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 Department of Educational Psychology
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RESEARCH INTERESTS:

- **Development and malleability of cognitive processes underlying spatial reasoning**
 - Identify the basic types of cues and factors influencing malleability in reorientation (i.e. re-establish a sense of direction after disorientation)
 - Test and refine the adaptive combination model as a theoretical account for cognitive development (as an alternative to core knowledge accounts)
 - Examine how to use children's strengths in navigation to support classroom learning
- **Factors that support/hinder spatial development as possible supports/barriers into STEM**
 - Examine developmental trajectories of the spatial concept "middle" across real world and computer tasks and scales of space (from navigation size to desktop scale)
 - Investigate if "middle" training transfers to math proficiency (fractions, division, number line)
 - Examine the role of cumulative sports experience in shaping spatial proficiency in university
 - Examine how playground play may influence spatial development
 - Investigate how fitness and nutrition (low-iron status) interact to support school achievement in undergraduate and high school students
- **Differentiate typical and clinical aging in spatial memory**
 - Understand how spatial memory changes with typical and clinical aging
 - Investigate potential of spatial tasks as early cognitive screeners for Alzheimer's disease

EDUCATION AND EMPLOYMENT

- Assistant Professor**, University of Nebraska-Lincoln, Lincoln, NE 2016 - present
 Department of Educational Psychology: Development & Learning Sciences
 Faculty Affiliate: Nebraska Center for Research on Children, Youth, Families, and Schools
 Faculty Affiliate: Center for Brain, Biology, and Behavior
- Adjunct Faculty**, Western University, London, Ontario, Canada 2013 - 2016
- Adjunct Faculty**, Kings University College, London, Ontario, Canada 2014 - 2016
- Ph.D.**, Temple University, Philadelphia, PA 2006 - 2011
 Department of Psychology, Developmental Specialization
 Supervisor: Nora Newcombe
 Dissertation: *Integration of geometric and featural information in reorientation: Evidence for an adaptive combination model*
- B.Sc. (with distinction)**, University of Alberta, Edmonton, Canada 2002 - 2006
 Double majors in psychology and biological sciences

PEER REVIEWED MANUSCRIPTS AND CHAPTERS

- Twyman, A. D., Holden, M. P., & Newcombe, N. S.** (in press). Integration of featural and geometric information in reorientation: Evidence for an adaptive combination model. *Cognitive Science*.
- Holden, M. P. & **Twyman, A. D.** (2017). Apps and Animations: Choosing Web-based Demonstrations to Support Student Learning. *Teaching Innovation Projects*, 7, 1 – 13.
- Twyman, A. D., Nardi, D. & Newcombe, N. S.** (2013). Two fields are better than one: Developmental and comparative perspectives on understanding spatial reorientation. *Comparative Cognition & Behavior Reviews*, 8, 78-97.
- Twyman, A. D., Newcombe, N. S., & Gould, T. G.** (2013). Malleability in the development of spatial reorientation. *Developmental Psychobiology*, 55, 243 – 255.
Award-winning Best Student-Authored Paper by *Developmental Psychobiology*.
- Sutton, J. E., **Twyman, A. D., Joannisse, M. F., & Newcombe, N. S.** (2012). Geometry three ways: an fMRI investigation of geometric information processing during reorientation. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 36, 1530 – 1541.
- Newcombe, N. S., Ratliff, K. R., Shallcross, W. L., & **Twyman, A. D.** (2010). Young children’s use of features to reorient is more than just associative: Further evidence against a modular view of spatial processing. *Developmental Science*, 13, 213-220.
- Twyman, A. D., & Newcombe, N. S.** (2010). Five reasons to doubt the existence of a geometric module. *Cognitive Science* 34, 1315 – 1356.
- Twyman, A. D., Newcombe, N. S. & Gould, T. G.** (2009). Of mice and toddlers: Evidence for species general spatial reorientation. *Journal of Comparative Psychology*, 123, 342-345.
- Newcombe, N. S., Ratliff, K. R., Shallcross, W. L., & **Twyman, A. D.** (2009) Is cognitive modularity necessary in an evolutionary account of development? In L. Tommasi, L. Nadel & M.A. Peterson (Eds.), *Cognitive Biology: Evolutionary and Developmental Perspectives on Mind, Brain, and Behavior*, Vienna Series in Theoretical Biology. Cambridge, MA: The MIT Press.
- Twyman, A., Friedman, A. & Spetch, M. L.** Penetrating the geometric module: Catalyzing children’s use of landmarks. (2007). *Developmental Psychology*, 43, 1523-1530.
- Twyman, A., Friedman, A., & Spetch, M. L.** (2007). Penetrating the geometric module: Catalyzing children’s use of landmarks. In D. S. McNamara & J. G. Trafton (Eds.), *Proceedings of the 29th Annual Cognitive Science Society* (pp. 671-676). Nashville, TN: Cognitive Science Society.

AWARDS AND GRANTS (Total value: \$239, 300)

PI: “Awakening the Sleeping Giant: Helping Children Find the Middle” Under Review
Grant: University of Nebraska-Lincoln Layman Seed Grant
Project purpose: Chart the developmental trajectories of preschoolers’ understanding of middle to improve math proficiency
Proposed Value: \$10, 000

External Funding: \$207, 300

Co-PI: “Will Beef Make You A Better Student-Athlete? Establishing the Value of Beef in Sports Nutrition and Education for High School Athletes?” 2017 - 2018
Grant: Nebraska Beef Council
Project Purpose: Promoting academic and athletic success through a better understanding of fitness, nutrition (iron) and cognition
Value: \$60, 000

Alexander Graham Bell Canada Graduate Scholarship 2008 - 2011
Purpose: Top Tier Ph.D. students within those funded
Value: \$105,000

Julie-Payette Masters Awards 2007 - 2008
Purpose: Awarded to the top 24 applicants
Value: \$25,000

NSERC Post-graduate Masters Award 2006
Value: \$17,300 - declined

Travel Awards and University Funding: \$92,000

Temple University Academic Fellowship, Temple University 2006 - 2011
Purpose: Awarded to the “most outstanding incoming graduate students” in each department at Temple University.
Total value: \$90,000

College of Liberal Arts \$500 Travel Stipend 2009
 College of Liberal Arts \$500 Travel Stipend 2008
 College of Liberal Arts \$500 Travel Stipend 2007
 Cognitive Sciences Student Travel Award (\$500) 2007

Other Grant-Writing Experience:

Grant Co-Author: “Helping Grandma Get Home” (not funded) 2009
Co-author: Mark Holden, PI: Tania Giovannetti
Grant: National Institutes of Health Stimulus Grant
Purpose: To examine spatial functions in elderly and clinical populations to develop early assessments of Alzheimer’s and Parkinson’s disease.
Decision: Grant was not funded but **was rated in the top 5% of over 11, 000 submissions.**
Proposed Value: \$1,082,037

RESEARCH HIGHLIGHTED IN THE MEDIA

- Western News: “*Study bridges STEM gender gap at early ages*” 2015
- Spatial Intelligence and Learning Center Research Showcase: 2009
 “*How spinning in circles informs spatial cognition*”

PRESENTATIONS (*Supervised Honors Student as Primary Presenter)

- Twyman, A. D., Holden, M. P., & Newcombe, N. S.** (2017, November). First direct evidence of cue integration in reorientation: A new paradigm. Poster presentation at the 58th annual meeting of the Psychonomic Society, Vancouver, British Columbia, Canada.
- Twyman, A. D., Holden, M. P., & Newcombe, N. S.** (2017, October). A new paradigm showing the first direct evidence of cue integration in reorientation. In N. S. Newcombe (Chair), *The development of spatial reorientation: An old puzzle, a new formulation*. Symposium conducted at the meeting of the Cognitive Development Society, Portland, OR.
- Twyman, A. D.** (2017, May). Learning to think spatially: Implications for theory, research, and STEM education. **Invited talk** at Miami University.
- Twyman, A. D.** (2017, February). Spatial development and cognition. **Invited talk** at the Center for Brain, Biology, and Behavior at the University of Nebraska-Lincoln.
- Samson*, H. E. & **Twyman, A. D.** (2015, May). The link between spatial ability and numeracy through preschoolers’ understanding of middle. Poster presentation at the 45th annual Ontario Psychology Undergrad Thesis Conference.
- Twyman, A. D.** (2012, November). Space and math: Why spatial understanding is vital for gender equality, SES equality, and preparing our children for the future. **Plenary address** at Early Years Spatial Reasoning: Learning and Teaching, Banff, Alberta, Canada.
- Twyman, A. D., & Newcombe, N.S.** (2012, September). Integration of features and geometric information in reorientation: Evidence for an adaptive combination model. **Oral presentation** at Spatial Cognition, Bavaria, Germany.
- Funk*, A. Y., **Twyman, A. D., & Newcombe, N. S.** (2011, April). Three-year-old children’s successful use of a “middle” search strategy. Poster presentation at the Society for Research in Child Development Conference, Montreal, Canada.
- Funk*, A. Y., **Twyman, A. D., & Newcombe, N. S.** (2010, March). Local and global cue use in children. **Oral presentation** at the annual International Conference on Comparative Cognition, Melbourne, FL, USA.
- Twyman, A. D., Newcombe, N. S., & Gould, T. J.** (2009, October). Sex effects, age effects, and malleability in spatial navigation. Poster session presented at the meeting of Cognitive Development Society, San Antonio, TX, USA.
- Twyman, A. D., Newcombe, N. S., & Gould, T. J.** (2009, August). A tale of two cities: Rearing environment influences spatial reorientation. In S. E. MacDonald (Chair), *Foraging and the Evolution of Cognition*. **Symposium** conducted at the meeting of the American Psychological Association, Toronto, ON, Canada.

- Twyman, A. D., Newcombe, N.S., & Shallcross, W. L.** (2009, February). Spinning in circles: Feature based reorientation. **Oral presentation** at inter-Science of Learning Conference, Seattle, WA, USA.
- Twyman, A. D.** (2009, January). Why should we care about spatial development? **Invited Talk** to the educators and parents of the Tiferet Bet Israel Early Childhood Education Community. Blue Bell, PA, USA.
- Twyman, A. D., Newcombe, N.S., & Shallcross, W. L.** (2008, November). Spinning in circles: Feature-based reorientation. **Oral presentation** at the Comparative Cognition and Learning Conference, Chicago, IL, USA.
- Twyman, A. D., Newcombe, N.S., & Gould, T. J.** (2008, March). Reorientation in the absence of geometric information: Evidence against a geometric module. **Oral presentation** at the annual International Conference on Comparative Cognition, Melbourne, FL, USA.
- Twyman, A. D., Friedman, A., & Spetch, M. L.** (2008, February). Penetrating the geometric module: Catalyzing children's use of landmarks. Poster presentation at inter-Science of Learning Conference, Pittsburgh, PA, USA.
- Twyman, A. D., Friedman, A., & Spetch, M. L.** (2007, August). Penetrating the geometric module: Catalyzing children's use of landmarks. **Oral paper presentation** at the meeting of Cognitive Science Society, Nashville, TN, USA.

TEACHING AND STUDENT MENTORSHIP

University Teaching Experience

Assistant Professor, University of Nebraska-Lincoln	2016 - present
<i>Theories of Learning: Hybrid (graduate course)</i>	
-Average student rating: 4.7 out of 5	2017
<i>Child Psychology: Hybrid (advanced undergrad/graduate course)</i>	
-Average student rating: 4.4 out of 5	2017
<i>Doctoral Seminar: Using Spatial Development, Mathematical Development, and Neuroscience to Support STEM success</i>	2017
Adjunct Faculty, Western University	2013 - 2016
<i>Child Development: On-Line</i>	
- Average student rating of Overall Effectiveness: 6.4 out of 7	2016
- Average student rating of Overall Effectiveness: 6.8 out of 7	2015
<i>Child Development: Active Learning Classroom</i>	
- Average student rating of Overall Effectiveness: 6.4 out of 7	2015
<i>Educational Psychology</i>	
- Average student rating of Overall Effectiveness: 6.5 out of 7	2015
<i>Introduction to Developmental Psychology</i>	
- Average student rating of Overall Effectiveness: 6.8 out of 7	2014

Exceptional Children: Developmental Disorders

- Average student rating of Overall Effectiveness: **6.6 out of 7** 2015
- Average student rating of Overall Effectiveness: **6.5 out of 7** 2014
- Average student rating of Overall Effectiveness: **6.1 out of 7** 2013

Adjunct Faculty, Kings University College 2014 - 2016

Child Development, Full-Year Course

- Average Student Evaluation Score: **6.5 out of 7** 2015 - 2016
- Average Student Evaluation Score: **6.4 out of 7** 2014 - 2015

Instructor, Temple University, Philadelphia, PA 2010

Special Topics: The Development of Spatial Cognition 2010

- Average Student Evaluation Score: **4.6 out of 5**

Teaching Awards & Honors

Finalist for the Award for King's University Award for Excellence in Teaching 2015 & 2016
- One of 6 university-wide finalists

Western University's Teaching Honor Roll 2014 - 2016
- 5 of the 60+ instructors in the Psychology department receive this honor

Students Mentorship

Advisor to Graduate students, University of Nebraska-Lincoln 2016 - present
Carrie Kennedy (*Children's understanding of "middle" across real-world and virtual environments*)
Susan Pense (*Circular statistics in spatial reorientation*)
Gregory J DeGirolamo (*Comparing spatial cognition in college students and seniors*)

Advisor to Undergraduate students, Western University 2014 – 2016
Rachel Belanger (*Teaching preschoolers "middle": Links between space and math*)
Michelle Murdock (*Episodic memory development in toddlers*)
Jia Jia (Angelina) Zhu (*Episodic memory development in toddlers*)
Abigail Benincasa (*preschoolers at play: playground experience and spatial ability*)
Julie Statler (*preschoolers at play: playground experience and spatial ability*)
Elliott Exton (*Preschoolers at play: playground experience and spatial ability*)
Martin Wolak (*Sports experience and spatial ability with college undergrads*)
Amanda Cyr (*Space and number development in children with ASL experience*)

Advisor to Undergraduate students, Temple University 2007 – 2011
Caitlin Vossberg (*Integration of cues in spatial memory*)
Samantha Goldhagen (*Integration of cues in spatial memory*)
Rania McCauley (*Malleability of spatial memory*)
Jennifer Conner (*Malleability of spatial memory*)
Stephen Basenfelder (*Categorical cue use in mice*)

- Advisor to Honors Student**, Western University 2014 - 2015
 Hayley Samson (*Teaching Preschoolers “Middle”: Links between Space & Math*)
- Poster presentation of honors thesis research at a provincial level conference
 - Project featured in the [local media](#)
 - Currently applying to graduate programs in psychology
- Advisor to Honors Student**, Temple University 2008 – 2010
 Amanda Funk (*Three-year-old children’s successful use of a “middle” search strategy*)
- Oral presentation at the international Conference on Comparative Cognition
 - Poster presentation at the *Society for Research in Child Development (SRCD)*
 - Masters degree in psychology from Lehigh University, Bethlehem, PA, USA
 - Currently as PsyD student at Millersville University, Millersville, PA
- Advisor to a Masters-level Research Coordinator**, Temple University 2007 – 2009
 Wendy Shallcross (*Development of spatial reorientation*)
- Co-authored one empirical paper and one peer-reviewed chapter
 - Currently an Applied Behavior Analysis Therapist (Lovaas Institute)

PROFESSIONAL SERVICE

Workshop Leader:

- Co-host of a workshop on spatial development for pre-service teachers** 2017
- *Space camp: Fostering spatial development*
 - Theories of spatial development
 - Hands-on workstations with kindergarten students

Professional Development:

- Faculty Scholarly Enhancement Workshop Series** 2016 - 2017
Monthly workshops to develop scholarship, teaching, and grant writing
- Campus Conversation Workshop: Teaching Effectively with Technology** 2017
- Diversity and Intercultural Competence Seminar** 2016

Service to Profession:

- Ad-doc reviewer for the biannual meeting of the Cognitive Development Society** 2017
- Ad hoc reviewer:** *Animal Cognition, Behavioural Brain Research, Cognition, Developmental Psychology, Developmental Science, Journal of Experimental Analysis of Behavior, Learning, and Motivation, Journal of Experimental Psychology: Animal Learning and Cognition, Psychological Bulletin & Review* 2011 - present
- Wiley Science Advisor** 2009 – present

Textbook reviewer:

How Children Develop, 4th edition, Worth Publishers 2016
Child Development: Perspectives in Developmental Psychology, Oxford University Press 2014

Ad-hoc reviewer for the biannual meeting of the Society for Research in Child Development (SRCD). 2013

Cognitive Development Society Book Award Steering Committee 2011

Ad-hoc reviewer for the Annual Inter-Science of Learning (iSLC) Conferences for Students and Postdoctoral Scholars. 2008

Conference and Symposia Organization:

Symposium Co-chair at the Cognitive Development Society 2011
“Burning questions for the professorate: What is the “right” academic job and what does it take to land it.”

Elected Positions Held:

Cognitive Development Society Board of Director, Student Representative 2009 – 2011

Spatial Intelligence and Learning Center (SILC) Student Vice-President 2008 – 2010
