The Role of Noncognitive Factors in Schools and Classrooms

CSG West Annual Meeting
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Shanette C. Porter
Consortium on Chicago School Research
University of Chicago
Today

- What is the practice-based problem?
- How do noncognitive factors affect school performance?
- How do we assess teachers’ contributions to students’ noncognitive skills?
Problem: CPS Long-term Outcomes
Trends in Chicago’s Schools across 3 Eras of Reform

FIGURE 9
Eleventh grade ACT scores have been rising, even though entering ninth grade EXPLORE scores have been flat

ACT Scores and EXPLORE Scores, 2001–2009

Luppescu, Allensworth, Moore, de la Torre, & Murphy (2011)
Grades, Suspensions, Attendance¹

- … are better predictors than test scores of long-term *educational outcomes* (high school graduation, college enrollment, college graduation)

- … are better predictors of *life outcomes* (wages, health, longevity, civic participation)

- … are where we observe growing *gaps* by race/ethnicity, socio-economic status

¹Chamberlain (2013), Bowen et al. (2009), Heckman et al. (2006)
Students who enroll in a four-year university with a high school GPA of 2.5 or lower are very unlikely to earn a university degree.

Note: These were CPS alumni who enrolled full time in a four-year college by spring following their high school graduation and enrolled in a college for which we have graduation information.
Capturing Cognitive and Noncognitive Skills in Administrative Data

1Heckman et al (2006)
Noncognitive Factors vs Cognitive Factors

• *Not measured by cognitive tests* (achievement or IQ tests)
• Other skills, behaviors, mindsets... “that allow individuals to regulate their thoughts and actions in ways that support achievement in a particular endeavor”\(^1\)

\(^1\)Lickona & Davidson (2005)
Teaching Adolescents To Become Learners
The Role of Noncognitive Factors In Shaping School Performance: A Critical Literature Review

Camille A. Farrington, Melissa Roderick, Elaine Allensworth, Jenny Nagaoka, Tasha Seneca Keyes, David W. Johnson, Nicole O. Williams
Literature Review Key Findings

Synthesized evidence on:

1. Which noncognitive factors matter for academic performance

2. Whether noncognitive skills are malleable
   a) We can impact noncognitive skills
Key Findings of Literature Review
Key Findings: What Matters for Academic Performance?

ACADEMIC MINDSETS

ACADEMIC PERSEVERANCE

ACADEMIC BEHAVIORS

ACADEMIC PERFORMANCE

LEARNING STRATEGIES

Academic Mindsets
- My ability and competence grow with my effort
- I believe I can succeed
- This work is relevant to me
- I feel I belong
Key Findings:
Noncognitive are Skills Malleable

• Intervention Research:
  – Mindset Works!\(^1\)
    • 8 sessions of videos
    • 7\(^{th}\) Graders
    • Math grades

\(^1\)Blackwell et al. (2007)
1. Measurement Questions
   a) Can teachers foster/impact/improve students’ noncognitive skills in schools in ways that matter for their future?
   b) If they can, how?

2. Accountability Questions
Key Questions from Literature Review
Key Questions: Can Teachers Foster Noncognitive Skills in Ways that Matter for Long-term Success?

• Effects of high quality classrooms\(^1\)
  – Long term effects on student outcomes
  – Not explained by changes in std. test scores

• MS teachers with high noncognitive value-added!\(^2\)
  – Value-added: grades, suspensions, attendance
  – Effects on high school outcomes

\(^1\)Chetty et al. (2011); Booker et al. (2008)
\(^2\)Jackson (2013)
Key Questions: *How can Teachers Foster Noncognitive Skills in Ways that Matter for Long-term Success?*

- Everyday practice
  - CCSR’s Becoming Effective Learners Survey (BELS)!
  - Student self-reports of 2 classrooms

- Limitations and alternative explanations:
  - Measurement
  - Causality?
  - Development or signaling
Next Steps: Address Key Q’s

• *Can* teachers foster skills in schools in ways that matter for students’ long-run goals?

• *How can* teachers foster skills in schools in ways that matter for students’ long-run goals?

• Incentivizing
Next Steps: Solutions

• Break the silo
  – Collaborations with researchers, practitioners, policy-makers, community organizations, parents
    • PERTS
    • Improvement research
    • BELS Partnership
    • CCSR community and policy-maker outreach

– Collaborations with experts in other fields
  • Housing, Social welfare, Healthcare
Thank you!

Shanette C. Porter

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Literature Review Key Questions

1. Measurement Questions
   a) Can teachers foster/impact/improve students’ noncognitive skills in schools in ways that matter for their future?
   b) If they can, how?

2. Accountability Question
   a) If they can, how can we encourage those practices?
Key Questions: Effects of Accountability

- Standardized test-based
- Noncognitive skills-based could also undermine
Key Findings: Noncognitive are Skills Malleable

- Intervention Research:
  - One Goal\(^1\)
    - 10-20% increase college enrollment
    - 5% decrease in arrests

\(^1\)Kautz et al. (2014)
## Classroom Belonging Responses

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Example: Measuring Growth vs. Fixed Mindset
(using Carol Dweck’s items)

How true are the following statements:

• You have a certain amount of intelligence, and you can’t really do much to change it.
• Your intelligence is something about you that you can’t change very much.
• To be honest, you can’t really change how intelligent you are.
• You can learn new things, but you can’t change your intelligence.

Strongly Agree, Agree, Mostly Agree, Mostly Disagree, Disagree, Strongly Disagree
Challenging These Assumptions

- Students’ attitudes, beliefs, behaviors, and strategies are at least as important as their content knowledge and academic skills.

- Grades are better than tests at measuring what matters. We should focus much more on grades and much less on test scores.

- Current approaches to “content coverage” reproduce social inequality.

- Developing students’ content knowledge and skills depends on developing their mindsets & strategies and structuring opportunities for their success.
Why Do Noncognitive Factors Matter?

• Essential for cognitive processing
• Facilitate/direct/motivate/energize learning
• Integral to identity development
• Shift our understanding of student behavior and of the role of adults in schools
• Focus our attention to some potential mechanisms of social reproduction
5 Guiding Questions for each Noncognitive Factor:

- What is it and does it matter for grades?
- Can we change it? (Is it malleable?)
- Do schools/classrooms have an influence?
- Do we know HOW to change it in classrooms?
- Does it matter for closing achievement gaps?
The Importance of School Transitions

• Transition to high school and to college are marked by decreased engagement, decreased academic performance
• New contexts call one’s belonging and one’s competence into question
• Concept of RECURSIVE PROCESSES for changing trajectories
What Do We Mean by “Context”?  

• Broadly defined: Systems, structures, policies, practices, opportunities, experiences, interactions, values, shared norms  
• NOT another thing to teach or another program to offer, but HOW we teach, HOW we interact with kids, and HOW we structure learning opportunities
Knowledge Gaps:

• What is the “natural” developmental trajectory of noncognitive factors from K to 12 and beyond?

• How are noncognitive factors shaped by daily classroom practice, absent “intervention”?

• Are noncognitive factors best understood as properties of individual students or as products of students’ contexts?

• Are noncognitive factors transferable across settings/contexts?

• What are the best measures of noncognitive factors?
Classroom Strategies to Support Academic Mindsets and Increase Perseverance:

- Clear learning goals
- Clear picture of success (models & benchmarks)
- Lay out the path from here to there
- Provide choice (different ways in)
- Monitor and provide support
- Lots of “safe” practice and timely feedback
- Repeated opportunities to demonstrate learning
- Grading practices that encourage effort and taking risks
- Scaffold challenging work
- Teach metacognitive strategies and other learning strategies
- Express your confidence & commitment
- Establish trusting relationships
- Hold high expectations
- Make progress visible
- Celebrate learning
School-wide Strategies

"Every system is perfectly designed to get the results it gets."

- School-wide culture of Student Success – “This is what we ALL do here”
- Clear picture of college readiness (models & benchmarks)
- Lay out the Path from Here to College
- Different Ways In – Recognizing the importance of MATCH and FIT
- Provide opportunities for interaction, discussion
- Establishing trusting relationships (among student peer groups, among adults, between students and adults)
- Holding high expectations for behavior and for the future
- Monitoring and providing support
- Teaching metacognitive strategies/reflection
- Make Progress Visible
- Celebrate Progress
Effective educators are those that:
- Support students’ motivation to learn
- Build students’ capacity to achieve
- Expand students’ academic competence
- Structure opportunities for students to do amazing things and to have a real impact
Thank you!

Camille Farrington

camillef@uchicago.edu
Belonging as a Classroom Condition

How much do the following statements describe your classmates in your [TARGET CLASS]?

• Students aren’t afraid to ask the teacher questions.
• Students in this class are happy to help each other understand the material.
• When someone makes a mistake, students try to help him or her.
• Students help each other to work hard.
• Students provide positive feedback to each other in discussions.
• Students are expected to work together on their class work.
• My classmates think it’s important to really understand what we’re learning.

Not at all, A little, Somewhat, A lot
Belonging as a Classroom Condition

- Students aren't afraid to ask the teacher questions.*
- Students in this class are happy to help each other understand the material.*
- When someone makes a mistake, students try to help him or her.*
- Students help each other to work hard.
- Students provide positive feedback to each other in discussions.*
- Students are expected to work together on their class work.*
- My classmates think it's important to really understand what we're learning.

*Not at all
- A little
- Some-what
- A lot
Belonging as a Classroom Condition

How true are the following in your [TARGET] class?

• My teacher gives us opportunities to work with each other.
• My teacher greets me when I come into class.
• My teacher makes sure that students get to know each other.
• Most of my classmates participate in class.
• Most of my classmates push each other to work hard.
• Students in this class feel like family to me.

Not at all true, A little true, Somewhat true, Mostly true, Completely true
Belonging as a Classroom Condition

- My teacher gives us opportunities to work with each other.
- My teacher greets me when I come into class.
- My teacher makes sure that students get to know each other.
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- Most of my classmates push each other to work hard.
- Students in this class feel like family to me.

Not at all true
A little true
Somewhat true
Mostly true
Completely true
Classroom Condition: *Belonging*

How true are the following statements in your [TARGET] class?

- Students feel comfortable asking the teacher questions.
- Students in this class are happy to help each other understand the material.
- When someone makes a mistake, students try to help him or her.
- Students help each other to work hard.
- Students provide positive feedback to each other in discussions.
- Students are expected to work together on their class work.
- My classmates think it’s important to really understand what we’re learning.

*Not at all true, A little true, Mostly true, Completely true*
Classroom Condition: Belonging
Mean Rasch Scores for 15 schools (labeled A-O) and for CPS district high schools vs. Charter high schools

CPS (No Charters)

Charters

- Less than 2.0
- 2.0 to 3.0
- Greater than 3.0
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<td>62% (34%)</td>
<td>76% (39%)</td>
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<tr>
<td>When someone makes a mistake, students try to help</td>
<td>61% (35%)</td>
<td>75% (39%)</td>
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<tr>
<td>Students help each other to work hard</td>
<td>63% (33%)</td>
<td>70% (40%)</td>
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<td>62% (38%)</td>
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Determining Item Difficulty in Rasch

We do our best to write items of increasing difficulty when we create the survey, and then we use the collected survey data to test the item difficulty.

Example:

*Measuring Grit*

*(using Angela Duckworth’s items on our pilot survey)*
### Grit Responses:

Example of increasing item difficulty as shown by survey responses

(Arrow shows increasing order of difficulty)

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<th>To what extent do the following describe you?</th>
<th>% Reporting <em>Mostly Like Me or Completely Like Me</em> (% <em>Completely Like Me</em>)</th>
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<td>N of Schools</td>
<td>15</td>
</tr>
<tr>
<td>N of Students</td>
<td>3193</td>
</tr>
<tr>
<td>I am a hard worker</td>
<td>76% (32%)</td>
</tr>
<tr>
<td>I am diligent</td>
<td>69% (30%)</td>
</tr>
<tr>
<td>I finish whatever I begin</td>
<td>61% (26%)</td>
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Grit – Behavioral Control

To what extent does the following describe you:
I am a hard worker.
I often set a goal but later choose to pursue a different one.
I finish whatever I begin.
I am diligent (hard working and careful).
Setbacks don’t discourage me.
Not at all like me, not much like me, somewhat like me, mostly like me, very much like me

![Graph showing Semester grade distribution](chart.png)
### Self-efficacy Responses by Gender

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<th>FEMALE</th>
<th>MALE</th>
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<tbody>
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<td>~N of Students</td>
<td>1795</td>
<td>1753</td>
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<td>% Reporting Somewhat or A lot to Each Question (% A lot)</td>
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<td>I can master the skills taught in this class</td>
<td>82% (41%)</td>
<td>85% (48%)</td>
</tr>
<tr>
<td>I can learn the material in this class, even if the work is hard</td>
<td>82% (42%)</td>
<td>85% (46%)</td>
</tr>
<tr>
<td>I know I can do well on a test, even when it’s hard</td>
<td>63% (29%)</td>
<td>70% (37%)</td>
</tr>
<tr>
<td>I am very good at this subject</td>
<td>58% (25%)</td>
<td>66% (31%)</td>
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Self-Efficacy: Mean Rasch Scores for 15 schools (labeled A-O) and for Males and Females across the 15 schools

- Less than 3.5
- 3.5 to 4.0
- Greater than 4.0
LOW Grades in Chicago public high schools
Over 50 percent of CPS graduates finish school with a high school GPA of 2.5 or less in their core classes.

![Bar chart showing the distribution of unweighted GPAs for CPS graduates (2002 and 2003)](chart.png)

- **35%** with a GPA < 2.0
- **24%** with a GPA 2.1-2.5
- **20%** with a GPA 2.6-3.0
- **14%** with a GPA 3.1-3.5
- **7%** with a GPA 3.6-4.0
• suspensions
Attendance