Lace M.K. Padilla

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Cognitive and Information Sciences

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Education

May 2018	Ph.D. in Psychology, University of Utah
May 2015	M.S. in Psychology, University of Utah
May 2013	M.F.A. in Studio Arts, University of Utah
May 2009	B.F.A. in Multimedia, Pacific Northwest College of Art

Professional Experience

2019 - Current	Assistant Professor, Cognitive & Information Sciences, UC Merced
2018 - 2020	NSF Postdoctoral Research Fellow, Northwestern University
2018 - 2019	Disaster Risk Management and Behavioral Science Consultant, World Bank
2011 - 2015	Adjunct Professor, University of Utah, Technology Education
2012 - 2013	Adjunct Professor, Stevens-Henager College, Graphic Design
2010 - 2012	Adjunct Professor, Provo College, Web Development
2010 - 2012	Adjunct Professor, Eagle Gate College, Web Development

Externally Funded Grants

National Science Foundation, 1810498, Improving Equity in STEM via Visualization Literacy Cognition, $138,000 (total), PI, 2018-20

Global Facility for Disaster Reduction and Recovery and NASA, 18-RRNES18-0008, Connecting Earth Observations to Decision Makers for Preparedness Actions, $100,000 (total), Collaborator (PI Andrew Kruczkiewicz, Columbia), 2018-20

NASA, administered by Gordon Research Conferences: Visionary Research Grant, S15-178-05, Improving Trust in Uncertain Science, $3,900, Co-PI with Steven Franconeri, Northwestern University and Hannah Fairfield, New York Times, 2018-20

Internally Funded Grants

University of Utah Graduate Research Fellowship, $24,000, 2017-18

Martin Harris Hiatt Memorial Graduate Fellowship, for work with underrepresented populations, $6,750, 2014

Academic Honors

The Frederick T. Rhodewalt Award for Innovative Scholarship: $1,000, *2018*

ETS Summer Pre-Doctoral Research Internship, Princeton: $7,000, *2017*

University of Utah Psychology All-Around Commendation (research, mentorship, and service): *2017*

Carl Storm Underrepresented Minority Fellowship, Visualization in Science & Education: $600, *2017*

Clayton Award for excellence in research with underrepresented populations: $2,000, *2014*

Martin Harris Hiatt Memorial Graduate Fellowship, for excellence in research: $6,750, *2017*

Best Poster Award, CSBS Research Day: $500, *2017*

University of Utah Psychology Professional Development Award: $500, *2016*

Summer Institute in Cognitive Neuroscience Fellowship: $1,200, *2015*

University of Utah Psychology Commendation in Research: *2015*

Teaching Assistant Scholarship, Art and Art History Department University of Utah: $9,620, *2011*

Multimedia Merit Grant, Pacific Northwest College of Art, OR: $4,000, *2004*

Journal Articles

1. **Padilla, L.**, Creem-Regehr, S. H., & Thompson, W. (in press). The powerful influence of marks: Visual and knowledge-driven processing in hurricane track displays. *Journal of Experimental Psychology: Applied*.
2. **Padilla, L.**, Castro, S., Quinan, P. S., Ruginski, I., & Creem-Regehr, S. H. (2019). Toward objective evaluation of working memory in visualizations: A case study using pupillometry and a dual-task paradigm. *IEEE Transactions on Visualization and Computer Graphics*.
3. Quinan, P. S., **Padilla, L.**, Creem-Regehr, S. H., & Meyer, M. (2019). Examining implicit discretization in spectral schemes. *Computer Graphics Forum*.
4. Liu, L., **Padilla, L.**, Creem-Regehr, S., & House, D. (2018). Visualizing uncertain tropical cyclone predictions using representative samples from ensembles of forecast tracks. *IEEE Transactions on Visualization and Computer Graphics*, *25*(1), 882–891. doi:10.1109/TVCG.2018.2865193
5. **Padilla, L.**, Creem-Regehr, S., Hegarty, M., & Stefanucci, J. K. (2018). Decision making with visualizations: A cognitive framework across disciplines. *Cognitive Research: Principles and Implications*, *3*(1), 29. doi:10.1186/s41235-018-0120-9
6. Liu, L., Boone, A. P., Ruginski, I. T., **Padilla, L.**, Hegarty, M., Creem-Regehr, S. H., ... House, D. (2017). Uncertainty visualization by representative sampling from prediction ensembles. *IEEE Transactions on Visualization and Computer Graphics*, *23*(9), 2165–2178.
7. **Padilla, L.**, Creem-Regehr, S. H., Stefanucci, J. K., & Cashdan, E. A. (2017). Sex differences in virtual navigation influenced by scale and navigation experience. *Psychonomic Bulletin & Review*, *24*(2), 582–590.
8. **Padilla, L.**, Quinan, P. S., Meyer, M., & Creem-Regehr, S. H. (2017). Evaluating the impact of binning 2D scalar fields. *IEEE Transactions on Visualization and Computer Graphics*, *23*(1), 431–440.
9. **Padilla, L.**, Ruginski, I. T., & Creem-Regehr, S. H. (2017). Effects of ensemble and summary displays on interpretations of geospatial uncertainty data. *Cognitive Research: Principles and Implications*, *2*(1), 40.
10. Cashdan, E., Kramer, K. L., Davis, H. E., **Padilla, L.**, & Greaves, R. D. (2016). Mobility and navigation among the Yucatec Maya. *Human Nature*, *27*(1), 35–50.
11. Ruginski, I. T., Boone, A. P., **Padilla, L.**, Liu, L., Heydari, N., Kramer, H. S., ... Creem-Regehr, S. H. (2016). Non-expert interpretations of hurricane forecast uncertainty visualizations. *Spatial Cognition & Computation*, *16*(2), 154–172.
12. Vashro, L., **Padilla, L.**, & Cashdan, E. (2016). Sex differences in mobility and spatial cognition. *Human Nature*, *27*(1), 16–34.
13. **Padilla, L.**, Hansen, G., Ruginski, I. T., Kramer, H. S., Thompson, W. B., & Creem-Regehr, S. H. (2015). The influence of different graphical displays on nonexpert decision making under uncertainty. *Journal of Experimental Psychology: Applied*, *21*(1), 37.

Book chapters

1. Kruczkiewicz, A. & **Padilla, L.** (2019). Moving from availability to use of flood risk and flood monitoring data to inform decision making for preparedness and response. In A. Kruczkiewicz (Ed.), *Global flood and drought prediction* (Chap. 3, pp. 40–65). Washington, DC: American Geophysical Union.

Submitted Manuscripts

1. Franconeri, S., Hulllman, J., & **Padilla, L.** (invited manuscript, under review). The science of visual data communication: What works. *Psychological Science in the Public Interest*.
2. **Padilla, L.**, Hulllman, J., & Kay, M. (invited book chapture, under review). Uncertainty visualization. *Handbook of Computational Statistics and Data Science*.

Peer Reviewed Conference Proceedings

1. **Padilla, L.** (2018). A case for cognitive models in visualization research. *Proceedings of Workshop at Evaluation and Beyond - MethodoLogical Approaches for Visualization (BELIV) at IEEE Information Visualization*.

2. Creem-Regehr, S. H., **Padilla, L.**, Stefanucci, J. K., & Cashdan, E. (2015a). Effects of spatial abilities, cue-types, and scale on spatial memory in virtual natural landscapes. *Cognitive Processing*, *16*, S18–S18.
3. Quinan, S., **Padilla, L.**, Creem-Regehr, S., & Meyer, M. (2015). Towards ecological validity in evaluating uncertainty. *Proceedings of Workshop on Visualization for Decision Making Under Uncertainty, at IEEE Information Visualization*.

Government Reports

1. **Padilla, L.**, Abella, J., Hsu, J., Perge, E., & Afif, Z. (2018). Using behavioral insights to improve Haiti disaster risk management. *The World Bank and the Government of Haiti*, *B-32*, 1–35.

Other Publications

1. **Padilla, L.** (2016). Sex differences in virtual navigation influenced by visual factors and individual differences. *ProQuest Dissertations Theses Global*.
2. **Padilla, L.** (2013). The art of maps. *Western Humanities Review*, *67*(1), 18.

Invited Talks and Symposia

1. de Sherbinin, A. & **Padilla, L.** (2019). Data visualization and cognition: The challenge of future scenario development. Invited talk to be presented at the Forum on Scenarios for Climate and Societal Futures. Denver, CO.
2. **Padilla, L.** (2019). The state of the art in uncertainty visualization. Invited symposium co-chair, Joint Statistical Meeting 2019. Denver, CO.
3. **Padilla, L.** (2018). Psychology of data visualization. Keynote presented at the Pac-12 Tableau User Group meeting, University of Utah. Salt Lake City, UT.
4. **Padilla, L.** (2018). Reasoning with meteorology displays. Invited talk presented at Columbia University. New York City, NY.
5. **Padilla, L.** (2018). Selecting the best satellite-derived risk tool: Mining the sky for decision-making. Panel talk presented at the 2018 Understanding Risk Forum. Mexico City, MX.
6. **Padilla, L.** (2018). Visualization biases and risk assessment. Session chair at the 2018 Understanding Risk Forum. Mexico City, MX.
7. **Padilla, L.** (2017). Reasoning with hurricane forecast visualizations. Invited talk presented at the University of Utah Dean's Research Leadership Luncheon. Salt Lake City, UT.
8. **Padilla, L.** (2017). Visualization decision making for UX designers. Invited talk presented at Adobe Systems. Lehi, UT.
9. **Padilla, L.**, Quinan, P. S., Meyer, M., & Creem-Regehr, S. (2016a). Evaluating the impact of binning 2D scalar fields. Invited talk presented at the Scientific Computing and Imaging Institute Visualization group meeting. Salt Lake City, UT.

Talks

1. House, D., **Padilla, L.**, Liu, L., & Creem-Regehr, S. (2018). Visualizing uncertain tropical cyclone predictions using representative samples from ensembles of forecast tracks. Talk presented at IEEE Information Visualization. Berlin, DE.
2. **Padilla, L.**, Ruginski, I., & Creem-Regehr, S. (2017). Exploring decision biases with ensemble display visualizations. Talk presented at the 25th Annual Workshop on Object Perception, Attention, and Memory (OPAM). Vancouver, BC.
3. Bartholomew, B., **Padilla, L.**, & Cashdan, E. (2016). Mobility, risk-preference, and genetics. Talk presented at Undergraduate Research Symposium. Salt Lake City, UT.
4. Dixon, L., **Padilla, L.**, Stefanucci, J., Johnstone, A., Creem-Regehr, S., & Cashdan, E. (2016). A comparison of female gamers and non-gamers on spatial cognitive abilities. Talk presented at the Undergraduate Research Symposium. Salt Lake City, UT.
5. **Padilla, L.**, Quinan, S., Meyer, M., & Creem-Regehr, S. (2016b). Evaluating the impact of binning 2D scalar fields. Talk presented at IEEE Information Visualization. Washington, DC.

6. Cashdan, E., Barhorst, E., **Padilla, L.**, Stefanucci, J., & Creem-Regehr, S. (2015). Sex differences in range size: When is travel worth the risk? Talk presented at the Human Behavior and Evolution Society Annual Meeting. Columbia University.
7. Creem-Regehr, S., **Padilla, L.**, Stefanucci, J., & Cashdan, E. (2015b). Effects of Spatial Abilities, Cue-Types, and Scale on Spatial Memory in Virtual Natural Landscape. Talk presented at the 6th International Conference on Spatial Cognition. Rome, ITA.
8. Quinan, P. S., **Padilla, L.**, Creem- Regehr, S., & Meyer, M. (2015). Towards Ecological Validity in Evaluating Uncertainty. Talk presented at the Workshop on Visualization for Decision Making Under Uncertainty at IEEE Information Visualization. Chicago, IL.
9. Ruginski, I., Boone, A., **Padilla, L.**, Kramer, H., Hegarty, M., Thompson, W., ... Creem-Regehr, S. (2015). Non-expert interpretations of hurricane forecast uncertainty visualizations. Talk presented at Annual Meeting of the Rocky Mountain Psychological Association. Boise, ID.
10. **Padilla, L.** (2014). Uncertainty computation workshop. Talk presented at the Computing Community Consortium (CCC). Baltimore, MD.

Poster presentations

1. Dixon, L., Pointon, G., **Padilla, L.**, Stefanucci, J., Creem-Regehr, S., & Johnstone, A. (2017). Development of a new gaming questionnaire to assess the influence of game genre on spatial cognitive abilities in males and females. Poster presented at the Rocky Mountain Psychological Association. Salt Lake City, UT.
2. **Padilla, L.**, Creem-Regehr, S., Hegarty, M., & Stefanucci, J. (2017). Decision making with visualizations: A selective review. Poster presented at the Visualization in Science and Education Gordon Research Conference. Lewiston, ME.
3. **Padilla, L.**, Ruginski, I., & Creem-Regehr, S. (2017). Exploring decision biases with ensemble display visualizations. Poster presented at the Annual Meeting - Psychonomic Society. Vancouver, BC.
4. Creem-Regehr, S., **Padilla, L.**, Stefanucci, J., & Cashdan, E. (2016). The influence of realistic textures and shading on mental rotation of 3D objects. Poster presented at Spatial Cognition 2016. Philadelphia, PA.
5. Dixon, L., **Padilla, L.**, Stefanucci, J., Creem-Regehr, S., & Johnstone, A. (2016). Relating video gaming and spatial cognition in women. Poster presented at Psychonomics 2016. Boston, MA.
6. Dixon, L., **Padilla, L.**, Stefanucci, J., Johnstone, A., Creem-Regehr, S., & Cashdan, E. (2016). A comparison of female gamers and non-gamers on spatial cognitive abilities. Poster presented at College of Social & Behavioral Science Student Research Day 2016. Salt Lake City, UT.
7. **Padilla, L.**, Bergmann, T., & Creem-Regehr, S. (2016). Uncertainty in Weather Forecast Phrasing. Poster presented at Psychonomics International 2016. Granda, Spain.
8. **Padilla, L.**, Creem- Regehr, S., Stefanucci, J., & Cashdan, E. (2015). Influence of instructions on female performance on a virtual Morris Water Maze. Poster presented at Psychonomics 2015. Chicago, IL.
9. **Padilla, L.**, Stefanucci, J., & Cashdan, E. (2015). Sex differences in virtual navigation influenced by scale, visual cue-types, spatial memory and lifetime mobility. Poster presented at Annual Conference of the Cognitive Science Society. Long Beach, CA.
10. Ruginski, I., Boone, A., **Padilla, L.**, Kramer, H., Hegarty, M., Thompson, W., ... Creem-Regehr, S. (2015). Understanding the cone of uncertainty: Non-expert interpretations of hurricane forecast uncertainty visualizations. Poster presented at the Annual Conference of the Cognitive Science Society. Pasadena, CA.
11. **Padilla, L.**, Creem-Regehr, S., Stefanucci, J., & Cashdan, E. (2014). Effects of spatial abilities cue types and scale on spatial memory in virtual natural landscape. Poster presented at Psychonomics 2014. Long Beach, CA.
12. **Padilla, L.**, Creem-Regehr, S., & Thompson, W. (2013). Uncertainty cognition of glyphs. Poster presented at the Center for Spatial Studies. Santa Barbara, CA.

13. **Padilla, L.**, Creem-Regehr, S., & Thompson, W. (2013). Understanding uncertainty visualizations. Poster presented at the International Spatial Cognition Summer Institute. Santa Barbara, CA.

Teaching Experience in Psychology

Courses:

PSY 3120-090 Cognitive Psych, University of Utah, *Summer 2018*

Guest Lecturer:

DMUY 4913 Climate and Design, New York University, *March 2019*
EESC GU5407 Applications in Climate + Society, Columbia University, *March 2019*
IEMS 365: Analytics for Social Good, Northwestern University, *January 2019*
EESC GU5407 Applications in Climate + Society, Columbia University, *March 2018*
PSY 2015: Skepticism and Scientific Thinking: Defense Against the Pseudosciences, University of Utah, *January 2018*
PSY 2010: Orientation to Psychology as a Science and Profession, University of Utah, *October 2016*
PSY 3150: Sensation and Perception, University of Utah, *January 2015*
PSY 3150: Sensation and Perception, University of Utah, *November 2014*
PSY 3960: Explorations Through Psychology and the Arts, University of Utah, *March 2013*

Teaching Experience in Graphic Design

Courses Developed:

Content Management Systems, University of Utah
Digital Photography, Stevens-Henager College
Design Studio, Provo College
Marketing and Branding for Designers, Provo College
Web Design 1 and 2, Provo College
Typography, Provo College

Courses Taught:

17 courses at four universities over a four-year period

Mentorship

Lisa Wilson, awards under mentorship: Navajo Nation Generating Station Scholar, SACNAS Student Travel Award, and Native American Summer Research Internship (NARI)

Natalia Abril, awards under mentorship: The Undergraduate Research Opportunities Program Award

Reuben Ryan Cano, awards under mentorship: Kaplan Scholarship

Brianna Bartholomew, awards under mentorship: The Undergraduate Research Opportunities Program Award

Brianna Bartholomew (Anthropology undergraduate, dual-citizen and female in science), Awards and placement under mentorship: The Undergraduate Research Opportunities Program Award $1,200, 2016.

Dixon Lanie (Psychology undergraduate, female in science), Awards and placement under mentorship: The Undergraduate Research Opportunities Program Award

Editorial Positions

- Guest Editor, Frontiers in Psychology and Frontiers in Computer Science, Special topic on Uncertainty Visualization *2019-2020*

Professional Activity

Poster Chair, Spatial Cognition Conference, Tuebingen, *2018*

Search Committee for the Senior Vice President for Academic Affairs, University of Utah *2018*

Founder: University of Utah Diversity Scholars Award, *2017 - 2018*

The National Science Foundation, STEM Ambassador, *2017 - 2018*

Diversity committee member, Department of Psychology, University of Utah, *2017 - 2018*

Outreach Coordinator, Utah Women and Education Initiative, *2014 - 2018*

Editorial services, Peters CRC Press Computer Graphics, Vision and Visualization, *2013*

Ad hoc reviewer

IEEE Info Vis

Diversity Outreach Talks

1. **Padilla, L.** (2018). Overcoming obstacles as a minority in STEM. Invited talk presented at Movimiento Estudiantil Chicanx de Aztlán (MEChA) Conference. Salt Lake City, UT.
2. **Padilla, L.** (2018). From rural to science. Invited talk presented at SUCCESS Academy. Cedar City, UT.
3. **Padilla, L.** (2017). The art of science. Invited talk presented at Latinos in Action | Youth Leadership Conference. Salt Lake City, UT.
4. **Padilla, L**. (2014). Enhancing your spatial abilities and performance in STEM. Talk presented at the Utah Valley University 2014. Orem, UT.
5. **Padilla, L.** (2014). Spatial abilities training for girls. Invited talk presented at Expanding Your Horizons Conference. Orem, UT.

Service

Founder and President: University of Utah Diversity Graduate School Application Advisory, *2015 - 2018*

Vice President, SACNAS University of Utah Chapter, *2017 - 2018*

Conference Workshop Leader: Expanding Your Horizons, Inspiring 6th - 10th Grade Girls to Love STEM!, Women's Success Center, *2014*

Volunteer Conference Workshop Leader: Empowering Your Tomorrow, The Equity in Education Center at Utah Valley University, *2014*

Membership

Psychonomic Society

IEEE Computer Society

Women Tech Council

Association for Women in the Sciences (AWIS)

Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)

Press

- Cairo, A. (2019, September 1). Explaining visualizations in The New York Times, NPR, and the BBC. The Functional Art, featured in the New York Times [Online Article]

- Hullman, J. (2019, September 1). How to Get Better at Embracing Unknowns. Scientific American [Magazine]

- Lewandowsky, S. (2017, October 4). Preparing for Nate and Ophelia: how people process hurricane forecasts. Psychonomic Society [Online Research Feature]

- Bartels, M. (2017, October 7). Hurricane Nate: no one knows wow to read hurricane forecasts - here's why. Newsweek [Online Article]

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