

Jennifer S. McCray
Associate Research Scientist and
Principal Investigator, Early Math Collaborative
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EDUCATION

- Ph.D. **Erikson Institute/Loyola University Chicago**
Granted May 2008 **Chicago, IL**
Applied Child Development
Minor Area: Cognitive Development and Information Processing
Dissertation: “Pedagogical Content Knowledge for Preschool Mathematics: Relationships to Teaching Practices and Child Outcomes”
Committee: Jie-Qi Chen (Chair-Erikson Institute), Samuel J. Meisels (Erikson Institute), and Catherine Haden (Loyola University Chicago)
- M.S. **Erikson Institute**
Granted June 1999 **Chicago, IL**
Child Development
- B.A. **University of North Carolina at Chapel Hill**
Granted June 1989 **Chapel Hill, NC**
English Literature

FELLOWSHIPS, AWARDS, AND FUNDED PROJECTS

- 2018-2021 Promising Math Conference and Racial Justice Roundtable (\$160,000)
Heising-Simons Foundation
- 2019-2020 Math All Around Me (\$100,000)
CME Group Foundation
- 2017-2022 Evaluating Quality Interactions in Preschool Classrooms around Math:
Development of a Video-based Observation
Institute for Education Sciences (\$1,400,000)
- 2016-2019 Math All Around Me (\$300,000)
CME Group Foundation
- 2016-2017 Promising Math Conference – First Biennial
CME Group Foundation (\$50,000)
Heising-Simons Foundation (\$50,000)
- 2015-2019 Collaborative Math (\$2,995,332)
National Science Foundation DRK-12
- 2015-2016 Online Module Development (\$450,000)
McCormick Foundation
- 2013-2016 Chicago P5 Math Leadership Initiative (\$1,291,116)

	Chicago Community Trust
	CME Group Foundation
2011-2015	Community College Partnership
	Robert R. McCormick Foundation (\$900,000)
2010	Investing in Innovation (i3) Development Grant from the U.S. Department of Education for “Achieving High Standards for PreK—Grade 3 Mathematics: A Whole Teacher Approach to Professional Development” (\$4,999,993)
2008-2010	International Symposia on Early Childhood Mathematics
	McCormick Tribune Foundation (\$325,000)
2007-2011	Early Mathematics Education (\$1,963,000)
	McCormick Foundation
	CME Group Foundation
	Motorola Foundation
	Chicago Public Schools
	Exelon Foundation
	Robert and Isabelle Bass Foundation
	Field Foundation
2009	Outstanding Dissertation Award, National Association of Early Childhood Teacher Educators (NAECTE)/Merrill-Prentice Hall
2009	Outstanding Dissertation Award, Division K (Teaching and Teacher Education) of the American Educational Research Association (AERA)
2005-2007	Head Start Graduate Student Research Grant, U.S. Department of Health and Human Services, Administration for Children and Families (\$50,000)
2005-2007	Office of Early Childhood Professional Development Grant, Chicago Public Schools (\$24,999)
1999-2001	Herr Research Center Fellowship in Applied Child Development, Erikson Institute
1997-1999	Doris Newberger Scholarship, Erikson Institute
1984-1989	Dean’s List Scholar, University of North Carolina at Chapel Hill
1984	National Merit Scholar

RESEARCH AND EVALUATION EXPERIENCE

Research Interests: Early childhood quantitative development and preschool mathematics, language and symbol use and their impact on cognitive development and implications for teaching, dialect and learning, pedagogical content knowledge among preschool teachers, and teacher education and professional development.

2016-present **Principal Investigator, Early Math Collaborative**, Erikson Institute, Chicago, IL
 Provide leadership for the Early Math Collaborative, a research, professional development and dissemination project with over 20 staff. Complete a National Science Foundation grant to develop and demonstrate the promise of a new professional development model for early childhood centers. Conduct strategic planning with staff to set vision and direction. Oversee all research and dissemination activities, write books and articles, represent the organization at national conferences and internationally. Provide oversight for the delivery of

professional development services for more than 600 early childhood teachers annually, and manage a budget ranging from \$1,200,000 to \$1,800,000.

2007-2016

Assistant Research Scientist and Founding Director, Early Math

Collaborative, Erikson Institute, Chicago, IL

Provided leadership to and oversight of an initiative to promote excellence in early childhood mathematics education through professional development, research, and dissemination activities. Managed a multi-funder, multi-university partnership serving the entire Chicago Public School system at the PreK to 5th grade level. Obtained and managed grant budgets in excess of \$1,500,000 annually. Oversaw evaluation activities related to interventions, and conducted research on questions of interest to the field. Provided direct supervision to three full-time staff, two half-time staff, a post-doctoral researcher and two doctoral research fellows. Pursued research questions relevant to adult learning among teachers and children's developing mathematical knowledge; disseminated results through publications and presentations. Represented the Collaborative at regional, state-wide and national events, providing expert knowledge in early mathematics education.

2005-2007

Grantee & Project Director, Erikson Institute, Chicago, IL. Head Start Graduate Student Research Grant, "Math-Related Talk among Head Start Teachers: Relationships to Child Math Gains and Classroom and Teacher Characteristics."

Implemented a federal grant-funded doctoral dissertation research study. Recruited and assessed 26 teacher subjects and 140 child subjects at Head Start sites throughout the city of Chicago. Hired and supervised project team of 3 master's students. Managed project budget and administrative functions. Coordinated approvals from participating bodies, including public agencies, schools, and community program sites.

2006-2007

Graduate Research Assistant, Erikson Institute, Chicago, IL. Chicago Public Schools Early Childhood Coaching - Early Math Education Survey Project. Jie-Qi Chen, Principal Investigator.

Assisted in development and implementation of a comprehensive survey of Chicago Public School Early Childhood teachers on preschool mathematics teaching; data analysis and dissemination of results; development of a professional development series addressing identified concerns.

2006

Research Consultant, Strategic Learning Initiatives, Chicago, IL. Conducted program evaluation for an early childhood parent involvement program serving families attending Chicago Public Schools.

2002

Research Assistant, Erikson Institute, Chicago, IL. Wrote report to the Chicago Community Trust on Teaching Language Arts to African American Children. Aisha Ray and Barbara Bowman, Principal Investigators.

- 1999-2006 **Research Assistant**, Erikson Institute, Chicago, IL. *Bridging: An Assessment for Teaching and Learning in Early Childhood Classrooms*. Jie-Qi Chen and Gillian McNamee, Principal Investigators.
- Assisted in development of *Bridging* – a set of child assessment activities designed to help teachers identify the learning styles and strengths of children between the ages of 3 and 8 years. Reviewed, summarized, and presented literature, wrote brief articles describing the project to scholarly communities, designed, piloted, and revised assessment activities and rubrics. Designed, piloted, implemented, and coded teacher interviews; analyzed teacher change data. Assisted in gathering and analyzed assessment data on 80 children and presented results at national conference. Designed teacher instructional manuals, trained student and in-service teachers.
- 1999-2003 **Accreditation Consultant**, Scholarship and Guidance Association, Chicago, IL.
- Assisted a child welfare agency in procuring initial accreditation and later re-accreditation. Wrote and edited self-study, produced policies/procedures, created forms, and supervised an editorial assistant.
- 1994-1995 **Research Assistant**, Psychology Department, DePaul University, Chicago, IL. Reginald Matias, Principal Investigator.
- 1993-1997 **Research Associate**, Department of Research and Quality Assurance, Children’s Home & Aid Society of Illinois, Chicago, IL.
- 1992 **Research Assistant**, Psychology Department, Loyola University, Judith Myers, Principal Investigator.

TEACHING AND CLINICAL EXPERIENCE

Teaching Interests: Child development, human development, cognitive development, language development, quantitative development, early numeracy, early literacy, social-emotional development, child welfare and child development, play and pedagogy, early childhood assessment, preschool pedagogy, early childhood mathematics.

- 2013-present **Doctoral Faculty**, teaching Seminar on Learning and Teaching, fall 2015; dissertation committee member for doctoral students Emma Whitman, Yinna Zhang, and Lauren Solarski.
- 2007-present **Senior Instructor**, Early Math Collaborative.
- 2006-2010 **Adjunct Faculty**, Inter-disciplinary course on *Children, Family, and the Law*, Erikson Institute/Loyola University Chicago Law School, Chicago, IL.

- 2007 **Instructor**, *Developing Math Literacy in the Early Childhood Classroom*, Erikson Institute Professional Development, Chicago, IL.
- 2002-2005 **Adjunct Faculty**, *Human Development*, College of Education, Roosevelt University, Chicago, IL.
- 2005 **Instructor**, *Bridging Assessment for In-Service Teachers*, Stock School, Chicago, IL (four month intensive professional development).
- 2001 - 2003 **Instructor**, *Bridging Assessment for In-Service Teachers*, Erikson Institute Professional Development.
- 2001 **Instructor**, *Value of Play in Child Development*, Parents as Teachers First, Chicago, IL.
- 1998-1999 **Educational Therapist** (Internship), Virginia Frank Child Development Center, Chicago, IL.
- 1993-1995 **Child Care Worker**, Treatment Foster Care Program, Children's Home & Aid Society of Illinois, Chicago, IL.
- 1988-1989 **Preschool Teacher**, Chapel of the Cross Child Care Center, Chapel Hill, NC.
- 1987-1988 **Preschool Teacher**, Holy Family Day Care, Chapel Hill, NC.

PUBLICATIONS

- McCray, J.S.**, Chen, J.Q., and Eisenband Sorkin, Eds. (In Press). *Growing Mathematical Minds: Conversations between Developmental Psychologists and Early Childhood Teachers*. New York, NY: Routledge.
- Chen, J. Q. & **McCray, J.S.** (2014). Intentional teaching: Integrating the processes of instruction and construction to promote quality early mathematics education. In Kortemkamp, U. (Ed.), *Early Mathematics Learning: Selected Papers of the POEM 2012 Conference*. New York, NY: Springer.
- McCray, J.S.** & The Early Math Collaborative (2014). *The Big Ideas of Early Mathematics: What Teachers of Young Children Need to Know*. Upper Saddle River, New Jersey: Pearson.
- Chen, J.Q., **McCray, J.S.**, Adams, M., & Leow, C. (2013). A Survey Study of Early Childhood Teachers' Beliefs and Confidence about Teacher Early Math. *Early Childhood Education Journal*, 41(6). DOI: 10.1007/s10643-013-0619-0

McCray, J. S., & Chen, J.-Q. (2012). Pedagogical content knowledge for preschool mathematics: Construct validity of a new teacher interview. *Journal of Research in Childhood Education, 26*(3), 291-307.

Jie-Qi Chen & **Jennifer McCray** (2012): A Conceptual Framework for Teacher Professional Development: The Whole Teacher Approach, *NHSA Dialog: A Research-to-Practice Journal for the Early Childhood Field, 15:1*, 8-23

Jie-Qi Chen & **Jennifer McCray** (2012): The What, How, and Why of Effective Teacher Professional Development in Early Mathematics Education, *NHSA Dialog: A Research-to-Practice Journal for the Early Childhood Field, 15:1*, 113-121

McCray, J.S., & Chen, J. (2011). Foundational Mathematics: A Neglected Opportunity. In B. Atweh; M. Graven; W. Secada; P. Valero (Eds.), *Mapping Equity and Quality in Mathematics Education*. New York: Springer Science + Business.

Chen, J. Q., McNamee, G., **McCray, J.** (2011). The learning profile: A construct to understand learning and development of the whole child in content areas. *The International Early Learning Journal, 1*(1), 1-24.

Chen, J., McNamee, G., with Masur, A.L., **McCray, J.S., & Melendez, L.** (2007). Implementation of Assessment Activities, in *Bridging: An assessment for teaching and learning in early childhood classrooms*. Thousand Oaks, CA: Corwin Press.

McNamee, G., Chen, J., Masur, A., **McCray, J., & Melendez, L.** (2002). Assessing and teaching diverse learners. *Journal of Early Childhood Teacher Education, 23*, 275-282.

INVITED PRESENTATIONS

McCray, J.S. (2018, July). Playing with Math to Build Access, Autonomy, and Attitude. “Big Talk” at Big Ideas in Early Learning Summer Institute, Erikson Institute, Chicago, IL.

McCray, J.S. (2018, February). Taking Shape in Early Math. Keynote Address at the Kohl Children’s Museum of Greater Chicago, IL.

McCray, J.S. (2017, October). Promising Math 2017: Access to Mathematics for Young English Language Learners. Promising Math Conference, Erikson Institute, Chicago, IL.

McCray, J.S. (2015, March). Preschool Math and the Common Core. Featured Speaker at the Kentucky Center for Mathematics Annual Conference, Lexington, KY.

McCray, J.S. (2014, August). Numeracy for Development. Save the Children Webinar Series.

McCray, J.S. (2014, July) STARNET Regions 1 and 3.

McCray, J.S., Chen, J. (2012, March). Foundations in Early Learning: Mathematics. Invited webinar presentation, U.S. Department of Education.

McCray, J.S. (2012, April). It's Not as Easy as 1-2-3: The Complexities of Early Mathematics. Invited Address at the Kentucky Center for Mathematics Annual Conference, Lexington, Kentucky.

McCray, J.S. (2012, April). It's Not as Easy as 1-2-3: The Complexities of Early Mathematics. Keynote Address at the Numbers Work! Institute, St. Paul, Minnesota.

McCray, J.S. (2012, January). Save the Children Numeracy Intervention Workshop. Invited address, New York, New York.

McCray, J.S. & Chen, J. (2010, April). Early Mathematics in Chicago and the Midwest: Addressing the Need. Presentation at the 2nd International Symposium on Early Mathematics Education, Erikson Institute, Chicago, IL.

McCray, J.S. (2009, November). Early Mathematics: Foundational Mathematics, Know Your Chicago Presentation at Erikson Institute, Chicago, IL.

McCray, J.S. (2009, October). Content Strands in U.S. Early Childhood Mathematics: Core Concepts as a Unifying Framework. Invited address, 2009 International Forum on Early Childhood Development and Education, Shanghai, China.

McCray, J.S. (2009, July). Panel Presentation on the Early Mathematics Education Project, Motorola Innovation Generation Network Conference, Schaumburg, IL.

McCray, J.S. (2009, May). Keynote Address, Preschool Awards Banquet, Science and Mathematics Education Network of Rush University Hospital, Chicago, IL.

PRESENTATIONS AT JURIED CONFERENCES

McCray, J.S., Chen, J., Eisenband Sorkin, J. (June, 2018). Creating Research-to-Practice Conversations in Early Math: A Case Study of an Innovative Book Writing Process. National Association for the Education of Young Children, Professional Learning Institute, Austin, TX.

Quest, M., Reid, E.E., **McCray, J.S.** (September, 2016). Measuring Teachers' Beliefs about Math: Efficacy and Epistemology. Poster presentation at the Illinois Education Research Council Symposium, Bloomington, IL.

Solarski, L., Reid, E.E., **McCray, J.S.**, Gaylor, E., Kamdar, D., Dominguez, X. (September, 2016). Collaborative Math in Head Start: Pilot Study. Poster presentation at the Illinois Education Research Council Symposium, Bloomington, IL.

Chen, J., Gaylor, E., **McCray, J.S.**, Spiker, D., and Wei, X. (2015, March). Understanding the Effects of an Early Math Intervention with Teachers on Child Outcomes.

Reid, E.E. & **McCray, J.S.** (2015, March). Assessing the Attitudes, Beliefs and Confidence of Teachers of Early Math. Roundtable Session at the Annual Meeting of the American Educational Research Association, Chicago, IL.

McCray, J.S. with The Chicago Public Schools, The Chicago Community Trust, CME Group Foundation, DePaul University, and Erikson Institute (2014, October). Preparing all Students to Succeed in a Global Economy: Implementing New math Standards is Key. Symposium presented at the Grantmakers for Education Annual Conference, Miami, FL.

McCray, J.S. (2014, August). Preschool Teachers' Ability to "see" Mathematics in Children's Play Predicts Learning. Symposium presentation at the EARLI Conference on SIG 5 Learning and Development in Early Childhood, Jyväskylä, Finland.

McCray, J.S., Chen, J. (2013, April). Preschool Mathematics PCK Interview Predicts Children's Mathematics Achievement. Presentation at the Annual Conference of the American Educational Research Association, San Francisco, California.

McCray, J.S., Chen, J. (2013, April). Teacher Interview Predicts Preschool Children's Mathematics Achievement. Presentation at the Research Pre-session of the Annual Meeting of the National Council of Teachers of Mathematics, Denver, Colorado.

Cerezci, B., **McCray, J.S.** (2012, June). Examining Quality Mathematics Teaching in Early Childhood Classrooms: Preliminary Results of the HIS-EM Teacher Observation. Presentation at the Illinois Educational Research Council Consortium, Tinley Park, Illinois.

McCray, J.S., Chen, J. & Zhang, Y. (2011, April). Preventing the Achievement Gap: Professional Development in Foundational Mathematics. Presentation at the Research Pre-session of the 2011 Annual Meeting and Exposition of the National Council of Teachers of Mathematics, Indianapolis, Indiana.

McCray, J.S., Itzkowich, R. (2010, October). Counting is Complex. Presentation at the Annual Meeting of the Illinois Association for the Education of Young Children, Springfield, Illinois.

McCray, J.S. & Chen, J. (2010, June). Understanding Big Ideas: Key to Effective Teacher Professional Development. Presentation at the 19th National Institute for Early Childhood Professional Development, NAEYC, Phoenix, Arizona.

McCray, J.S. and Chen, J. (2009, May). The Whole Teacher Approach: A Model for Teacher Education. Chicago Mathematics and Science Initiative Conference, Malcolm X College, Chicago, IL.

Itzkowich, R. & **McCray, J.S.** (2009, January). Where's the Math in Goldilocks? Opening Minds: The Chicago Early Education, Child Care and School-Age Conference (CMAEYC), Chicago, IL.

- McCray, J.S.** (2008, November). Combining Whole Teacher Approach, Pedagogical Content Knowledge, and Collaborative Learning Methods to Help Preschool Teachers with Early Mathematics Teaching. Annual Conference of the National Association for the Education of Young Children, Dallas-Fort Worth, TX.
- McCray, J.S.** (2008, April). Preschool Mathematics PCK Interview Predicts Children's Outcomes. National Council of Teachers of Mathematics Annual Meeting, Research Pre-session, Salt Lake City, UT.
- McCray, J.S.** (2008, March). Environmental Checklist for Preschool Mathematics Correlates with Teaching Practices: Evaluating the Math-Rich Environment Checklist (MRE). Annual Conference of the American Education Research Association Meeting, New York, NY.
- McCray, J.S., Masur, A.L., Whitehead, C., Korfmacher, J.** (2007, March-April). Early childhood parent workshops at urban elementary schools: Successfully promoting family involvement in literacy. Society for Research in Child Development Biennial Meeting, Boston, MA.
- McCray, J.S.** (2007, March). Re-visiting the concept-procedure analysis of preschool mathematics. National Council of Teachers of Mathematics Annual Meeting, Research Pre-session, Atlanta, GA.
- McCray, J.S.** (2007, January). The math-rich environment: Setting up your classroom for mathematics learning. Chicago Metro Association for the Education of Young Children (CAEYC) Opening Minds Conference, Chicago, Illinois.
- McCray, J.S.** (2006, June). Measuring pedagogical content knowledge for preschool mathematics. Head Start Research Conference, Washington, DC.
- McCray, J.S., Chen, J.Q., & McNamee, G.** (2004, April). Identification and nurturance of diverse cognitive profiles in young children. Annual Conference of the American Education Research Association Meeting, San Diego, Ca.
- Chen, J.Q., McCray, J.S., & Masur, A.** (2003, November). Assessing how children learn. Annual Conference of the National Association for the Education of Young Children, Chicago.
- Masur, A., & McCray, J. S.** (2001, April). Developing an assessment for diverse cognitive profiles. AERA National Conference, Seattle, WA.
- McCray, J.S. and Southward, K.** (1996, June). Illinois Parents Anonymous 1993 Parent Survey. Department of Research and Quality Assurance, Children's Home & Aid Society of Illinois. Society for Community Research and Action (Division 28 of the American Psychological Association) Biennial National Conference, Chicago, Illinois.

METHODOLOGICAL SKILLS

Coding Qualitative Data and Interrater Reliability
Standardized Assessment of Young Children
Multi-level Modeling

Field Methods
Survey Design and Piloting
Interview Design and Piloting

PROFESSIONAL ORGANIZATIONS

Cognitive Development Society

American Educational Research Association:

Division K – Teaching and Teacher Education;

Early Education/Child Development SIG; and

Research in Mathematics Education SIG

National Association for the Education of Young Children

National Council of Teachers of Mathematics

Association for Supervision and Curriculum Development