

Matthew C. Keller

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Positions and Education

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| July 2007-present | University of Colorado, Boulder
Department of Psychology and Neuroscience
Institute for Behavioral Genetics
Assistant Professor |
| 2005-2007 | Virginia Commonwealth University
Virginia Institute of Psychiatric and Behavioral Genetics
Postdoctoral Fellow |
| 2004-2005 (8 months) | University of California, Los Angeles
Center for Society and Genetics
Postdoctoral Fellow |
| 2004 (3 months) | Queensland Institute of Medical Research, Australia
Genetic Epidemiology
Postdoctoral Fellow |
| 1998-2004 | University of Michigan, Ann Arbor
Ph.D. in Social Psychology
M.A. in Statistics |
| 1991-1996 | University of Texas, Austin
B.A. in Psychology
Minor in Biology |

Grants

NIMH K01 MH085812-01A1. *Evolutionary Roles of Homozygosity & Copy Number Variation in Mental Disorders*. 2010–2015. Principal Investigator (\$824,000 direct costs; 75% effort)

Publications

- Keller, M. C., Medland, S. E., & Duncan, L. E. (in press). Are extended twin family designs worth the trouble? A comparison of the bias, precision, and accuracy of parameters estimated in four twin family models. *Behavior Genetics*.
- Hatemi, P. K., Medland, S. E., Keller, M. C., Martin, N. G., Hibbing, J. R., Smith, K., Alford, J. R. & Eaves L. J. (in press). Not by twins alone: Using the extended family design to investigate genetic influence on political beliefs. *American Journal of Political Science*
- Keller, M. C., Howrigan, D. P., & Simonson, M. A. (in press). Theory and methods in evolutionary behavioral genetics. To appear in D. Buss & P. Hawley (eds.), *Evolution of personality and individual differences*.
- Keller, M. C., McCrae, A., McGaughran, J. M., Visscher, P. M., Visscher, P. M., Martin, N. G., & Montgomery, G. W. (2009). Non-pathological paternal isodisomy of chromosome 2 detected from a genome-wide SNP scan. *American Journal of Medical Genetics Part A*, *149*, 1823-1826.
- Keller, M. C., Medland, S. E., Duncan, L. E., Hatemi, P. K., Neale, M. C., Maes, H. H. M., Eaves, L. J. (2009). Modeling extended twin family data I: Description of the Cascade model. *Twin Research and Human Genetics*, *29*, 8-18.
- Medland, S. E., & Keller, M. C. (2009). Modeling extended twin family data II: Power associated with different family structures. *Twin Research and Human Genetics*, *29*, 19-25.
- Maes, H. H., Neale, M. C., Medland, S. E., Keller, M. C., Martin, N. G., Heath, A. C., & Eaves, L. J. (2009). Flexible Mx specifications of various extended twin kinship designs. *Twin Research and Human Genetics*, *29*, 26-34.
- Keller, M. C. (2008). On the evolutionary persistence of genes that increase mental disorder risk. *Current Directions of Psychological Science*, *17*, 395-399.
- Zietsch, B. P., Morley, K. I., Shekar, S. N., Verweij, K. J. H., Keller, M. C., Macgregor, S., Wright, M. J., Bailey, J. M., Martin, N. G. (2008). Genetic factors predisposing to homosexuality may increase mating success in heterosexuals. *Evolution and Human Behavior*, *29*, 424-433.
- Keller, M. C. (2008). Problems with the imprinting hypothesis of schizophrenia and autism. *Brain and Behavioral Sciences*, *31*, 241-320.

Publications (continued)

- Medland, S. E., Loehlin, J. C., Willemsen, G., Hatemi, P. K., Keller, M. C., Boomsma, D. I., Eaves, L. J., & Martin, N. G. (2008). Males do not reduce the fitness of their female co-twins in contemporary samples. Data from Australia, the Netherlands, and the United States. *Twin Research and Human Genetics*, *11*, 481-487.
- Keller, M. C. (2008). An evolutionary genetic framework for heritable disorders. *Encyclopedia of Life Sciences (ELS)*. John Wiley & Sons Ltd: Chichester.
- Keller, M. C. (2008). Dr. Keller replies [Response to Letter], *American Journal of Psychiatry*, *165*, 533-534.
- Ybarra, O., Burnstein, E., Winkielman, P., Keller, M. C., Manis, M., Chan, E., & Rodriguez, J. (2008). Mental exercising through simple socializing: Social interaction promotes general cognitive functioning. *Personality and Social Psychology Bulletin*, *34*, 248-259.
- Keller, M. C. (2008). The role of mutation in human mating. In G. Geher & G. Miller (Eds.), *Mating intelligence: Theoretical, experimental, and differential perspectives*. Lawrence Erlbaum: Mahwah, NJ.
- Keller, M. C., Neale, M. C., & Kendler, K. S. (2007). Different negative life events are associated with different patterns of depressive symptoms. *American Journal of Psychiatry*, *164*, 1521-1529. [Selected by the editors as a notable paper of 2007]
- Keller, M. C. (2007). Standards of evidence in the nascent field of evolutionary behavioral genetics [Commentary]. *European Journal of Personality*, *21*, 608-610.
- Ybarra, O., Keller, M. C., Chan, E., Baron, A. S., Hutsler, J., Garcia, S. M., Sanchez-Burks, J., & Morrison, K. R. (2007). The social prediction dynamic: A legacy of cognition and mixed motives. In J. Forgas, M. Haselton, & W. von Hippel (Eds.), *Evolution and the Social Mind*. Psychology Press: New York.
- Keller, M. C., & Miller, G. F. (2006). Resolving the paradox of common, harmful, heritable mental disorders: Which evolutionary genetic models work best? *Behavioral and Brain Sciences*, *29*, 385-452. [Editors' Choice Award; given to 1-2 articles per year].
- Keller, M. C., & Miller, G. F. (2006). An evolutionary framework for mental disorders: Integrating adaptationist and evolutionary genetic models. [Response to commentaries]. *Behavioral and Brain Sciences*, *29*, 429-441
- Keller, M. C., & Nesse, R. M. (2006). The evolutionary significance of depressive symptoms: Different life events lead to different depressive symptom patterns. *Journal of Personality and Social Psychology*, *91*, 316-330.
- Cannon, T., & Keller, M. C. (2005). Endophenotypes in genetic analyses of mental disorders. *Annual Review of Clinical Psychology*, *2*, 267-290.

Publications (continued)

Keller, M. C., Coventry, W. L., Heath, A. C., & Martin, N. G. (2005). Widespread evidence for non-additive genetic variation in Cloninger's and Eysenck's personality dimensions using a twin plus sibling design. *Behavior Genetics*, *35*, 707-721.

Keller, M. C., Fredrickson, B. L., Ybarra, O., Côté, S., Johnson, K., Mikels, J., & Wager, T. (2005). A warm heart and a clear head: The contingent effects of weather on human mood and cognition. *Psychological Science*, *17*, 724-731.

Keller, M. C. & Coventry, W. L. (2005). Quantifying and addressing parameter indeterminacy in the classical twin design. *Twin Research and Human Genetics*, *8*, 201-213.

Coventry, W. L. & Keller, M. C. (2005). What is the extent of parameter bias in the classical twin design? A comparison of parameter estimates from the extended twin-family and classical twin designs. *Twin Research and Human Genetics*, *8*, 214-223.

Wager, T., Keller, M. C., Jonides, J., Smith, O., & Lacey, S. (2005). Increased sensitivity in neuroimaging analyses using robust regression. *NeuroImage*, *26*, 99-113.

Keller, M. C., & Nesse, R. M. (2005). Subtypes of low mood provide evidence of its adaptive significance. *Journal of Affective Disorders*, *86*, 27-35.

Keller, M. C. (2004) Evolutionary explanations of schizophrenia must ultimately explain the genes that predispose to it [Commentary]. *Behavioral and Brain Sciences*, *27*, 861-862.

Keller, M. C., Nesse, R. M., & Hofferth, S. (2001). The Trivers-Willard effect in parental investment: No effect in the contemporary U.S. *Evolution and Human Behavior*, *22*, 343-360.

Keller, M. C., Thiessen, D. T., & Young, R. K. (1996). Mate assortment in dating and married couples. *Personality and Individual Differences*, *21*, 217-221.

Conference Presentations

Duncan, L. E., Keller, M. C., Willcutt, E. G., McClelland, G. H. A comprehensive review of measured genotype by environment (GxE) interactions: Trends, methodological issues, and recommendations. Poster presented at the 2009 World Congress of Psychiatric Genetics, San Diego, CA.

Simonson, M. A., McQueen, M. B., Keller, M. C. Runs of homozygosity are not associated with increased risk of schizophrenia. Poster presented at the 2009 World Congress of Psychiatric Genetics, San Diego, CA.

Keller, M. C. An evolutionary understanding of heritable mental disorders in humans. Paper presented at the 2009 Evolution Meeting, Moscow, ID.

Conference Presentations (continued)

Lubke, G., Keller, M. C., Hatemi, P. K., Gillespie, N. Merging twin data bases: Measurement invariance and the impediments of using sum scores in twin studies. Paper presented at the 2009 Behavior Genetics Association, Minneapolis, MN.

Howrigan, D. P., Simonson, M., Keller, M. C. Utilizing current genetic methods to understand the evolution of individual differences and mental disorders. Paper presented at the 2009 Annual Meeting of the Human Behavior and Evolution Society, Fullerton, CA.

Keller, M. C., Neale, B., McRae, A., Harris, S., Martin, N., Deary, I., & Visscher, P. Relationship between genome-wide homozygosity and IQ. Poster presented at the Gordon Research Conference on Quantitative Genetics, Galveston, TX.

Keller, M. C., Medland, S. E., Duncan, L. E., Hatemi, P. K., Neale, M. C., Maes, H. H. M., & Eaves, L. J. Description of the Cascade model. Paper presented at the 2008 Behavior Genetics Association, Louisville, KY.

Keller, M. C. PedEvolve: A simulator of genetically informative data implemented in *R*. Paper presented at the 2007 Behavior Genetics Association, Amsterdam, Netherlands.

Keller, M. C. Psychiatric genetics needs evolutionary theory. Paper presented at the 2006 World Congress on Psychiatric Genetics, Cagliari, Italy.

Keller, M. C. The evolutionary significance of depressive symptoms. Paper presented at the 2006 Annual Meeting of the Human Behavior and Evolution Society, Philadelphia, PA.

Keller, M. C. & Coventry, W. L. Quantifying and addressing parameter indeterminacy in the classical twin design. Paper presented at the 2005 Annual Meeting of Behavior Genetics, Los Angeles, CA.

Coventry, W. L. & Keller, M. C. A comparison of parameter estimates from the Stealth and Classical Twin Designs. Paper presented at the 2005 Annual Meeting of Behavior Genetics, Los Angeles, CA.

Keller, M. C. The role of mutation in mental disorders. Paper presented at the 2005 Annual Meeting of the Human Behavior and Evolution Society, Austin, TX.

Keller, M. C., Fredrickson, B. L., Ybarra, O., Côté, S., Johnson, K., Mikels, J., & Wager, T. The contingent effects of weather on human mood and cognition. *Hot Topic Talk*, 2005 Annual Meeting of American Psychological Society, Los Angeles, CA.

Keller, M. C., Fredrickson, B. L., Ybarra, O., Côté, S., Johnson, K., Mikels, J., & Wager, T. The effects of weather on mood and cognition: Time spent outside as the crucial moderator. Paper presented at the 2003 Annual Meeting of the Midwestern Psychological Society, Chicago, IL.

Conference Presentations (continued)

Keller, M. C. An evolutionary framework for understanding mental disorders: What evolutionary genetics can tell us. Paper presented at the 2003 Annual Meeting of the Human Behavior and Evolution Society, Lincoln, NB.

Keller, M. C., & Nesse, R. M. Is Low Mood an Adaptation? Evidence for subtypes with symptoms that match precipitants. Paper presented at the 2002 Annual Meeting of the Human Behavior and Evolution Society, Rutgers, NJ.

Keller, M. C., & Nesse, R. M. Subtypes of low mood provide evidence for its adaptive significance. Poster presented at the 2001 Annual Meeting of the Human Behavior and Evolution Society, London, UK.

Nesse R. M. & Keller M. C. Mood: A domain-general effort allocation mechanism. Paper presented at the 2001 Annual Meeting of the Human Behavior and Evolution Society, London, UK.

Keller, M. C., Nesse, R. M., & Hofferth, S. The Trivers-Willard Effect in parental investment: No effect in contemporary North American society. Paper presented at the 1999 Annual Meeting of the Human Behavior and Evolution Society, Salt Lake City, UT

Invited Colloquia

- Center in Psychiatric Genetics Seminar, Northwestern University (Jan., 2010).
- Systems Biology and Social Behavior Seminar, University of Nebraska (Dec., 2009).
- EvoS Consortium, Society for the Study of Evolution (June, 2009).
- Grand Rounds, Akron General Medical Center (Sept., 2008).
- Neuroscience Research Group, University of Denver (Oct., 2008).
- Henry Stewart Talks: Evolutionary Medicine (talk series available for purchase; Sept., 2006).
- Center for Society and Genetics Seminar Series, UCLA, Los Angeles, CA (April, 2005).
- Behavior, Evolution, and Culture, UCLA, Los Angeles, CA (March, 2005).
- Virginia Institute of Psychiatric and Behavioral Genetics, Richmond, VA (February, 2004).
- Evolutionary Studies Seminar Series, SUNY Binghamton, NY (October, 2003).
- Evolutionary Human Adaptation Program, University of Michigan, MI (February, 2001).

Affiliations

- American Society for Human Genetics
- Human Behavior and Evolution Society
- International Society for Twin Studies
- Behavior Genetics Association

Postdoctoral and Graduate Mentorship

2007 - present	Laramie Duncan (graduate student, CU Boulder)
2008 - present	Christine Garver-Apgar (postdoctoral fellow, IBG)
2008 - present	Dan Howrigan (graduate student), CU Boulder
2008 - present	Matthew Simonson (graduate student, CU Boulder)
2009 - present	Amanda Wills (graduate student, CU Boulder)

Courses Taught

- *Honors Statistics* (Instructor), CU (Fall 2008, Spring 2009, Fall 2009)
- *Programming in the R Statistical Language* (Instructor), CU (Winter 2008, Spring 2009)
- *Introduction to the R Statistical Language* (Co-Instructor), VIPBG (Summer 2006 & 2007)
- *Evolution, Genetics, and Mental Disorders* (Instructor), UCLA (Spring 2005)
- *Introduction to Social Psychology* (Teaching Asst.), University of Michigan (Winter 2003)
- *Advanced Graduate Statistics* (Teaching Asst.), University of Michigan (Fall 2002)
- *Introduction to Statistics* (Teaching Asst.), University of Michigan (Fall 2001, Winter 2002)

Workshop Teaching

- *2010 Workshop on Methodology of Twin and Family Studies*, Boulder, CO – Instructor
- *2008 Workshop on Methodology of Twin and Family Studies*, Boulder, CO – Instructor
- *2008 International Statistical Genetics Methods Workshop*, Leuven, Belgium – Instructor

Departmental Service

- Honors Undergraduate Committee (2007-present)
- Co-Director, Undergraduate Research Day (2007-present)
- Organizer, Institute for Behavioral Genetics Journal Club (2008-present)

Awards & Distinctions

2009	Editor's Choice Article (Keller & Miller, 2006) [1 of 7 chosen in last 4 years], <i>Behavioral and Brain Sciences</i>
2007	Notable paper of 2007 (Keller, Neale, & Kendler, 2007) [1 of 6], <i>American Journal of Psychiatry</i>
2007	<i>Lindon J. Eaves Award for Excellence in Postdoctoral Research</i> , (VIPBG)
2006	Runner-up, Postdoctoral Talk Competition, 2006 Annual Meeting of the Human Behavior and Evolution Society, Philadelphia, PA
2001	<i>Brickman Prize</i> (Best Paper in Social Psychology), University of Michigan
1998-2002	<i>Graduate Research Fellowship</i> , National Science Foundation (NSF)

Editorial Service

Senior Correspondent, The Evolution & Medicine Review.

Ad Hoc & Academic Book Reviewer

- Alcoholism: Clin. & Exp. Research (2007)
- American Journal of Medical Genetics B (2008)
- American Journal of Psychiatry (2008)
- Behavioral and Brain Sciences (2008)
- Behavior Genetics (2006, 2007, 2008, 2009, 2009)
- Biological Psychiatry (2009)
- Current Directions of Psychological Science (2008)
- Emotion (2007)
- Evolution and Human Behavior (2006, 2006, 2007, 2008, 2009, 2009)
- Human Nature (2009)
- Human Genetics (2008)
- Journal of Personality (2006)
- Journal of Politics (2009)
- Journal of Theoretical Biology (2007, 2009)
- Neuropsychiatric Genetics (2008)
- Oxford University Press (2007)
- Personality and Individual Differences (2006, 2007)
- Personality and Social Psychology Review (2009)
- PLOS Genetics (2008, 2009)
- Proc. of the Royal Society B: Biological Sciences (2006)
- Psychiatric Research (2006)
- Psychological Medicine (2008, 2009)
- Psychological Reports (2007)
- Psychological Science (2006, 2008)
- Twin Research & Human Genetics (2006, 2007)

A Sample of Popular Press Coverage of Research

- Men's Health, *The Science of Heartbreak*, March, 2009
- Colorado Arts & Sciences Magazine, *An Evolutionary Paradox*, March, 2009
- Scientific American, *'Spring Fever' Is a Real Phenomenon*, March 22, 2007
- The Los Angeles Times, *The Mind, As It Evolves*, Feb 12, 2007
- Psychology Today, *Happiness is a Beach, Sometimes*, Feb, 2006
- The British Psychological Society, *A Pleasant Thing to Behold the Sun*, Oct 12, 2005
- The Washington Post, *Unconventional Wisdom: Spring Forward, Fall Down*, Oct 9, 2005
- The Courier Mail (Queensland, Australia), *Rugged Up in Winter Blues*, July 2, 2005
- Herald Sun (Melbourne, Australia), *Bright Way to Lift Spirits*, June 24, 2005
- The Los Angeles Times, *Happy Daze*, April 18, 2005
- The Dallas Morning News, *Hey, its spring! Why are you inside?* March 19, 2005
- Science Central News, *Sunny Mood*, Jan 27, 2005
- ABC News, *A Walk in Nice Weather Improves Mood*, Nov 4, 2004

References

Randolph Nesse (dissertation chair)
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