



LEVERAGING MONTESSORI RESEARCH IN YOUR COMMUNITY

2018 AMS ANNUAL CONFERENCE



PRESENTER



- Angela Murray, PhD
 - AMS Senior Researcher
 - KU Assistant Research Professor



AMERICAN MONTESSORI SOCIETY
education that transforms lives

AGENDA

- What does research say about Montessori outcomes?
- What does the mainstream education field say about Montessori practices?
- Where can research be accessed on an ongoing basis?
- How can we leverage research to promote Montessori?



OVERALL MONTESSORI OUTCOMES



SCHOLARLY LITERATURE REVIEW OF EVIDENCE BASE

npj | Science of Learning

www.nature.com/npjscilearn

REVIEW ARTICLE **OPEN**

Montessori education: a review of the evidence base

Chloë Marshall¹

The Montessori educational method has existed for over 100 years, but evaluations of its effectiveness are scarce. This review paper has three aims, namely to (1) identify some key elements of the method, (2) review existing evaluations of Montessori education, and (3) review studies that do not explicitly evaluate Montessori education but which evaluate the key elements identified in (1). The goal of the paper is therefore to provide a review of the evidence base for Montessori education, with the dual aspirations of stimulating future research and helping teachers to better understand whether and why Montessori education might be effective.

npj Science of Learning (2017)2:11 ; doi:10.1038/s41539-017-0012-7

GROWING BODY OF EVIDENCE ON MONTESSORI EFFECTIVENESS

Studies show children in Montessori environments have as good as if not better outcomes in academic and non-academic domains.

SUMMARY OF OUTCOMES RESEARCH IN PAST 5 YEARS

	CT	SC	NC	FL Latino	FL Black	France	US
Math					small		
Language					small		
Social Skills							
Exec. Func.		small					
Behavioral					small		
Creativity							
Source	Lillard 2017	Culclasure In prep	Brown 2017	Ansari 2014		Besançon 2013	Lillard 2012

M+

M=

M-

No data

ANGELINE LILLARD'S OUTCOME STUDY FROM HARTFORD

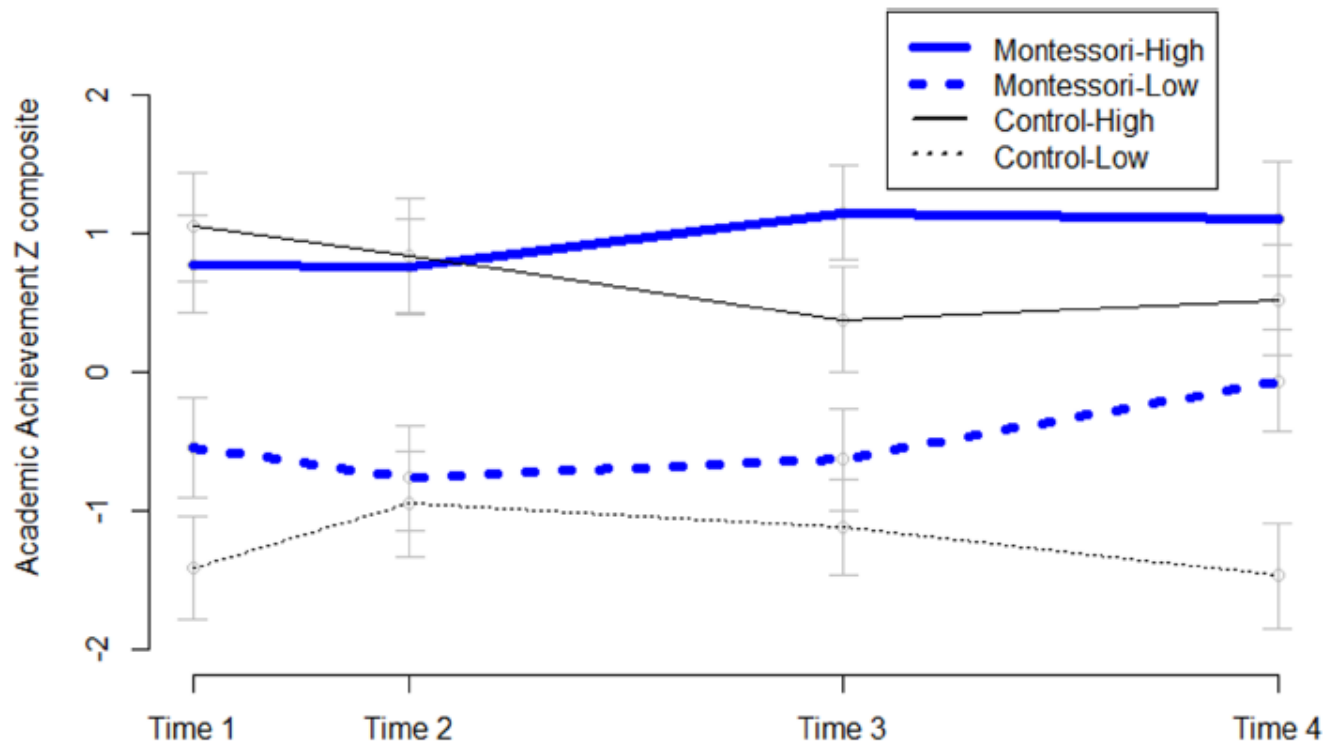
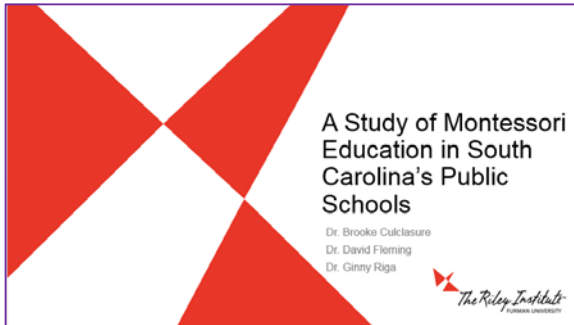


FIGURE 5 | Academic achievement across four time points by school condition and income group. Although equal to the lower income control children at Time 1, by Time 4 the lower income children in Montessori showed a strong positive trajectory towards closing the achievement gap with the higher income children in control and Montessori schools. Standard error bars are shown.

FIVE YEAR STATEWIDE STUDY IN SOUTH CAROLINA

Montessori education and academic outcomes



	ELA	Math	Writing	Science	Social Studies
Low Income	Mont	Mont			Mont
Non-Low Income	Mont	Mont			Mont
White	Mont	Mont	Mont	Mont	Mont
Black	Mont				Mont
Hispanic					
Other Race					
Female	Mont	Mont	Mont		Mont
Male	Mont	Mont			Mont
Lowest Test	Mont		Mont		Mont
Highest Test		Mont			

AFRICAN AMERICAN STUDENTS SCORED HIGHER IN READING

- African American 3rd graders
- Public Montessori and other magnet schools
- Montessori students scored higher in reading, but no difference in math on end of year state tests scores





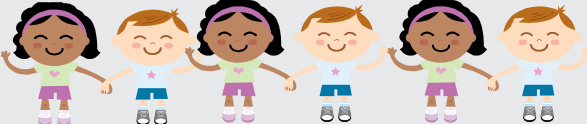



Large, urban
district in North
Carolina

LATINO CHILDREN SAW MOST BENEFIT

- 14,000 Title-I pre-K Montessori & High/Scope in Miami
- Beginning and end of 4-year-old pre-K year
 - Socio-emotional and behavioral skills
 - Pre-academic skills (cognitive, motor, and language)
- Latino Montessori children
 - began at most risk but had greatest gains
 - ended above national averages
- Black Montessori children had healthy gains but slightly greater in conventional

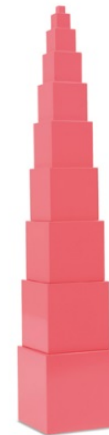


MORE MONTESSORI STUDENTS “HIGHLY CREATIVE” IN FRENCH STUDY

Identified as highly creative in	Montessori	Traditional
improving a toy task		
parallel lines task		
storytelling task		
drawing task		

“CLASSIC” MONTESSORI YIELDS STRONG ECE RESULTS

- Material use as index of Montessori fidelity
- 172 3-6 year old children participated
- Classic greater gains than Supplemented, Conventional on:
 - executive function
 - reading
 - math
 - vocabulary
 - social problem-solving



REMOVING SUPPLEMENTARY MATERIALS IMPROVED GROWTH

- Experiment: Non-Montessori materials removed from two of three classrooms
- Pretests given as baseline, retest after four months
- Children in “supplementary removed” classrooms
 - Grew significantly more in early reading and EF
 - Grew directionally more in early math
 - No differences in growth in vocabulary, social knowledge, or social problem-solving skills tests

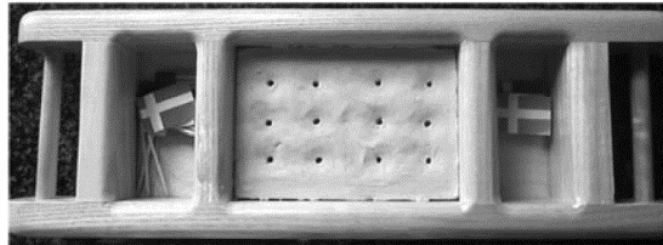




SPECIFIC MONTESSORI PRACTICES



SUPERIOR FINE MOTOR DEVELOPMENT



- Five year olds in 4 Montessori schools and one high-performing suburban school
- Practical life impact on fine motor development
- Montessori moderate to large effects on fine motor development
 - accuracy, speed, consistent use of dominant hand

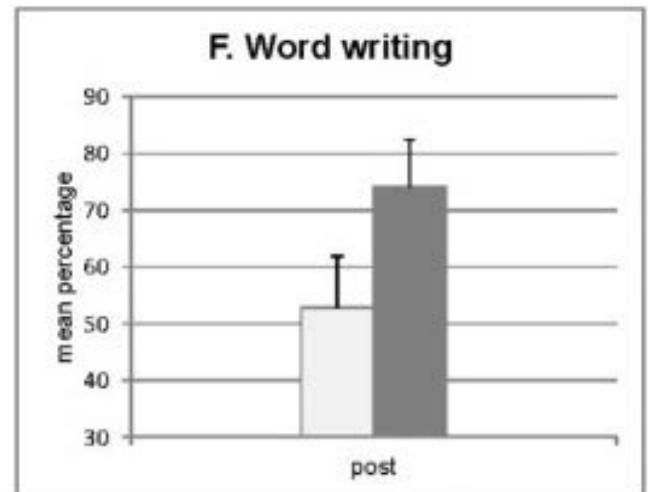
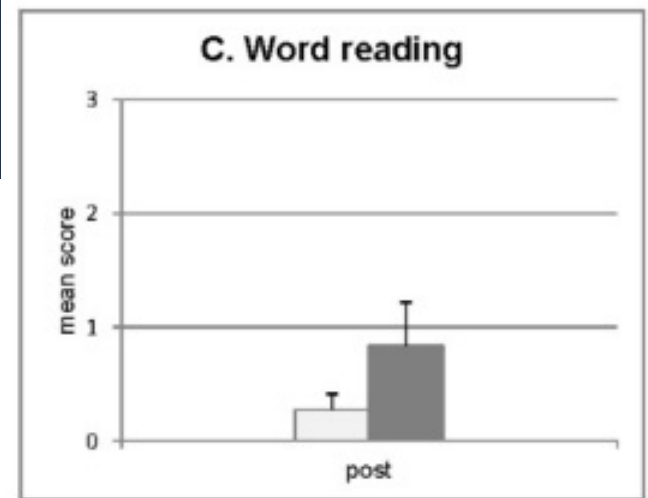
EMBODIED PEDAGOGY (TRACING)

- Finger tracing elements showed benefit
- Experiment with over 100 students
 - Triangle geometry (adolescents)
 - Order of operations (4th graders)
- Tracing students
 - correctly solved more practice problems
 - made fewer errors on follow-up test



HANDWRITING

- Handwriting superior to typing training in word writing, and, directionally, in word reading
- Suggests “action-perception coupling” facilitates “sensory-motor representations established during handwriting on reading and writing.”



□ typing group ■ writing group

PRIORITIZING DEVELOPMENT OF ATTENTION

- Materials enhance attention in children with ADHD
- 15 non-Montessori preschoolers with ADD and ADHD
- Pre-post test design experiment with a control group

Used tactile boards,
sound boxes, binomial

- Significant improvement on PTFK Attention test



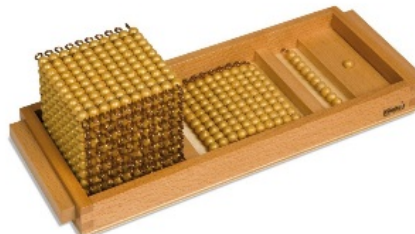
MIXED AGE GROUPS

- School readiness of nationally representative sample of 3's & 4's
- 4-year-olds fewer gains in academic skills when more 3-year-olds (4 to 5 months worth of development)
- Age composition unrelated to 3-year-olds' school readiness
- Author acknowledges not applicable to Montessori



MATH “MANIPULATIVES”

- Principles for effective use of mathematics manipulatives from cognitive science
- Use of manipulative consistently, over a long period of time
- Begin with highly transparent concrete representations and move to more abstract representations over time
- Avoid manipulatives that resemble everyday objects or have distracting, irrelevant features
- Explicitly explain the relation between the manipulatives and the math concept






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Research Library

The American Montessori Society Research Library provides Montessori educators and researchers. In addition to presenting relevant, high-quality research to encourage new research that will strengthen the existing body of Montessori education. If you are conducting Montessori research to share with AMS, please contact [Angela Murray](#).

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www.amshq.org/researchjournal

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SOCIAL MEDIA RESOURCE FOR RELEVANT RESEARCH

Facebook Group



The image shows a screenshot of a Facebook group page for the "Montessori Research Interest Group". The page header includes the Facebook logo, the group name, a search bar, and navigation links for "Angela", "Home", and "Find Friends". The main content area features a large photograph of hands using Montessori number cards on a table. Below the photo are interaction buttons: "Joined", "Notifications", "Share", and "More". At the bottom, there are options to "Write Post", "Add Photo/Vid...", "Live Video", and "More", along with an "ADD MEMBERS" button. A sidebar on the left lists group navigation options: "About", "Discussion", "Members", "Events", "Videos", "Photos", "Files", "Group Insights", and "Manage Group".



TAKING ACTION

SMALL GROUP ACTIVITY



STEP 1: IDENTIFY RELEVANT CONSTITUENTS

- Administrators
- Teachers
- Funders
- Legislators
- Regulators
- Adult Learners
- Parents

STEP 2: IDENTIFY RELEVANT TOPICS

Long-Term

- Montessori effectiveness
- Special education
- Need for teachers
- Diversity

Short-Term

- Items in the news
- Local emerging issues
- Scheduled events
- Broadcast news
- New publications

STEP 3: IDENTIFY COMMUNICATION VEHICLES

- Email
- Hard Copy
- Social Media
- Local Press
- In-Person Meetings
- Presentations
- Guest Speakers

STEP 4: ASSEMBLE COMMUNICATION CONTENT STRATEGY

	1.	2.	3.
Constituent Group			
Long Term Topics			
Short Term Topics			
Communication Vehicles			

STEP 5: CREATE AN IMPLEMENTATION PLAN

- Roles & Responsibilities
 - Who determines long-term priority topics?
 - Who monitors sources for short-term topics?
 - Who maintains communication vehicles?
 - Who creates content?
 - Who owns the big picture?

STEP 6: BUILD AN IMPLEMENTATION TIMELINE

2-3 Months

Create
Content
Strategy
and Roles
& Resp.

3-6 Months

Begin
Short-
Term
Topic
Communi-
cations

6-9 Months

Roll Out
Phase I of
Long
Term
Topic
Communi-
cations

9-12 Months

Roll Out
Phase II
of Long
Term
Topic
Communi-
cations

SIX STEPS, PLUS ONE

1. Identify Relevant Constituents
2. Identify Relevant Topics
3. Identify Communication Vehicles
4. Assemble Communication Content Strategy
5. Create an Implementation Plan
6. Build an Implementation Timeline
- 7. Continuously Evaluate Processes for Improvement!**