

# Mary A. Pyc

Dart NeuroScience  
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## Education & Employment

2014-present Dart NeuroScience, San Diego, CA  
Scientist I, Target Discovery

Supervisor: J. Steven de Belle

2010-2014 Washington University, St. Louis, MO  
Postdoctoral fellow

Mentors: Dave Balota, Henry (Roddy) Roediger, and Kathleen McDermott

2005-2010 Kent State University, Kent, OH  
Graduate Student

Mentor: Katherine Rawson

Ph.D., December 2010

Dissertation: Why is retrieval practice beneficial for memory? An evaluation of the mediator shift hypothesis.

M.A., May 2008

Master's Thesis: Labor and gain, but then labor in vain: Diminishing returns of repeated retrieval practice

2001-2005 Keene State University, Keene, NH  
Undergraduate Student

Mentor: Donna Viveiros

B.A., Psychology, 2005, Magna Cum Laude

## Research Program

My research interests involve promoting long term retention, including investigation of when retrieval practice and spacing are beneficial for memory, evaluating theoretical accounts for why retrieval practice and spacing are beneficial for memory, how spacing in combination with retrieval practice maximizes performance, how individuals self-regulate learning, how metacognition is related to self-regulated learning, and how individual differences (e.g., age, memory expertise) and strategy use may influence the efficacy of learning schedules. I have experience developing and managing large-scale online studies (e.g., [www.extremememorychallenge.com](http://www.extremememorychallenge.com)) as well as smaller in-lab studies with children, undergraduates, and older adults.

## Teaching Interests

At the undergraduate level, I have experience teaching cognitive psychology and a writing intensive course for cognitive psychology (Fall 2008, Spring 2009), and could teach advanced cognitive psychology, seminars in cognitive psychology, learning and memory, introductory psychology, introductory statistics, and research methods. At the graduate level, I am interested in teaching cognitive psychology, seminars in cognitive psychology, including seminars in learning and memory and applying cognitive principles to education.

## Peer-reviewed Publications

Bui, D., Pyc, M. A., & Bailey, H. R. (in press). When people's judgments of learning (JOLs) are extremely accurate at predicting subsequent recall: The "displaced-JOL effect". *Memory*.

Morehead, K., Dunlosky, J., Rawson, K. A., Bishop, M., & Pyc, M. A. (in press). Do mediator production and shifts contribute to the spacing effect for cued recall? Critical tests of the shift hypothesis. *Memory*

Pyc, M. A., Balota, D. A., McDermott, K. B., Tully, T. & Roediger, H. L. III. (2014). Between-list lag effects in recall depend on retention interval. *Memory & Cognition*, 42,965-977

Pyc, M. A., Rawson, K. A., & Aschenbrenner, A. J. (2014) Metacognitive monitoring during criterion learning: When and why are judgments accurate? *Memory & Cognition*, 42, 886-897.

Lipowski, S. L., Pyc, M. A., Dunlosky, J., & Rawson, K. A. (2014). Establishing and explaining the testing effect in free recall for young children. *Developmental Psychology*, 50,994-1000.

Jones, A. C., & Pyc, M. A. (2014). The production effect: Costs and benefits in free recall.

*Journal of Experimental Psychology: Learning, Memory, and Cognition*, 40, 300-305.

Pyc, M. A., Agarwal, P. K., & Roediger, H. L. III (2014). Test-enhanced learning. In V. Benassi, C. Overson, & C. Hakala (Eds.), *Applying the science of learning in education: Infusing psychological science into the curriculum*. Retrieved from the Society for the Teaching of Psychology web site: <http://teachpsych.org/ebooks/asle2014/index.php>

Vaughn, K. E., Rawson, K. A., & Pyc, M. A. (2013). Repeated retrieval practice and item difficulty: Does criterion learning eliminate item difficulty effects? *Psychonomic Bulletin & Review*, 20, 1239-1245.

Roediger, H. L. III, & Pyc, M. A. (2012). Applying cognitive psychology to education: Complexities and prospects. *Journal of Applied Research in Memory and Cognition*, 1, 263-265.

Roediger, H. L. III, & Pyc, M. A. (2012). Inexpensive techniques to improve education: Applying Cognitive Psychology to enhance educational practice. *Journal of Applied Research in Memory and Cognition*, 1, 242-248.

Pyc, M. A. & Rawson, K. A. (2012). Why is retrieval practice beneficial for memory? An evaluation of the mediator shift hypothesis. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 38, 737-746.

Pyc, M. A., & Rawson, K. A. (2012). Are judgments of learning made after correct responses during retrieval practice sensitive to lag and criterion level effects? *Memory & Cognition*, 40, 976-988.

Wissman, K. T., Rawson, K. A. & Pyc, M. A. (2012). How and when do students use flashcards? *Memory*, 20, 568-579.

Pyc, M. A., & Rawson, K. A. (2011). Costs and benefits of dropout schedules of test-restudy practice: Implications for student learning. *Applied Cognitive Psychology*, 25, 87-95.

Wissman, K. T., Rawson, K. A., & Pyc, M. A. (2011). The interim test effect: Testing prior material can facilitate the learning of new material. *Psychonomic Bulletin & Review*, 18, 1140-1147.

Pyc, M. A., & Rawson, K. A. (2010). Why testing improves memory: Mediator effectiveness hypothesis. *Science*, 333, 335.

Pyc, M. A., & Dunlosky, J. (2010). Toward an understanding of students' allocation of study time: Why do they decide to mass or space their practice? *Memory & Cognition*, 38, 431-440.

Grimaldi, P., Pyc, M. A., & Rawson, K. A. (2010). Normative multitrial recall performance, metacognitive judgments, and retrieval latencies for Lithuanian-English paired associates. *Behavior Research Methods*, *42*, 634-642.

Pyc, M. A., & Rawson, K. A. (2009). Testing the retrieval effort hypothesis: Does greater difficulty correctly recalling information lead to higher levels of memory? *Journal of Memory and Language*, *60*, 437-447.

Pyc, M. A., & Rawson, K. A. (2007). Examining the efficiency of schedules of distributed retrieval practice. *Memory & Cognition*, *35*, 1917-1927.

## **Manuscripts in Preparation or Under Review**

Jones, A. C., Pyc, M. A., & Wetherill, C. Production enhances item, but not associative, memory.

Jones, A. C., Kregiel, B., & Pyc, M. A. The production effect and item-order encoding.

Maddox, G., Pyc, M. A., Gatewood, J., & Schonhoff, A. Examining the contributions of desirable difficulty and reminding to the spacing effect.

Pyc, M. A., & Balota, D. A. Catastrophic interference? The influence of lag and testing on retention in a criterion learning paradigm in young and older adults.

## **Presentations**

Pyc, M. A., Fenger, D., Cheung, P., de Belle, S., & Tully, T. (2017, November). *The EXTREME MEMORY® Challenge: A search for the heritable foundations of exceptional memory*. Poster presented at the 58<sup>th</sup> Annual Meeting of the Psychonomic Society.

Pyc, M. A., Giron, E., Cheung, P., Fenger, D., de Belle, S., & Tully, T. (2017, January). *The EXTREME MEMORY® Challenge: A search for the heritable foundations of exceptional memory*. Poster presented at the Pacific Symposium on Biocomputing, Hawaii.

Pyc, M. A., Giron, E., Cheung, P., de Belle, S. & Tully, T., (2016, November). *The extreme memory challenge: A search for the heritable foundations of exceptional memory*. Poster presented at the annual meeting of the Society for Neuroscience, San Diego, California.

- Huff, M. J., Woody, R., Pyc, M. A., & Balota, D. A. (2016, April). *Hooked on memory: A method of loci training program for older and younger adults*. Poster presented at the biannual meeting of the Cognitive Aging Conference.
- Jones, A. C., & Pyc, M. A. (2015, November). *I studied write, right? Homophones and the production effect*. Poster presented at the 26<sup>th</sup> annual meeting of the Psychonomic Society, Chicago, Illinois.
- Maddox, G. B., & Pyc, M. A. (2015, November). *Examining the contributions of desirable difficulty to the lag effect in recognition testing*. Poster presented at the 26<sup>th</sup> annual meeting of the Psychonomic Society, Chicago, Illinois.
- Pyc, M. A., & Dellis, N. (2015, September) *How memory athletes perform and how their techniques can help you*. Invited guest lecturer at John Carroll University, University Heights, OH.
- Schonhoff, A. M., Maddox, G. B., & Pyc, M. A. (2015, May). *Examining the contributions of encoding variability and desirable difficulty to the benefits of repetition*. Poster presented at the 27<sup>th</sup> annual meeting of the Association for Psychological Science, New York, NY.
- Pyc, M. A., & Jones, A. C. (2014, November). *Production enhances item, but not associative, learning*. Poster presented at the 55<sup>th</sup> annual meeting of the Psychonomic Society, Long Beach, California.
- Bui, D., Pyc, M. A., & Bailey, H. R. (2014, November). *When people's judgments of learning (JOLs) are extremely accurate at predicting subsequent recall: The displaced JOL effect*. Poster presented at the 55<sup>th</sup> annual meeting of the Psychonomic Society, Long Beach, California.
- Pyc, M. A. (2014, November). *Identifying factors to promote student learning*. Invited guest lecturer at Hillsdale College, Hillsdale, MI.
- Pyc, M. A., & Dellis, N. (2014, November). *How memory athletes perform and how their techniques can help you*. Invited guest lecturer at Hillsdale College, Hillsdale, MI.
- Pyc, M. A., Balota, D. A., McDermott, K. B., & Roediger, H. L. III. (2014, May). *Mediated effects of testing: The influence of spacing and retention interval on retrieval practice effects*. Paper presented at the 26<sup>th</sup> annual meeting of the Association for Psychological Science, San Francisco, CA.
- Pyc, M. A. (2014, May). *Identifying factors to promote student learning*. Invited guest lecturer at Dartmouth College, Hanover, NH.

- Pyc, M. A., Balota, D. A., McDermott, K. A., & Roediger, H. L. III. (2014, February). *Identifying individuals with superior memory abilities: Mass screening the general population*. Paper presented at the Human biomarkers symposium, San Diego, CA.
- Roediger, H. L. III., Balota, D. A., McDermott, K. A., & Pyc, M. A. (2014, February). *Memory athletes: Does their ability generalize to other cognitive tasks?* Paper presented at the Human biomarkers symposium, San Diego, CA.
- Pyc, M. A., & Balota, D. A. (2013, November). *Catastrophic interference? The influence of lag and testing on retention in young and older adults*. Paper presented at the 54<sup>th</sup> annual meeting of the Psychonomic Society, Toronto, Canada.
- Pyc, M. A. (2013, June). *Test-enhanced learning: When and why is testing beneficial for memory?* Invited paper presented at the cognitive and brain-imaging studies of test enhanced learning: An international symposium on educational neuroscience, Umea University, Sweden.
- Jones, A. C., & Pyc, M. A. (2013, May). *The costs and benefits of production*. Paper presented at the 85<sup>th</sup> annual meetings of the Midwestern Psychological Association, Chicago, IL.
- Pyc, M. A., & Balota, D. A. (2013, May). *Catastrophic interference? The influence of lag and testing on retention in young and older adults*. Paper presented at the 85<sup>th</sup> annual meetings of the Midwestern Psychological Association, Chicago, IL.
- Pyc, M. A., Balota, D. A., McDermott, K. B., & Roediger, H. L. (2012, November). *Searching for individuals with capacities for superior consolidation*. Presentation to owner and board of directors at Dart Neuroscience, Dart Neuroscience Headquarters, San Diego, California.
- Pyc, M. A., Balota, D. A., Tully, T., McDermott, K. B., & Roediger, H. L. III. (2012, November). *Paradoxes of spacing: Effects of mode of second presentation (study or test) and retention interval*. Poster presented at the 53<sup>rd</sup> annual meeting of the Psychonomic Society, Minneapolis, MN.
- Roediger, H. L. III., Pyc, M. A., Balota, D. A., Tully, T., & McDermott, K. B. (2012, November). *Memory athletes: Does their ability generalize to other cognitive tasks?* Paper presented at the 53<sup>rd</sup> annual meeting of the Psychonomic Society, Minneapolis, MN.
- Pyc, M. A., Balota, D. A., McDermott, K. B., & Roediger, H. L. (2012, October). *Searching for individuals with capacities for superior consolidation*. Presentation to researchers at Dart Neuroscience, Dart Neuroscience Headquarters, San Diego, California.

- Jones, A. C., & Pyc, M. A. (2012, May). *Making hard things easy: The production effect and paired-associate learning*. Paper presented at the 84<sup>th</sup> annual meeting of the Midwestern Psychological Association, Chicago, IL.
- Pyc, M. A., Balota, D. A., McDermott, K. B., Tully, T., & Roediger, H. L. III. (2011, November). *Overcoming forgetting: Spacing across days can improve memory*. Poster presented at the 52<sup>nd</sup> annual meeting of the Psychonomic Society, Seattle, WA.
- Jones, A. C., & Pyc, M. A. (2011, November). *How durable is the production effect?* Poster presented at the 52<sup>nd</sup> annual meeting of the Psychonomic Society, Seattle, WA.
- Pyc, M. A., Rawson, K. A., & Dunlosky, J. (2011, May). *Are self-regulated learning decisions sensitive to spacing and lag effects?* Paper presented at the 83<sup>rd</sup> annual meeting of the Midwestern Psychological Association, Chicago, IL.
- Lipowski, S. L., Pyc, M. A., Dunlosky, J., & Rawson, K. A. (2011, May). *An examination of developmental trends and mechanisms underlying the testing effect*. Paper presented at the 83<sup>rd</sup> annual meeting of the Midwestern Psychological Association, Chicago, IL.
- Pyc, M. A., & Rawson, K. A. (2010, November). *Why does testing promote memory? The mediator effectiveness hypothesis*. Paper presented at the 51<sup>st</sup> annual meeting of the Psychonomic Society, St Louis, MO.
- Pyc, M. A., & Rawson, K. A. (2010, November). *Why does testing improve memory? Evaluating the mediator shift hypothesis*. Poster presented at the 51<sup>st</sup> annual meeting of the Psychonomic Society, St Louis, MO.
- Vaughn, K. E., Rawson, K. A., & Pyc, M. A. (2010, November). *The effects of repeated retrieval as a function of item difficulty*. Poster presented at the 51<sup>st</sup> annual meeting of the Psychonomic Society, St Louis, MO.
- Rawson, K. A., Wissman, K. T., & Pyc, M. A. (2010, August). *Do interim recall tests promote text learning and retention?* Paper presented at the 20<sup>th</sup> Annual meeting of the Society for Text and Discourse, Chicago, IL.
- Pyc, M. A. & Rawson, K. A. (2010, April). *Why does testing improve memory? Evaluating the mediator shift hypothesis*. Paper presented at the 82<sup>nd</sup> annual meeting of the Midwestern Psychological Association, Chicago, IL.
- Wissman, K. T., Pyc, M. A., & Rawson, K. A. (2010, April). *Do intervening tests facilitate learning of complex materials?* Poster presented at the 82<sup>nd</sup> annual meeting of the Midwestern Psychological Association, Chicago, IL.

- Pyc, M. A., & Rawson, K. A. (2009, November). *Are students sensitive to ISI and criterion level effects when monitoring learning?* Poster presented at the 50<sup>th</sup> annual meeting of the Psychonomic Society, Boston, MA.
- Pyc, M. A., & Rawson, K. A. (2009, May). *Are judgments-of-learning sensitive to ISI and criterion level effects?* Paper presented at the 81<sup>st</sup> annual meeting of the Midwestern Psychological Association, Chicago, IL.
- Wissman, K. T., Pyc, M. A., & Rawson, K. A. (2009, May). *Less is more: Shorter texts improve memory and reduce proactive interference.* Poster presented at the 81<sup>st</sup> annual meeting of the Midwestern Psychological Association, Chicago, IL.
- Pyc, M. A., & Rawson, K. A. (2008, November). *Testing the Desirable Difficult Account of Retrieval Practice.* Poster presented at the 49<sup>th</sup> annual meeting of the Psychonomic Society, Long Beach, CA.
- Pyc, M. A., & Rawson, K. A. (2008, May). *Diminishing Returns of Increasing Retrieval Practice.* Paper presented at the 80<sup>th</sup> meeting of the Midwestern Psychological Association, Chicago, IL.
- Pyc, M. A., & Rawson, K. A. (2007, November). *Distributed retrieval practice: How much is enough?* Poster presented at the 48<sup>th</sup> annual meeting of the Psychonomic Society, Long Beach, CA.
- Pyc, M. A. & Rawson, K. A. (2007, May). *Efficiency of fixed vs. variable schedules of distributed retrieval practice.* Paper presented at the 79<sup>th</sup> meeting of the Midwestern Psychological Association, Chicago, IL.
- Burke, T. M., Pyc, M. A., & Rawson, K. A. (2007, May) *Does repeated retrieval-plus-restudy improve memory for key ideas in text?* Poster presented at the 79<sup>th</sup> meeting of the Midwestern Psychological Association, Chicago, IL.
- Rawson, K. A., Dunlosky, J., & Pyc, M. A. (2006, June). *Do repeated practice tests promote student learning of text material?* Poster presented at the Institute of Education Sciences Research Conference, Washington, DC.
- Pyc, M. & Viveiros, D. M. (2006, May). *Film-induced emotionality does not influence performance on a reading comprehension task.* Presented at the 18<sup>th</sup> meeting of the Association for Psychological Science, New York, NY.
- Pyc, M. A., & Rawson, K. A. (2006, November). *Schedules of retrieval practice for improving learning: Less is more?* Poster presented at the 47<sup>th</sup> meeting of the Psychonomic Society, Houston, TX.



## **Honors and Awards**

- 2010            University Fellowship, Kent State University
- 2010            Best Student Research Prepared for Publication or Presentation in Applied Psychology, Kent State University
- 2005            Keene State College Honors Award
- 2001-2005     Dean's Scholar Award, Keene State College

## **Professional Organizations**

International Association for Metacognition (IAM)

Psi Chi National Honor Society

Psychonomic Society – Full Member

Society for Neuroscience

## **Professional Service**

Ad Hoc Reviewer:

Acta Psychologica

American Journal of Psychology

Applied Cognitive Psychology

Bilingualism Language and Cognition

Canadian Journal of Experimental Psychology

Educational Psychology

Educational Psychology Review

European Journal of Psychology of Education

Frontiers in Human Neuroscience

Human Factors

Journal of Applied Research in Memory and Cognition

Journal of Cognitive Psychology

Journal of Experimental Psychology: Learning, Memory, and Cognition

Memory

Memory & Cognition

Psychonomic Bulletin & Review