

## Curriculum Vitae

Robert S. Siegler  
Schiff Foundations Professor of Psychology  
Department of Human Development  
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### Education:

<u>Schools</u>	<u>Dates</u>	<u>Degree</u>	<u>Major</u>
SUNY at Stony Brook	1970-1974	Ph.D.	Psychology
Univ. of Illinois, Urbana-Champaign	1966-1970	B.A.	Psychology

### Employment:

2018-	Schiff Foundations Professor of Psychology, Columbia University
1997-2018	Teresa Heinz Professor of Cognitive Psychology, Carnegie-Mellon University
1984-1997	Professor, Carnegie-Mellon University
1981-1984	Associate Professor, Carnegie-Mellon University
1980-1981	Associate Professor, University of Chicago
1978-1980	Associate Professor, Carnegie-Mellon University
1974-1978	Assistant Professor, Carnegie-Mellon University

### Courses taught:

Adolescent Psychology	Development of Mathematical Skills
Children's Learning	Experimental Design
Cognitive Development	Graduate Research Methods
Cognitive Processes in Reading	How Children Learn Mathematics
Contributions of Psychological Research to Education	New Perspectives on Cognitive Development
Developmental Psychology	Principles of Child Development
	Theories of Development

### Memberships in Professional Organizations:

American Psychological Association	National Academy of Education
Association for Psychological Science	Society for Research in Child Development
Cognitive Development Society	

### Major Awards and Honors:

Recipient of the 2022 G. Stanley Hall Award for Distinguished Contribution to Developmental Psychology from Division 7 of APA. Chosen for the "in honor of" group of the Federation of Associations in Behavioral and Brain Sciences, 2017.

Jacob H. Schiff Foundations Chair of Psychology and Education, Teachers College, Columbia University, 2018-present

Hommage for Dr. Robert Siegler, Aix en Provence, France, 2016

Contributions published as Lemaire, P. (Ed.). (2017). *Cognitive development from a strategy perspective: A Festschrift for Robert S. Siegler*. New York: Routledge.

Elected Fellow of the Society of Experimental Psychologists, 2015

Honorary Professor, Henan University, Kaifeng, China, 2015

Rated one of the 200 most eminent psychologists of the modern era (Diener, Oishi, & Park, 2014, *Archives of Scientific Psychology*)

Astor Visiting Lectureship, Department of Experimental Psychology, St. Hilda's College, University of Oxford, June, 2014  
 National Assessment of Educational Progress (NAEP) Board Member, 2013  
 Honorary Professor, East China Normal University, 2013-present  
 Siegler Center for Innovative Learning (SCIL) established at Beijing Normal University, China, to stimulate innovations in education and to promote research collaborations between China and the U.S., 2012-present  
 Elected Member of the National Academy of Education, 2010-present  
 Headed Fractions Practice Guide Panel for U. S. Department of Education/Mathematica Policy Research, 2009-2010  
 Tisch Visiting Professor, Columbia University, 2009-2010  
 Appointed to the National Mathematics Advisory Panel (Presidential Commission), 2006-2008  
 American Psychological Association Distinguished Scientific Contribution Award, 2005  
 Honorary doctorate (Doctor Honoris Causa), University of Liege, Liege, Belgium, 2004  
 Named 1 of 40 most prominent alumni from University's first 40 years, SUNY at Stony Brook, 1998  
 Teresa Heinz Chair in Cognitive Psychology, 1997-present  
 U.S. Delegate for Psychology, Oxford University Press, 1997-2002  
 Association of American Publishers, "Best Psychology Book of 1996", Second Prize  
 Festival in Honor of Dr. Siegler, Tokyo University, September, 1984  
 McCandless Distinguished Young Scientist Award, American Psychological Association, Div. 7, 1979  
 Spencer Fellow, National Academy of Education, 1978

#### References:

Dr. David Geary	Dr. Susan Goldin-Meadow
Dr. Robert Sternberg	Dr. David Klahr
Dr. Martha Alibali	Dr. Dong Qi (President of Beijing Normal University)
Dr. Greg Duncan	

#### Publications:

##### Books

Siegler, R. S., Saffran, J. R., Eisenberg, N., & Gershoff, E. (2020). *How children develop, 6th edition*. New York: Worth.

Siegler, R. S., & Alibali, M. W. *Children's thinking, 5th edition*. (2019). Upper Saddle River, NJ: Prentice Hall.

Siegler, R. S., Saffran, J. R., Eisenberg, N., DeLoache, J. S., & Gershoff, E. (2017). *How children develop, 5th edition*. New York: Worth.

Siegler, R. S., DeLoache, J. S., Eisenberg, N., & Saffran, J. (2014). *How children develop, 4th edition*. New York: Worth.

Siegler, R. S., DeLoache, J. S., & Eisenberg, N. (2011). *How children develop, 3rd edition*. New York: Worth.

Damon, W., Lerner, R. M., Kuhn, D., Siegler, R. S., & Eisenberg, N. (Eds.) (2008). *Child and adolescent development: An advanced course*. Hoboken, NJ: Wiley.

Kuhn, D., & Siegler, R. S. (Vol. Eds.). (2006). *Volume 2: Cognition, perception, and language*. In W. Damon & R. M. Lerner (Series Eds.), *Handbook of child psychology* (6<sup>th</sup> ed.). Hoboken, NJ: Wiley.

Siegler, R. S., DeLoache, J., & Eisenberg, N. (Eds.) (2006). *Child development reader: 15 articles from Scientific American*. New York: Scientific American, Inc./Worth.

Siegler, R. S., DeLoache, J. S., & Eisenberg, N. (2006). *How children develop, 2nd edition*. New York: Worth.

- Siegler, R. S., & Alibali, M. W. (2005). *Children's thinking, 4th edition*. Upper Saddle River, NJ: Prentice Hall. Translated into Chinese, 2006.
- Siegler, R. S., DeLoache, J. S., & Eisenberg, N. (2003). *How children develop*. New York: Worth. Translated into German.
- McClelland, J. L., & Siegler, R. S. (Eds.). (2001). *Mechanisms of cognitive development: Behavioral and neural perspectives*. Mahwah, NJ: Erlbaum.
- Kuhn, D., & Siegler, R. S. (Vol. Eds.). (1998). *Volume 2: Cognition, perception, and language*. In W. Damon (Series Ed.), *Handbook of child psychology* (5th ed.). New York: Wiley.
- Siegler, R. S. (1998). *Children's thinking, 3rd edition*. Upper Saddle River, NJ: Prentice Hall. Translated into French and Greek.
- Siegler, R. S. (1996). *Emerging minds: The process of change in children's thinking*. New York: Oxford University Press. Translated into French and Portuguese.
- Siegler, R. S. (1991). *Children's thinking, 2nd edition*. Englewood Cliffs, NJ: Prentice-Hall. Translated into Korean.
- Siegler, R. S., & Jenkins, E. A. (1989). *How children discover new strategies*. Hillsdale, NJ: Erlbaum.
- Siegler, R. S. (1986). *Children's thinking*. Englewood-Cliffs, NJ: Prentice-Hall. Translated into Japanese.
- Siegler, R. S. (1978). (Ed.), *Children's thinking: What develops?* Hillsdale, NJ: Erlbaum.

#### Reports to Governments and Other Organizations

- Diamond, K. E., Justice, L. M., Siegler, R. S., & Snyder, P. A. (2013). Synthesis of IES research on early intervention and early childhood education. (NCSER 2013-3001). Washington, DC: National Center for Special Education Research, Institute of Education Sciences, U.S. Department of Education. This report is available on the IES website at <http://ies.ed.gov/>
- Fazio, L. & Siegler, R. S. (2012). *Teaching fractions. Vol. 22 of Educational practices series*. Geneva: International Academy of Education-International Bureau of Education.
- Siegler, R., Carpenter, T., Fennell, F., Geary, D., Lewis, J., Okamoto, Y., Thompson, L., & Wray, J. (2010). *Developing effective fractions instruction for kindergarten through 8<sup>th</sup> grade: A practice guide* (NCEE #2010-009). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. See <http://ies.ed.gov/ncee/wwc/PracticeGuide.aspx?sid=15>.
- National Mathematics Advisory Panel (NMAP). (2008). *Foundations for success: The final report of the National Mathematics Advisory Panel*. Washington, DC, U.S. Department of Education. See <http://www2.ed.gov/about/bdscomm/list/mathpanel/index.html> for more information.

#### Journal Articles and Book Chapters

##### In Press

- Schiller, L., Fan, A., & Siegler, R. S. (in press). The Power of One: The Importance of Flexible Understanding. *Journal of Numerical Cognition*.

##### 2022

- Hopkins, S., Russo, J., & Siegler, R.S. (2022). Is counting hindering learning? An investigation into children's proficiency with simple addition and their flexibility with mental computation strategies. *Mathematical Thinking and Learning*, 24(1), 52-69. doi:10.1080/10986065.2020.1842968
- McMullen, J., Hannula-Sormunen, M.M., Lehtinen, E., & Siegler, R.S. (2022). Predicting adaptive expertise with rational number arithmetic. *British Journal of Educational Psychology*, 92, 688-706. doi:10.1111/bjep.12471
- Siegler, R. S. (2022). Development of Numerical Knowledge. In O. Houdé & G. Borst (Eds.), *The Cambridge handbook of cognitive development* (pp. 361–382). Cambridge, United Kingdom: Cambridge University Press.

Thompson, C., Opfer, J., & Siegler, R. S. (2022). Comments Regarding Numerical Estimation Strategies Are Correlated with Math Ability in School-Age Children. *Cognitive Development*, 62, 101188. doi:10.1016/j.cogdev.2022.101188

Tian, J., Leib, E. R., Griger, C., Oppenato, C. O., & Siegler R. S. (2022). Biased problem distributions in assignments parallel those in textbooks: Evidence from fraction and decimal arithmetic. *Journal of Numerical Cognition*, 8(1), 73-88. doi:10.5964/jnc.6365.

2021

Braithwaite, D. W., & Siegler, R. S. (2020). Putting fractions together. *Journal of Educational Psychology*, 113(3), 556-571. doi: 10.1037/edu0000477

Braithwaite, D. W., Sprague, L., & Siegler, R. S. (2021). Towards a Unified Theory of Rational Number Arithmetic. *Journal of Experimental Psychology: Learning, Memory, and Cognition*. doi:10.1037/xlm0001073

Opfer J.E., Kim D., Fazio L.K., Zhou X., & Siegler R.S. (2021). Cognitive mediators of US—China differences in early symbolic arithmetic. *PLoS One*, 16(8), e0255283. doi:10.1371/journal.pone.02552

Siegler, R. S., & Oppenato, C. O. (2021). Missing input: How imbalanced distributions of textbook problems affect mathematics learning. *Child Development Perspectives*, 15(2), 76-82. doi:10.1111/cdep.12402

Tian, J., Braithwaite, D. W., & Siegler, R. S. (2021). Distributions of textbook problems predict student learning: Data from decimal arithmetic. *Journal of Educational Psychology*, 113(3), 516-529. doi:10.1037/edu0000618

2020

Barbot, B., Hein, S., Trentacosta, C., Beckmann, J., Bick, J., Crocetti, E., Liu, Y., Fernandez S., Liew, J., Overbeek, G., Ponguta, L., Scheithauer, H., Super, C., Arnett, J., Cook, T., Cooper, C., Côté, J., Eccles, J., Eid, M., Hiraki, K., Johnson, M., Juang, L., Landi, N., Leckman, J., Mulvey, L., McCardle, P., Preiss, D., Piquero, A., Siegler, R. S., Soenens, B., Yousafzai, A., Bornstein, M., Goossens, L., Harkness, S., van IJzendoorn, M. (2020). Manifesto for new directions in developmental science. *New Directions for Child and Adolescent Development*, 2020(172), 135-149. doi:10.1002/cad.20359

Cui, J., Li, L., Li, M., Siegler, R. S., & Zhou, X. (2020). Middle temporal cortex is involved in processing fractions. *Neuroscience Letters*, 725, 134901. doi: 10.1016/j.neulet.2020.134901

Hopkins, S., Russo, J., & Siegler, R. S. (2020). Is counting hindering learning? An investigation into the children's proficiency with simple addition and their flexibility with mental computation strategies. *Mathematical Thinking and Learning*, 24(1), 52-69. doi:10.1080/10986065.2020.1842968

McMullen, J., Hannula-Sormunen, M. M., Lehtinen, E., & Siegler, R. S. (2020). Distinguishing adaptive from routine expertise with rational number arithmetic. *Learning and Instruction*, 68, 101347. doi: 10.1016/j.learninstruc.2020.101347

McMullen, J., & Siegler, R. S. (2020). Spontaneous focusing on multiplicative relations and fraction magnitude knowledge. *Mathematical Thinking and Learning*, 22(4), 351-359. doi:10.1080/10986065.2020.1816284

Siegler, R. S., Im, S., & Braithwaite, D. W. (2020). Understanding development requires assessing the environment in which learning occurs: examples from mathematics learning. *New Directions for Child and Adolescent Development*, 173, 83-100. doi:10.1002/cad.20372

Siegler, R. S., Im, S-h, Schiller, L., Tian, J., & Braithwaite, D. W. (2020). The sleep of reason produces monsters: how and when biased input shapes mathematics learning. *Annual Review of Developmental Psychology*, 2, 413-435. doi:10.1146/annurev-devpsych-041620-031544

Tian, J., Braithwaite, D. W., & Siegler, R. S. (2020). How do people choose among rational number notations? *Cognitive Psychology*, 123, 101333. doi:10.1016/j.cogpsych.2020.101333

2019

Braithwaite, D. W., Leib, E., Siegler, R. S., & McMullen, J. (2019). Individual differences in fraction

arithmetic learning. *Cognitive Psychology*, *112*, 81-98. doi: 10.1016/j.cogpsych.2019.04.002  
2018

Braithwaite, D. W., & Siegler, R. S. (2018, April 26). Children learn spurious associations in their math textbooks: Examples from fraction arithmetic. *Journal of Experimental Psychology: Learning, Memory, and Cognition*. Advance online publication. doi: 10.1037/xlm0000546

Braithwaite, D. W., & Siegler, R. S. (2018). Developmental changes in whole number bias. *Developmental Science*, *21*(2), e12541. doi: 10.1111/desc.12541

Braithwaite, D. W., Tian, J., & Siegler, R. S. (2018). Do children understand fraction addition? *Developmental Science*, *21*(4), e12601. doi: 10.1111/desc.12601

Tian, J., & Siegler, R. S. (2018). Which type of rational numbers should students learn first? *Educational Psychology Review*, *30*, 351-372. doi: 10.1007/s10648-017-9417-3

Grandau, L., Itzkowich, R., & Siegler, R. S. (2018). Variability in children's mathematical thinking and learning. *Growing Mathematical Minds*, 109-137. doi:10.4324/9781315646497-5  
2017

Braithwaite, D. W., Pyke, A. A., & Siegler, R. S. (2017). A computational model of fraction arithmetic. *Psychological Review*, *124*(5), 603-625. doi: 10.1037/rev0000072

Lortie-Forgues, H., & Siegler, R. S. (2017). Conceptual knowledge of decimal arithmetic. *Journal of Educational Psychology*, *109*(3), 374-386. doi: 10.1037/edu0000148

Ninaus, M., Kiili, K., Siegler, R. S., & Moeller, K. (2017). Data-driven design decisions to improve game-based learning of fractions. In J. Dias, P. A. Santos, & R. C. Veltkamp (Eds.), *Games and learning alliance* (pp. 3-13). Cham: Springer International Publishing. doi: 10.1007/978-3-319-71940-5\_1

Siegler, R. S. (2017). Concluding words: The best job in the world. In Patrick Lemaire (Ed.), *Cognitive development from a strategy perspective: A Festschrift for Robert S. Siegler* (pp. 216-226). New York: Routledge.

Siegler, R. S. (2017). Fractions: Where it all goes wrong. Why do Americans have such trouble with fractions — and what can be done? *Scientific American* [November 28 blog post]. Retrieved from <https://www.scientificamerican.com/article/fractions-where-it-all-goes-wrong/>

Siegler, R. S. (2017). Foreword: Build it and they will come. In D. G. Geary, D. B. Berch, R. Ochsendorf, & K. Mann Koepke (Eds.), *Acquisition of complex arithmetic skills and higher order mathematics concepts* (pp. xv-xix). New York: Academic Press.

Siegler, R. S., & Braithwaite, D. W. (2017). Numerical development. *Annual Review of Psychology*, *68*, 187-213. doi: 10.1146/annurev-psych-010416-044101

Siegler, R. S., & Lortie-Forgues, H. (2017). Hard lessons: Why rational number arithmetic is so difficult for so many people. *Current Directions in Psychological Science*, *26*(4), 346-351. doi: 10.1177/0963721417700129

Tian, J., & Siegler, R. S. (2017). Fractions learning in children with mathematics difficulties. *Journal of Learning Disabilities*, *50*(6), 614-620. doi: 10.1177/0022219416662032  
2016

Fazio, L. K., DeWolf, M., & Siegler, R. S. (2016). Strategy use and strategy choice in fraction magnitude comparison. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *42*, 1-16, doi: 10.1037/xlm0000153

Fazio, L. K., Kennedy, C., & Siegler, R. S. (2016). Improving children's knowledge of fraction magnitudes. *PLOS ONE*. doi: 10.1371/journal.pone.0165243

Fuchs, L. S., Malone, A., Schumacher, R. F., Namkung, J., Hamlett, C. L., Jordan, N. C., Siegler, R. S., Gersten, R., & Changas, P. (2016). Supported self-explaining during fraction intervention. *Journal of Educational Psychology*, *108*(4), 493-508. doi: 10.1037/edu0000073

- Fuchs, L. S., Schumacher, R. F., Long, J., Namkung, J., Malone, A., Wang, A., Hamlett, C. L., Jordan, N. C., Siegler, R. S., & Changas, P. (2016). Effects of intervention to improve at-risk fourth graders' understanding, calculations, and word problems with fractions. *Elementary School Journal, 116*(4), 625-651. doi: 10.1086/686303
- Resnick, I., Jordan, N. C., Hansen, N., Rajan, V., Rodrigues, J., Siegler, R. S., & Fuchs, L. (2016). Developmental growth trajectories in understanding of fraction magnitude from fourth through sixth grade. *Developmental Psychology, 52*(5), 746-757. doi: 10.1037/dev0000102
- Siegler, R. S. (2016). Continuity and change in the field of cognitive development and in the perspectives of one cognitive developmentalist. *Child Development Perspectives, 10*(2), 128-133. doi: 10.1111/cdep.12173
- Siegler, R. S. (2016). How does change occur? In R. Sternberg, S. Fiske, & D. Foss, (Eds.), *Scientists making a difference: One hundred eminent behavioral and brain scientists talk about their most important contributions* (pp. 223-227). New York: Cambridge University Press.
- Siegler, R. S. (2016). Magnitude knowledge: The common core of numerical development. *Developmental Science, 19*, 341-361. doi: 10.1111/desc.1239z

## 2015

- Bailey, D. H., Zhou, X., Zhang, Y., Cui, J., Fuchs, L. S., Jordan, N. C., Gersten, R., & Siegler, R. S. (2015). Development of fraction concepts and procedures in U.S. and Chinese children. *Journal of Experimental Child Psychology, 129*, 68-83. doi: 10.1016/j.jecp.2014.08.006
- Hansen, N., Jordan, N. C., Fernandez, E., Siegler, R. S., Fuchs, L., Gersten, R., & Micklos, D. (2015). General and math-specific predictors of sixth-graders' knowledge of fractions. *Cognitive Development, 35*, 34-49. doi: 10.1016/j.cogdev.2015.02.001
- Lortie-Forgues, H., Tian, J., & Siegler, R. S. (2015). Why is learning fraction and decimal arithmetic so difficult? *Developmental Review, 38*, 201-221, doi: 10.1016/j.dr.2015.07.008
- Siegler, R., Fuchs, L., Jordan, N., Gersten, R., & Ochsendorf, R. (2015). The Center for Improving Learning of Fractions: A progress report. In S. Chinn (Ed.), *The Routledge international handbook of dyscalculia and mathematical learning difficulties*, (pp. 292-303). New York: Routledge.
- Siegler, R. S., & Lortie-Forgues, H. (2015). Conceptual knowledge of fraction arithmetic. *Journal of Educational Psychology, 107*, 909-918. doi: 10.1037/edu0000025
- Torbeyns, J., Schneider, M., Xin, Z. & Siegler, R. S. (2015). Bridging the gap: Fraction understanding is central to mathematics achievement in students from three different continents. *Learning and Instruction, 37*, 5-13. doi: 10.1016/j.learninstruc. 2014.03.002
- Watts, T. W., Duncan, G. J., Chen, M., Claessens, A., Davis-Kean, P. E., Duckworth, P., Engle, M., Siegler, R., & Susperreguy, M. I. (2015). The role of mediators in the development of longitudinal mathematics achievement associations. *Child Development, 86*, 1892-1907, doi: 10.1111/cdev.12416

## 2014

- Bailey, D. H., Siegler, R. S., & Geary, D. C. (2014). Early predictors of middle school fraction knowledge. *Developmental Science, 17*, 775-785. doi: 10.1111/desc.12155
- Fazio, L. K., Bailey, D. H., Thompson, C. A., & Siegler, R. S. (2014). Relations of different types of numerical magnitude representations to each other and to mathematics achievement. *Journal of Experimental Child Psychology, 123*, 53-72. doi: 10.1016/j.jecp.2014.01.013
- Fuchs, L. S., Schumacher, R. F., Sterba, S. K., Long, J., Namkung, J., Malone, A., Hamlett, C. L., Jordan, N. C., Gersten, R., Siegler, R. S., & Changas, P. (2014). Does working memory moderate the effects of fraction intervention? An aptitude-treatment interaction. *Journal of Educational Psychology, 106*, 499-514. doi: 10.1037/a0034341
- Laski, E. V., & Siegler, R. S. (2014). Learning from number board games: You learn what you encode. *Developmental Psychology, 50*, 853-864. doi: 10.1037/a0034321

- Ramani, G. B., & Siegler, R. S. (2014). How informal learning activities can promote children's numerical knowledge. In R. C. Kadosh & A. Dowker (Eds.), *Oxford handbook of mathematical cognition*, published on-line, 3-2014. doi: 10.1093/oxfordhb/9780199642342.013.012
- Siegler, R. S. & Lortie-Forgues, H. (2014). An integrative theory of numerical development. *Child Development Perspectives*, 8, 144-150. doi: 10.1111/cdep.12077
- Siegler, R. S., & Thompson, C. A. (2014). Numerical landmarks are useful – Except when they're not. *Journal of Experimental Child Psychology*, 120, 39-58. doi: 10.1016/j.jecp.2013.11.014
- Vukovic, R. K., Fuchs, L. S., Geary, D. C., Jordan, N. C., Gersten, R., & Siegler, R. S. (2014). Sources of individual differences in children's understanding of fractions. *Child Development*, 85, 1461-1476. doi: 10.1111/cdev.12218
- Watts, T. W., Duncan, G. J., Siegler, R. S., & Davis-Kean, P. E. (2014). What's past is prologue: Relations between early mathematics knowledge and high school achievement. *Educational Researcher*, 43, 352-360. doi: 10.3102/0013189X14553660

## 2013

- Chen, Z., & Siegler, R. S. (2013). Young children's analogical problem solving: Gaining insights from video displays. *Journal of Experimental Child Psychology*, 116, 904-913. doi: 10.1016/j.jecp.2013.08.009
- Fazio, L. K. & Siegler, R. S. (2013). Microgenetic learning analysis: A distinction without a difference. Commentary on Parnafes and diSessa. *Human Development*, 56, 52-58. doi: 10.1159/000345542
- Fuchs, L. S., Schumacher, R. F., Long, J., Namkung, J., Hamlett, C. L., Cirino, P. T., Jordan N. C., Siegler, R., Gersten R., & Changas, P. (2013). Improving at-risk learners' understanding of fractions. *Journal of Educational Psychology*, 105, 683-700. doi: 10.1037/a0032446
- Jordan N. C., Hansen, N., Fuchs, L. S., Siegler, R. S., Gersten, R., & Micklos, D. (2013). Developmental predictors of fraction concepts and procedures. *Journal of Experimental Child Psychology*, 116, 45-58. doi: 10.1016/j.jecp.2013.02.001
- Siegler, R. S. (2013). Cognitive development in childhood. In E. Diener & R. Biswas-Diener (Eds.), *Noba textbook series: Psychology*. Champaign, IL: DEF Publishers. doi: www.nobaproject.com
- Siegler, R. S. (2013). How do people become experts? In J. Staszewski, (Ed.), *Expertise and skill acquisition: The impact of William G. Chase* (pp. 107-116). New York: Taylor & Francis.
- Siegler, R. S., Fazio, L. K., Bailey, D. H., & Zhou, X. (2013). Fractions: The new frontier for theories of numerical development. *Trends in Cognitive Science*, 17, 13-19. doi: 10.1016/j.tics.2012.11.004
- Siegler, R. S., & Pyke, A. A. (2013). Developmental and individual differences in understanding fractions. *Developmental Psychology*, 49, 1994-2004. doi: 10.1037/a0031200
- Siegler, R. S., & Svetina, M. (2013). Relations between short-term and long-term conceptual change. In S. Vosniadou (Ed.), *International Handbook of Research on Conceptual Change*, 2<sup>nd</sup> edition (pp. 96-117). New York: Routledge.
- Vogel, S. E., Grabner, R. H., Schneider, M., Siegler, R. S., & Ansari, D. (2013). Overlapping and distinct brain regions involved in estimating the spatial position of numerical and non-numerical magnitudes: An fMRI study. *Neuropsychologia*, 51, 979-989. doi: 10.1016/j.neuropsychologia.2013.02.001
- Wang, Y., & Siegler, R. S. (2013). Representations of and translation between common fractions and decimal fractions. *Chinese Science Bulletin*, 58, 4630-4640. doi: 10.1007/s11434-013-6035-4

## 2012

- Opfer, J. E., & Siegler, R. S. (2012). Development of quantitative thinking. In K. J. Holyoak & R. G. Morrison (Eds.), *Oxford handbook of thinking and reasoning* (pp. 585-605). Cambridge, UK: Oxford University Press.
- Ramani, G. B., Siegler, R. S., & Hitti, A. (2012). Taking it to the classroom: Number board games as a

small group learning activity. *Journal of Educational Psychology*, *104*, 661-672. doi: 10.1037/a0028995

Siegler, R. S. (2012). From theory to application and back: Following in the giant footsteps of David Klahr. In S. M. Carver & J. Shrager (Eds.), *The journey from child to scientist: Integrating cognitive development and the education sciences* (pp. 17-36). Sage Press.

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## 2011

Geary, D. C., Berch, D. B., Boykin, A. W., Embretson, S., Reyna, V., & Siegler, R. S. (2011). Learning mathematics: Findings from the National (United States) Mathematics Advisory Panel. In N. Canto (Ed.), *Issues and proposals in mathematics education* (pp. 175-221). Lisbon, Portugal: Gulbenkian.

Opfer, J. E., Siegler, R. S., & Young, C. J. (2011). The powers of noise-fitting: Reply to Barth and Paladino. *Developmental Science*, *14*, 1194-1204. doi: 10.1111/j.1467-7687.2011.01070.x

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Siegler, R. S. (Among 19 other contributing consultants) (1974). *Social Psychology: Experiments in understanding*. Camino Del Mar, CA: CRM Books.

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Siegler, R. S. (1973). Inducing a general conservation of liquid quantity relationship as a function of rules and feedback, number of training problems, and age of subjects. *Perceptual and Motor Skills*, 37, 443-452. doi: 10.2466/pms.1973.37.2.443

Siegler, R. S., & Liebert, R. M. (1973). Effects of consistent, partially consistent, and inconsistent model behavior on children's imitative learning. *Proceedings of the American Psychological Association*, 81, 75-76

Siegler, R. S., Liebert, D. E., & Liebert, R. M. (1973). Inhelder and Piaget's pendulum problem: Teaching preadolescents to act as scientists. *Developmental Psychology*, 9, 97-101. doi: 10.1037/h0035073

Siegler, R. S. (Among 56 other contributing consultants) (1973). *Educational psychology: A contemporary view*. Camino Del Mar, California: CRM Books.

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Siegler, R. S., & Liebert, R. M. (1972). Effects of presenting relevant rules and complete feedback on the conservation of liquid quantity task. *Developmental Psychology*, 7, 133-138. doi: 10.1037/h0033019

Siegler, R. S., & Liebert, R. M. (1972). Learning of liquid quantity relationships as a function of rules and feedback, number of training problems, and age of subjects. *Proceedings of the American Psychological Association*, 80, 117-118.

## Talks:

### Keynote Addresses

From 1993 to the present, I have presented keynote addresses at the following meetings: International Society for the Study of Behavioral Development, Recife, Brazil, July, 1993; Gatlinburg Conference on Mental Retardation, March, 1994; Human Development Conference, April, 1994; Jean Piaget Society, June 1994; Society for Research and Child Development, 1995; British Psychological Society, London, 1996; Freiburg Autumn School in Cognitive Science, Freiburg, Germany, October, 1997; Conference on Intellectual Development, Santiago, Chile, January, 1998; Human Development Conference, March, 1998; American Psychological Association, 2000; Conference on the Rule Assessment Method, Amsterdam, Netherlands, 2001; 16<sup>th</sup> Annual Joseph Royce Conference,

Edmonton, Canada, April 2002; American Psychological Association, August, 2002; Conference on Learning & Instruction, Paris, France, June, 2002; Third Annual Waterford Early Education Conference, November, 2003; American Education Research Association, April, 2004; Conference on Studying Developmental Change Processes, Verona, Italy, May, 2004; Conference on Microgenetic Methods, St. Andrews, Scotland, September, 2004; American Psychological Association, August, 2005; Midwestern Psychological Association, May, 2006; International Society for the Study of Behavioral Development, Melbourne, Australia, July, 2006; Cognitive Science Society, Vancouver, BC, July, 2006; Conference on Human Development, Indianapolis, April, 2008; Eastern Psychological Association, Pittsburgh, March, 2009; Japanese Psychological Association, Kyoto, August, 2009; Nordic Research Network on Special Needs in Mathematics, October, 2009; Tisch Lecture, Columbia University, February, 2010; B. F. Skinner Lecture, Association for Behavior Analysis International, Denver, May, 2011; Ghiselli Lecture, UC-Berkeley, November, 2011; Opening Conference, Siegler Center for Innovative Learning, Beijing Normal University, July, 2012; McDaniel College, March, 2013; American Psychological Society, Washington, DC, May, 2013; International Society for the Study of Behavioral Development, Shanghai, July, 2014; Robbie Case Lecture, University of Toronto, February, 2015; Society for Research in Child Development Teaching Institute, SRCD Biennial Meeting, Philadelphia, PA, March, 2015; Leuven Conference on STEM Research, Leuven Institute, Belgium, October 14, 2015; North Carolina State Improvement Project Spring Network Meeting, Greensboro, March 22, 2016, LEAD (Learning Educational Achievement and Development) Graduate School and Research Network Retreat, Bad Boll, Germany, April 20, 2017; Joint Conference of the Divisions for Educational and Developmental Psychology of the German Society of Psychology (PaEpsy), Leipzig, September 9, 2019.

### Colloquia

From 1974 to the present, I have presented colloquia at the following universities: University of Virginia, University of Washington, University of North Carolina, Chapel Hill, Washington University of St. Louis, University of Pittsburgh, University of California at Santa Barbara, University of Alberta, University of Delaware, University of Heidelberg, Germany, Yale University, University of California at San Diego, University of Michigan, Institute of Child Development (University of Minnesota), Cornell University, University of Chicago, University of Rochester, Stanford University, University of Waterloo, University of Massachusetts, University of Texas, University of California at Los Angeles, Tulane University, Case Western Reserve University, University of Delaware, University of Wisconsin, University of Virginia, University of Michigan, Tokyo University, University of Kyoto, University of Minnesota, Brown University, McGill University, Vanderbilt University, University of California, Berkeley, University of California, Santa Barbara, University of Illinois, Chicago, Duke University, Tel Aviv University, Oberlin College, Beijing University, University of Delaware, Yale University, University of North Carolina, Greensboro, University of Puerto Rico, Catholic University of Puerto Rico, Max-Planck-Institut, Munich, Stanford University, University of Alberta, University of California, Santa Cruz, Ontario Institutes for Studies in Education (OISE), Vanderbilt University, SUNY at Stony Brook, General Motors Institute (Sigma XI Speaker), Johns Hopkins University, University of California at Berkeley, University of West Virginia, Fordham University, University of Minnesota, Universidad Autonoma, Madrid, Spain, U.N.E.D. Ciudad Universitaria, Madrid, Spain, Universidad de La Laguna, Tenerife, Spain, University of North Carolina (Carolina Consortium on Development), University of Illinois, Urbana, University of South Florida, University of Virginia, University of California, Riverside, UCLA, Yale University, Tel-Aviv University, University of Paris, University of Alabama, Birmingham, Fordham University, Brock University, University of Missouri, University of Leipzig (Germany), University of Padova, Italy, Max Planck Institut, Berlin, University of Texas at Dallas, Brandeis University, University of Illinois, Champaign, University of Sussex,

University College, London, University of Iowa, Ohio State University, University of Freiburg, Germany, University de Chile, University of South Alabama, University of Pittsburgh, West Virginia University, University of Aix-en-Provence, University of Iowa, Vanderbilt University, Yale University, Arizona State University, UCLA, University of Amsterdam, University of Hawaii, University of Alberta, University of Paris, University of Maryland, University of Leuven, University of St. Andrews, Brock University, University of California, Davis, University of Maryland, University of Liege, Belgium, University of Verona, Italy, University of St. Andrews, Scotland, University of California, San Diego, University of California, Davis, Brock University, St. Catherine's University, Ontario University, Emory University, Tel-Aviv University, Sackler Institute (Cornell Medical School), Duke University, University of Melbourne, Harvard University, University of Athens, University of Pavia, University of Delaware, Beijing Normal University, University of Wisconsin-Madison, University of Chicago, East China Normal University, University of Maryland, New York University, Dartmouth College, University of Oxford, Boston College, University of Delaware, Henan University, Kaifeng, China, Rutgers University, New Brunswick, NJ, Columbia University.

#### Conference Talks

From 1972 to the present, I have presented over 150 talks at conferences, including those of the American Association of Physics Teachers, American Chemical Society, American Educational Research Association, American Psychological Association, American Psychological Society, Beijing Normal University Symposium on Fractions Learning, British Psychological Association, Carnegie-Mellon Cognition Symposium, Center for the Analyses of Pathways from Childhood to Adulthood (CAPCA) Conference on Longitudinal Analyses, Cognitive Development Society, Cognitive Science Society, Council for Exceptional Children, Gatlinburg Conference on Mental Retardation, Head Start's Eleventh National Research Conference, International Society for the Study of Behavioral Development, Joint Conference of the Divisions for Educational and Developmental Psychology of the German Society of Psychology, Learning and the Brain, Learning Disabilities Conference, Midwest Psychological Association, Minnesota Symposium on Child Development, National Council of Teachers of Mathematics, Philosophical Society of Texas, Jean Piaget Society, Psychiatric Outpatient Clinics of America, Psychonomics Society, Reading Recovery Council of North America, Society of Experimental Psychologists, Society for Research in Child Development, Waterford Institute.

#### Grant Funding:

- |           |   |
|-----------|---|
| 2018-     | Schiff Foundations Professor Grant," \$15,000/year.   |
| 2015-2020 | U.S. Department of Education, Institute of Education Sciences, R305A150262/R305A180514, "Improving Understanding of Fractions." <u>PI</u> , \$1,598,775.  |
| 2010-2016 | U.S. Department of Education, Institute of Education Sciences, R324C10004: 84.324C, "National Center for Special Research (Center for Improvement of Fractions Learning)." <u>Co-PI</u> (with Nancy Jordan and Lynn Fuchs), \$10,000,000. |
| 2010-2016 | U.S. Department of Education, Institute of Education Sciences, R305B100001, "Postdoctoral training in children's mathematics learning." <u>PI</u> , \$366,518.  |

- 2008-2012 U.S. Department of Education, Institute of Education Sciences, R305A080013, "Improving children's numerical understanding." PI, \$1,184,676.
- 2005-2010 U.S. Department of Education, R305H050035, "Improving children's pure numerical estimation." PI, \$851,346.
- 2002-2005 U.S. Department of Education, R305H020060, "Using cognitive analyses to improve children's math and science learning." PI, \$428,879.
- 2000-2005 National Institutes of Health, HD 19011/16-20, "The development of strategy choice procedures." PI, \$1,304,575.
- 1998-1999 National Science Foundation, SBR-9729061, "Mechanisms of cognitive development: Behavioral and neural perspectives." (Funding for Carnegie Mellon Cognition Symposium, October, 1998). Co-PI (with Jay McClelland).
- 1997-2018 Heinz Foundation, Endowed Chair, "Teresa Heinz Professor of Cognitive Psychology." \$15,000 per year.
- 1997-2000 Spencer Foundation, "Microgenetic studies of self-explanation." PI.
- 1997-1999 NICHD, PA-96 025, "Microgenetic studies of infants' problem solving." Co-PI (with Zhe Chen).
- 1997-1998 University of Iowa, "Closing the 'Great Divide': Toward a synthesis of social-emotional and cognitive development." Co-PI (with Grazyna Kochanska).
- 1995-2000 National Institutes of Health, HD 19011/11-15, "The development of strategy choice procedures." PI.
- 1992-1995 Mellon Foundation, "Literacy in Science Center." Co-PI (with David Klahr).
- 1991-1995 National Institutes of Health, HD 19011/6-10, "The development of strategy choice procedures." PI.
- 1990-1992 Binational Foundation (U.S.-Israel), "A geometrical misconception: Development, schooling, and training effects." Co-PI (with Iris Levin).
- 1989-1993 Spencer Foundation, "Long term strategy construction." PI.
- 1989-1992 Mellon Foundation, "Literacy in Science Center." Co-PI (with David Klahr).
- 1987-1991 McDonnell Foundation, "Project Rightstart." Co-PI (with Robbie Case).
- 1986-1990 National Institutes of Health, HD 19011/3-6, "The development of strategy choice procedures." PI.
- 1986-1989 Spencer Foundation, "Children's strategy choices: Theoretical and educational issues." PI.
- 1984-1986 National Institutes of Health, HD 19011, "Development of strategy choice procedures." PI.
- 1984-1986 National Institute of Education, NIE-G-0050, "Children's early understandings of numbers." PI.
- 1981-1984 National Institutes of Health, HD15285 (4-6), "Development of scientific reasoning." PI.
- 1978-1981 National Institutes of Health, HD15285, "Development of scientific reasoning." PI.

Professional Work:Editing:

Associate Editor

*Developmental Psychology* (1993-1996)

Editorial Board Member Current; Editorial Board Member Past

*Journal of Educational Psychology* (2017-)*AERA Open* (2014-2019)*Psychological Science* (2012-)*Journal of Cognition and Development* (2006-2009)*Cognitive Science Quarterly* (1999-2003)*Developmental Science* (1996-)*Developmental Review* (1980-)*Journal of Experimental Psychology: General* (2001-2008)*Cognitive Development* (1985-1999)*Contemporary Psychology* (1984-1991)*American Journal of Education* (1982-1986)*Developmental Psychology* (1977-1984)*Child Development* (1976-1984)

Wiley New Directions for Child and Adolescent Development (2019-)

Guest Consulting Editor

*American Psychologist**American Scientist**Cognition and Instruction**Cognitive Psychology**Contemporary Psychology**Journal of Educational Psychology**Journal of Experimental Child Psychology**Journal of Experimental Psychology: General**Psychological Bulletin**Psychological Review**Review of Educational Research Science*National Service:

Grants Review Panel Member

National Institutes of Health - Child Development &amp; Aging (1987-1991)

National Institute of Education - Mathematics Learning - Ad Hoc

NIE/NSF Joint Panel on Science Learning - Ad Hoc

NIE Center for the Study of Learning - Ad Hoc

National Institutes of Health - BPPP IV - Ad Hoc

Grant Reviewer

Bush Foundation

Canada Council

McDonnell Foundation

National Institute of Education



National Institute of Mental Health  
National Research Council of Canada  
National Science Foundation  
Spencer Foundation

National Panels

National Assessment of Educational Progress (NAEP) Board Member, 2013-2015  
American Psychological Association Committee on Scientific Awards, 2010-2012  
Boyd McCandless Award Selection Committee, 2011 & 1990  
Headed Fractions Practice Guide Panel for U. S. Department of Education/Mathematica  
Policy Research, 2009-2010  
National Mathematics Advisory Panel (U. S. Presidential Commission), 2006-2008

University Service:

Search Committee, Vice President of Research, 2013-2014

Consulting:

ACT, Inc.; Alef Education; Amplify Education; the Laura and John Arnold Foundation; Carnegie Learning; Dinosaur Train Productions; the Walt Disney Company; Doing What Works; HBO; Mathematica Policy Research, Inc.; the Mid-Atlantic Regional Educational Laboratory, OECD, Penn State; Scientific Learning; Team Umizoomi/Nick Jr. TV; World Bank.