Family and School Influences on Student Motivation and School Achievement

- Jacquelynne S. Eccles
- University of Michigan

- Presentation at Swiss Educational Society Meeting
  - Bern, Switzerland
  - Fall 2003
Motivation

↓

Engagement

↓

Learning and Achievement
Critical Motivational Beliefs

- Confidence in One’s Academic Abilities – Can I Do the Task? Can I Master the Material?

- Valuing the Task – Do I Want to Do the Task?
  - Enjoyment
  - Importance to Self
  - Usefulness for Short and Long Range Goals
Students’ Goals & General Self-Schemata

- Short Term Goals
- Long Term Goals
- Personal Identity
- Social Identity

Confidence In One’s Ability

Engagement and Achievement Choices

Valuing of School Achievement and Learning

- Enjoyment
- Importance
- Utility

Choices
Goals of Talk

- Summarize the Ways in Which Parents Can Influence These Motivational Beliefs
- Summarize the Ways in Which Teachers and Parents Can Work Together to Influence These Motivational Beliefs
How Might Parents Influence Their Children’s Motivation to Engage in Academic Subjects and In School Achievement?
Family Demographic Characteristics:
- Social Class
- Education
- Culture

Parent General Values and Beliefs:
- Importance of school success
- Stereotypes

Parent Behaviors:
- Role Modeling
- Instruction
- Provision of educational experiences
- Emotional support
- Involvement at school
- Collaboration with teachers

Child’s School Motivation

Child’s Characteristics
- Sex
- Intelligence
- Other Aptitudes

Parents’ Child Specific Beliefs
- Expectations
- Perceptions of child’s abilities and interests
- Goals
Let’s Look First at the Influence of Family Demographic Characteristics

– In a National Sample
– In One of My Own Studies
Parent Education Model
MADICS: Maryland Adolescence Development in Context Study
Sample

- Longitudinal Study
  - Followed from 7th Grade (age = 11)
  - to age 23
  - Data collected in 7th grade, 8-9th grade, 11-12th grade, one year post 12th grade, three years post 12th grade

- Sample Size = 755
- 66% African American
- 50% Female
Family SES Variables

- Parent Income (Family)
  - Mean: $52,987
  - St. dev: $25,407
  - Range: $3,500 to > $150,000

- Parent Education (Highest)
  - High school degree or below: 30%
  - Some college: 29%
  - College degree: 22%
  - Advanced degree: 18%
Methods

- Data were collected from interviews and surveys administered in the home to the parents and target adolescent.

- Data to be presented next were gathered at the beginning of 7th grade (1991) and in the summer following the 8th grade (1993).

- School record data was obtained in 1991 and 1993 (which included the 5th grade California Achievement Test scores).
Family Influences: Model To Be Tested

- Family Income
- Parent Education
- Prior Achievement
- Parent Efficacy
- Parental Education Expectations
- Perceived Rule Structure
- Educational Activities
- Achievement
Parent Beliefs

- **Academic Efficacy (alpha = .79)**
  - e.g., How much can you do to get your 7th grader... to do (his/her) homework?
    - (1=nothing; 2=a little; 3=some; 4=a lot)

- **Educational Expectations (single item)**
  - ...how far do you think (7th grader) will actually go in school?
    - (e.g., 3 = Graduate from high school; 9 = MD, Law, PhD or other doctoral degree)
Parent Behavior

- **Family Structure** (alpha = .65)
  - e.g., Do you have family rules or expectations for your 7th grader about... doing homework?
    (1 = No; 2 = Yes)

- **Educational Activities**
  - How often have you or your spouse/partner helped your 7th grader do homework or a school project?
    (1 = never; 6 = daily, more than 1 hour)
Youth Achievement

- **Academic Achievement - Grade 5**
  - California Achievement Test (Total Scale Score)

- **Academic Achievement - Grade 8**
  - Maryland Functional Test (Total Math Score)

- **Grade Point Average - Grade 8**
  - Final English Grade
  - Final Science Grade
  - Final Math Grade
  - Final Health Grade
  - *(Scale based on school records data)*
Model of Family Influence to be Tested

- Income
- Parent Education
- Prior Achievement (5th Grade)
- Parent Efficacy
- Parental Education Expectations
- Percived Rule Structure
- Educational Activities
- Achievement

Wave 1

Wave 3
Parent Effects In MADICS

- Income
- Education
- Prior Achievement

Factors:
- Efficacy
- Expectations
- Educational Activities

Correlation Coefficients:
- Income to Education: 0.26
- Income to Expectations: 0.24
- Income to Prior Achievement: 0.33

Expectations to Educational Activities: 0.31
Efficacy to Educational Activities: 0.31
Educational Activities to Achievement: 0.72

Achievement: 0.72
What Can Teachers/Educators Do?

- Work with Less Educated Parents to Increase Their Confidence in Their Ability to Help Their Children Do Well in School
  - Provide more information about what is being taught – e.g., Weekly Notebooks
  - Provide joint adult-child educational opportunities - Family Math, Family Computers
  - Provide more guidance to these parents on:
    - How to help their children with school work,
    - How to provide enriching educational opportunities, and
    - What their children need to do to succeed in school
What Can Teachers/Educators Do - 2?

- Work with Less Educated Parents to Make Them More Comfortable Coming to School
  - Provide information about what is going on at school
  - Talk to them about the good things their children are doing at school
  - Try to work with the parents as a team on behalf of their children
  - Don’t assume that the parents are not interested in helping their children
What Else Do Parents Do To Influence Their Children’s Engagement in Intellectual Activities?
PARENT, FAMILY, & NEIGHBORHOOD CHARACTERISTICS (e.g., Education, Occupation, Number of Children, Ethnicity, Neighborhood)

PARENTS’ GENERAL BELIEFS & BEHAVIOR (e.g., Gender Role Stereotypes, General & Specific Personal Values, Child Rearing Beliefs, Emotional Warmth, Involvement in Activities)

PARENTS’ CHILD SPECIFIC BELIEFS (e.g., Perceptions of Child’s Abilities/Talents, Perceptions of Child’s Temperament, Perceptions of the Value of Various Skills for Child, Perceptions of Child’s Interests)

PARENT SPECIFIC BEHAVIORS (e.g., Time Spent with Child, Encouragement to Participate in Activities, Provision of Toys, Equipment, Lessons, Training of Specific Personal Values, Attributions for Child’s Successes/Failures)

CHILD OUTCOMES (e.g., Self-Perceptions, Subjective Task Values, Interest Values, Future Goals, Performance Expectations, Activity Choices, Performance)

CHILD AND SIB CHARACTERISTICS (e.g., Sex, Past Performance, Aptitudes, Temperament, Attitudes)
Childhood and Beyond (CAB) longitudinal study (1989-1999)

- Cohort-sequential Design (children in K, 1, 3 in 1989) followed each year for 12 years

- 912 children (451 girls, 461 boys) and their parents – Primarily middle class families
Eccles’ Parenting Model

**Parent & Family Characteristics**
- Education
- Family Income

**Child Characteristics**
- Sex
- Age
- Aptitudes

**Parent Behaviors**
- Coactivity
- Encouragement
- Modeling

**Child Activity Engagement**
Measures: Children’s Activities

- **Child report**
  - How often they
    - Used a computer outside of school
    - Engaged in math activities
    - Engaged in science activities
    - Scale: 0 = *never*, 6 = *almost every day for a lot of time*
Measures: Parent Behaviors

- **Parent encouragement**
  - How much they generally encouraged their child to
    - Work on or play with a computer outside of school
    - Do math-related (e.g., math-oriented games such as mastermind) or science-related (e.g., chemistry sets) activities at home
    - Scale: 1 = strongly discourage, 7 = strongly encourage

- **Parent-child coactivity**
  - Generally, how often did they
    - Work with their child on the computer
    - Engage in math or science activities with their child
    - Scale: 1 = never, 3 = 2-3 times a month, 7 = every day for 30 minutes or more

- **Parent modeling**
  - In the last week, how much time they spent on
    - Math- and science-related activities
    - A microcomputer for activities other than action video games
    - Scale: 1 = 0 hours, 6 = 10-15 hours, 8 = more than 20 hours
Measures: Parent & Child Characteristics

- Parent education
  - Highest level of education across each mother-father dyad
- Family annual income
- Digit Span
  - Assess children’s mathematics aptitudes
    - Stevenson & Newman, 1986
    - Includes 12 sets of whole numbers
Predicting Children’s Activity Engagement
Computer Use

\[ R^2 = .27 \]

\[ R^2 = .03 \]

\[ X^2 (58) = 140.71, p < .001, \quad TLI = .98, \quad CFI = .99, \quad RMSEA = .05 \]
Math and Science

Child aptitude

Child grade

Child gender

Parent education

Family income

Parent coactivity

Paternal coactivity

Maternal modeling

Paternal modeling

Maternal encouragement

Paternal encouragement

Parent Socialization $R^2 = .03$

Child-reported math & science $R^2 = .07$

$X^2 (58) = 122.29, p < .001, \ TLI = .98, \ CFI = .99, \ RMSEA = .05$
Figure 16- Number of Math Promotive Factors by Gender of Child

<table>
<thead>
<tr>
<th>Number of Promotive Factors</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>60</td>
</tr>
<tr>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>80</td>
</tr>
<tr>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>4 or more</td>
<td>30</td>
</tr>
</tbody>
</table>

- **Boys**
- **Girls**
Figure 18- Relation of Multiple Promotive Scores to Children's Motivation Math

Normalized Scores

Self-concept (w3)
Liking (w3)
Importance (w3)
Self-concept (w4)
Liking (w4)
Importance (w4)
Conclusions

- Synergistic combination of socialization methods
Parents’ Perceptions of Their Children’s Math Ability

Question:

Do parents’ perceptions of their children’s academic abilities predict the children’s own confidence in their academic abilities?

YES! Especially in the Elementary School Years
Measures

- Teachers’ Ratings of Each Child’s Math Ability
- Parents’ Ratings of Their Own Child’s Math Ability (e.g., How good is (CHILD’S NAME) at math? How well is (XX) doing in math this year? How well will (XX) do next year in math? - rated on 7 point scales)
Measures continued

- Child’s Rating of His or Her Own Math Ability
  (e.g., How good are you at math? How good at math are you compared to other subjects? How good at math are you than other children? )
Teacher's Rating

Mother's Wave 2 Rating

.76

.64

.23

.06

Mother's Wave 3 Rating

Child's Wave 2 Rating Of Own Math Ability

.30

Child's Wave 3 Rating of Own Math Ability

.37
## Conclusion on Parents’ Beliefs

- Parents’ Beliefs and Expectations Have Bigger Impact on Their Children’s Math and Language Arts Abilities than Do Teachers and School Marks, Particularly in the Elementary School Years.

- Parents’ Early Confidence in Their Child’s Academic Abilities Reduce the Amount of Decline in the Children’s Own Confidence in Their Academic Abilities.
What About Sex of Child?

Question:

- Does the Sex of One’s Child Influence Parents’ Confidence in Their Child’s Academic Abilities?

- YES!! Particularly in the Early and Middle Adolescence (Between Ages 11-16)
Parents’ Effects on Girls versus Boys for Mathematics and Language Arts

- In USA, girls are less confident than boys in their math abilities and less interested in math than boys once they reach 11-12 years of age.
- Females are also less likely to take advanced mathematics courses.
- Exactly the opposite is true for Language Arts.
WHY? FOCUS ON MATH

- Girls earn the same or higher marks than boys in mathematics but do slightly less well on standardized tests.
- The sex differences in interest and confidence remain even when the differences in tests scores are accounted for.
- Teachers play some role
- Parents play an even more critical role
Role of Parents

- Perceptions of how difficult math is for sons versus daughters
  - Parents of daughters think that math is harder for their child than parents of sons even though the girls get better grades than the boys
  - Parents of daughters think their child is having to work harder to do well in mathematics than parents of sons
  - Parents of daughters think that their child is trying harder in mathematics than in English
Parents’ Rating of Adolescent Child’s Effort in Math and English
Role of Parents

- **Expectations for future performance in mathematics**
  - Parents of daughters have lower expectations for their child’s future performance in math than parents of sons
  - Parents of daughters think that their child will do better in the future in English than in mathematics
Parents’ Expectations for Adolescent Child’s Future Performance

<table>
<thead>
<tr>
<th></th>
<th>Math</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls</td>
<td>10.5</td>
<td>11.5</td>
</tr>
<tr>
<td>Boys</td>
<td>10.0</td>
<td>10.5</td>
</tr>
</tbody>
</table>
Why Do Parents Have These Views?

- Boys are actually better than girls at mathematics.
  - MAYBE BUT at this age boys and girls are doing equally well and are putting in an equal amount of effort on math according to their teachers and girls continue to earn better grades than boys in math throughout primary and secondary school, as well as at the university.

- Parents have a different explanation for girls’ than for boys’ performances in math.
  - YES!
Parents’ Causal Attributions for Child’s Math Successes

![Bar chart showing causal attributions for boys and girls.]

- **Boys**
  - Talent: 4.5
  - Effort: 5
- **Girls**
  - Talent: 5.5
  - Effort: 5.5
Relation of Parents’ Causal Attribution for Child’s Math Success to Parents’ Ratings of Child’s Effort and Talent in Math

![Chart showing relationship between parental attribution and child's effort and talent in math.](chart.png)
Impact of These Beliefs on Daughters’ Math Confidence and Interest

- Teacher’s Rating of Girls’ Math Ability
- Mother’s Rating of Girl’s Math Ability
  - Mother’s Rating of Girl’s English Ability
  - Girl’s Rating of Own Math Ability
  - Girl’s Interest In Math

Correlation Coefficients:
- 0.60
- 0.48
- 0.31
- 0.21
- -0.19
- -0.20
What Can Teachers Do About This?

- Assuming the goal is to increase math talented girls’ interest in math
- Tell parents of these girls that their daughters are talented in math
- Tell these girls that they are talented in math
- Provide these girls with vocational and intellectual reasons why they might be interested in pursuing their talent in math
- Use more girl friendly teaching methods for math and physical science courses
Summary

- Parents have great influence on children and adolescents’ academic motivation and engagement.
- Teachers can work with parents to facilitate positive motivation and school engagement.
- Such collaboration can be especially helpful in cases where the social class and gender role stereotypes may undermine some students’ academic motivation and engagement.
Thank you.

For More Information:

http://www.rcgd.isr.umich.edu/garp
What About Schools and Teachers?

- There is Extensive Work on the Influence of Schools and Teachers on Students’ Academic Achievement

- Much More than I can Discuss Today

- I’ll Focus on Just One Effect – The Decline in Students’ School Motivation as They Move Through School
## School Achievement, Attendance & Motivation In MADICS

<table>
<thead>
<tr>
<th></th>
<th>7th Grade</th>
<th>8th Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade Point Average</td>
<td>3.67</td>
<td>3.63</td>
</tr>
<tr>
<td>Days Absent from School</td>
<td>9.35</td>
<td>10.78</td>
</tr>
<tr>
<td>Academic Competence Beliefs</td>
<td>5.36</td>
<td>5.23</td>
</tr>
<tr>
<td>Academic Importance Beliefs</td>
<td>4.05</td>
<td>3.91</td>
</tr>
<tr>
<td>Academic Utility Beliefs</td>
<td>5.49</td>
<td>5.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ns)</td>
</tr>
</tbody>
</table>
School Problem Behaviors
Seventh and Eighth Grade

- Sent to Principal’s Office
- Cheated on Tests
- Suspended from School
- Skipped Class
- Brought Drugs/Alcohol
- Expelled from School

Percent Mentioning Once in Two Chances

- Seventh Grade
- Eighth Grade
Percentage of Adolescents Reporting Different Phenomenological Risks and Protection Associated with School

% Youth

Risk Factors

- School Relative Ability Focus
- Racial Discrimination in School
- Gender Discrimination in School

Protective Factors

- School Mastery Focus
- Meaningful Curriculum
- Autonomy Provisions
- Teacher Support
- Positive Teacher Expectations
Change in Psychological Distress and School Motivation by (Risks-Protections) in School
Seventh to Eighth Grade

Change in Relative Status (Standard Units)

More Protections <------------------------> More Risks
Change in School Problem Behaviors and GPA by (Risk - Protective) Factors in School
Seventh to Eighth Grade

More Protections <------------------------> More Risks