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Anthony Bryk
President Emeritus, Carnegie Foundation for the Advancement of Teaching
Half Moon Bay, California

"Drawing on her experience helping schools use data effectively, Allensworth provides clear and compelling guidance on how educators can use data to improve student outcomes. Along the way, she clarifies all the hot-button issues of test scores, GPA, early warning systems, and surveys."

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"Data aren't just a tool for tracking progress—they're a key ingredient in fostering collaboration and understanding across the entire school community. Whether for teachers, families, or students, the way data are used to communicate goals and expectations can truly shape how we support every child's growth and success."

Kristopher Kwiatek
Principal, Bob Hope Elementary School, DoDEA
St. Clair Shores, Michigan

"Using Data to Improve Schools is an essential guide for educators seeking to transform their schools through the power of data. By providing practical strategies and clear examples, this book empowers educators to move beyond simply collecting data to using data to drive meaningful and equitable school improvement."

Tamara Daugherty
Third Grade Teacher, Zellwood Elementary School
Orlando, Florida

"Allensworth has a wonderful way of engaging readers in the possibilities of using data to motivate all parties in sustained school improvement while understanding the context. Data by itself is not enough to transform a good school into a great school. Allensworth helps the reader to understand many different approaches."

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"*Using Data to Improve Schools* does an excellent job of articulating how practitioners should select, utilize, and interpret data for improving student outcomes in schools. The book provides clear examples of data that can support or impair school improvement goals. As an education policy advocate, I strongly recommend this book to inform how we can best support school leaders and stakeholders engaged in school improvement efforts."

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"Systems get the results they're designed for. Allensworth shows how to improve school systems through the enlightened use of data—data that serve not as a knuckle-rapping tool of inspection, but as the key navigational aid that unlocks progress. It's a principled, practical, and immediately usable playbook."

Dan Heath
Author of *Upstream* and *Reset*
Durham, North Carolina

Using Data to Improve Schools

Using Data to Improve Schools

Elaine Allensworth

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Contents

ACKNOWLEDGMENTS ix

ABOUT THE AUTHOR xi

INTRODUCTION 1

CHAPTER 1: DESIGNING THE SCHOOL TO REACH YOUR VISION 5

- Results With the Right Data 5
- Focusing on the Wrong Metrics 7
- Improvement Requires Change 9
- What Is Evidence-Informed Practice in Education? 10
- Data Are the Starting Point to Productive Conversations 16
- What the Data Represent Is Most Important 17
- Data for Accountability Versus Improvement 19
- Using Data to Support Success, Not Add Burden 21
- Key Takeaways 22
- Reflection Questions 22

CHAPTER 2: SIX KEY PROPERTIES OF DATA 25

- Data Are Messy: Reliability and Validity Show Trustworthiness 26
- Properties That Make Data Useful for School Improvement 30
- How to Get Data on the Properties of Data 44
- Key Takeaways 44
- Reflection Questions 45

CHAPTER 3: DATA ON STUDENT LEARNING 47

- Standardized Test Scores 48
- Course Grades and GPAs 61
- Key Takeaways 69
- Reflection Questions 70

CHAPTER 4: USEFUL DATA FOR STUDENT ENGAGEMENT AND EXPERIENCES IN SCHOOL 73
Data on Student Engagement and Experiences 74
Attendance 76
Student and Teacher Survey Data 81
Classroom Observations 89
Opportunity Structures 92
Key Takeaways 96
Reflection Questions 97

CHAPTER 5: MAKING USE OF DATA: VISION AND GOALS 99
Shared Leadership and Alignment 99
A Compelling Vision 101
Setting Goals 104
Key Takeaway 115
Reflection Questions 115

CHAPTER 6: MAKING USE OF DATA: CONTINUAL IMPROVEMENT 117
Building the Conditions for Student Success: School-Wide and Tier 1 Strategies 118
Supporting Struggling Students: EWI Systems and Tier 2 and 3 Interventions 125
Evaluating Instructional and Program Effectiveness 132
Communication Across the School Community 135
Key Takeaways 138
Reflection Questions 139

CONCLUSION: WHICH DATA FOR WHAT PURPOSE? 141
REFERENCES 145
INDEX 151

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About the Author

Elaine Allensworth is the Lewis-Sebring Director of the University of Chicago Consortium on Chicago School Research and a research professor at the Crown School of Social Work, where she has conducted research on educational policy and practice for more than 25 years. Her research examines factors influencing students' educational attainment, school leadership, and school improvement. She works with policymakers and practitioners to bridge research and practice, serving on panels, policy commissions, and working groups at the local, state, and national levels. Her research on the factors that predict whether students will drop out of high school has shifted the conversation from factors that schools cannot control to factors that schools can influence; school districts across the country have adopted early warning indicator systems based on her research. Her work on school leadership has documented the ways in which organizational structures in schools influence improvements in student achievement. Dr. Allensworth has been the principal investigator on research grants from funders such as the Institute of Education Sciences, the National Science Foundation, and the Bill and Melinda Gates Foundation. She has received a number of awards from the American Educational Research Association for outstanding publications. She holds a doctorate in sociology from Michigan State University and was once a high school teacher.

Introduction

School improvement requires the use of data. Without data, there is no way of knowing if the changes being made to improve students' outcomes are having the desired effects. Data can be used to set goals, make decisions, monitor progress, and reflect. Most importantly, data can be used to focus conversations on evidence to help people work together around shared goals.

I have seen schools become vastly better at serving their students based on using the right data in the right ways. Conversely, I have seen schools focus a lot of effort on data that are not useful because the properties of the data do not allow for the meaning that people make from them or the uses to which they are being put. Using bad data is like an ordinary person reading tea leaves—you can make meaning from what you see, and it may give you direction, but the actions you take on those interpretations are no more likely to improve your situation than if you didn't look at the data at all.

Dramatic improvement is possible through the use of data, but far too often school administrators and teachers have to swim in a sea of data that is not organized in useful ways. Metrics that are the most valuable for improving student outcomes are easily looked over or dismissed in favor of metrics that seem on the surface to be important but have little utility for producing change. Choosing the right metrics on which to focus is the first crucial element of using data for improvement. The second crucial element is building organizational structures that support the productive use of data and build a culture of continuous improvement in the school.

In my years at the University of Chicago Consortium on Chicago School Research and as a research professor at the Crown School of Social Work, it's become abundantly clear to me that using the right data has a profound impact on improved outcomes. But what is the "right" data? How are school and district leaders supposed to make useful sense of the vast ocean of available data that comes across their desks, coupled with the perceived urgency to do something, anything, with it, to remedy the problems to solve that fall on their shoulders? In short, what data will help them help their students in meaningful ways?

This book is intended to offer that guidance. In the following chapters, I'll

- differentiate between what works and the common pitfalls around data use;
- compare common data metrics, including their strengths and weaknesses and what they are and are not useful for, in ways that are likely to be surprising;
- reveal concrete examples of how schools have used data to change practices and improve student outcomes; and
- answer common questions about data.

I hope to provide you with the confidence and comfort level to focus on the data that matters and that will truly help you make positive changes in your district or school. You'll learn the power of the right metrics and how to focus on actionable and relevant data, create a shared vision and attainable goals, use data for school improvement, use systems for continuous improvement such as the early warning indicator (EWI) and multi-tiered systems of support (MTSS) that use data to support students proactively and collaboratively, and evaluate and communicate effectiveness.

Chapter 1 introduces the topic of using data in schools and offers guidance on how to design the school to reach its vision. **Chapter 2** takes a look at data used in schools and presents a framework for thinking about whether those data are useful for structuring school improvement work. It describes the properties of data that make them useful for improvement: predictiveness, causality, clarity, availability, and malleability, as well as the standard markers of data quality—reliability and validity. **Chapters 3** and **4** provide an overview of metrics commonly used in schools and the extent to which they hold those properties. The chapters address common myths and assumptions about data that divert attention away from focusing on the metrics most useful for supporting students' educational outcomes.

The last two chapters discuss practices for supporting data use. Based on research on successful school leaders, they summarize practices found to distinguish leaders whose schools improved student outcomes from respected school leaders whose student outcomes showed little improvement. They also describe ways that school leaders can organize data to achieve the greatest impact. **Chapter 5** focuses on data for communicating a compelling vision for the school community and then setting particular goals for meeting that vision—goals that have high leverage for achieving the vision you want for students and that are attainable. **Chapter 6** gets into the nitty-gritty of data for planning and evaluating strategies to support individual students, making school-wide changes to practice, and communicating with students and families.

Each chapter closes with Key Takeaways and Reflection Questions to help you think through your own situation and how you can achieve the best outcome for district, school, staff, and most importantly, your students.

My hope is to utilize the tool of strategic data use to empower school leaders to drive meaningful and lasting change. By focusing on high-leverage, actionable data—such as course grades and attendance—principals and superintendents can move beyond compliance-driven metrics and instead foster a culture of continuous improvement. This book encourages a shift toward collaborative, reflective practices through which teachers and staff use data to innovate, evaluate, and refine strategies together. It equips educators with the tools to implement EWI systems and MTSS, enabling early intervention and reducing the need for crisis responses. It describes practices for interpreting disaggregated data across student subgroups, to strengthen equity and inclusion, helping uncover and address disparities in opportunity and achievement. School leaders will learn to identify measurable, attainable goals that unify staff, students, and families. Finally, teachers will gain strategies to use classroom-level data, student surveys, and observations to reflect on and improve their instructional practice within a culture of trust and professional growth.

CHAPTER 1

Designing the School to Reach Your Vision

Data can be used to focus attention in the right way, on the right students and the right issues, at the right time. Data systems need to focus attention on the most actionable data, and choices about the specific metrics created from data matter considerably, including thresholds or benchmarks to make meaning of the data. You can have improvement in outcomes only if you have change in practices. Therefore, the people changing their practices—whether principals, teachers, staff, students, or families—need to be the people using the data.

The people changing their practices need to be the people using the data.

Results With the Right Data

To illustrate the difference that focusing on the right data can make, let's take a look at the high school graduation rates in Chicago Public Schools. In the 2010s, high schools in Chicago started using data in a new way to support students to graduate. Based on evidence of what data mattered—and what did not—school teams organized around monthly data reports on ninth grade course grades and attendance. The goal was to make sure all students finished their ninth grade year on track to graduate, which meant that they had enough credits to move on to 10th grade and failed no more than one semester of a core course.

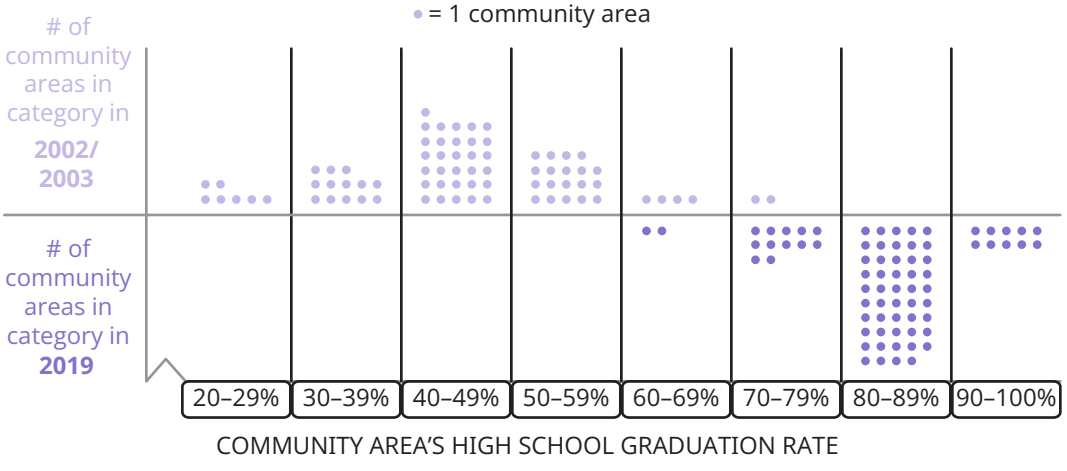
In 9 years, the Chicago high schools showed a 27 percentage point increase in 4-year high school graduation rates (from 51 to 78%). Four-year high school graduation rates are now at 85% in the district. That is about at the national average, even though greater than 80% of students in Chicago public schools are economically disadvantaged. Furthermore, nongraduates are now likely to be students still in

school after 4 years, whereas before they were predominantly students who left school without a diploma. Schools weren't just passing students through; while more students graduated, average test scores, grade point averages (GPAs), advance placement (AP) courses taken, and AP test pass rates among graduates also increased. This was a double win: Many more students were graduating from high school, and they were graduating with higher achievement than in the past. College enrollment rates increased, and now thousands more Chicago graduates earn college degrees each year than they did 15 years ago, even while enrollment in the district has declined.

Students of all backgrounds had higher graduation rates, and improvements were largest among those groups whose graduation rates started the furthest behind—students from the lowest income neighborhoods and Black and Latino young men. In a city that is highly segregated by race and income, students' likelihood of graduating used to be strongly defined by the neighborhood in which they lived. As shown in Figure 1.1, in the 2002–2003 school year, there were large differences in graduation rates across different communities in Chicago, ranging from less than 30% of students graduating high school to close to 80%. By the 2018–2019 school year, students' neighborhoods no longer strongly defined whether they would graduate high school. Graduation rates among students who lived in almost all neighborhoods were greater than 70% with graduation rates between 80 and 90% in most neighborhoods (McKoy et al., 2021). All communities showed increasing graduation rates, and the changes were largest in the communities where students had been least likely to graduate.

FIGURE 1.1: CHICAGO HIGH SCHOOL GRADUATION RATES 2002 AND 2019

High school graduation rates by Chicago's 77 community areas dramatically increased between 2002/2003 and 2019



SOURCE: University of Chicago To&Through Project, created from data in McKoy et al. (2021).

This happened through continuous improvement, with schools figuring out strategies based on data, and then other schools learning from them, with each school continuing to make improvements in subsequent years. The secret was focusing on the right metrics at the right time (ninth grade attendance and course pass rates) with the right strategies.

In the first year that information about the freshman on-track indicators became available, the 2007–2008 school year, three high schools (out of 117) showed large improvements in ninth grade on-track rates. The next year, the Department of Graduation Pathways in the central office developed and implemented an Early Warning Indicator (EWI) system for high schools, putting out monthly reports showing which ninth graders were at risk of ending the year off track based on low attendance or low grades. Some schools also received funds to hire on-track coordinators charged with figuring out how to effectively use the data reports, and the district provided supports for those coordinators as a learning community. Several other schools joined together in their own learning community, called the Network for College Success (NCS), to support each other to improve freshman on-track rates. NCS brought school leadership teams together with researchers and skilled facilitators to look at each other's freshman on-track data reports and share strategies. That year, 17 additional schools showed improvements in freshman on-track rates, while the first three schools improved even more. In the following school year, the schools that showed improvements in the prior 2 years improved their freshman on-track rates even more, while more schools started to show improvements, and that growth continued in each subsequent year (Roderick et al., 2014). By the 2018–2019 school year, 89% of ninth graders were on track to graduate at the end of their ninth grade year.

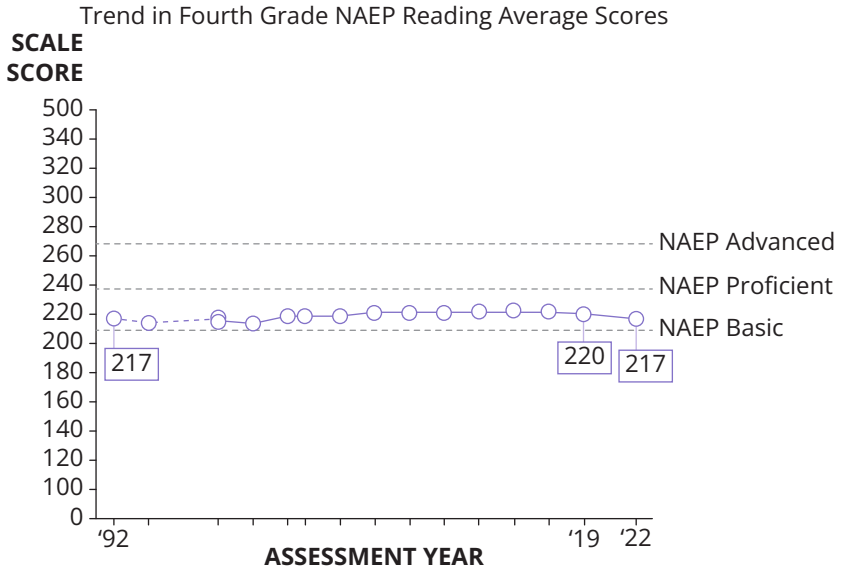
As those freshman cohorts moved through high school, graduation rates rose by about the same percentage points 4 years later. Students were more successful, teachers felt empowered, and school administrators saw changes that had seemed impossible happen in their schools.

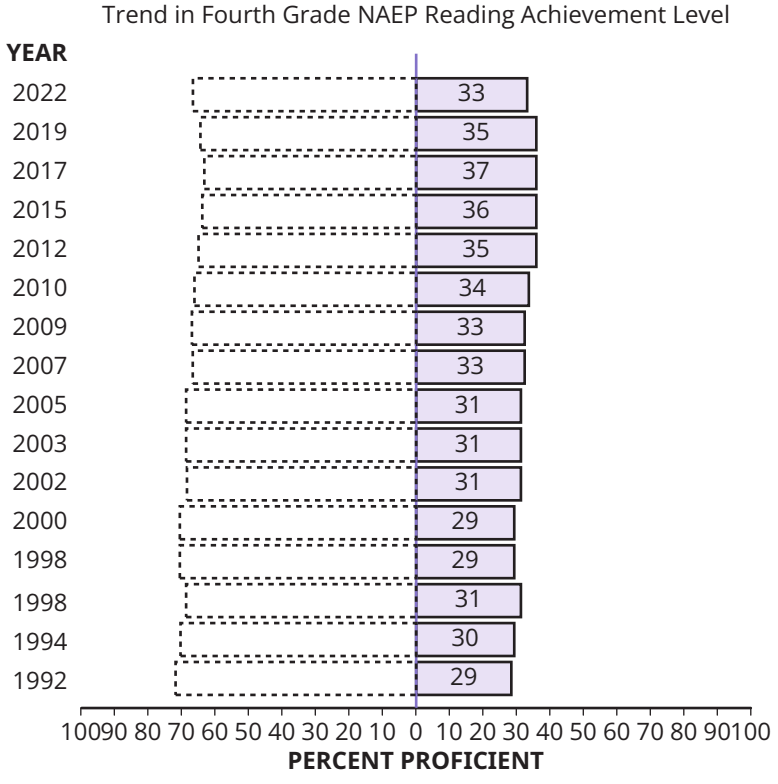
Focusing on the Wrong Metrics

I often hear teachers and school leaders share their frustration about the lack of improvement in student outcomes. *Why is there so little change in the percentage of students who meet state standards? Why do so many English learners never reach proficiency? Why aren't our dropout prevention programs successful?* The answers to all of these questions can be seen in the data, but data are often presented in ways that obscure what is happening.

Consider the changes that have occurred over the years in the percentage of students meeting proficiency benchmarks on the National Assessment of Education Progress (NAEP), shown in Figure 1.2. Think about all of the policies and resources that have been directed at improving reading scores in this country.

FIGURE 1.2: NATIONAL TRENDS IN FOURTH GRADE NAEP READING SCORES





SOURCE: NAEP, 2022. Taken from U.S. Department of Education ([n.d.]), the NAEP Report Card at https://www.nationsreportcard.gov/reading/nation/scores/?grade=4.

With the exception of standardized scores in mathematics, there is probably no other outcome in schools that has received such concerted efforts regarding improvement. With all this effort, average scores in fourth grade have mostly fluctuated between 217 and 223 for the last 30 years (which is like moving between the 50th and 57th percentiles), whereas the percentage of students reaching proficiency has risen from under 30% to 37% at its high point. Why hasn't there been more progress?

Could it be that we're focused on the wrong metrics? Could it be that we are interpreting them incorrectly or using them in an unproductive way?

Although dramatic improvement is possible through the use of data, far too often metrics that are the most useful for improving student outcomes are looked over or dismissed in favor of metrics that seem on the surface to be important but have little utility for actually producing change. One of the founding leaders of the NCS, Sarah Duncan, said that what was crucial to the success of the freshman on-track initiative was that it didn't only put something new on the table for people to focus on, but it took off other things that weren't as important. Choosing the right metrics to focus on is the first crucial element of using data for improvement.

The second crucial element is building organizational structures that support the productive use of data. You need intentional structures for using data, such as reserved time for discussing and planning, reports that organize data in a clear and useful manner, protocols for having candid discussions, and timelines for acting and evaluating the effects of those actions. Without those structures, data end up sitting on a shelf or going into a trash can. The data may be used for evaluation but not improvement. Using data for improvement requires intentional work; it takes time to set up productive structures and get buy-in. But it is work that eventually makes other work easier, allowing students and teachers to feel more successful. It can, and should, be used as a means for supporting collaboration in the school, helping build trust across the school community.

Improvement Requires Change

You may have heard the expression that "every system is perfectly designed to get the results it gets," which has been attributed to W. Edwards Deming. It's true about schools, like any other system. You need to change the system to get different outcomes. That means changing established practice—and changing established practice is risky. If things get worse, people will complain that you are not following standard practice. And even if things get better, that improvement might not be obvious, and it may come with some negative consequences that also have to be addressed. There will always be pushback, and you need to know whether that pushback means that things are not working or if you have evidence to stay the course. You need data and evidence.

There is only one way to reach your goals. You need to organize the school to collaborate on continuous improvement. The change has to come from people working in the school because it is their work that needs to change and they need to believe in what they are doing. It has to be done collaboratively. Nobody can change school outcomes by themselves, even a superstar. The way school leaders organize others in the school around data will determine whether the work is successful. Think of it as a multilayered process of design. As a leader, you are designing the conditions that lead your faculty and staff to use data to design their own work, setting the conditions for students to be successful. Then you are helping them determine if those changes result in improvement. It is a process of continually looking at the data, making decisions, and then looking at the effects of those decisions with more data at the classroom level, the initiative level, and the school level.

Before getting into all of the details, let's take a step back and think about what it means to work toward improving educational outcomes and what people mean by evidence-informed practice.

What Is Evidence-Informed Practice in Education?

Data- and evidence-based practice can mean different things to different people. Here are some examples of the many ways people in schools and districts typically use data:

- To choose programs and policies
- To guide student support systems and instructional planning
- To set goals
- To support instructional coaching

Choosing Programs and Policies

One way to think about using data in decision-making is enacting programs or policies with strong evidence of effectiveness. In these cases, the data come from studies of programs or policies implemented in other places. Federal grants are set up to encourage schools and districts to use programs in which there is evidence of effectiveness to receive funding. A program with evidence of effectiveness has a better chance than an unproven program to be effective—and less of a chance of negative, unexpected consequences. Yet, there is always the question—will it be effective in your school or district in the way that you plan to implement it?

Are proven programs generally effective when they are implemented in new sites? Unfortunately, the answer is often no. We live in complex social systems, which means something that worked in the past, or worked for someone else, may not work as you expect in your school setting.

Logic says that if you implement a program that was effective in one place, you will see the same results in another. But implementation conditions are never exactly the same in a new time and place. That means you could try a string of programs with evidence of effectiveness, one after another, and end up with no improvement in outcomes but probably a big increase in cynicism at your school about trying "the next new thing." Jim Manzi (2012), who wrote a book about learning through experimentation, cleverly described the process of learning through experiments under natural conditions, which are filled with uncertainty, as like "find[ing] our way through a dark room by bumping our shins on furniture."

All this is to say it's not enough to adopt a program with evidence of effectiveness—although that could be a good first step. Whether you're adopting a program that has been effective elsewhere, or creating your own school-based initiative, you need to track process data to see if the new program is producing the change you want to see. Everybody thinks their plans will be successful, but they never work exactly as you think they will. You cannot predict all of the outcomes in a complex social system. By tracking the right metrics, you can see if your changes are having the intended effects—or if you need to rethink how you are working on your goals. It's the use of your school data that is the focus of this book.

You also can't expect to achieve large-scale change or continuous improvement by investing in the right program, unless it is a program that focuses on continuous improvement and data use. Consider this: Let's say a school adopts a program that has been shown to improve standardized math scores by five percentile points and math GPAs by 0.2 points—which would be considered a successful program in the universe of successful mathematics interventions. They implement it perfectly, and it works as well as expected based on the prior research. That's a one-time gain. But what if you want to increase test scores and math grades more than five percentile points? Even if the program brings the intended benefit, it is unlikely to continue to show a benefit beyond that initial gain unless it is part of a continuous improvement effort.

That requires using data. The freshman on-track initiative produced dramatic change in Chicago because it was an initiative that was focused on using data to continually innovate. It did not tell schools to do any specific practice except to get together around data reports, try new strategies, and look at the results.

MTSS, Early Intervention, and Instructional Planning With Student-Level Data

There are many ways that you may use data about individual students to tailor instruction to best meet individual needs. Classroom teachers may use formative and interim assessment data to plan and adjust instruction. Multi-tiered systems of support (MTSS) or behavioral health teams may use data on attendance, grades, assessments, or behavior to identify students in need of interventions. High school grade-level teams may use EWI and college readiness indicator (CRI) systems to support goals regarding educational attainment. This is where the rubber meets the

road in daily school practice. You need systems that will help you and your team members make good decisions about how to best support students.

Human beings are not necessarily good at predicting outcomes or knowing where to put their effort to have the greatest impact. For example, our brains are wired to focus on problems, and the harder the problem, the more likely we are going to worry about it. So, your school staff will be likely to focus their attention on problems that are the most difficult rather than areas on which they can have the largest impact. That can lead people to put a lot of time into efforts that have little payoff while ignoring issues that start small and become big later.

School staff will be likely to focus their attention on problems that are the most difficult rather than areas on which they can have the largest impact.

As an example, in the late 1990s, when I first started working with city and district officials interested in improving graduation rates in Chicago, conversations often turned to students returning from incarceration or pregnant and parenting students. Strategies to address graduation rates were often programs and classes for students who had failed half of their courses or were rarely attending school. Subsequent research showed that students failing half of their classes had a 3% chance of graduating. Even if a program were incredibly successful and doubled students' chances of graduating (from 3 to 6%!), it would not get most of its participants to graduate. At the time, the district had about a 50% graduation rate. That meant that the typical student was at risk of not graduating, not only special populations of students who were extremely unlikely to graduate. Yet, the typical student was not seen as at risk until they were also failing half their classes.

By intervening early, educators can prevent small problems, such as a few course absences, from growing into major obstacles, such as course failures, accumulating more failures, and eventually leaving school without graduating. Early intervention requires fewer resources and makes it easier for the intervention to be successful because students are not so far behind. It also reduces the number of students who eventually need substantial interventions, making it possible to actually give those students the intense supports they need.

Using data as a means of encouraging teachers and staff to reach out to individual students and families can also be a mechanism for building trust. Students can fall behind—missing class, homework, or being confused about course content—for many different reasons. If nobody says anything, and they keep falling further behind, they may take it as a sign that it doesn't matter and continue to fall behind, or as a sign that nobody cares and feel increasingly resentful and disengaged, or both. When a teacher reaches out at the first sign a student might need help to get them caught up, and makes sure they get caught up, the teacher shows they care. Ultimately, the thing that students and families most want from their teacher and school leaders is to help the student succeed in school.

Goal Setting and School Improvement Planning With School-Level Data

Whether you are adopting new programs, or developing in-house strategies, you probably use school-level data to help shape your school's vision and set goals to achieve it. This is a crucial role for school leaders that supports any change that is likely to happen. When setting these goals it is critical that they be attainable and that they matter for the well-being of students. In my work, I often see goals set for schools that are not attainable. Often this is because the goals are based on metrics that are not sufficiently malleable or because they have chosen interim goals based on data that are not highly predictive of the larger goals they are trying to reach. Choosing unattainable goals is a recipe for burnout and finger pointing. Choosing attainable goals, and then achieving those goals, builds momentum and buy-in for more improvement work. As a school leader, you need wins. And you need to keep track of those wins to keep the momentum going.

I have also seen schools set goals that are tangible and attainable but don't have major impact on students' long-term outcomes. Even if you achieve them, you will not ultimately reach an ambitious vision for students in your school. You need to ask how predictive they are of outcomes you care about most for students.

> Choosing attainable goals, and then achieving those goals, builds momentum and buy-in for more improvement work.

Improving student outcomes on a large scale requires system-wide solutions. Good data at the classroom or school level can help track how well school practices are working by giving early signs of progress toward outcomes that occur many years later. Setting-level data can be used to test assumptions, helping identify areas where school structures are not operating as expected. This focus on data can lead to changes in adult behaviors and school systems so that they are more effective in supporting students.

Setting-level data can be summative or formative. Summative metrics provide information at the end of the year about how well the school met its goals around the data metric. Freshman on-track rates in Chicago, for example, provided information to schools at the end of the year on how many of their ninth graders made sufficient progress to be likely to graduate high school in 4 years (less than one semester F and sufficient credits). Schools in Chicago use this information, holistically and broken down by student subgroups, to evaluate their efforts over the prior year. This information is useful for school improvement planning for the following year. But summative indicators do not allow for quick feedback on practices. It is not efficient to wait a year to see if new school practices had the intended result.

Formative setting-level data that are available repeatedly throughout the year allow for much more rapid feedback about whether and how practices are working. This allows educators to continually work on improvement. For example, because

attendance is strongly related to on-track rates, and attendance data are available on an ongoing basis, classroom or school-wide attendance rates can be good setting-level data to monitor ninth graders' progress in a formative way. Schools can set goals regarding attendance and monitor them weekly or monthly to determine whether new practices are showing improvements in those attendance indicators.

Some setting-level metrics are developed by aggregating student-level data. It is often helpful to look for patterns in the data based on student characteristics (e.g., demographics, prior academic achievement) and school groupings (e.g., period, teacher, subject) to understand the dynamics of student performance. For example, a school that has considerably higher graduation rates among their girls than their boys might monitor gender differences in ninth grade course failure rates—an early indicator of high school graduation—to test strategies intended to reduce the gender gap in graduation. School leaders may track the percentage of students earning Fs in their ninth grade year as a setting-level indicator and then compare failure rates across different classes and teachers. If course failure is clustered in a few classes, interventions might be more appropriately provided to teachers or departments rather than individual students. In contrast, if students are failing classes without a strong difference across subjects, the level of intervention may be more appropriately targeted at school culture and support structures. They can also use patterns in the indicators to better understand inequities in subgroup educational attainment in their context.

Setting-level metrics can foster a collaborative school community. As student-level indicators can be used to guide collaboration around individual students' goals, setting-level indicators can provide information to students and their families about the school's progress toward common goals. This can help make connections for families between the messages they receive about their child and the larger efforts occurring at the school. For example, a school might regularly send out information about its progress in meeting overall attendance goals along with a summary of research findings on the relationship between attendance and learning gains or educational attainment. This can help families make the connection between their own child's attendance, their goals for their child's educational attainment, and the broader goals of the school. It also provides accountability to families, showing the degree to which the school is meeting students' needs and being transparent about where there is a need for further work.

Instructional Coaching With Teacher- and Classroom-Level Data

Data are also key to supporting teacher development, keeping conversations focused on shared goals regarding how to further meet students' needs and boost their academic outcomes. There is clear evidence that some teachers are more effective than others with the average student and also that different students respond differently to different teachers. Teachers have different strengths, and the job of teaching is so complex and could vary so much from one class to another that there will always be more to learn

and consider. Even the most effective teacher is likely to have more success with some students than with others. Students bring their own perspectives and challenges to the classroom, which means each person may experience the classroom differently.

Teachers aren't mind readers. They don't necessarily know how students are experiencing what they do in the classroom—or they may miss signs that students are struggling—unless they have data that show their students' perspectives and outcomes and an opportunity to process those data with others.

Teachers aren't mind readers.

Teachers also can't read the future—they don't know how well they have prepared their students for the future without data on their students' subsequent performance. They may not realize how successful they have been in preparing students or where they could modify their practices to better prepare them for the future. They need to focus on metrics that are strongly predictive of students' long-term outcomes. Elementary grade teachers need to know what matters most for the middle grades and high school; high school teachers need to know what matters most for college, career, citizenship, and well-being.

Teachers also can't read the future.

An old-school perspective sees teachers as either effective or not effective. Traditionally, evidence has suggested that teachers improved their practice during their first couple of years teaching, and then their effectiveness stayed about the same for the rest of their careers until tapering off before retirement. If there are not strong structures in the school to collaborate around data and provide support for innovating, then teachers may not improve their teaching much over time. In that case, data can be used to identify teachers who are effective from those who are not to make human resource decisions about who to retain or promote and who to let go. There is evidence that strategic human resource decisions are associated with stronger outcomes for students. Yet, that is a costly and inefficient way to go about improving schools because it takes time and effort to recruit new teachers and for them to reach their peak effectiveness without a guarantee that the new teacher will be more effective than the teacher who left. Constant turnover also is debilitating for school improvement efforts, which require sustained effort and momentum.

Even more important than having strong individual teachers is having a culture of teacher collaboration and support so that all teachers are more effective. In a wide-reaching study that looked to identify which characteristics of schools were associated with strong improvements in test scores in Chicago, we found that teachers' qualifications were far less important than the professional community among teachers and the degree to which teachers took collective responsibility for the school (Bryk et al., 2010). In fact, teacher backgrounds were only related to improvements in schools without a strong professional community among teachers or high-quality professional development. In other words, schools without a

collaborative learning culture among teachers seemed to need particularly highly qualified teachers to show improvement. Teachers also tend to show better instructional practices, as measured by observations of their instructional practice and by their value added on students' test scores, in schools with more trust and commitment among school staff (Jiang & Sporte, 2016).

Teachers' growth does not stop after 3 years in schools with strong collaboration. Their individual effectiveness continually grows if they are in schools characterized by trust, openness, and a commitment to student achievement and where there is a high degree of collaboration among teachers—where teachers collaborate to refine their teaching practices and work together to solve problems in the school (Kraft & Papay, 2014). Strong networks among teachers can sustain the impacts of instructional improvement initiatives after the supports provided by the initiatives are withdrawn (Coburn et al., 2012). Data can be used to monitor the degree of trust and collaboration in a school and to inform professional learning and teacher collaboration. One example of this comes from a field experiment that paired high-performing teachers with low-performing teachers at the same school and tasked them with working to improve the specific skills identified in the low-performer's performance review. Not only did student performance in the classroom of the low-performing teacher improve, but also the improvements continued in the following year (Papay et al., 2020).

Data Are the Starting Point to Productive Conversations

It goes without saying that only having access to the right data, even if they're organized in meaningful ways, does nothing for school improvement. Change happens from the conversations and actions that emerge around the data. Data help move conversations from a focus on extreme cases and hearsay to conversations about the most prevalent issues and what is really happening. There may be different opinions about what actions to take, but data provide an anchor that keeps those opinions grounded with some common understanding.

Ideally, systems built around good student-level data, such as EWI and CRI Systems and MTSS go beyond simply assigning students to a particular intervention. As adults reach out to students to learn why students are struggling, they build better relationships with students and increase engagement in school. Students learn that they are not alone in their struggles and that adults are willing to help them succeed. This helps prevent them from struggling again in the future. Thus, data become means by which to build stronger relationships with those students who most need help.

Effective systems for using data are highly collaborative. Student-level data can be used to bring teachers, school staff, families, and students themselves together to develop plans for helping students reach their educational goals. School-level data can be used to figure out ways that teachers, school staff, students, and families can support each other regarding their common goals for students in the school. Thus, data systems can be a mechanism for increasing collaboration in the school around student-centered goals.

Communicating Connections Between Current Practices and Later Goals

Students and their families need to know that the effort they put in to getting to school and completing assignments matters for later outcomes. They need to know how to prepare for high school graduation and college. Without the signal provided by data, students and families may not be clear about what is required to reach their long-term educational goals. Are they doing enough? Can they rest easy, or should they push even harder? What if that means giving up time for leisure, socializing, enrichment, or sports? Often, teachers are not sure themselves. Telling students they "need to work harder" or "attendance is important" is different from showing them how the probability of graduating or going to college changes based on their grades, attendance, or test scores. Data that are communicated clearly and accurately, which meets the five properties discussed in Chapter 2, should empower students and families to take control of their education. Strong data systems provide clear, shared goals that school staff, families, and students work together to achieve.

Without the signal provided by data, students and families may not be clear about what is required to reach their long-term educational goals.

Fostering a Collaborative School Community

As student-level indicators can be used to guide collaboration regarding individual students' goals, setting-level indicators can provide information to students and their families about the school's progress toward common goals. It also makes schools accountable to families, providing assurance that school staff are providing an environment where students are likely to succeed and working to improve those areas of performance that are weaker than desired. Almost all schools have some strengths and other weaknesses, and it is important to celebrate successes to build community and to build collaborative efforts around those areas that should improve.

What the Data Represent Is Most Important

Ultimately, we care about monitoring data in schools, and reaching goals around data, because those data represent something that is important for students. It can be easy to focus on the data as a goal when the data matter only to the extent that they represent something that is happening with students or their school environment. That's why it is so critical to get the data right—good metrics help adults in the school community better support their students, whereas poor metrics are distracting at best and harmful at worst. We want to focus adult effort on practices that ultimately result in better developmental experiences and outcomes for students.

Families, educators, and the public often see schools as the mechanism to achieve many diverse goals for students. Schools prepare students for life's challenges by helping them develop the knowledge, skills, and attitudes that will lead them to succeed in careers, family, health, citizenship, and more. School leaders are unlikely to have data on those broad, long-term outcomes for students. The metrics they focus on should be building blocks to attain these broader outcomes—that is, the available data that provide the best indication of how well schools are preparing students to have long-term success in these broad areas. We care about the metrics because we believe they signal something that matters to our long-term vision for students.

Some data metrics have been shown to have strong relationships with a variety of later-life outcomes. For example, a high school diploma is one of the most predictive indicators of just about any life outcome that people care about—from labor market success to incarceration, health, and even length of life. Likewise, a college diploma is highly predictive of earnings, career, and a host of health outcomes. As a result, goals regarding increasing students' likelihood of graduating from high school, going to college, and earning a college degree are a major focus of most schools and districts. We care about them because they seem to directly matter for life success.

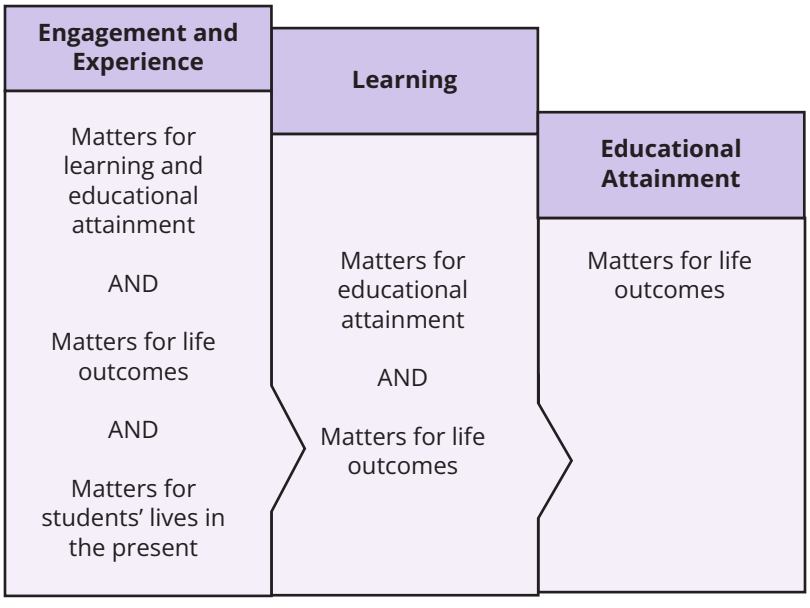
Do all students need to graduate high school and go to college to have successful life outcomes? Of course not. And that's one reason we don't want to focus on metrics to the detriment of what is in the best interest of students—the person who has an amazing opportunity without formal education should be able to pursue their passion without feeling like a school has somehow let them down. Yet, for most students, attaining the credential will open opportunities and allow them to develop skills that will benefit them in the long run. Therefore, schools may not aim for 100% college enrollment and degree completion, but if 80% of their students aim to get a college degree, they might aim for 80% getting one and the others having fulfilled the steps needed for their alternative path. To know whether these goals are on track to be met, schools can use indicators of achievement such as course grades and gains on standardized tests to examine two different things that both matter: 1) whether students are gaining knowledge, skills, and learning habits that matter for success in life and 2) whether they are making progress toward educational attainment outcomes. Both matter.

In addition to data on educational attainment and student achievement, there are many metrics that capture the ways in which students are experiencing school—how engaged they are in learning (e.g., attendance, study habits), and the types of experiences they have in school (e.g., coursework content, challenge, perceptions of relevance). School provides many developmentally meaningful opportunities for students that can lead to positive effects on diverse types of long-term outcomes. Schools can also unintentionally have negative effects on students' development. These experiences matter, in part, because they determine the degree to which students are able to gain academic skills and knowledge and progress toward higher levels of educational attainment. They also matter because those experiences affect students' development in ways that may not even be obvious in metrics of

achievement or educational attainment—affecting their beliefs and attitudes about themselves and their world, their values, and their interactions with others (Nagaoka et al., 2015). They also matter keenly to families who care about their students' lives in the present and want to know that their loved ones are experiencing an environment that is safe, supportive, and challenging, where they feel they belong and are doing meaningful and interesting work.

Because there is an overwhelming number of metrics we could potentially produce, we need to make choices about what it is we are tracking. We need to know that the metrics are strong indicators of something we care about for students in the present or that they matter considerably for something we care about in the future (see Figure 1.3). We care about academic learning not only because skills and knowledge matter for educational attainment but also because skills and knowledge are important for living healthy, happy, productive lives. But here the choice of metrics can get tricky. Ultimately, the purpose defines how we evaluate the metrics (e.g., do they matter for students now or in the future?). It also affects how we communicate about the metrics as we develop systems for using data to improve schools. If a metric is not important for students today, then it needs to matter for students' academic growth or affect their later life outcomes. Otherwise, why do we bother to track it?

FIGURE 1.3: DATA MATTER FOR DIFFERENT REASONS



Data for Accountability Versus Improvement

Is data for improvement the same thing as data used in state or district accountability? Probably not—although they should be aligned so that accountability metrics will change if the data used in schools change. All of us need a little

accountability for motivation, especially when doing something new or difficult. But that accountability has to be focused on goals that are attainable and perceived to be important and fair. For many school staff and educators, school data are not seen in a positive light because data have been used in a punitive way or to exert pressure in ways that lead to inappropriate practices.

Any public reporting of data has some degree of accountability because people will be concerned about how they or their school are represented. You can think of public reporting as "soft accountability." The stronger the sanctions associated with accountability, the greater the chance that people will try to corrupt the data or perceive the data to be corrupted by others, making them unlikely to trust data at all.

Putting a metric into an accountability system can bring attention to factors and data that people might not otherwise prioritize in the midst of competing goals. For example, putting the freshman on-track metric in the district accountability system in Chicago provided an incentive for high school staff to put more attention on students' outcomes in the ninth grade year. This may sound crazy now, but we also saw that when the district enacted accountability based on standardized test scores in the 1990s, instructional practices around mathematics shifted in the middle grade years so that teachers were more likely to teach grade-level mathematics than before. Previously, many students received similar content from fifth through eighth grade, and this shift in practice was associated with gains in students' math scores. So, accountability metrics can focus attention in new ways that have the potential of being beneficial.

At the same time, if people being held accountable for school outcomes do not have strategies and means for realistically reaching the goals that are set, then accountability metrics are simply labels, not tools for improvement. The metrics can easily be seen as unjust, even if they represent outcomes that are important to students, given that schools and teachers serve different populations of students and families with different resources and constraints for supporting students' learning and engagement. That can worsen inequities in outcomes across students and schools. We've seen this in Chicago. The accountability policy that shifted instructional practices in mathematics in a good way also led to a narrowing of instruction, so students were less likely to get instruction in science and social studies, especially in schools with the lowest tested achievement levels. And schools serving the most economically disadvantaged students became at risk of being closed with students having to change schools (which we found negatively affected students' test scores), even in schools that showed assessment gains on par or better than other schools in the district (because school accountability was focused on attainment rather than growth).

Data used for accountability are supposed to motivate efforts for change. But it is difficult to take in negative information about yourself, your school, or your practice. The most natural reaction is to say the data are bad. Even neutral ratings can be de-motivating to people who are working hard and believe they are having a positive impact. Delivering negative information has to be done in a way that people feel supported to act. That means addressing their concerns about bias or bad

data—look to see if they are right. If they are, do you need to adjust the metrics or acknowledge the differences and provide resources and supports to make up for unequal expectations? Even if there is no bias in the data, people still need time to process bad news and come to accept it. Then they need time to figure out what to do next. This has to happen in a way where they do not feel under threat: nonpublic with supportive colleagues or coaches. Processing and thoughtful planning cannot occur when people are under a spotlight and feel threatened.

Processing and thoughtful planning cannot occur when people are under a spotlight and feel threatened.

All of this suggests caution about publicly reporting metrics being used for continuous improvement and a warning about incorporating them into accountability systems that contain hard sanctions. School teams need to be able to process these data in a nonthreatening way without incentives for corrupting the quality. Metrics used for big school goals might be public (e.g., graduation rates, gains on math assessments, school climate ratings), and might be included in accountability systems, but the nitty-gritty data used by school teams to evaluate their own practices should be private—although aligned with the big goals represented by the public data (e.g., monthly data on students' grades, classroom observations of instructional practices, quarterly short student surveys on perceptions of their classes).

In Chicago, adding ninth grade on-track rates to the accountability system did not, on its own, lead to improvements. It started out as another metric that came at the end of the year on which school leaders felt judged. On-track rates improved only after the district developed systems around real-time data, along with supports for using those data for supporting practice, not for evaluating teachers or schools but for allowing teachers to be reflective and collaborate around common goals. Incorporating the metric into the accountability system may have encouraged schools to use the real-time data reports and change practices, but accountability by itself was not effective.

Using Data to Support Success, Not Add Burden

Working with data in schools may seem like a lot of work, but if you focus on the right data, it should make everyone's jobs easier. Focusing on the right indicators means letting go of things that don't matter as much, and letting people put their attention on the things that ultimately will have the biggest impact on students. It prevents students from struggling early on so that teaching and learning is easier and there is less of a need for intervention. And it allows for more coherent collaboration across students, teachers, staff, families, and administrators, providing a broader base of support for everyone in the school community.

In Chapter 2, I discuss six properties of data that we need to consider when deciding which data to use for school improvement. Chapters 3 and 4 share specifics about particular kinds of data used in schools, bringing out assumptions and little known facts that influence how useful particular data metrics are in

practice—whether they provide information that can be used for a specific purpose or are likely to lead to counterproductive practices for students. Chapter 3 digs into data used to capture student learning in school, standardized test scores and student grades, whereas Chapter 4 discusses data on engagement and school context—attendance, student surveys, classroom observations, and the breadth of opportunities that students have. The final chapters describe the ways data are used in schools, bringing out specific metrics that work well for different purposes—whether setting school-wide goals as discussed in Chapter 5 or using data throughout the school year to work on particular strategies discussed in Chapter 6. As a result, you will understand how data can be used to make success easier rather than feel like a burden to those who use it or are held accountable by it.

KEY TAKEAWAYS

- Large-scale improvement requires the use of data—not only buying the right program.
- Choosing attainable, meaningful goals is critical—and not all data will get you there.
- The rubber meets the road in how schools are organized to use student-level data, but setting-level data are needed for large-scale systemic improvements.
- Data are a communication tool; fostering productive conversations about data ultimately leads to school improvement.

Reflection Questions

- What are the current data metrics your school or district relies on most heavily?
  - What data do you primarily use for goal setting, student support systems, instructional planning, and instructional coaching?
  - Do you care about these data because they represent student well-being in the present or because they represent progress toward other goals (e.g., future outcomes or potential effects on students)? If the latter, what evidence do you have that they are strongly associated with those student goals?
  - Are there metrics you track that seem to move little despite concerted effort at change, or that seem to change randomly from one year to the next, or that you or others in the school do not trust for some reason? Consider their properties as you read the next two chapters.

- How are conversations about data currently structured in your school(s)?
  - What structures do you have set up to use data with teachers, staff, students, and families?
  - Do people use data to collaborate? Do they see it as purely evaluative or punitive, or do they use it as a conversation and action tool?
  - Are the people reflected in the data (students, teachers, parents) involved in analyzing the data and deciding how to act on it?
- Do you use data to drive change in practices or mostly justify the status quo?
  - When your data reports are different than expected, do you dismiss them as being flawed? (That is the natural thing to do, and that's always my first reaction as well as everybody to whom I've presented data.) Try shifting your perspective when that happens and asking the following:
    - What if this is correct? What would that mean?
    - Are there other data that might provide additional evidence on whether this is true?
  - Does data use in your school seem helpful or burdensome?