

Yunji Park, Ph.D.

Postdoctoral Scholar
Department of Psychiatry & Behavioral Sciences
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EDUCATION

2021 Ph.D. in Educational Psychology with concentration on Human Development, and minor in Cognitive Neuroscience, University of Wisconsin–Madison, Madison, WI, USA
2019 M.S. in Educational Psychology, 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

2021 – present Postdoctoral Scholar, Department of Psychiatry and Behavioral Sciences, Stanford University
2021 – present Honorary Research Fellow, Waisman Center, University of Wisconsin-Madison
2019 – 2021 Research Assistant, Waisman Center, University of Wisconsin-Madison
2018 – 2019 Teaching Assistant, Department of Educational Psychology, University of Wisconsin- Madison
2016 – 2018 Project Assistant, Waisman Center, University of Wisconsin-Madison
2014 – 2016 Research Associate, Department of Psychology, Chung-Ang University
2013 – 2014 Teaching Assistant, Department of Psychology, Chung-Ang University
2012 – 2014 Research Assistant and Lab coordinator, Department of Psychology, Chung-Ang University

HONORS AND AWARDS

2020 AERA-NSF Institute on Statistical Analysis, AERA Grant Program
2020 Hartzman International Travel Awards, School of Education, UW-Madison
2014 Outstanding Paper Awards, Korean Journal of Cognitive Sciences
2013-2014 BK 21 PLUS Scholarship, the Ministry of Education, Science, and Technology
2012-2014 Graduate School Scholarships for Outstanding Performance, Chung-Ang University
2008-2012 Outstanding Academic Performance Awards (Four times). Department of Physics, Chung-Ang University

PUBLICATIONS

Manuscripts

Park, Y., Zhang, Y.*, Schwartz, F., Iuculano, T., Chang, H., & Menon, V. (submitted).
Integrated number sense tutoring remediates aberrant cross-format neural

representations in children with mathematical disabilities. *Proceedings of the National Academy of Sciences*. *Equal contribution.

- Park, Y., & Matthews, P.G.** (submitted). Math Language Matters: Weak influence of nonsymbolic ratio processing ability on symbolic fraction equation error detection ability. *Journal of Experimental Child Psychology*.
- Park, Y., Zhang, Y.*, Chang, H.*, & Menon, V.** (second revision under review). Short-term number sense training recapitulates long-term neurodevelopmental changes from childhood to adolescence. *Developmental Science*. *Equal contribution
- Park, Y., Binzak, J.V., Kalra, P., Matthews, P.G., & Hubbard, E.M.** (revision under review). Developmental changes in children's processing of nonsymbolic ratio magnitudes: A cross-sectional fMRI study. *Developmental Science*. DOI: <https://doi.org/10.31234/osf.io/mzg9x>
- 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: <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: <https://doi.org/10.1111/desc.13043> PMCID: 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*.

Manuscripts in preparation

- 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.3rd, Alexander, A., Matthews, P.G., & Hubbard, E.M.** (in preparation). Developmental changes in white matter tracts for symbolic and non-symbolic fractions.
- 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.

Talks

- Park, Y. & Matthews, P.G.** (July, 2022). Beyond magnitude: nonsymbolic ratio perception as a form of number sense?. *Paper submitted as part of a symposium at the 3rd 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. *Paper submitted as part of a symposium at Mathematical Cognition and Learning Society*.
- Park, Y.** (Feb, 2021). Online Experiment with Kids. *A trainee workshop on Online experiment of Mathematical Cognition and Learning Society*.
- Park, Y., Dean, D.3rd, 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. *Paper submitted as part of a symposium at Mathematical Cognition and Learning Society.*

Park, Y. & Matthews, P.G. (Aug, 2020). Ratio as a Part of Quantity. *Paper submitted as part of a symposium to 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. *Paper submitted as part of a symposium to 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.*

Conference 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.3rd, 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.3rd, Alexander, A., Matthews, P.G., & Hubbard, E.M. (Sep, 2018). Developmental changes in white matter tracts for symbolic and non-symbolic fractions, *6th 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 2nd vs. 5th grade children: Longitudinal Analysis, *6th 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 *40th 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 1st 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 Acuties 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 Acuties 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

TEACHING

Guest lecturer, Psych 230 – Lecture topics: Human Development/Mathematical Brain, Department of Psychology, UW-Eau Claire, Fall 2023, Spring 2024

Guest lecturer, Ed Psych 320 – Lecture topic: Neuroimaging Methods in Developmental Science Studies, Department of Education Psychology, UW-Madison, Fall 2020.

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

Graduate Students Research Mentor for Laura Carbonell (Fall, 2022), Zehra Unal (Fall 2023 – Present), Stanford University
Symbolic System Internship Mentor for Kheli Atluru (Spring, 2023), Sachin Allums and Oliver Lee (Summer, 2023), Stanford University
NSF Psychology Research Experience Program (PREP) Mentor for Steven Montalvo (Summer 2020), University of Wisconsin–Madison
Honors Thesis Research Mentor for Monica Janz (Fall 2018 – Spring 2019), University of Wisconsin–Madison
Undergraduate Research Project Mentor for 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), University of Wisconsin–Madison
Undergraduate Research Assistant Mentor for Amelia Jensen, Mikayla Oertel, & Vishal Srinivasan (Fall 2020 – Spring 2021), Sai Xiong (Spring 2017 - Fall 2019)

ACADEMIC SERVICE

2023 – present	Reviewer for <i>Cognition</i> , <i>Scientific Reports</i> , <i>Educational Studies in Mathematics</i> , <i>Journal of Experimental Psychology: Human Perception and Performance</i>
2020 – present	Reviewer for <i>Cognitive Development</i> and <i>Journal of Numerical Cognition</i> ,
2020 – 2022	Research Chair, Members of Trainee Board in International Mind, Brain, and Education Society

Symposium organization

Moderator (Aug, 2021). Virtual Conference Series. International Mind, Brain and Education.
Organizer and Moderator (Sep, 2021). Accessing to fractional magnitudes: From perception to higher cognition. *Mathematical Cognition and Learning Society*.
Organizer and Moderator (Sep, 2020). Neural Development of Symbolic Math Knowledge from Childhood to Young, *Mathematical Cognition and Learning Society*.
Organizer and Host (June 2020), Ask-Me-Anything: Online Experiment, *International Mind, Brain and Education*.

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