Latest Montessori Research

AMS 2012 Annual Conference
March 16, 2012, 8:00-9:30 AM
Presenters

- Angela Murray, PhD
  University of Kansas
  AMS Research Coordinator

- Carolyn Daoust, PhD
  Saint Mary's College of California
  AMS Board of Directors
  Co-chair of the AMS Research Committee

- Ann Epstein, PhD
  University of Wisconsin-La Crosse
  Co-chair of the AMS Research Committee
Agenda

• What does research say about Montessori outcomes?
• How can we speak mainstream language about Montessori?
• How does AMS support research?
What does research say about Montessori outcomes?
Montessori Research
Background

• Most frequently requested: Outcomes research
• Montessori education: Whole child focused
  ▫ participate in the nation’s conversations about academic success as measured by standardized tests but must not be confined to this sole indicator
• Number of published studies: Increased in recent years
  ▫ includes academic as well as socio-emotional outcomes
Challenges in Quality Montessori Research

- No single study can *prove* Montessori education is superior
- Process of building a body of knowledge from many studies over time
- Difficult to account for diversity across Montessori schools and teachers
- Studies must control for impact of parental choice
The body of work summarized here includes some of the most well-designed and influential research regarding Montessori outcomes.
Published studies find superior academic outcomes for Montessori students

- **Meta Analysis:**
  - Almost 30 reform programs
  - Two Montessori studies had some of largest positive effects on achievement of all programs evaluated (Borman, 2003)

- **Longitudinal Study:**
  - High schoolers in Milwaukee Public School’s Montessori program from ages 3 to 11 outperformed control group on Math/Science standardized assessments (Dohrmann, et al, 2007)
Published studies find superior academic outcomes for Montessori students

- Randomized Study:
  - Shows Montessori academic effectiveness with younger Montessori students
  - Superior standardized tests of reading and math (Lillard, 2006)
Studies also show other benefits of Montessori

- Montessori middle schoolers were more positively engaged in school (Rathunde & Csikszentmihalyi, 2005a,b)

- International study found Montessori approach superior to Freinet or traditional pedagogy in fostering creativity (Besançon, M. and Lubart, 2008)

- Randomized study shows Montessori effectiveness at fostering social skills, complex thinking and creativity (Lillard, 2006)
Recent dissertations find stronger test scores among Montessori students

- **McDurham, 2011:**
  - Public Montessori 7th and 8th graders
  - Higher passing rates on state tests than students in matched non-Montessori schools

- **Peng, 2009:**
  - Catholic elementary students in Taiwan with Montessori early childhood education
  - Higher language arts test scores than students without

- **Hobbs, 2008:**
  - Matched pairs of 6th grade Montessori and non-Montessori students
  - Montessori students perform significantly higher in reading & math achievement on SAT
Montessori Research Momentum

- Hartford Longitudinal Study – Angeline Lillard
  - Three-year grant funded study of 3-6 year olds
  - Includes two Montessori magnet schools and controls
  - Assessing a range of social, behavioral and academic outcomes

- University Education Faculty Perceptions of Montessori Education – Bagby, Barnard-Brak, Sulak, Walter, Murray
  - Study of 721 school of education faculty across the country
  - Examining their thoughts on Montessori education
How can we speak mainstream language about Montessori?

Executive Functioning
Motivation
Wellbeing
Mindfulness
Experts
Language of Executive Functioning

- Success requires creativity, flexibility, self-control and discipline
- Executive functions play a central role:
  - mentally playing with ideas
  - giving a considered rather than an impulsive response
  - staying focused
- Diamond and Lee (2011) evaluated four programs, including Montessori, in fostering executive functioning
Language of Executive Functioning

• Tools of the Mind: 18 of 18 characteristics
• Montessori: 17 of 18
  ▫ Only one ages 0-18
  ▫ Play not given prominent role: “playfulness, creativity encouraged; but rather than play at activities like cooking, children cook; no social dramatic play”
  ▫ The widest geographical spread of any educational program; currently in 117 countries across six continents
  ▫ Teacher training 1-2 years full time plus in service refreshers as opposed to days of workshops
• PATHS: 13 of 18
• CSRP: 6 of 18
## Language of Executive Functioning

### Montessori Alignment with Executive Functioning

<table>
<thead>
<tr>
<th>Dynamic assessment</th>
<th>Virtually never reprimands</th>
<th>Active, hands-on learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socioemotional content</td>
<td>No extrinsic rewards</td>
<td>Character development</td>
</tr>
<tr>
<td>EF challenged all day</td>
<td>Planning by child emphasized</td>
<td>Extensive teacher training</td>
</tr>
<tr>
<td>Connects cognitive, social, emotional development</td>
<td>Individualized pacing and instruction is pronounced</td>
<td>Widest geographical spread</td>
</tr>
<tr>
<td>Particular focus on oral language development</td>
<td>Child to child, cross age tutoring</td>
<td>Scaffolds for success</td>
</tr>
<tr>
<td>Self talk encouraged</td>
<td>Teacher as scientist</td>
<td>Labeling and identifying feelings not emphasized</td>
</tr>
</tbody>
</table>
Language of Motivation

• Maria Montessori was passionate about students’ becoming enthused and engaged in their own learning.

• Montessori theories resonate with current psychological research on improving education.

“Our aim therefore is not merely to make the child understand...but to so touch his imagination as to enthuse him to his inmost core. We do not want complacent pupils, but eager ones...” (Montessori, 1989, p. 11).
Language of Motivation

• Four elements consistently reported as enhancing internal motivation:
  ▫ **Autonomy**: crucial for enhancing internalized student motivation
  ▫ **Interest**: more cognitive engagement, more learning, and higher levels of achievement
  ▫ **Competence**: establishes expectations of future success which motivates effort to meet new challenges
  ▫ **Relatedness**: interactions with other students provide context for shaping motivation

• Elements are well-established in Montessori elementary
## Language of Motivation

<table>
<thead>
<tr>
<th>Motivating Element</th>
<th>Montessori Elementary Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Autonomy</strong></td>
<td>• Student control of work time</td>
</tr>
<tr>
<td></td>
<td>• Teacher as guide</td>
</tr>
<tr>
<td></td>
<td>• Individualized goal setting and conferences</td>
</tr>
<tr>
<td></td>
<td>• “Going out”</td>
</tr>
<tr>
<td><strong>Interest</strong></td>
<td>• Linking new knowledge to larger universe</td>
</tr>
<tr>
<td></td>
<td>• Following the child</td>
</tr>
<tr>
<td></td>
<td>• Uninterrupted work cycle</td>
</tr>
<tr>
<td><strong>Competence</strong></td>
<td>• Sequential and individualized curriculum</td>
</tr>
<tr>
<td></td>
<td>• Three-year age span</td>
</tr>
<tr>
<td></td>
<td>• Individualized evaluation process</td>
</tr>
<tr>
<td><strong>Relatedness</strong></td>
<td>• Three-year age cycle</td>
</tr>
<tr>
<td></td>
<td>• Frequent small group work</td>
</tr>
<tr>
<td></td>
<td>• Class meetings</td>
</tr>
</tbody>
</table>
Language of Wellbeing

• Wellbeing research often termed ‘eudaimonic’, from Aristotle’s discussion of Eudaimonia:
  ▪ a state of wellbeing in which a person has achieved their highest potential (Aristotle 4th Century BCE/1987)

• Eudaimonic research focuses on the needs associated with psychological wellbeing:
  ▫ self-acceptance
  ▫ positive relations with others
  ▫ autonomy
  ▫ environmental mastery
  ▫ purpose in life
  ▫ personal growth
Language of Wellbeing

• Biswas-Diener (2011) cites evidence that:

“...each of these needs is actively cultivated in the children who attend [Montessori] schools. It may be that the unique techniques employed at Montessori schools are well-suited to promoting a sense of self-acceptance in children, or connectedness, or mastery.”
Mindfulness is the “quality of focused attention on the present moment accompanied by a non-judgmental stance.”

Research on mindfulness practices to improve children’s well-being.

Interventions with adults are clearly related to well-being, but the challenge with very young children is age-appropriateness.
Language of Mindfulness

- Montessori schooling “naturally incorporates practices that align with mindfulness and are suited to very young children.” Lillard, A. S. (2011)
  - privileging concentrated attention
  - attending to sensory experience
  - engaging in practical work
  - emphasis on simplicity
  - avoidance of judgment
  - grounding in stories
  - mindfulness in teacher education
Language of Mindfulness

- Lillard suggests these practices “might be responsible for some of the socio-emotional and executive function benefits that have been associated with Montessori education.”

- Outcomes research tied to mindfulness:
  - Rathunde and Csikszentmihalyi 2005a
  - Rathunde and Csikszentmihalyi 2005b
  - Lillard and Else-Quest 2006
  - Lillard 2011
Final items

- Online Research Library at [www.amshq.org](http://www.amshq.org)
- AMS Teacher Research Panel
- AMS Montessori Parent Research Panel
- AMS/MRX Research Collaboration
- Research Resources Poster and Postcards
- Poster Session Friday
- Grad Student Roundtable Friday
Invited Researchers Discuss their Work
Early Childhood Teacher Perceptions
Ann Epstein, Ph.D., Assistant Professor, University of Wisconsin - La Crosse, ECE Coordinator

Do early childhood teachers’ perceptions of family priorities and stressors align with parents’ actual statements of their priorities and stressors?
Current Research

- Teacher-family alliance is essential (NAEYC, 2010)
- Communication (both verbal and non-verbal) in early childhood centers can lead to misunderstandings regarding priorities (Reedy & McGrath, 2010)
- Stressors abound
  - financial hardships (Kochan, 2010)
  - guiding children’s behaviors (Waldfogel, 2010)
  - cultural and linguistic diversity (Eberly, Joshi, & Konzal, 2007)
  - family member difficulties (Boger et. al., 2008)
- Scant research on current family priorities or on Montessori teacher perceptions
Methods and Participants

- **What**: surveys and focus group discussion
  - Two 22 item parallel surveys: multiple choice, rank order, open response; on-line and hard copy
  - One focus group: 2 parents, 1 teacher, 1 administrator
- **Who**: La Crosse area early childhood teachers and families

<table>
<thead>
<tr>
<th></th>
<th>Non Head Start</th>
<th>Head Start</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers</td>
<td>23</td>
<td>16</td>
<td>39</td>
</tr>
<tr>
<td>Family Members</td>
<td>26</td>
<td>42</td>
<td>68</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>58</td>
<td>107</td>
</tr>
</tbody>
</table>
Key Survey Questions

Please rank order the following list of families’ priorities for their young children.

1. learning to behave appropriately
2. making academic progress
3. making friends
4. learning to be kind
5. making sure children have adequate materials (toys, clothing, food, housing, etc.)
6. having opportunities to express individual creativity
7. learning to be respectful
## Family Priorities
(Non-Head Start)

<table>
<thead>
<tr>
<th>Teacher Predictions</th>
<th>Actual Family Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>top</strong></td>
<td><strong>top</strong></td>
</tr>
<tr>
<td>1. Providing adequate materials</td>
<td>1. Learning to behave</td>
</tr>
<tr>
<td>2. Learning to behave</td>
<td>2. Providing adequate materials</td>
</tr>
<tr>
<td></td>
<td>(bi-modal)/learning to be kind</td>
</tr>
<tr>
<td><strong>bottom</strong></td>
<td><strong>bottom</strong></td>
</tr>
<tr>
<td>6. Learning to be respectful</td>
<td>6. Providing adequate materials</td>
</tr>
<tr>
<td>7. Creative expression</td>
<td>(bi-modal)/ supporting academic progress</td>
</tr>
<tr>
<td></td>
<td>7. Creative expression (bi-modal)</td>
</tr>
</tbody>
</table>
Family Stressors

Please rank order the following list of family stressors.

1. economic challenges
2. academic performance expectations
3. behavioral expectations
4. not enough time
5. adjusting to a different culture and/or language
6. family challenges (for example, marital problems, extended family issues, etc)
# Family Stressors
(Non-Head Start)

<table>
<thead>
<tr>
<th>Teacher Predictions</th>
<th>Actual Family Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>top</strong></td>
<td><strong>top</strong></td>
</tr>
<tr>
<td>1. Economic challenges</td>
<td>1. Not enough time</td>
</tr>
<tr>
<td>2. Family challenges</td>
<td>2. Economic challenges</td>
</tr>
<tr>
<td><strong>bottom</strong></td>
<td><strong>bottom</strong></td>
</tr>
<tr>
<td>5. Academic performance expectations</td>
<td>5. Family challenges</td>
</tr>
<tr>
<td>6. Adjusting to a different culture</td>
<td>6. Adjusting to a different culture</td>
</tr>
<tr>
<td>Teacher Predictions</td>
<td>Actual Family Ratings</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td><strong>Top</strong></td>
<td><strong>Top</strong></td>
</tr>
<tr>
<td>1. Providing adequate materials</td>
<td>1. Assisting children to be respectful</td>
</tr>
<tr>
<td>2. Guiding children’s behaviors</td>
<td>2. Guiding children’s behaviors</td>
</tr>
<tr>
<td><strong>Bottom</strong></td>
<td><strong>Bottom</strong></td>
</tr>
<tr>
<td></td>
<td>7. Providing adequate materials</td>
</tr>
</tbody>
</table>
# Family Stressors
(Head Start)

<table>
<thead>
<tr>
<th><strong>Teacher Predictions</strong></th>
<th><strong>Actual Family Ratings</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Top/most stressful</strong></td>
<td><strong>Top/most stressful</strong></td>
</tr>
<tr>
<td>1. Economic challenges</td>
<td>1. Economic challenges</td>
</tr>
<tr>
<td>2. Family challenges</td>
<td>2. Guiding children’s behaviors</td>
</tr>
<tr>
<td><strong>Bottom/least stressful</strong></td>
<td><strong>Bottom/least stressful</strong></td>
</tr>
<tr>
<td>5. Cultural adjustment</td>
<td>5. Finding quality time/family challenges</td>
</tr>
</tbody>
</table>
Areas of Agreement

Non-Head Start

*Priorities*
- Providing adequate materials (top)
- Guiding children’s behaviors (top)

*Stressors*
- Economic challenges (top)
- Adjusting to another culture (bottom)

Head Start

*Priorities*
- Guiding children’s behaviors (top)
- Creative expression (bottom)

*Stressors*
- Economic challenges (top)
- Adjusting to another culture (bottom)
## Areas of Non-Alignment

<table>
<thead>
<tr>
<th>Non-Head Start</th>
<th>Head Start</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Priorities</strong></td>
<td><strong>Priorities</strong></td>
</tr>
<tr>
<td>- Creative expression (bi-modal)</td>
<td>- Providing adequate resources (bottom for families, top by teachers)</td>
</tr>
<tr>
<td>- Providing adequate resources (bi-modal)</td>
<td>- Assisting children to be respectful (top for families, middle for teachers)</td>
</tr>
<tr>
<td><strong>Stressors</strong></td>
<td><strong>Stressors</strong></td>
</tr>
<tr>
<td>- Family challenges (top for teachers, bottom for families)</td>
<td>- Helping children learn beginning concepts (top for families, bottom for teachers)</td>
</tr>
<tr>
<td>- Behavioral expectations (top for families, middle for teachers)</td>
<td>- Family challenges (top for teachers, bottom for families)</td>
</tr>
</tbody>
</table>
Using this information...

- As a Montessori teacher or administrator
  - Increase awareness of your own beliefs, priorities, stressors and possible biases
  - List possible priorities and stressors of your families
  - Consider school surveys or individual classroom surveys
  - Look for opportunities to strengthen teacher/family partnerships
Focus Group Findings

**Communication is essential**

- Families appreciate on-going notes, phone calls, texts, social events
- Families do not like to be told how to parent

  “Parent education” gives the impression that there is something wrong with the way parents are already conducting themselves....perhaps rewording this to "parent support" would be a more suitable approach.”

  (member check parent)
Focus Group Findings

Communication is essential (continued)

Advice to new teachers from veteran administrator

“The other thing that’s really, really, really important, especially in my role (as administrator) more than anybody’s is, if I was to say three things they need to do: listen, listen, listen!”
Focus Group Findings

**Respect, Communication, Trust**

“I do believe that if problems develop with children, it is easier to meet and resolve the issue if there is a respect for the teacher (and I assume, respect for the parents).

For me, respect is gained from the relationship the teacher has with my children and how they interact together.... . If there is a strong effort made by the teacher, it is much easier for me as a parent to trust what the teacher has to say and be "fully on board" with whatever plan is in place to resolve the issue.” (member check parent)
Central and Supporting Themes

relationships between families and teachers require trust

communication:
social events, regular notes & conversations

family priorities:
behavior, adequate materials, learning to be respectful and kind, creativity

family stressors:
guiding behavior, time, economics, beginning concepts

diversity:
single parents, international families
Implications for Early Childhood Professionals

• Communicate respectfully
  ▪ Aim to build trusting partnerships

• Emphasize importance of partnering with all families to understand each set of individual priorities and stressors
  ▪ Be careful of making assumptions!

• Connect families with community resources (when applicable)

• Be ready to provide respectful assistance
  ▪ Guiding behaviors
  ▪ Learning concepts
Latest Findings of the Public Montessori Elementary Teacher Research Project

Sawako Suzuki, Ph.D.
Carolyn Daoust, Ph.D.
The PMT Research Project

- **Participants**
  - 444 public elementary Montessori educators in the US
  - Mostly:
    - Female (93%)
    - Caucasian (90%)
    - State Credentialed (94%)
  - Most held Montessori certificates (75%), some were in Montessori training (13%)
  - Most (77%) were between 31 and 60 years of age
  - Worked at the same school for 7 years on average
Participants:

Educational Background

- Bachelors
- Masters
- Doctorate
- Other
Participants:

Credential Type

AMI
AMS
NAMC
Other
Participants:

Training Format

- Online
- Summer Intensive
- Multiple Summer
- FT Academic Year
- PT 2+ Years
- Other
Participants:

Age Grouping in Their Classrooms

- Same Age
- Two Age Levels
- Three Age Levels
- 4 or More Levels
The PMT Research Project

- **The Schools**
  - Montessori ECE: 66%
  - Free or Reduced Lunch: 41%
  - Limited English Speakers: 11%
  - Mont. Trained Admin.: 37%
  - Years in Operation: 13
The Schools:

Type of Montessori School

- Charter
- Magnet
- Neighborhood
- W/in a School
The Schools:

Admissions Process

- First Come
- Lottery
- Selective
## Cluster Variables & Overall Sample Scores

<table>
<thead>
<tr>
<th>Extent Like Me</th>
<th>1 = Completely Unlike</th>
<th>6 = Completely Like</th>
</tr>
</thead>
<tbody>
<tr>
<td>(N = 444)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Hour Uninterrupted Work Period</td>
<td></td>
<td>3.80</td>
</tr>
<tr>
<td>Creation Story Told</td>
<td></td>
<td>4.53</td>
</tr>
<tr>
<td>Child Help Develop Work Plans</td>
<td></td>
<td>3.79</td>
</tr>
<tr>
<td>Children Choose Snack Time</td>
<td></td>
<td>3.91</td>
</tr>
<tr>
<td>Non-Montessori Instruction Daily</td>
<td></td>
<td>4.08</td>
</tr>
<tr>
<td>Extent of Mixed Age Grouping*</td>
<td>1 age level = 6%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 age levels = 28%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 age levels = 61%</td>
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</tr>
</tbody>
</table>
Implications to Montessori Practice and Visual Skills of Emergent Readers

Dr. Ginger Kelley McKenzie
Dr. Victoria Zascavage
Xavier University
Cincinnati, Ohio
Participants:
214 First Graders in three public Montessori schools

- **Trail One**: Each participant read 26 three letter phonetic words (1) In three-dimensional print format and (2) in traditional flat print format.
- **Trail Two**: Each participant read the same collection of phonetic words with the following modification: If the print was three-dimensional first then the traditional flat print format was used first in the second trail.
Findings

Of the 214 students participating in the study, 56 pronounced more words correctly with three dimensional print format.

When comparing high fluency readers with low fluency readers, there was a statistically significant difference in improvement with the three-dimensional print format (p~0.04).

Typesetting format is not a flawless remedy for students with reading difficulties, as demonstrated by the 10 students for whom reading scores decreased with the three-dimensional print format.
Implications to Montessori Practice

A difficulty that could be addressed by a median step

Using three dimensional print which creates a right hemispheric stimulation.

- Our study begins an exploration that for some students, the abrupt progression from the use of manipulative (sandpaper letters, moveable alphabet) to traditional flat print may create an unnecessary reading difficulty attributed to visual spatial delays.
Jamilah R. Jor'dan, PhD

Assistant Professor, Department of Early Childhood/Primary Bilingual Education, Chicago State University, Chicago, IL

Research interests: Childhood exposure to violence; family strengthening practices; family child care
AMS Research Resources

www.amshq.org
Resources from AMS: Research Library

- **White Papers for General Audiences**
  - Overview of Research on Montessori Education: An Evidence-Based Curriculum
  - Montessori and the Needs of African American Students
  - Special Education and Montessori Math

- **White Papers for Researchers**
  - Topics for Montessori Researchers
  - Challenges of Montessori Research
  - Action Research in Montessori Classrooms
  - Research Using AMS Archives
Resources from AMS: Research Library

Journal Articles

- “Manipulating Happiness: Maria Montessori.” International Journal of Wellbeing, Biswas-Diener
- "Montessori Moments: Voices from the Field." Research supported by the American Montessori Society and the West Side Montessori School. Ely, M, and Matias, B
- "Montessori Elementary Philosophy Reflects Current Motivation Theories." Montessori Life, Murray
- “Montessori and the Mainstream: A Century of Reform on the Margins.” Teachers College Record, Whitescarver and Cossentino
Resources from AMS: Research Funding

- Research Mini-Grants
- Dissertation and Thesis Awards
- Travel Awards
- Links to Outside Funding Sources
Resources from AMS: Research Infrastructure

- Research Committee
- Research Coordinator
- Annual Conference Events
- *Montessori Life*
Montessori Photo credits

- Unless otherwise noted, Montessori photos are courtesy of AMI
  http://www.montessori-ami.org/centenary/photos/index.html
Highlights of Montessori Outcomes Research Literature

White Paper Available in AMS Research Library under Position and White Papers: "Overview of Research on Montessori Education: An Evidence-Based Curriculum"


Highlights of Montessori Outcomes Research Literature


A comparison of academic achievement for seventh and eighth grade students from Montessori and non-Montessori school programs


A comparison of the achievement test performance of children who attended Montessori schools and those who attended non-Montessori schools in Taiwan


Academic achievement: Montessori and non-Montessori private school settings

Mainstream Language: 21st Century Skills


Mainstream Language:

Problem Solving

Executive Functioning

Motivation
Mainstream Language: Self Actualization

Self Actualization

Wellbeing
Mainstream language:
Mindfulness

Mindfulness


Early Childhood Teacher Perceptions