

Local Data, Local Capacity, Local Solutions: Mobilizing Local Systems to Improve Student Outcomes

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- Setting the Stage
 - Framework for Data Use
 - Understanding Data
 - Building a data use ecosystem
- Conventional Solutions.
 - Data Coaches
 - Data Teams
 - Data Audits
- A Modest Proposal Towards Building that Ecosystem
 - Where is the capacity
 - Where are the data?



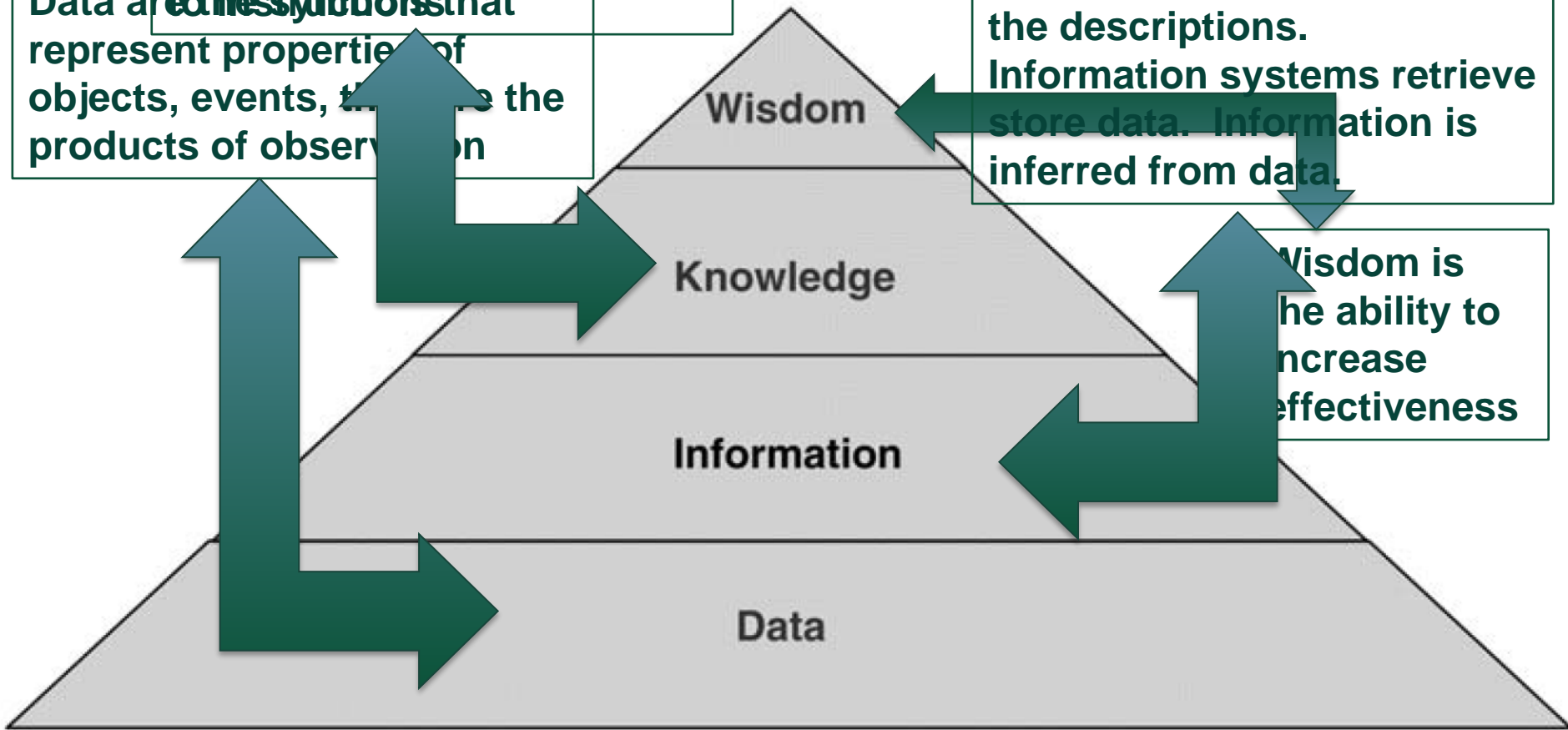
Data, Information, Knowledge, Wisdom Framework

Knowledge is “Know How” and transforms information

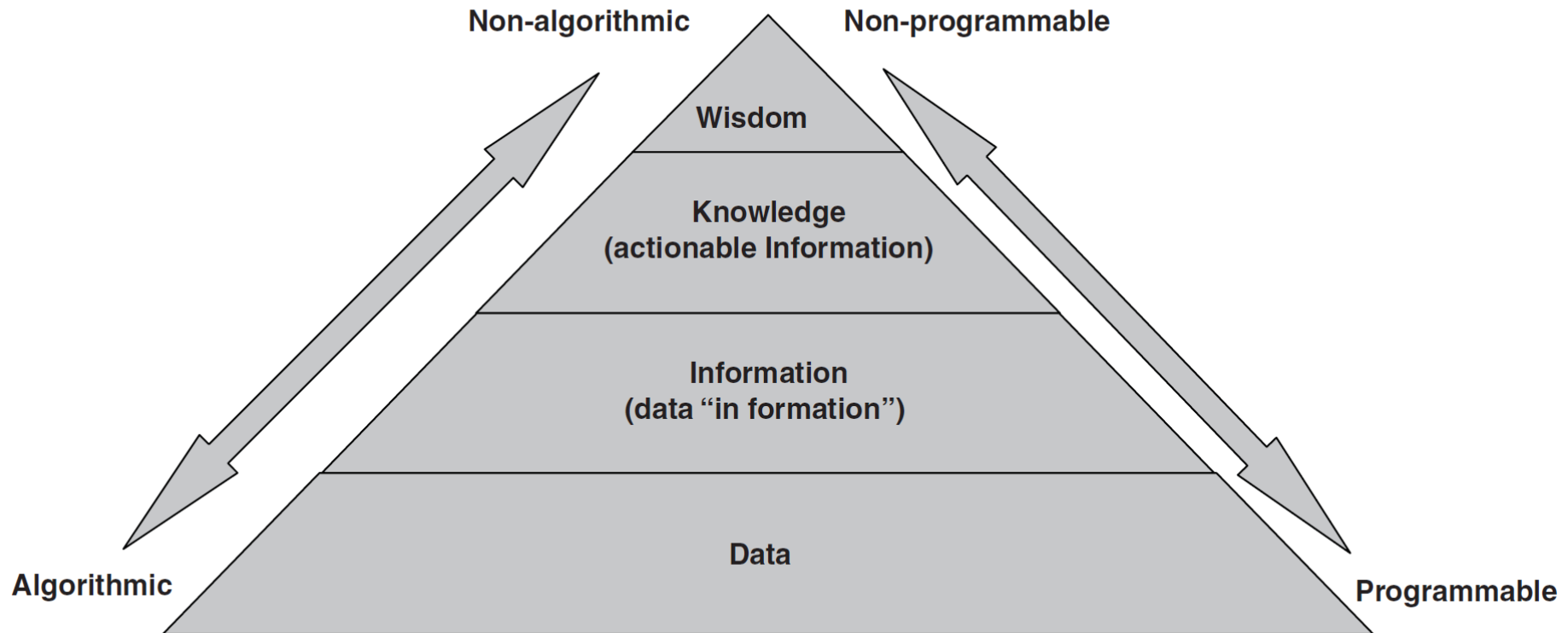
Data are the symbols that represent properties of objects, events, things, or the products of observation

Information is contained in the descriptions. Information systems retrieve store data. Information is inferred from data.

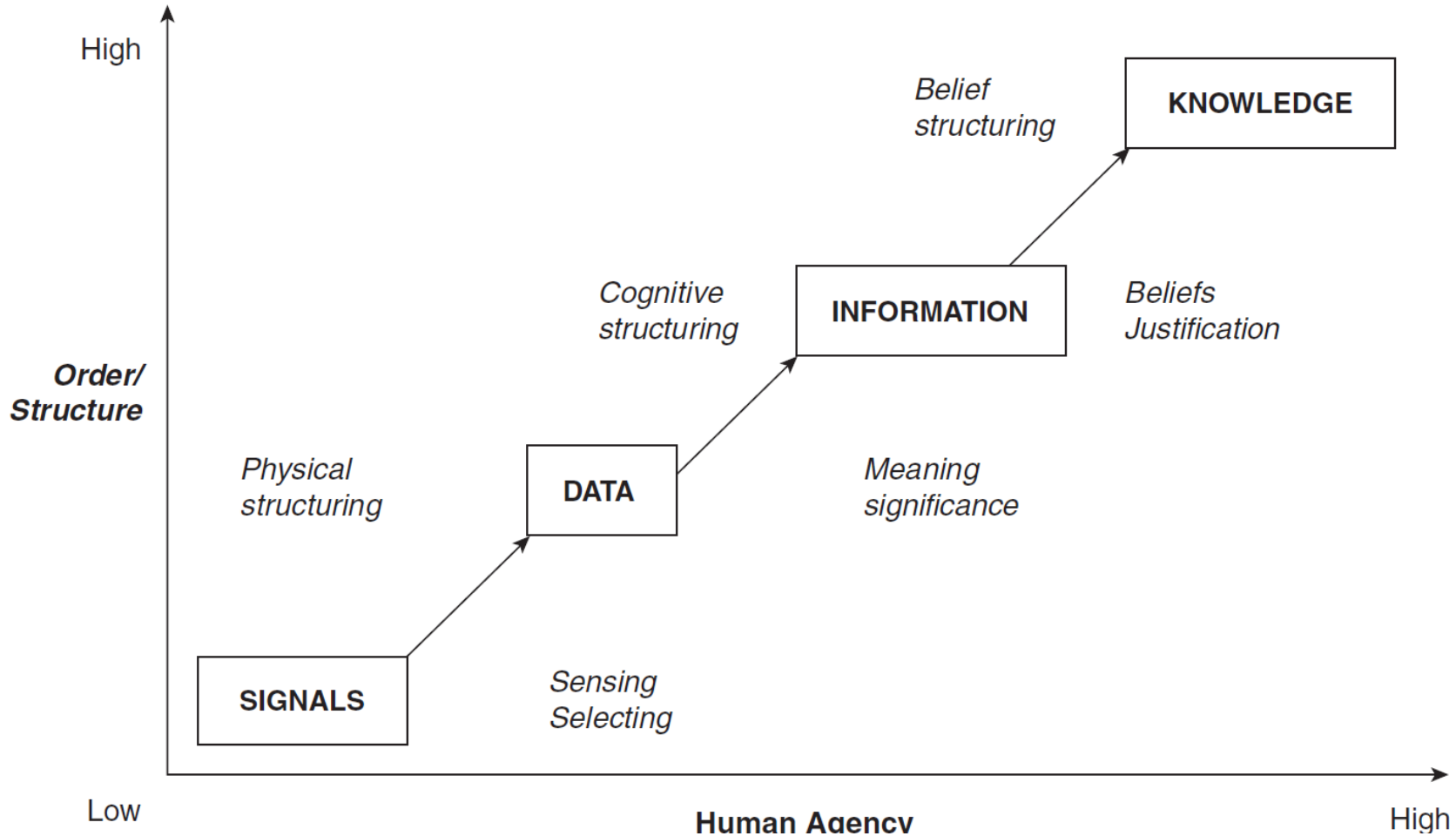
Wisdom is the ability to increase effectiveness



Data, Information, Knowledge, Wisdom Framework



Data, Information, Knowledge, Wisdom Framework



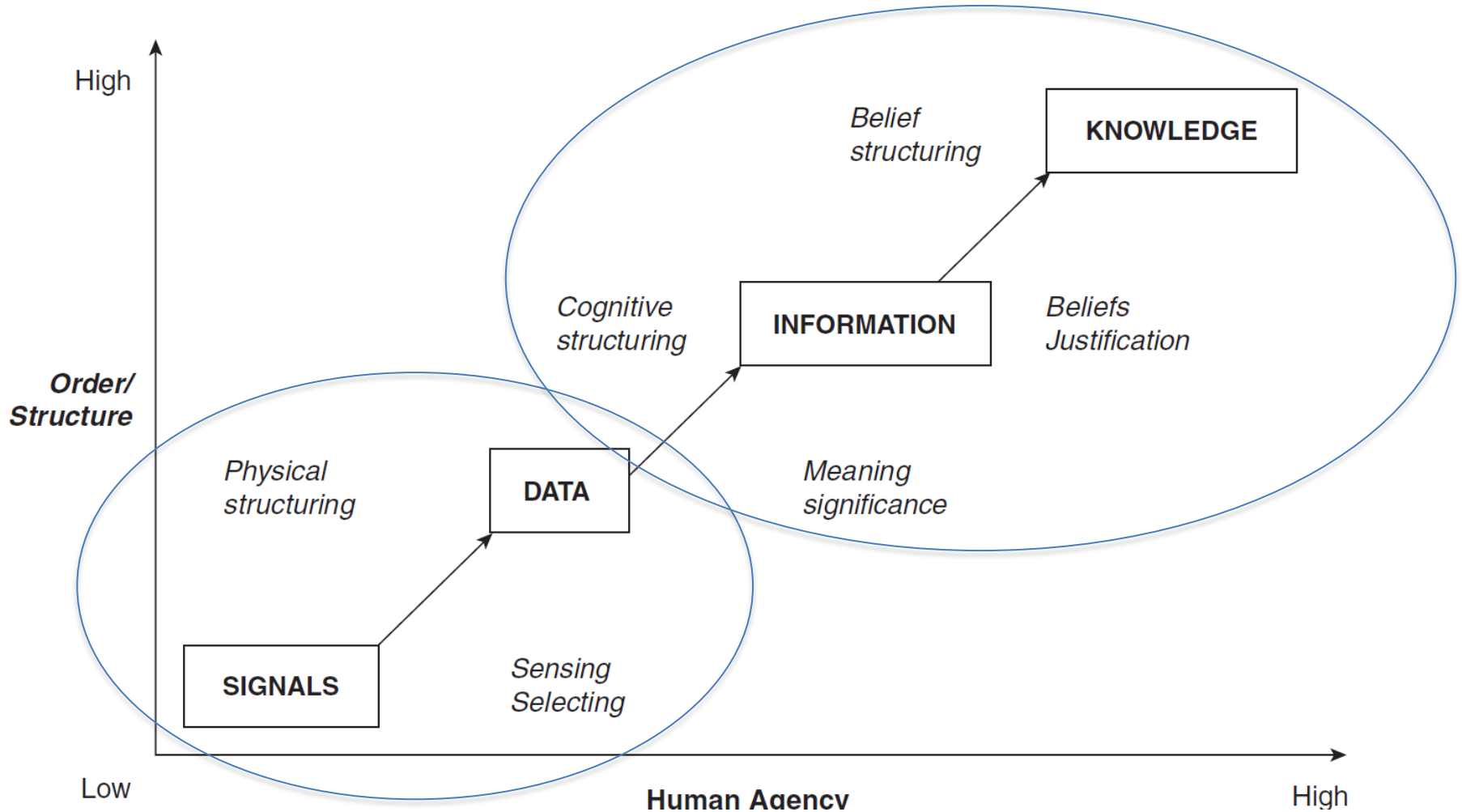
C.W. Choo, *The Knowing Organization: How Organisations Use Information to Construct Meaning, Create Knowledge, and Make Decisions* (OUP, Oxford, 2006).

Data, Information, Knowledge, Wisdom Framework

- The key idea is that somehow Data must be transformed to Information---information to knowledge---and knowledge to wisdom
- The Somehow is the magic of data use.



Data, Information, Knowledge, Wisdom Framework



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Sensing/Data (through the Lens of Org)

- State/National Level
 - Very slow to change
 - Highly organized/structure for uniformity
 - Selecting based on state frameworks
- District
 - Depending on district size easier to change from year to year
 - Both highly structured fluid to meet needs of state/schools
 - Selecting based on state and district
- School/Classroom
 - Quickly change depending on conditions or questions
 - Selecting based on state, district, and self



Information/Knowledge (through the lens of org)

- State/National Level
 - Collected for a particular purposed defined by state needs
 - Collected based on a specific belief structure/cognitive structure
- District
 - May hold different belief/cognitive structure than state
 - Data may not address local district needs
- School/Classroom
 - May hold different belief/cognitive structure than state/District
 - Data may not address local school needs



State

District

School

Higher

Capacity

Lower

Higher

Relevance to Policy

Lower

Lower

Variety of Questions

Higher

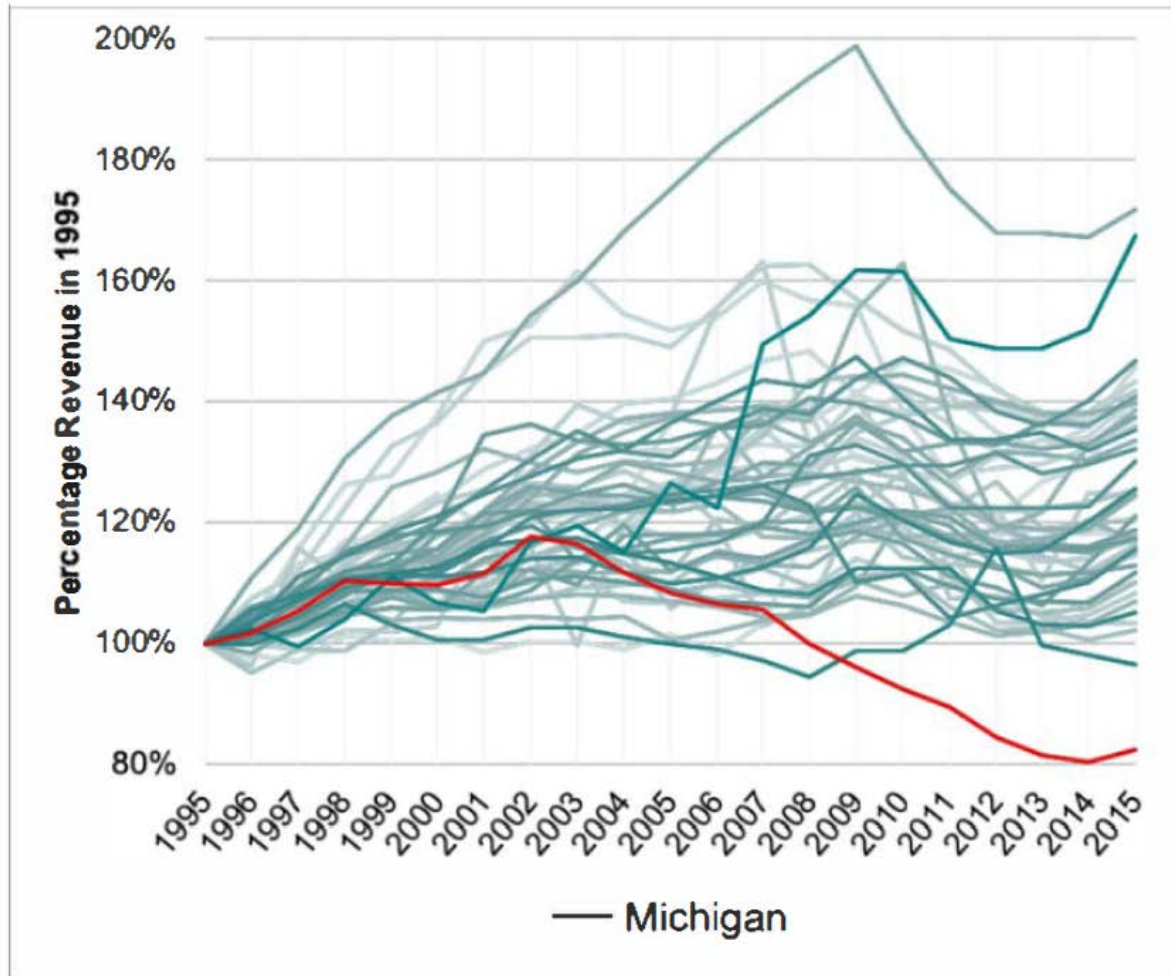
Lower

Relevance to Classroom

Higher



Figure 6. Inflation Adjusted Total K-12 Education Revenue as Percentage of 1995 Revenue, 50 States



Source: National Center for Education Statistics, F-33 Common Core of Data.

State

District

School

Higher

Capacity

Lower

Higher

Relevance to Policy

Lower

Lower

Variety of Questions

Higher

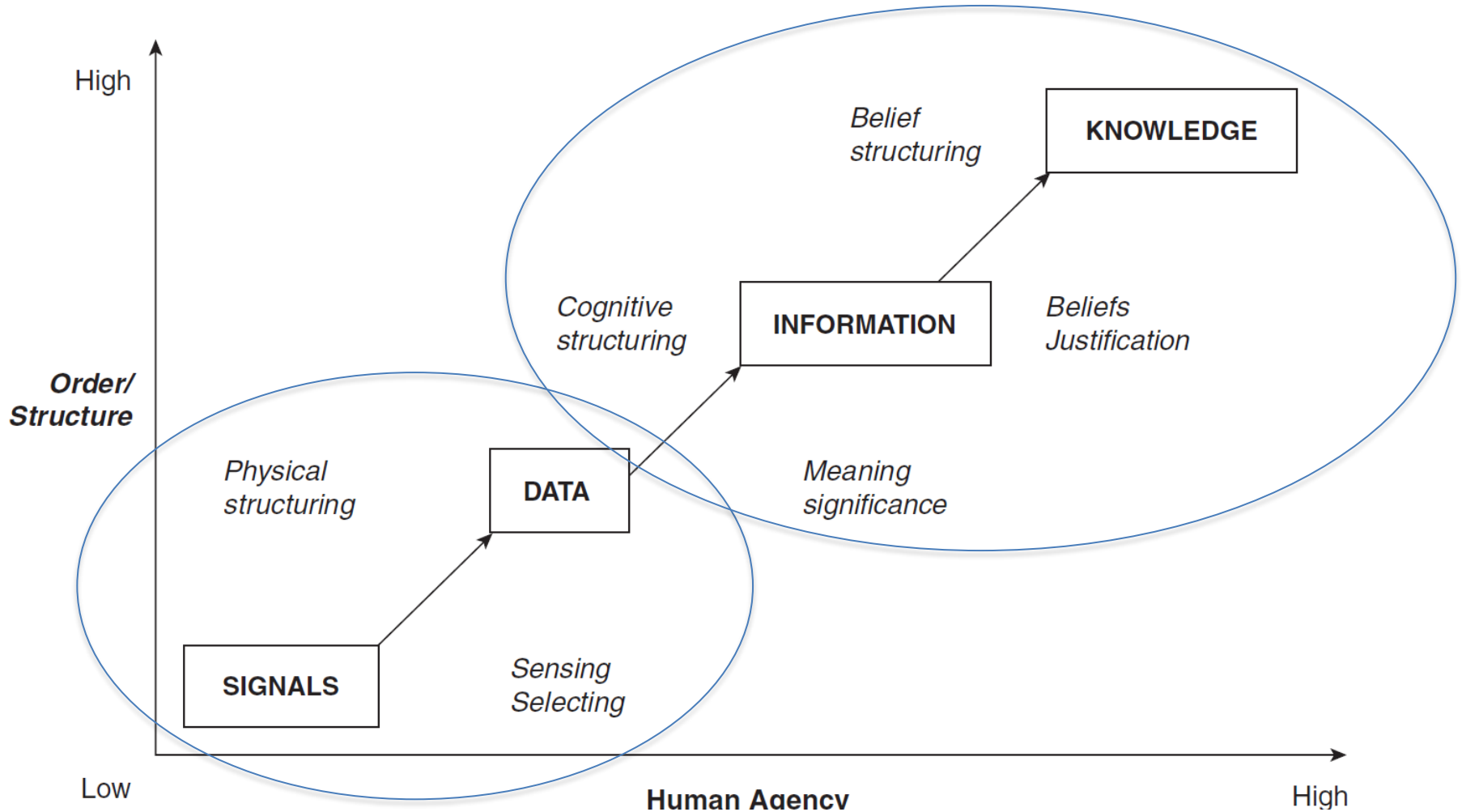
Lower

Relevance to Classroom

Higher



Data, Information, Knowledge, Wisdom Framework



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Benefits of State Capacity

- Focus on large solutions to large problems
- Create uniformity on data collected and solutions
- Can monitor equity and equitable outcomes.
- Very large datasets can provide rich data and variation across school and district composition to examine heterogeneous effects
- Can provide support for local decision-making and provide evidence for strong practices



Benefits of Local Capacity

- Can customize data to local issues and local priorities (Builds on the idea of wisdom)
- Provides leverage when dealing with District, State, or ISD priorities.
 - If schools or districts have strong data capacity and evidence suggesting their practices are successful, have a basis to pushback on top-down mandates
- When unexpected changes occur (say a worldwide pandemic), the capacity exists to appropriately collect/analyze data necessary to monitor and support school or district decisions and practices.
- Local data by local people more accepted/believed



Fundamental Problem Between State/Local

- Large scale policy analysis is generally designed to focus on average affects or the affect on the “average student”.
 - Can be used to look for differential outcomes (heterogenous treatment effect)
 - Also tries to identify “best practices” which are generally understood as things that do the best for the most people
- Classroom teacher are concerned with that, but they are just as concerned about the tails of the distribution.
 - Not necessarily concerned about the “average student” but about how to reach everyone.



Fundamental Problem Between State/Local

- This focus on reaching ALL students (and in many cases all aspects of All students), means that the conclusions of statewide or national studies may NOT be the information that classroom teachers want or need.
- This necessitates a different kind of study and data analysis



So Where are we?

- Clear that state and local analysis:
 - Have different capabilities
 - Much more sophisticated analysis can be performed with larger datasets
 - May have different goals related to scale
 - Equity across state, degree to which improvement/achievement is keeping up with national trends, whether large policy initiatives are effective
 - Have different data
 - Have different influence with different players. Information is the same, but knowledge may not be.
 - What is the first thing we hear when state data is presented locally?



So Where are we? (cont.)

- This is not to say that one is better than the other
- Different priorities, different strengths, different scale
- So how do we maximize all of it?



Takeaway from Framework on Data Use

- We have a failure to imagine an integrated statewide data ecosystem that capitalizes on the features of both the micro and the macro.
 - There is an assumption that the building of a state-level data system benefits all organizational levels equally.
- State and local capacity should be complements not substitutes
 - Statewide analysis can provide key information for local decisionmakers
 - Local capacity could provide key answers or areas to explore for state.



So what do we do now?

- Build local capacity!
- How?



Conventional Approaches to Building Capacity

- Data Coaches
 - One person responsible for this work.
 - Can be effective, but difficult for one person to have all the skills necessary to address content, and do analysis, collect data
- Data Teams
 - Can be very effective as long as they have time, expertise (or access to expertise), and resources to design and conduct analyses.
 - Clearly difficult if capacity doesn't actually exist, a team that lack time or expertise will not be effective.



Conventional Approaches to Building Capacity

- Data Audits
 - Can be extremely helpful and should compile
 - All assessment that are uniform across district
 - All assessments that are uniform across school/grades
 - All surveys that are conducted across district/schools
 - Who these data inform
 - What is their purpose
 - What decisions can be made using these data (instructional, programmatic, policy)
 - Helps to build the upper part of that DIKW pyramid



How do we improve local capacity? (cont.)

- Once assessments are identified ask key questions
 - What do we want to do to move to Knowledge from data?
What do we care about?
 - Local initiatives?
 - Improving instruction?
 - The Whole Child?
 - What data do we need/can we collect?



How do we improve local capacity? (cont.)

- In the case of improvement of mathematics performance you could ask
 - Are there ways to modify the assessment/survey that could provide better information for their purpose?
 - Example—for district mathematics assessments making sure common mathematics errors and misconceptions are included as distractors in either district or school assessments, and this information is conveyed to teachers to inform instruction (what proportion are making this type of error). Moves the work to content experts (teachers)



Challenges with these approaches

- All very time consuming
- Need LOTS of different types of capacity
 - Surveys
 - Survey Analysis
 - Content knowledge
 - Statistical Skills
 - Assessment knowledge
 - Communication Skills
 - TIME



Modest Proposal

- This local infrastructure must be built to make local systems robust to changes like covid, 3rd grade reading, changes to SAT from ACT
- Essential part of the educational data ecosystem
- Absent local investments and current capacity what can we do?



Modest Proposal (Cont.)

- As a transition we can tap the untapped capacity available at institutions of higher education
 - Many faculty and outreach organizations have willingness to help locally (particularly if there is the possibility of data and sites for data collection)
 - These faculties have capacity and expertise across multiple areas.
 - These groups have innovative ideas that could be used to address key problems or challenges in k-12 schools



New Data New Possibilities.

- Higher education partnerships can bring to bear new possibilities that would not be possible without additional capacity.
- Data is in the schools
- Capacity is at the universities
- Part of the data ecosystem
 - 857 laboratory districts
- What might be some of the key roles?



Potential Roles for Higher Education Partnerships

- Can provide expertise that may be lacking locally
- Can provide an “outside eye” to school approaches to data.
- Can guide discussions given expertise
- Can provide time that local actors may not have
- Can train local data teams to work without them and leave expertise.
- Can take advantage of Graduate Students for work
- Can introduce “new” ideas to data analysis for example using Big Data.

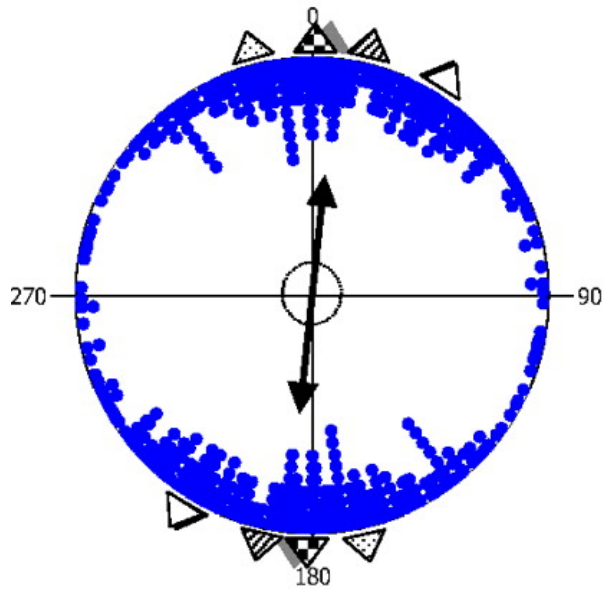


The Potential for Big Data

- Big Data means, “extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions.” – Oxford Languages
- Can also mean using algorithms to explore complex patterns and use those complex patterns to make predictions.

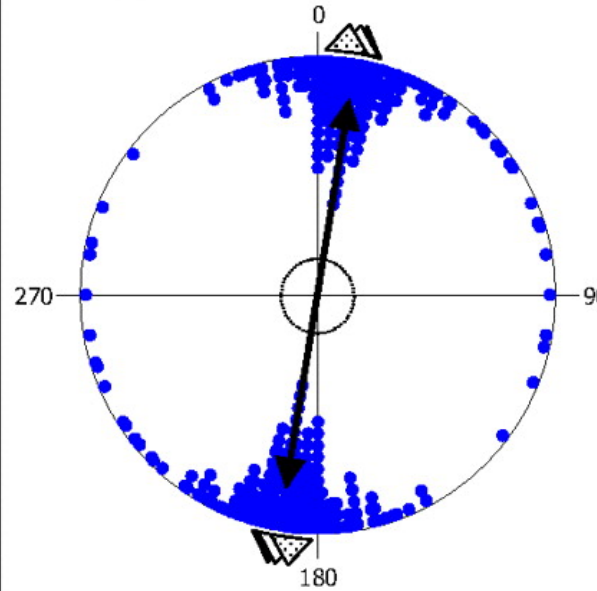


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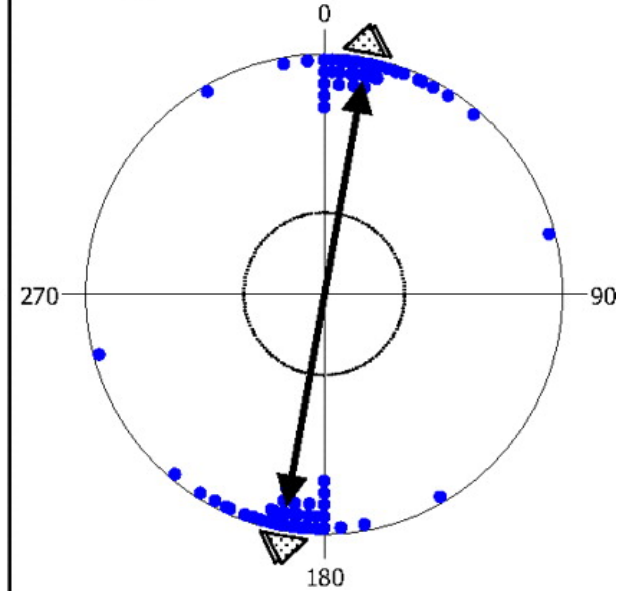
Cattle

B



Roe Deer

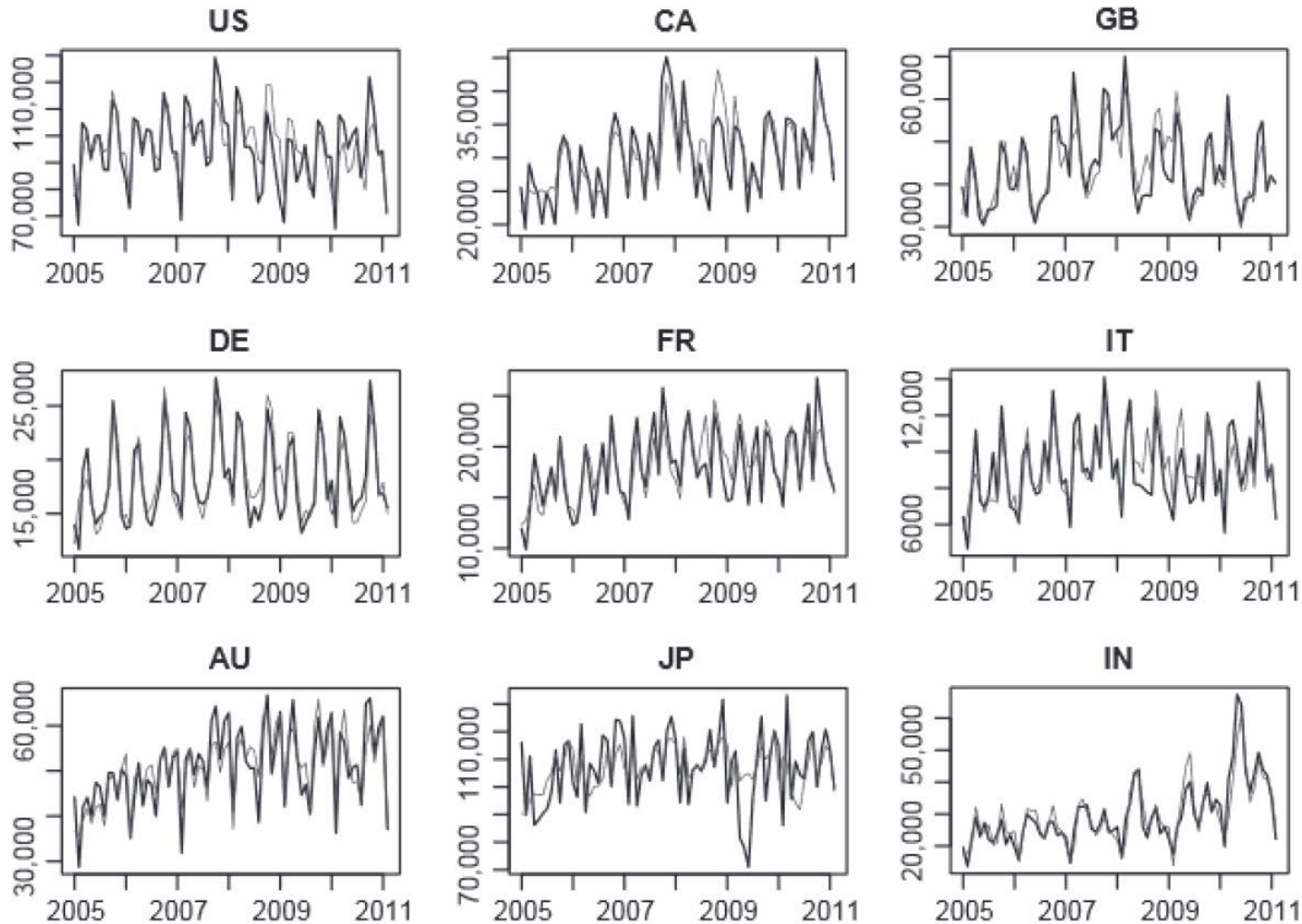
C



Red Deer



FIGURE 5
Visitors to Hong Kong



Big Data Potential

- Online schooling behaviors predicting performance
- Attendance, daily school performance behaviors predicting persistence or achievement
- Wouldn't necessarily be used in any other way but to better direct school resources earlier to students who might be at risk of dropping out, or possibly identifying students who could successfully perform in AP courses.



Takeaway

- We need to think top to bottom about a data use ecosystem in education
- Both state and local capacity matters
- Local capacity has many benefits that cannot be replicated at the state-level
- University school partnerships may be an interim step towards building that ecosystem. Both Schools and Universities need to provide support for development

