

**Yunji Park, Ph.D.**

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**EDUCATION**

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2021	Ph.D. in Educational Psychology, Human Development Program with a minor in Cognitive Neuroscience, University of Wisconsin–Madison, Madison, WI, USA
2019	M.S. in Educational Psychology, Human Development Program, University of Wisconsin–Madison, Madison, WI, USA
2014	M.A. in Cognition and Perception, Chung-Ang University, Seoul, South Korea
2012	B.S. in Physics and B.A. in Psychology Chung-Ang University, Seoul, South Korea
2010	1-year Exchange Student, University of California, Davis, CA, USA

**ACADEMIC POSITION**

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2021 – present	Postdoctoral Scholar, Cognitive and Systems Neuroscience Lab, Stanford University
2021 – present	Honorary Research Fellow, Educational Neuroscience Lab, Waisman Center, University of Wisconsin-Madison
2019 – 2021	Research Assistant, Educational Neuroscience Lab, Waisman Center, University of Wisconsin-Madison
2016 – 2018	Project Assistant, Educational Neuroscience Lab, Waisman Center, University of Wisconsin-Madison
2014 – 2016	Research Associate, Cognitive Neuroscience Lab, Chung-Ang University
2012 – 2014	Research Assistant and Lab coordinator, Cognitive Neuroscience Lab, Chung-Ang University

**HONORS AND AWARDS**

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2020	Invited participant at AERA-NSF Institute on Statistical Analysis for Early Math Education, AERA Grant Program
2020	Hartzman International Travel Awards, School of Education, UW-Madison (~\$2,300)
2014	Outstanding Paper Awards, Korean Journal of Cognitive Sciences
2013-2014	BK 21 PLUS Scholarship, the Ministry of Education, Science, and Technology (~ \$2,000)
2012-2014	Excellent Student Scholarships, Chung-Ang University (~ \$18,000)
2012	Department Honor Scholarship. Department of Physics, Chung-Ang University (~ \$2,600)
2010	Interchange student at UC Davis, Chung-Ang University (~ \$4,000)
2008-2009	Department Secondary Honor Scholarships. Department of Physics, Chung-Ang University (~ \$3,600)

**RESEARCH AND PUBLICATION**

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### **ARTICLES IN REFEREED JOURNALS**

- Park, Y.,** Zhang, Y., Chang, H., & Menon, V. (2024). Short-term number sense training recapitulates long-term neurodevelopmental changes from childhood to adolescence. *Developmental Science*. e13524. <https://doi.org/10.1111/desc.13524>
- Park, Y.** & Matthews, P.G. (2021). Revisiting and refining relations between nonsymbolic ratio processing and symbolic math achievement. *Journal of Numerical Cognition*, 7(3), 328-350. DOI: [doi.org/10.5964/jnc.6927](https://doi.org/10.5964/jnc.6927)
- Park, Y.,** Viegut, A.A., & Matthews, P.G. (2021). More than the Sum of its Parts: Exploring the Development of Ratio Magnitude vs. Simple Magnitude Perception. *Developmental Science*. e13043. DOI: [doi.org/10.1111/desc.13043](https://doi.org/10.1111/desc.13043) PMID: PMC8742982
- Park, Y.** & Cho, S. (2017). Developmental Changes in the Relationship between Magnitude Acuity and Mathematical Achievement in Elementary School Children. *Educational Psychology*, 37(7), 378-887. DOI: <https://doi.org/10.1080/01443410.2015.1127332>
- Park, Y.** & Cho, S. (2014). Comparing Construct and Predictive Validities of the Measurement of Children's Approximate Number Acuity Depending on Numerosity Comparison Task Format. *Korean Journal of Cognitive Sciences*, 25(2), 79-101. *Outstanding paper Award.*

### **PREPRINT AND MANUSCRIPTS UNDER REVIEW**

- Kim, M., **Park, Y.** & Cho, S. (under review). The acuities for Number, Area and their Correlations with Math Achievement in 4<sup>th</sup> and 6<sup>th</sup> Grade Children. *Korean Journal of Cognitive and Biological Psychology*.
- Park, Y.,** & Matthews, P.G. (in revision). Math Language Matters: Weak influence of nonsymbolic ratio processing ability on symbolic fraction equation error detection ability. *Journal of Experimental Child Psychology*. Preprint published in *PsyArXiv*: [doi.org/10.31234/osf.io/65kv8](https://doi.org/10.31234/osf.io/65kv8).
- Park, Y.,** Zhang, Y., Schwartz, F., Iuculano, T., Chang, H., & Menon, V. (under review). Integrated number sense tutoring remediates aberrant cross-format neural representations in children with mathematical disabilities. *NPJ Science of Learning*. Preprint published in *BioRxiv*. <https://doi.org/10.1101/2024.04.09.587577> PMID: PMC11030345
- Park, Y.,** Kalra, P., Binzak, J.V., Matthews, P.G., & Hubbard, E.M. (in revision). Developmental changes in children's processing of nonsymbolic ratio magnitudes: A cross-sectional fMRI study. *Developmental Science*. Preprint published in *PsyArXiv*. DOI: [doi.org/10.31234/osf.io/mzg9x](https://doi.org/10.31234/osf.io/mzg9x)

### **MANUSCRIPT IN PREPARATION**

- Unal, Z., **Park, Y.,** Chang, H., Menon, V., & Geary, D. (in preparation). Developmental changes in neural mechanisms between mathematics and reading: A meta-analysis.
- Park, Y.,\*** Chuang, Y.\*, Austerweil, J. & Hubbard, E.M. (in preparation). Development of neural representations for symbolic and non-symbolic fractions from childhood to adults.

**Park, Y.,** Viegut, A. A. & Matthews, P.G. (in preparation). Perceptual processing of non-symbolic and symbolic fractional magnitudes: cross-format distance effects across multiple nonsymbolic and symbolic formats.

**Park, Y.,** Dean, D.3<sup>rd</sup>, Alexander, A., Matthews, P.G., & Hubbard, E.M. (in preparation). Developmental changes in white matter tracts for symbolic and non-symbolic fractions.

### **CONFERENCE TALKS**

**Park, Y.,** Kalra, P.\*, Chuang, Y.\*, Binzak, J.V., Matthews, P.G., & Hubbard, E.M. (June, 2024). Developmental changes in non-symbolic and symbolic fraction processing in primary school children. *Mathematical Cognition and Learning Society*, Washington D.C.

**Park, Y. & Matthews, P.G.** (July, 2022). Beyond magnitude: nonsymbolic ratio perception as a form of number sense?. *3<sup>rd</sup> Joint Meeting of the Society for Philosophy and Psychology & European Society for Philosophy and Psychology*, Milan, Italy.

**Park, Y. & Matthews, P.G.** (Sep, 2021). Perceptual processing of non-symbolic and symbolic fractional magnitudes: cross-format distance effects across multiple nonsymbolic and symbolic formats. *Mathematical Cognition and Learning Society*.

**Park, Y.,** Dean, D.3<sup>rd</sup>, Binzak, J.V., Matthews, P.G., & Hubbard, E.M. (Sep, 2020). Developmental Changes in White Matter Tracts for Symbolic and Non-Symbolic Fractions in primary school children. *Mathematical Cognition and Learning Society*.

**Park, Y. & Matthews, P.G.** (Aug, 2020). Ratio as a Part of Quantity. *Cognitive Science. Society*.

**Park, Y.,** Binzak, J.V., Toomarian, E.Y., Kalra, P., Matthews, P.G., & Hubbard, E.M. (April, 2019). Differences in processing symbolic vs. non-symbolic representations ratios: Behavioral and neural evidence. *American Education Research Association*, Toronto, Canada.

**Park, Y.,** Binzak, J.V., Toomarian, E.Y. Kalra, P.B., Matthews, P.G., & Hubbard, E.M. (April, 2018). Developmental changes in children's processing of nonsymbolic ratio magnitudes: A cross-sectional fMRI study. Waisman Center, UW-Madison.

**Park, Y. & Cho, S.** (2013). Acuity for Continuous Magnitude but not Numerosity is Associated with Children's Mathematical Achievement. *CAU International Symposium on BK21 PLUS*, Chung-Ang University, Seoul, Korea.

### **POSTER PRESENTATIONS**

**Park, Y.\*,** Zhang, Y.\*, Schwartz, F., Iuculano, T., Chang, H., & Menon, V. (March, 2023) Integrated number sense tutoring induces distinct patterns of changes in neural representations in children with and without mathematical difficulties. \*Equal contribution. *Poster presented at the 30th Annual Meeting of Cognitive Neuroscience Society Annual Meeting*, San Francisco, CA.

Viegut, A.A., **Park, Y.,** Hubbard, E.M. & Matthews, P.G. (April, 2021). Fraction estimation predicts later calculation, but not fluency: A cross-sequential study. *2021 Biennial Meeting on Society for Research in Child Development*.

- Park, Y.,** Dean, D.3<sup>rd</sup>, Binzak, J.V., Matthews, P.G., & Hubbard, E.M. (May, 2020) Symbolic and Non-Symbolic Fractions Relate to Different White Matter Tracts: A Cross-Sectional Diffusion MRI Tractography Study. Poster presented at *the 27th Annual Meeting of Cognitive Neuroscience Society Annual Meeting*, Virtual Conference due to COVID-19.
- Sterling-Alves, I., **Park, Y.,** Kalra, P.B., Binzak, J.V., Matthews, P.G., & Hubbard, E.M. (May, 2020). Educational Experience Connect Symbolic Fractions to Parietofrontal Nonsymbolic Ratio Processing Systems. Poster presented at *the 27th Annual Meeting of Cognitive Neuroscience Society Annual Meeting*, Virtual Conference due to COVID-19.
- Matthews, P. G., Hubbard, E. M., Kalra, P. & **Park, Y.** (Apr, 2020) The Comparative Importance of Two Types of Relational Reasoning for Supporting Fractions Knowledge [Symposium]. *AERA Annual Meeting San Francisco*, CA <http://tinyurl.com/yx2d4jfx> (Conference Canceled)
- Toomarian, E.Y., **Park, Y.,** Matthews, P.G., & Hubbard, E.M. (April, 2019). Spatial-numerical associations of fractions: Evidence from internal and external representations. *Paper submitted as part of a symposium to American Education Research Association*, Toronto, Canada.
- Park, Y.,** Viegut, A.A., & Matthews, P.G. (March, 2019). The development of multiple non-symbolic ratio representations in children. *2019 Biennial Meeting on Society for Research in Child Development*, Baltimore, MD.
- Viegut, A.A. **Park, Y.** & Matthews, P.G. (March, 2019). Number Line Estimation is More than Numerical: Evidence from Nonstandard Number Lines, *2019 Biennial Meeting on Society for Research in Child Development*, Baltimore, MD.
- Matthews, P.G., Binzak, J.V., Kalra, P.B., **Park, Y.,** & Hubbard, E.M. (March, 2019). Perceptual Routes to Rational Numbers. *Paper submitted as part of a symposium to 2019 Biennial Meeting on Society for Research in Child Development*, Baltimore, MD.
- Park, Y.,** Binzak, J.V., Dean, D.3<sup>rd</sup>, Alexander, A., Matthews, P.G., & Hubbard, E.M. (Sep, 2018). Developmental changes in white matter tracts for symbolic and non-symbolic fractions, *6<sup>th</sup> Biennial conference on International Mind, Brain and Education Society*, Los Angeles, CA.
- Viegut, A.A. **Park, Y.,** Hubbard, E.M. & Matthews, P.G. (Sep, 2018). Differential improvement in fraction estimation in 2<sup>nd</sup> vs. 5<sup>th</sup> grade children: Longitudinal Analysis, *6<sup>th</sup> Biennial conference on International Mind, Brain and Education Society*, Los Angeles, CA.
- Park, Y.,** Binzak, J.V., Toomarian, E.Y. Kalra, P.B., Matthews, P.G., & Hubbard, E.M. (July, 2018). Developmental changes in children's processing of nonsymbolic ratio magnitudes: A cross-sectional fMRI study, Poster presented at the *40<sup>th</sup> Annual Meetings on Cognitive Science Society*, Madison, WI.
- Hubbard, E.M., Binzak, J.V., **Park, Y.,** Kalra, P.B., Toomarian, E.Y. (April, 2018). The ratio processing system underpins symbolic fraction understanding: Developmental neuroimaging investigations. *Paper submitted as part of a symposium to 1<sup>st</sup> Mathematical Cognition and Learning Society Conference*.

- Binzak, J.V., **Park, Y.**, Toomarian, E.Y., Kalra, P.B., Chuang, Y-S., Matthews, P.G., & Hubbard, E.M. (March, 2018). Neurocognitive Relationships between Nonsymbolic and Symbolic Ratio Processing in Children and Adults. Poster presented at *the 25th Annual Meeting of the Cognitive Neuroscience Society*, Boston, MA.
- Kalra, P. Binzak, J.V., **Park, Y.**, Matthews, P.G. & Hubbard, E.M. (March, 2018). Developmental lateralization of non- symbolic ratio processing predicts fraction knowledge. Poster presented at *the 25th Annual Meeting of Cognitive Neuroscience Society Annual Meeting*, Boston.
- Binzak, J.V., **Park, Y.**, Toomarian, E.Y., Kalra, P., Matthews, P.G., & Hubbard, E.M. (October, 2017). Exploring the ratio processing system among primary school children: Behavioral and neural evidence. Poster presented at the *Cognitive Development Society*, Portland, OR.
- Park, Y.** & Matthews, P.G. (July, 2017). Proportional reasoning in the context of continuous vs. discretized: Adults go wrong where children go wrong, Poster presented at the *5th Annual Midwest Meeting on Mathematical Thinking*, Minneapolis, MN.
- Park, I., **Park, Y.** & Cho, S (2016). Comparing the Influence of Numeracy, Positive and Negative Number Estimation on Financial Risky Decision Making. *Korean Society for Cognitive and Biological Psychology*, Jeju, Korea
- Park, I., **Park, Y.** & Cho, S (2015). Comparing the Influence of Effect of Symbolic Number Estimation and Numeracy on Financial Risky Decision Making. *Society for Judgment and Decision Making*, Chicago, IL.
- Park, I., **Park, Y.** & Cho, S (2015). Comparing the Influence of Numeracy and Symbolic Number Acuity on Financial Decision Making. *Korean Psychological Association Annual Conference*, Seoul, Korea.
- Jang, S., **Park, Y.** & Cho, S. (2014). A Purer Measure of Number Acuity better predicts Mathematical Achievement. *Cognitive Neuroscience Society*, Boston, MA.
- Park, Y.**, Jang, S. & Cho, S. (2014). Acuity for Continuous Magnitude but not Pure Numerosity correlates with Children's Math Achievement. *Cognitive Neuroscience Society*, Boston, MA.
- Kim, N., Jang, S., Kweon, J., **Park, Y.**, Chun, J. & Cho, S. (2014). Bias towards Continuous Magnitude influences performance on the Numerosity comparison task. *Cognitive Neuroscience Society*, Boston, MA.
- Jang, S., **Park, Y.**, Cho, S. (2014). The Longitudinal Study of the Relationship Between Approximate Number Sense and Mathematical Achievement. *Korean Society for Cognitive and Biological Psychology*, Buyeo, Korea.
- Lee, K., **Park, Y.**, Jang, S., Cho, S. (2014). The Negative Influence of Math Anxiety and how it relates to Working Memory Load. *Cognitive Neuroscience Conference*, Seoul, Korea
- Park, Y.**, Lee, Y., Lee, K. & Cho, S. (2014). Comparing the Acuities for Numerosity and Continuous Magnitude and their Correlations with Mathematical Achievement between Lower vs. Higher Grade Elementary School Children. *Korean Psychological Association Annual Conference*, Seoul, Korea.

- Park, Y.,** Lee, D., Lee, K., Choi, Y., & Cho, S. (2014). Comparing Acuities for Length vs. Area and their Correlations with Mathematical Achievement in Primary School Children. *Korean Psychological Association Annual Conference*, Seoul, Korea.
- Lee, K., **Park, Y.,** Jang, S., Cho, S. (2014). The Negative Influence of Math Anxiety and how it relates to Working Memory Load. *Korean Psychological Association Annual Conference*, Seoul, Korea.
- Jang, S., **Park, Y.,** Cho, S. (2013). A Purer Measure of Number Acuity better predicts Mathematical Achievement, *CAU International Symposium on BK 21 PLUS 2013*, Seoul, Korea.
- Jang, S., **Park, Y.,** Kim, N., Kweon, J., Chun, J., Cho, S. (2013). Bias towards Continuous Magnitude influences performance on the Numerosity comparison task. *CAU International Symposium on BK 21 PLUS 2013*, Seoul, Korea.
- Park, Y.,** Jang, S., & Cho, S. (2013). The Acuity for Numerosity vs. Continuous Magnitude and its Relationship to Mathematical Achievement in Elementary School Children. *Cognitive Neuroscience Conference*, Seoul, Korea.
- Jang, S., **Park, Y.** & Cho, S. (2013). The Acuity for Numerosity vs. Continuous Magnitude and its Relationship to Mathematical Reasoning. *Korean Psychological Association Annual Conference*, Daejeon, Korea
- Park, Y.,** Jang, S. & Cho, S. (2013). Acuity for Continuous Magnitude is associated with Mathematical Achievement in Early Elementary School Children. *Cognitive Neuroscience Society*, San Francisco, CA.
- Park, Y.** & Cho, S. (2012). Acuity for Continuous Magnitude is Associated with Mathematical Achievement in Early Elementary School Children. *2nd Doshisha and Chung-Ang Symposium of Psychological Science*, Kyoto, Japan.
- Park, Y.** & Cho, S. (2012). Two-dimensional Testing of Three-dimensionally Encoded Information Impairs Children's Recognition Memory. *Cognitive Neuroscience Conference*, Seoul National University, Korea
- Park, Y.** & Cho, S. (2012). Two-dimensional Testing of Three-dimensionally Encoded Information Impairs Children's Recognition Memory. *Korean Psychological Association Annual Conference*, Chuncheon, Korea

## **RESEARCH SUPPORT**

NIH/NICHD R01 HD059205 (PI: Menon) 12/15/08 – 06/30/26  
Title: Interventions in mathematical learning disabilities: cognitive and neural correlates.  
Goal: To investigate brain mechanisms underlying cognitive remediation in children with learning disabilities.  
Role: Postdoctoral Research Fellow

NIH/NICHD R01 HD088585 (PI: Hubbard & Co-PI: Matthews) 09/16/16 – 08/31/21  
Title: Perceptual and cognitive mechanisms of developing fractions knowledge: A cross-sequential approach  
Goal: To investigate brain mechanisms underlying cognitive remediation in children with learning disabilities.

Role: Graduate Research Assistant

Grants Proposals Currently Under Review:

NIH Maximizing Opportunities for Scientific and Academic Independent Careers (MOSAIC) Postdoctoral Career Transition Award to Promote Diversity (K99/R00) Proposal K99HD118172: Functional brain signatures of learning disabilities across development (PI: Park)

**TEACHING**

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Guest lecturer, Psych 230, Human Development, Department of Psychology, UW-Eau Claire, Fall 2023, Spring 2024

Lecture topics: Brain Development; Mathematical Brain,

Guest lecturer, Ed Psych 320, Developmental Psychology, Department of Educational Psychology, UW-Madison, Fall 2020.

Lecture topic: Neuroimaging Methods in Developmental Science Studies,

Teaching Assistant, Ed Psych 326, Mind Brain Education, Department of Education Psychology, UW-Madison, Fall 2018, Spring 2019

Teaching Assistant, Psychological Statistics, Department of Psychology, Chung-Ang University, Spring 2013, Spring 2014

**MENTORING**

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Stanford University

2021 - Present

Visiting Graduate Students Research Mentor:

Laura Carbonell, Stanford University (Fall, 2022); Zehra Unal, University of Missouri (Fall 2023 – Present)

Post-baccalaureate Research Assistant Mentor:

Charles Murray (Fall 2021 – Summer 2023); Harshitha Venkatesh (Fall 2022 – Present); George Tragoudas (Summer 2023– Present)

Symbolic System Internship Mentor:

Kheli Atluru (Spring, 2023); Sachin Allums and Oliver Lee (Summer, 2023)

University of Wisconsin- Madison

NSF Psychology Research Experience Program (PREP) Mentor:

Steven Montalvo (Summer 2020)

Honors Thesis Research Mentor:

Monica Janz (Fall 2018 – Spring 2019)

Undergraduate Research Project Mentor:

Eva Bacskai (Spring 2021); Matthew Eliason (Spring 2020); Valerie Buroker & Samantha Weinfurter (Fall 2019); Jillian Aschenbrener & Adileen C. Sll (Spring 2019); Sarha Skinner (Fall 2018); Angela G. Schmidt (Spring 2018); Anna T. Ferrigan (Fall 2017)

Undergraduate Research Assistant Mentor:

Amelia Jensen, Mikayla Oertel, & Vishal Srinivasan (Fall 2020 – Spring 2021); Sai Xiong (Spring 2017 - Fall 2019)

## **PROFESSIONAL SERVICE**

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2020 – 2022      Research Chair, Members of Trainee Board in International Mind, Brain, and Education Society

### A manuscript reviewer for

European Journal of Neuroscience; Journal of Educational Psychology; Attention, Perception, & Psychophysics; Cognition; Scientific Reports; Educational Studies in Mathematics; Journal of Experimental Psychology: Human Perception and Performance; Cognitive Development; Journal of Numerical Cognition

## **SCIENTIFIC COMMUNICATIONS**

September 2021      Symposia organizer and Moderator. Accessing to fractional magnitudes: From perception higher cognition. Mathematical Cognition and Learning Society.  
[https://youtu.be/90j9MYehEZO?si=O-z\\_guvaTwLiYUaA](https://youtu.be/90j9MYehEZO?si=O-z_guvaTwLiYUaA)

August 2021      Symposia Moderator International Mind, Brain and Education Virtual Conference Series.  
[https://youtu.be/xQxI7W7x3\\_s?si=OwIfAqBalm9BHB6G](https://youtu.be/xQxI7W7x3_s?si=OwIfAqBalm9BHB6G)

March 2021      Invited Panel, Mathematical Cognition and Learning Society  
Workshop: Developing and implementing online studies with children.  
<https://youtu.be/29e4Zijos44?si=2kijYcDxEtFKjznI>

September 2020      Symposia organizer and Moderator. *Mathematical Cognition and Learning Society*: Neural Development of Symbolic Math Knowledge from Childhood to Young Adulthood.  
[https://youtu.be/VMYqjifQYM8?si=LvFZyPUP4d6m\\_1Iu](https://youtu.be/VMYqjifQYM8?si=LvFZyPUP4d6m_1Iu)

June 2020      Organizer and Host, Ask-Me-Anything: Online Experiment, International Mind, Brain and Education.  
<https://www.imbes.org/event-3880124>

## **PROFESSIONAL MEMBERSHIPS**

Society for Philosophy and Psychology; International Mind, Brain, and Education Society; American Educational Research Association; Cognitive Science Society; Society for Research in Child Development; Mathematical Cognition and Learning Society; Cognitive Developmental Society; Cognitive Neuroscience Society