WHATEVER SUCCESS human society has mustered over the past hundred y
is in large measure a result of widespread educational investment by nat
in the skills, attitudes, and behaviors of all children. Schools are part of
essential fabric of life in a modern society. Although schools are so c
monplace we often overlook them, they play a crucial role in the makin
our social world. In the global community, a high-quality public syste
education is the *sine qua non* of a modern democratic society. Many ec
mists and others who study how nations develop stress that high-qu
schools are essential for the human capital development and econo
growth of nations (OECD, 2001). Beyond economic development, a na
would be hard-pressed to consider itself a functioning country witho
national system of education.

With all the importance attached to schools, it is no wonder that po
cians and policy makers around the world place much emphasis on pro
ing quality public education to their constituents. Operating and regula
a nation's schools—public or private—is of extreme importance to nati
leaders, and governments everywhere guide and direct the kind of ed
tion that children receive. In a very short time, public schooling has bec
the major means by which governments try to promote positive econo
change, strengthen national identity, and inculcate citizenship values and
havior in entire populations of people. Consequently there is incessant p
lic discussion about schooling, and political campaigns in all sorts of nat
make educational policy and the performance of schools a central poin

By and large, most people most of the time think about educatio
solely a national undertaking. The trends we examine here, however, lea
quite a different vision, one where there is a considerable global proce

nation's) schools as separate national entities. After all, what could b
deeply embedded in a nation's society than its schools preparing c
for future adult lives in that country? The reigning image of educat
day is that schools are designed and managed within a national con
the specific needs and goals of a particular nation.

This vision also assumes that schooling is organized to educate
cialize children in a specific way that is directly linked to the future
of a particular nation. For example, German schools are thought to p
German adults with the technical skills, linguistic capabilities, and
awareness necessary to carry forth the entity of Germany into the fu
national product of educated citizens issuing forth from the school sy
the main image of what schooling does in every nation. Educators
aware of the larger global world, but their predominant image of a
schools is as a means to pass on a sense of national uniqueness and h
as well as meet the technical needs of its particular labor market. Thi
implies that schooling is limited to the specific needs of a nation, th
schooling would not expand except as is needed for national reason
would schools engage in education that is separable from traditiona
of the nation. Additionally, this image of schooling holds that becaus
markets are hierarchical, so should schooling be hierarchical. For eff
the argument continues, the best and the brightest of a nation dese
best educational opportunities for the best national outcomes, an
with lesser endowments should receive less. All of this is wrapped up
picture of a national system of education operating uniquely to prod
ficiently adults with the kind of skill necessary for a range of tasks in
bor market and adult life within a national context.

This common image of schooling bound up in a national contex
ther reinforced by the rhetoric of official comparisons of educatio
nations (Schümer, 2004). Observing schooling across nations is tho
reveal significant differences in specific and unique national features
relative differences in academic outcomes, such as national achie
among nations. A common extension of this idea is that the specifi
acteristics of a nation's schools are partly responsible for its relative p
in the world's economy, and that nations are different enough from

has been the *need to investigate the roots of the educational systems* of which the v
around us shows such a striking diversity. In the *search for causative factors behin*
development and "productivity" of educational systems there is a need for empirical
and for cross-nationally valid variables pertaining to these systems as they act
function [Husén, 1967, p. 19, emphasis added].

Now listen to how he perceives schooling as inseparable from national
text: "Any educational system can only be fully understood in the con
of the culture, traditions, history and general social structure of the *nati*
is designed to serve" (p. 220, emphasis added).

This image of national schooling is how many think the educati
world works, but ultimately it is mostly inaccurate, and becoming mor
every moment. In spite of the fact that nations (and their subunits, provin
and states) have immediate political and fiduciary control over schoo
education as an institution has become a global enterprise. We show
that there are all kinds of trends suggesting that ideas and demands and
pectations for what school can, and should, do for a society have develo
well beyond any particular national context. The same global ideas, dema
and expectations filter into nations, greatly shaping their schools in u
with school all over the world. Over the last century, there have been
steady expansion of schooling into our daily lives and deepening of ed
tion's meaning for things people hold dear. The current situation in sch
ing across nations is wholly unpredictable from the image of unique nati
models of schooling.

All the while that schooling has been considered a national techn
project, from nation to nation considerable global forces are at work sh
ing and changing schooling in fundamental ways that many people are
aware of as they view education mostly from a national perspective. But
like the shrinking of the world's marketplace, media, and politics, educa
too is undergoing intensive globalization. Whether you find them in M
ico City, a small town in Pennsylvania, or in rural Kenya, schools all over
world appear to run in much the same way everywhere. Whether we
educated in a public school in New York City or a Catholic school in To
we experienced the same basic patterns of education. Today we can
into almost any public school around the world and be able to unders

dents, parents, teachers, and administrators remain mostly unappreciа

This book is about the global state of education, and about how wide forces interact with local ones to create educational change students, their families, teachers, and administrators in your neighb school. Although we focus on mathematics and science in the fourth, and twelfth grades, we generalize to all academic subjects in element secondary schooling. We tell this story of globalized education throu separate tales of educational trends, using some of an ever-growing st complex information intended to compare schooling across many

Over the past three decades, there has been an explosion of infor comparing schools and their outcomes, particularly the academic a ment of their students across nations. In most nations, this kind of in tion has become part of the dialogue about education improveme this information is often misinterpreted or misused, deliberately through for certain results and highlighting a particular political p within a national debate. Two good examples are the massive debates ing from the Reagan administration's *Nation at Risk* report, with its gratuitous negative misinterpretation of American student performa ative to other nations (Bradburn, Haertel, Schwille, and Torney-Purta and last year's debate in Germany over the causes of achievement diff among its provinces on the international assessment called PISA, in politicians attributed educational outcomes to all sorts of unrelated p

With this recent flood of international information about schoo various nations, it is not clear that national policy makers, educato even some policy analysts really understand how to interpret such conjunction with the global forces driving their school systems. We nize that educational policy for running and improving schools is aimed at national or subnational issues, and always will be. As the goes, all politics is local. Policy makers all over the globe have been o ing and reorganizing national school systems nationally or semina since at least the end of World War II, and in some nations well befo But there is another major part of the story (increasingly becoming th part of the story), namely, the effects of the globalization of school national and local educators alike are bombarded with comparative

Bank, OECD, and development foundations (see, for example, Dale
Robertson, 2002).

Using analyses of the data from the Third International Mathematics
Science Study (TIMSS), we give the reader a look at how schools v
around the world, and how complex forces are affecting all nations, sha
both their understanding of educational problems and solutions to th
We highlight the dramatic changes that have occurred in the recent past
speculate on where current trends will take the institution of mass ed
tion in the future.

TIMSS collected a massive amount of data in 1994, in schools in fo
one nations across three grades (fourth, eighth, and twelfth). In addition
some analyses we use data from TIMSS-99, an identical study (don
1999) that also included other nations, making a total of fifty-three nat
participating in one or both TIMSS studies.[1] TIMSS sampled thousand
students in hundreds of schools and classrooms in nations as diverse as
United States, South Korea, Kuwait, Colombia, Germany, and Latvia. In
dition to a mathematics and science test, students were asked a numbe
questions about themselves, their schooling, and their parents. Their ma
matics teachers and the headmaster of the school were also asked a nur
of questions about the mathematics and science curricula, teaching, and
school. This huge data set was then compiled by the International Asso
tion for Educational Achievement and Evaluation (IEA) and made avail
to nations and researchers. We augmented the original cross-national
with more than one hundred indicators of other qualities of nations dr
from a range of international sources. Complete technical details about
TIMSS data and study can be found in Martin, Gregory, and Stemler, 1

If we combine the nations represented in the TIMSS of 1994 and
TIMSS-99, there are now extensive data on how schools run and what

1. Australia, Austria, Belgium (Flemish), Belgium (French), Bulgaria, Canada, Chile, Ch
Taipei, Colombia, Cyprus, Czech Republic, Denmark, England, Finland, France, Ger
Greece, Hong Kong, Hungary, Iceland, Indonesia, Ireland, Islamic Republic of Iran,
Italy, Japan, Jordan, Republic of Korea, Kuwait, Latvia, Lithuania, Macedonia, Repub
Malaysia, Moldova, Morocco, Netherlands, New Zealand, Norway, Philippines, Por
Romania, Russian Federation, Scotland, Singapore, Slovak Republic, Slovenia, South A
Spain, Sweden, Switzerland, Thailand, Tunisia, Turkey, United States.

zens, political regime, economic productivity, level of violence, and others.[2] Most of the OECD nations are here, along with nations from America, the former Soviet East Bloc, and the Pacific Rim. There are ever, no sub-Saharan African nations, not many in South America, a many extremely poor ones. So we take some liberty when we say t trends described here are worldwide, but we are confident that they fact trends found in developed nations and many developing nations a the case of extremely poor nations, or those with severe health or p crises, it is less clear what is happening in their educational systems; w sider what the case might be for nations of this kind only in passing picture of education in the most impoverished and politically dysfun nations is much needed, but it is beyond the scope of this work.

Each of the nine tales is interesting in itself; together they plot the state of education now and what it might look like in the near futu all good stories there are subplots, and ours has three.

Subplot One: The Worldwide Success of Mass Schooling

In developing these tales about cross-national trends in education, struck by how successful schooling is in the world. But we don't me any kind of schooling; rather, we refer to a particularly successful schooling that has spread around the world and has become the *model* of educating children, regardless of a nation's political regime, economic wealth, cultural heritage, and social problems. This is of ferred to as *state-sponsored mass schooling*, or "mass schooling" for sho mostly public schooling for large masses of children, hence the name

2. The TIMSS sample of nations is technically not a random one; all nations ar to participate and those that wish to are included. In each participating country, a t sampling design was used in TIMSS, where first a probability proportional to the si sample of schools was selected from a sampling frame of all schools in a participating that had most of their students in the target ages. The second stage sampled all stude to two mathematics classrooms per school with an equal probability of selection. S weights are used to take into account any disproportional sampling of subgroups an ment for nonresponse (U.S. Department of Education, 1999). Some variation appli study at the twelfth grade, which is noted in some of our technical papers.

recorded history, education was practical, situational, and highly limited
with an apprenticeship to gain a set of skills—and it often did not req
literacy. Most of the time, children learned all they needed to know wi
their family, clan, or tribe. Much of the content of premodern formal sch
ing was "religious" in nature: learning the legends, beliefs, and sacred tr
tions of a people or culture, and some limited literacy for reading relig
texts. It was in this situation that premodern schooling became most el
rated; a small, elite group of students were taught how to read, write,
memorize the texts important to that culture. Practical apprenticeships
education for some nonelites, but this was not available for all and
aimed at a specific craft.

This all started to change some 150 to 200 years ago with the rise of
schooling in many Western nations. There were still elite forms of educa
but over time schooling was developed in principle for all children to l
academic skills through a more or less common curricula. Since then
schooling has become one of the most impressive cases of successful trans
sion of a cultural model in the history of human society, developing
spreading in a relatively short time without limitations. Using mass schoo
most nations have achieved mass literacy within just the last hundred y
and currently there are no real alternatives to mass schooling anywhere.
enrollment in elementary education was achieved before the middle of
twentieth century in wealthier nations and over the next forty years in po
nations. Mass secondary education expanded to the same full enrollme
decade or two after elementary reached full enrollment, and the growt
higher education continues unabated in many nations today. Mass schoo
has developed and intensified over time as an institution, deepening its m
ing for everyday life. A big part of our story is what effects this resilient i
tution has on students, families, teachers, and school administrators.

Subplot Two: Schooling Is an Institution

At the core of the spread of mass schooling is a set of fundamental ideas
were unique just a short time ago but now have become widely accepted
even cherished. For instance, the ideas that all children should be educa

sition in labor markets all over the world. Now in human society, schooling has an unprecedented monopoly on the issuing and co these credentials that lead to so many aspects of adult life.

Our stories lead us to appreciate how these ideas about mass sc have formed a broad globalizing process making schooling a pervas powerful institution. As we have just described, the schooling-as-a-n enterprise perspective tends not to appreciate the complex institutio ture of education, or its ability to reach across national borders as the ideas behind modern capitalism and democratic governme spread worldwide. A big part of this underlying subplot is what is h ing to the institution of mass education, more than what is happeni cationally in any one nation, or even type of nation.

Education is an institution, like modern health care or the fam may take on differing forms from nation to nation and even from re region within a nation, but that at a deeper level is strongly affixed t norms and rules about what education is and how schools should If one turns a blind eye toward the image of schooling as a world tion, one is easily led astray in interpreting trends in schools, part cross-national trends that appear to differ so much from our individ perience (chiefly with a particular nation's schooling).

The trends we describe in this book are essentially meaningless the aid of this institutional perspective. For example, why is it that i TIMSS nations the educational background of parents has a large im school achievement even though school quality has been on the i over the past three decades? Why have gender differences in eight mathematics almost vanished across so many national school system do teachers from diverse nations have similar core beliefs about the teaching and the role of the student? Why have so many national a trations of schooling produced a paradoxical mix of centralized and tralized operating procedures for managing schools? The answers t questions, and similar ones asked in each chapter, are found in unde ing the consequences of the deepening of institutional ideas abo schooling and how nations respond to this institutional force.

themselves are simultaneously so fundamental to our behavior and so p
erful in constructing how we make sense of our daily world that they
hard to observe. All of us are part *of* institutions, within them more than
are outside observing them. Historians have long known that time off
useful perspective on institutions, and to a degree we use that perspec
here. Also, cross-national difference, or a perspective from multiple pl
is a useful technique to observe institutions. If we hold the social w
like a prism at just at the right angle to the light, we can see somethin
its institutional structure underneath; cross-national analyses help make
happen.

Institutions are the building blocks of human society at any time or p
By *institution* we do not mean a specific place with bricks and mortar,
the vernacular sense that a particular mental hospital is an institution. Ins
we mean a set of rules for behavior and social roles to be played in a pa
ular sector of life. Institution is more process than entity, more cogn
than physical, powerful in its control of human behavior through the
duction of shared meaning in all realms of human existence. The s
world is a world of social institutions providing meanings and values al
how to think and act in the everyday world. Individuals and collectiv
formal organizations, informal groups, and the individual human—ob
realities through social institutions. From an institutional perspective,
very essence of social change is institutional change (see Berger, Berger
Kellner, 1974). In terms of schooling as an institution, we borrow an a
ogy from educational historians Larry Cuban and David Tyack: the ins
tionalness of education constitutes the "grammar" of how things wor
schools.

Our point here is that to a large extent the grammar of schooling is gl
This means that much of the grammar of schools and the ideas behi
are reproduced and reinforced at a global level. Every individual scho
still influenced by local, regional, and national factors, but the basic imag
a school—what it is and what it should do—is commonly defined in
same way globally. Consequently, the organization of national school syst
(French, German, American, and so on) is now influenced by transnati

As a global institution, schooling has developed powerful world and beliefs about children, learning, teaching, and the administra schools. Over a thirty-year research program with colleagues, instit theorist and comparative sociologist John Meyer has convincingly lished a strong case for thinking about schooling as a product of culture that renders education as a resilient and powerful institu modern society (see, as examples, Baker, 1999; Meyer, 1977; Rami Boli, 1987; Meyer, Ramirez, and Soysal, 1992; Fuller and Rubinson They have shown that mass schooling takes similar forms through world, and that there are common beliefs in what schooling can and do for society. This process, they argue, has to a large degree been dr a dynamic world culture.

By *world culture*, we do not mean a culture that is void, ersatz, or torical. Institutionalists see a dynamic world culture that (for be worse) evolved out of Western ideals of rationality and purposeful (Berger, Berger, and Kellner, 1974). Rationality as a pervasive cultura uct (some would say even a hegemonic product) of the historical rise West serves to bureaucratize, marketize, individuate, and homogenize stitutions of the world (Finnemore, 1996; Scott and Meyer, 1994; T Ramirez, Boli, and Meyer, 1987). Homogenization produces co norms of behavior across a set of modern institutions, thus tying insti such as the modern nation state and formal education together in political sphere. Rationality, along with its offshoots of marketizatio vidualization, bureaucratization, and homogenization, plays the tune modern global institutions march to, but it is itself a cultural prod acts as such throughout the social system.

All this is not to suggest that local and national cultures do not h fluence in schooling; they do. Perhaps a better way to think of cultu terms of a *dynamic mix of cultures*, as discussed in comparative anthro cal studies. Global institutions can traverse and shape local, regional tional versions of particular areas of human life such as education. Th from the perspective of wide-open dynamics of culture, national cul if they exist at all—have only vague boundaries. Culture is far too d to stay purely national, yet subglobal cultures do mix with global or

Culture . . . refers to shared designs for living. It is not the people or things o
haviors themselves. Culture can be equated with the *shared models* people car
their minds for perceiving, relating to, and interpreting the world around them
Sociocultural systems therefore include customary, agreed upon, *institutionaliz*
lutions which influence most individuals to behave in a predictable manner mo
the time, but never all of the time [1977, pp. 4–5; emphasis added].

One of the major consequences of a dynamic cultural model is that world
tures are easily imagined, as are global or transnational institutional solu
applied to common human problems across nations (Boli and Thomas 19

An institution heavily shaped by a world culture of schooling more
curately depicts the cross-national trends we observe here than a visio
many national cultures of schooling operating independently. Further,
a perspective offers a rich description of how organizations such as sch
and institutional ideas interact to produce consequences for the people
ticipating in them. This also offers us a way to think about what will ch
in schooling in the future, and this leads us to the last of our subplots,
cational change.

Subplot Three: Educational Change Is Institutional Change

Institutions by their very nature impart deep meaning to our everyday w
hence they are resistant to change. When we go to a hospital, we ex
things to run in pretty much the same way the last time we were ther
we were to experience a completely different organization each time
had to rely on a hospital for our health care, most of us would be extre
upset. The same is true for schools. Change does occur, but most of us
pect that basic patterns of interaction have not changed all that much
when we were in school. But the schooling and the political discuss
surrounding it, in most nations, are full of rhetoric about change.

In fact, institutions do change, and institutional theorists have recogn
this for some time. They tend to see two main types of force that mak
institutional change: those outside the institution itself and those wor
from within. Outside forces tend to be large and progress over a long hi
ical period. They also interact between institutions over time. Forces

change and will likely continue to do so in the near future. First is th
of standardization and universalism, meaning that organizations and i
uals within a particular institution tend to become more similar ov
and place. The pioneering works of sociologists of neoinstitutionalis
that there are strong global tendencies toward homogeneity within th
cation sector. We examine this force of *isomorphism* in schooling in a r
of the chapters.

The second type of endogenous change in institutions occurs t
the process of institutionalization itself. In other words, as a particul
tutional pattern deepens and spreads, it creates wider consequences
turn have an impact on the original pattern. We sense this kind of pr
at play in a number of our stories. For example, the deepening link b
school credentials from mass schooling and the labor market has cre
recent times increased pressure on families to seek help outside sch
children, which in turn has an impact on the way schools themsel
doing things. Many of our tales show the consequence of greater
tionalization for educational change.

Mass schooling is the predominant model of education in the worl
It pervades every part of people's lives in modern society and creates a
of education unparalleled in human existence. Although nations have
and will continue to make, their own modifications to the model, ma
cation chiefly develops as a world institution. But it is far from s
monolithic; global forces dynamically interact with national ones and
ing often changes unpredictably. This is the image of institutional chan
we take to our stories of cross-national trends in schooling.

Stories from Cross-National Analyses of Schooling

In Chapter 2, "The Declining Significance of Gender and the Rise o
tarian Mathematics Education," the first of our tales of cross-nationa
tells the story of how and why gender differences in mathematics and
achievement are vanishing worldwide, and it illustrates the power of
schooling to flatten traditional distinctions between categories of pe
with male and female). Building off an analysis of gender differences in

with some irony, that the considerable institutional strength and public
port of mass schooling have created a situation where smaller and sm
differences in family resources take on greater saliency in creating di
ences in achievement in most nations in the world.

Pressure to teach and learn mathematics and science has increased
matically over the past few decades. This has led to growth in the su
of outside school tutoring services; rising demand by families with chil
in public schools to buy them is an unexpected and potentially transfo
ing addition to mass schooling. Chapter 4, "Demand for Achievem
The Worldwide Growth of Shadow Education Systems," examines the c
national dimensions of this rapidly growing private sector of educati
services oriented toward a student's performance in public school tha
been termed, as the chapter title suggests, "shadow education."

Chapter 5, "Rich Land, Poor Schools: Inequality of National Educati
Resources and Disadvantaged Students," develops a related theme. Per
the most sacred of principles of modern mass schooling is the notio
equality. Access to schooling for all children and the fundamental social
tice and benefits to society are assumed to stem from this goal and drive
organizational development of school systems everywhere in the world.
jumping-off point for the chapter is an empirical study of disadvant
students and their mathematics and science achievement cross-nation
The analysis shows American schools placing socially disadvantaged stud
at considerable risk of school failure compared to similar students in c
national systems. We then examine some of the causes of this problem
compare educational resource inequalities cross-nationally, with some
vealing findings about their patterns and levels across nations. The cha
then discusses the institutional basis for beliefs in universal education
the practical problem presented by inequality of resources, and it specu
where issues of equal quality are likely to take national systems of educa
in the future.

School violence is the subject of intense study and national preven
efforts in the United States and elsewhere; it is the topic examined in Ch
ter 6, "Safe Schools, Dangerous Nations: The Paradox of School Violen
Over the past decade many Americans have come to wonder if public sch

determined by cultural values, school organization, and national and
national factors. Worldwide, teaching is a tapestry with many comm
ties, but a few striking differences. Teachers' work in schools is incre
similar around the world, which in fact has created an independent
culture of teaching." At the same time, the cultural role of "teach
highly developed in many nations before the modern age. The chapt
with a discussion of what a teacher's job in the future will look like as
ing is pushed toward homogeneity by increased global discourse, b
pushed toward diversity as wealthy nations continue to reform their
in order to increase the national level of academic achievement.

Chapter 8, "Schoolwork at Home? Low-Quality Schooling and
work," explores the fact that homework is ubiquitous in school
around the world but has not garnered the international attention tha
teaching practices have, even though some scholars argue it can be
factor in student academic success. Cross-national patterns in the
homework and its relationship to the national level of achievem
more complicated than most people think. For example, in the mos
tive systems little homework is given. Around the world, teachers g
virtually the same type of homework (textbook assignments and work
but nations vary considerably in how teachers use homework (whet
included in grading or not, used for class discussion, and so on) as w
how much homework they give. Homework in poor-quality national
appears to be underused and serves as a way to try to support weak
national curricula.

Chapter 9, "Slouching Toward a Global Ideology: The Devolution
lution in Education Governance," explores the dramatic change in id
and practice of managing public school systems occurring during t
three decades. Many nations are adopting a mixture of decentraliz
centralized procedures without a clear rationale for doing so. Using
ular quality control as an example, the chapter explores what this b
devolution means for school-level decision making across nations a
dicts where this trend will lead nation-state governance of public sch
in the future.

the institution of schooling motivates so many to engage in educationa
form and reorganization across all nations.

We conclude the book by looking to the future. If the trends we
identified continue (and there is every indication they will), then we
make some general predictions about what schools will be like, and
problems educators or reformers will have to address. These predictions
serve a scientific purpose—they suggest a future way to assess whether
institutional perspective we have used is indeed accurate. We hope that
tales and the perspective we bring to them provide some new ways to t
about global trends in education in the future.