean	μ	2.315	2.677	2.978	3.004
			(0.064)	(0.069)	(0.082)	(0.078)
Variance Components						
	Between school	σ^2_γ	0.264	0.306	0.477	0.459
			(0.060)	(0.072)	(0.102)	(0.089)
	Between teacher	σ^2_ζ	3.472	4.079	3.693	3.026
			(0.115)	(0.136)	(0.149)	(0.123)
	Within teacher	σ^2_ε	15.283	18.329	21.606	20.388
			(0.115)	(0.138)	(0.178)	(0.161)
Intraclass Correlations						
	Between schools		0.014	0.013	0.018	0.019
	Between teachers		0.183	0.180	0.143	0.127
Teachers			3,918	3,918	3,263	3,549
Months			10	10	10	10
Observations			39,180	39,180	32,630	35,490

Note: By design, estimated standard errors account for the nesting of periods within teachers and teachers within schools. The unconditional means model has three error terms, one for each level expressed in the model: one is fixed across a school, one is fixed across a teacher, and one is an individual teacher-month error term. Intraclass correlations summarize the proportion of total variance of the outcome residing at each level of interest: between schools $\frac{\sigma^2_\gamma}{\sigma^2_\gamma + \sigma^2_\zeta + \sigma^2_\varepsilon}$ and between teachers within schools $\frac{\sigma^2_\zeta}{\sigma^2_\gamma + \sigma^2_\zeta + \sigma^2_\varepsilon}$.

The percentage of variance residing between schools ranges from a low of 1.3 percent in school year 2003 to a high of 1.9 percent in school year 2005 while the proportion of variance between teachers ranges from 12.7 percent in school year 2005 to 18.3 percent in school year 2002. Thus, the proportion of variance between teachers is larger than the proportion of variance between schools by roughly a factor of 10. This observation is helpful, for unless random variation between schools is a major concern, it appears feasible to drop the school-level residual in models that inform school profiles. In this scenario, each teacher in the population retains her own average rate of discretionary absence across periods, and systematic differences between schools (e.g., enrollment) can still be used to distinguish school-level averages.

Appendix C: Creating School Profiles

The first step in profiling schools with respect to discretionary absence of their teachers is to estimate trajectories showing how rates of discretionary absence change over the months of a school year, by school, controlling for the fixed-effects of school years and select observed characteristics teachers and schools. Change trajectories arise from the hypothesized regression model, shown in Equation C1:

$$D_{it} = \alpha f(t) + \beta X_i + \delta + v_i + \varepsilon_{it}$$

In this hypothesized model, D_{it} represents the rate of discretionary absence of teacher i during month t, and $f(t)$ represents a function of t. The X_i represents a vector of characteristics of teachers and schools. All of these characteristics are fixed across periods within a school year, but some of them do vary over the years. For example, a teacher can gain permanent status from one year to the next, and school enrollment fluctuates from year to year. The δ represents a set of fixed-effects for the school years. The v_i and ε_{it} represent residual components of a complex error term. Put another way, monthly rates of discretionary absence are allowed to vary randomly between teachers and within teachers. As mentioned above, the need to respect random variation between schools is slight, but doing so is complicated by transfers of teachers between schools.

The further inclusion of dummy variables representing schools facilitates the estimation of a unique change trajectory for each school. Crucially, such trajectories account statistically for secular trends in discretionary absence, observed differences between schools in the composition of their teaching forces, and all time-invariant characteristics of schools, observed and unobserved. In particular, they capture any chronic (time-invariant) effects that schools' distinct absence cultures have on teachers' discretionary absence behavior, and deviance statistics offer a basis for assessing the importance of such effects.

Table C1 presents results of fitting a taxonomy of models represented by Equation A2 to the data. Each column contains successively more predictors, added in groups. Goodness of fit statistics document the extent to which characteristics of teachers and schools help explain the between-teacher variance discussed above.

Table C1. Parameter estimates, (robust standard errors), approximate p-values, and select goodness-of-fit statistics from models fitted to a teacher-month dataset with outcome equal to the rate of discretionary absence, the number of such absences per month (146,480 teacher-months representing 5,189 unique teachers appearing in one or more of the school years between school year 2002 and school year 2005)

Variable	I	II	III	IV	V
School fixed-effects	No	No	No	No	Yes
School year 2002		-0.256** (0.041)	-0.246** (0.040)	-0.258** (0.041)	-0.271** (0.040)
School year 2003		0.063 (0.040)	0.071~ (0.040)	0.074~ (0.040)	0.048 (0.039)
School year 2004		0.117** (0.041)	0.102* (0.041)	0.107** (0.041)	0.092* (0.041)
Female			0.155* (0.067)	0.145* (0.071)	0.130~ (0.070)
Asian			-0.429** (0.117)	-0.427** (0.116)	-0.312** (0.120)
Black			0.542** (0.074)	0.549** (0.073)	0.502** (0.074)
Hispanic			0.478** (0.110)	0.469** (0.110)	0.432** (0.113)
Permanent status			0.448** (0.070)	0.466** (0.071)	0.498** (0.070)
Experience			0.133** (0.010)	0.127** (0.010)	0.121** (0.010)
Experience2			-0.004** (0.000)	-0.004** (0.000)	-0.004** (0.000)
Log(distance)			0.065** (0.025)	0.062* (0.025)	0.058* (0.025)
Square root of enrollment				0.022** (0.004)	
Student attendance rate				-0.058** (0.009)	
Grades K-8				-0.392** (0.091)	
Middle school				-0.252** (0.081)	
High school				-0.727** (0.110)	
Between teacher variance	3.832	3.426	2.879	2.842	2.681
Within teacher variance	18.635	18.624	18.617	18.612	18.594
Intraclass correlation	0.171	0.155	0.134	0.132	0.126
Between R-squared	0	0.061	0.136	0.145	0.185
Within R-squared	0	0.022	0.022	0.023	0.023
Overall R-squared	0.018	0.020	0.040	0.042	0.052

~ significant at 10 percent; * significant at 5 percent; ** significant at 1 percent

Note: Estimated constants and parameter estimates corresponding to the function of month $a_1t + a_2t^2 + a_3t^3 + a_4t^4$, where t indexes the months, are omitted from the table. Each estimate was significant (p<.01) in every specification, but the estimates hold no interest, in and of themselves. Teachers identified as white and school year 2005 serve as reference categories.

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Endnotes

1 National Center for Education Statistics, Schools and Staffing Survey (2003-04 Public Schools). The statistic reported is derived from the number of full-time teachers divided by number of short-term substitutes (Q37).

2 See District Management Council 2004; Roza, 2007.

3 See Clotfelter, Ladd, and Vigor. 2007; Miller, Murnane, and Willett, 2007.

4 Clotfelter, Ladd, and Vigdor. 2007

5 District Management Council 2004.

6 See, for example, Rivkin, Hanushek, and Kain, 2005; Rockoff, 2004; Kane, Rockoff, and Staiger, 2006.

7 Miller et al. (2008a, 2008b) focused on mathematics and English language arts achievement of 4th grade students; Clotfelter et al. (2007) focused on mathematics and reading achievement in 4th and 5th grade. Numerous studies have found a negative relationship between teacher absence and student achievement (Bayard, 2003; Boswell, 1993; Cantrell, 2003; Madden et al., 1991; Pitkoff, 1989; Smith, 1984; Summers and Raivetz, 1982; Womble, 2001; Woods, 1990), and some have found no relationship at all (Ehrenberg, Ehrenberg, Rees, and Ehrenberg, 1991; Kirk, 1998; New York City Public Schools, 2000; Occhino, 1987). The, Ehrenberg et al. paper, for example, used data aggregated to the level of the school district. By and large, these studies lacked the statistical power to detect small effect, the data were aggregated in ways that conceal important variation (e.g., Ehrenberg et al.), or they fail to control for important covariates of achievement and teacher absence.

8 Tom Scott, executive director of the Massachusetts Association of School Superintendents, was recently quoted in a *Boston Globe* article: "A substitute, generally speaking, is not the same quality as a regular teacher." (Rathi, 2008).

9 "State Requirements," available at http://sti.usu.edu/common/documents/state_requirements07.pdf (last accessed Sept. 19, 2008).

10 The Substitute Training Institute at Utah State University makes a number of resources available to substitutes and those who manage them. Inspection of these materials leads one to believe that substitutes' primary concern is classroom management/discipline.

11 See Peske and Haycock, 2008.

12 Eligibility for free or reduced-price lunch is used as a proxy for family income. Since this eligibility is self-reported, it becomes less reliable with student age. Researchers generally have no access to other information on family income.

13 National Center for Education Statistics, Schools and Staffing Survey (2003-04 Public Schools).

14 See Clotfelter, Ladd, and Vigdor, 2007.

15 The School and Staffing Survey (SASS), administered by the National Center for Education Statistics, supports the construction of a national rate of teacher absence: the ratio of short-term substitutes to full-time equivalent teachers on a given day. Based on 2003-4 survey results, the rate was 4.9 percent in large or mid-sized cities, 5.2 percent in the fringe of urban areas, and 6.2 percent in small towns and rural areas. These rates are very similar to those reported from earlier versions of SASS (Ballou, 1996) and those reported in studies that created rates from fine-grained administrative data (Clotfelter et al. 2007; Miller et al. 2008).

16 See Chaudhury, Hammer, Kremer, Muralidharan, and Rogers, 2006.

17 In the United Kingdom, teachers are absent at a rate of 3.2 percent (Bowers, 2001); in Queensland, Australia, 3.1 (Bradley, Green, and Leeves, 2007).

18 For empirical studies, see Ehrenberg et al., 1991; Winkler, 1980. For a policy example, see California Education Code §22717(b), which specifies that a teacher's accumulated, unused leave (illness or injury) converts to additional service credit upon retirement. This credit boosts pension annuity calculations.

19 For generosity of leave, see Ehrenberg et al., 1991; Winkler, 1980; for bonuses, Freeman and Grant, 1987; Jacobson, 1990; Skidmore, 1984; White, 1990; District Management Council, 2004.

20 See Farrell and Stamm, 1988; Winkler, 1980. Web-based absence reporting systems are becoming popular, not surprisingly. These systems also lack the kind of personal contact absent in an automated, phone-based system. However, web-based systems may offer additional benefits whose value is not well understood. For example, principals can rapidly survey the teacher absence situation on a given morning if all relevant information appears in a single, clear interface.

21 For example, Clotfelter et al. (2007) found female teachers to take nine sick and personal days, as compared to eight for male teachers, on average, controlling for a host of other teacher, school, and district characteristics.

22 See Beavers, 1981; Bridges and Hallinan, 1978; Educational Research Service, 1981; Scott and Wimbush, 1991; Winkler, 1980.

23 Miller, Murnane, and Willett (2008a) found measures of weather conditions in teachers' neighborhoods (number of frigid days a year) to be useful in predicting teacher absence. This suggests that the effect of commuting distance may vary by region.

24 Absence habits of teachers in the twilight years of their careers can differ starkly from this trend. In the district which was the focus of this study, for example, some nearly retired teachers are known to exhaust deliberately accumulated sick-leave in a manner calculated to avoid official sanction. District officials even have a name for this behavior. Using the actual name here could compromise the anonymity of the district. Going out with a bang in a cynical, selfish way is the general meaning of the name.

25 See Clotfelter, Ladd and Vigdor, 2007. In North Carolina, teachers endure a four-year probationary period before gaining tenure.

26 See Education Commission of the States, 2007.

27 See Clotfelter, Ladd and Vigdor, 2007.

28 See, for example, Educational Research Service, 1981; Miller et al., 2008a.

29 Using the insight that teachers who change schools are bound to adjust their behavior to the new school's absence culture, one team of researchers found evidence that an individual teacher's absence behavior is affected by the behavior of her or his peers, at least in Australia. Bradley, Green and Leeves (2007) exploit teacher transfers between schools in Queensland, Australia to identify these peer effects.

30 See Pitkoff, 1993.

31 First proposed by Johns and Nicholson (1982), the theory of absence culture has focused on two dimensions. Fist, *salience* refers to the strength of an organization's absence culture, the extent to which individual behavior is affected by the professional norms around absence (see, for example, Martocchio, 1994). The second dimension is the degree of *trust* embodied in social contract within the school (Nicholson and Johns, 1985). Imants and van Zoelen (1995) frame this dimension as the degree of professional autonomy enjoyed by teachers. Rhodes and Steers (1990) summarize a typology of absence cultures based on these two dimensions.

32 See Educational Research Service, 1980; Malick, 1997; Miller, Murnane, and Willett, 2007; Pennsylvania School Boards Association, 1978.

33 See Educational Research Service, 1980; Rhodes and Steers, 1990; Miller et al., 2008a, 2008b.

34 See, for example, Nechas, 1989.

35 See Hammond, Ali, Fendler, Dolan, and Donovan, 2000.

36 A small literature on "presentism" outlines key ideas for researchers interested in this dimension of teacher absence. See, for example, Chatterji and Tilley, 2002.

37 See Rosenberg et al., 1999.

38 See Borg and Riding, 1991; Dworkin et al., 1990; van Dick and Wagner, 2001.

39 District officials preferred that the district remain anonymous.

40 The distribution of teacher experience is relatively uniform, apart from an elevated percentage (8 percent) of teachers in their first year in the district.

41 The measure of commuting distance was constructed by applying the appropriate formula from spherical trigonometry to the longitudes and latitudes of the teachers' schools (available from the National Center for Education Statistics, Common Core of Data) and those of the geographic centroids of teachers' home Zip codes.

42 The 17 types above were constructed by consolidating conceptually related codes from among the 46 codes present in the raw data. For example, multiple labels dealing with a death in the family were consolidated into a single type. Fewer than 200 days of absence had split codes or were over-coded. A prominent example was three hours for cancer screening and four hours for personal illness. The code associated with the most hours of absence was used or, in the case of ties, the last code given in the raw data file was used.

43 An alternative to the label "discretionary" is the widely used "absenteeism." The latter term usually attaches a sense of volition to absences, and it has a pejorative character. "Discretionary" also implies volition, but without the pejorative baggage.

44 In the research site, a 10 percent reduction in discretionary absences would yield a savings of roughly $250,000 per year. Thus individual and group incentives aimed at reducing overall absences by 10 percent have a budget of $250,000.

45 Conventionally, labor economists use the term *leisure time* in a dispassionate way. Activities undertaken during leisure time may be obligatory or voluntary. They are, however, distinct from the activities of work. The notion of building leisure time (Behrend, 1959), however, attaches a bias towards volition. Thus, an absence taken on a Friday to facilitate travel to the wedding of a childhood friend would be considered as building leisure time.

46 Non-instructional days include those devoted to district-wide professional development as well as holidays, weekend days, and snow days.

47 Managerial wariness around a shortage of substitutes on Fridays surfaced in conversations with district officials and four principals of the elementary schools represented in the data.

48 The collective bargaining agreement in effect in school year 2002 and school year 2003 provided for three personal days; afterwards, four.

49 The percentage of students eligible for free or reduced-priced lunch was strongly, negatively correlated with the average student attendance rate. Only the former predictor was included in final models, for the sake of parsimony, and to allow for the point about future directions for research. Clearly, both predictors merit attention in work on teacher absence.

50 See Rhodes and Steers (1990) for a fuller explanation of this typology.

51 See, for example, Mauer and Zimmerman, 2000.

52 See "Teacher Rules, Roles, and Rights," an online database created by the National Council on Teacher Quality. The database includes summaries and notes on key provisions of teacher contracts and collective bargaining agreements. The particular code of note here is Ohio code 3319.141; Revised Code of Washington, 28A.400.300.

53 See Clotfelter, Ladd, and Vigdor, 2007.

About the Author

Raegen T. Miller is a Senior Education Policy Analyst at American Progress. His work focuses on strategic management of human capital in education. He has published articles in peer-reviewed research journals shedding light on the productivity costs of teacher absences. Prior to joining American Progress, Raegen was a National Academy of Education/Spencer Postdoctoral Fellow affiliated with the Center on Reinventing Public Education at the University of Washington. He holds a doctorate in Administration, Planning, and Social Policy from the Harvard Graduate School of Education, where he taught courses on applied data analysis and the foundations of schooling and teaching.

Raegen's work in education policy is grounded in many years of practice and service. He taught mathematics in the United States and abroad, in traditional public schools and in charter schools, and in urban and suburban settings. Raegen completed his teacher training at Stanford University, and he holds an M.S. in mathematics from Cal Poly, San Luis Obispo. He was a trustee of Prospect Hill Academy Charter School in Somerville, Massachusetts, and he served as president of his local teachers' union in Palo Alto, California.

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