



**The Michigan State University Twin  
Registry (MSUTR):  
Current Status and Future Directions**  
[www.msutwinstudies.com](http://www.msutwinstudies.com)

**1. Project Description:** The Michigan State University Twin Registry (MSUTR) is a large, population-based twin registry, co-directed by Drs. Burt and Klump in the Department of Psychology at Michigan State University (MSU). The goals of the MSUTR are two-fold:

- 1) **Augment psychological and medical research infrastructure across the globe by providing a unique resource for subject identification and recruitment; and**
- 2) **Generate immediate knowledge through empirical analyses of collected twin data.**

These goals are achieved by recruiting twins born in Michigan into the MSUTR. Twin families are enrolled into the registry by completing a health survey that asks about basic demographic characteristics, twin status, and family history of approximately 40 medical and psychiatric illnesses. By answering yes to a future participation question, twins and their families indicate that they would be interested in participation in future research studies (>95% of the twins/families say yes). In addition to the potential for recruiting these twins for further research, their answers to the family history questionnaire items can be immediately analyzed to understand genetic and environmental influences on major health conditions. Twin studies are exceptionally strong tools for examining the etiology of a trait or disorder, as they allow for the examination of genetic influences across multiple levels of analysis (latent and molecular) and layers of risk (environmental, biological, epigenetic). The MSUTR capitalizes on the inherent strengths of twin methodology and builds a leading resource that fosters innovative scholarship.

**2. Current Status:** In only 7.5 years, the MSUTR has enrolled over 28,000 twins ages 3-55 years into the registry. For the adult twins, we are also gathering information on their children in order to examine cross-generational transmission of major medical and mental health conditions.

In terms of Aims 1 and 2, we have had 19 research groups, outside of our own, analyze MSUTR data or recruit MSUTR twins for their research projects (e.g., Dr. Moser, MSU Dept of Psychology; Dr. Hopwood, MSU Dept of Psychology; Dr. Paneth, MSU Dept of Epidemiology; Drs. Fink, Watson, and Rayamajhi, MSU Dept of Medicine; Dr. Pivarnik, MSU Dept of Kinesiology; Dr. Nigg, Oregon Health & Science University Dept of Psychiatry; Dr. Chang, University of Michigan Dept of Psychiatry; Dr. Hyde, University of Michigan Dept of Psychology; Dr. Trentacosta, Wayne State University Dept of Psychology; Dr. Nikolas, University of Iowa Dept of Psychological and Brain Sciences; Drs. Silventoinen and Kaprio, University of Helsinki Dept of Sociology and Dept of Public Health). Selected publications and funded grants from the MSUTR directors are included on the reverse side of this flyer.

**3. Future Directions:** We hope to recruit ~5,000 additional twins within the age ranges specified above. This recruitment is expected to take approximately 2-3 years. We also plan to assess new cohorts at age 3 and at four-year intervals thereafter. In addition to ensuring adequate numbers of twins in the registry, an additional benefit of this sampling strategy is the ability to conduct longitudinal studies of health risk using the MSUTR questionnaire data.

**4. Invitation to Investigators:** We are very pleased to see the use of the MSUTR by faculty at MSU and other institutions! We would like to foster more of these collaborations and welcome inquiries from scientists interested in accessing MSUTR data for their own projects. If you are interested, please see our website ([www.msutwinstudies.com](http://www.msutwinstudies.com)) for more information on collaborative opportunities and/or feel free to contact the MSUTR Co-Directors directly at:

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## **5. Selected Publications:**

1. Klump, K.L., Keel, P.K., Sisk, C.L., & Burt, S.A. (2010). Preliminary evidence that estradiol moderates genetic effects on disordered eating attitudes and behaviors during puberty. *Psychological Medicine*, *40*(10), 1745-1754.
2. Moore, M., Slane, J., Mindell, J.A., Burt, S.A., & Klump, K.L. (2011). Genetic and environmental influences on sleep problems: A study of preadolescent and adolescent twins. *Child: Health, Care and Development*, *5*, 638-641.
3. Suisman, J.L., Burt, S.A., McGue, M., Iacono, W.G., & Klump, K.L. (2011). Parental divorce and disordered eating: An investigation of a gene-environment interaction. *International Journal of Eating Disorders*, *44*(2), 169-177.
4. Burt, S.A., & Klump, K.L. (2012). Etiological distinctions between aggressive and non-aggressive antisocial behavior: Results from a Nuclear Twin Family Model. *Journal of Abnormal Child Psychology*, *40*(7), 1059-1071.
5. Klump, K.L., Culbert, K.M., Slane, J.D., Burt, S.A., Sisk, C.L., & Nigg, J.T. (2012). The effects of puberty on genetic risk for disordered eating: Evidence for a sex difference. *Psychological Medicine*, *42*(3), 627-638.
6. Moser, J.S., Slane, J.D., Burt, S.A., & Klump, K.L. (2012). Etiologic relationships between anxiety and dimensions of maladaptive perfectionism in young adult females. *Depression and Anxiety*, *29*(1), 47-53.
7. Nikolas, M., Klump, K.L., & Burt, S.A. (2012). The impact of youth appraisals of marital conflict on genetic and environmental contributions to Attention-Deficit Hyperactivity Disorder: Examination of GxE effects in a twin sample. *Journal of Abnormal Child Psychology*, *40*(4), 543-554.
8. Burt, S.A., & Klump, K.L. (2013). Delinquent peer affiliation as an etiological moderator of childhood delinquency. *Psychological Medicine*, *43*(6), 1269-1278.
9. Burt, S.A., & Klump, K.L. (2013). The Michigan State University Twin Registry (MSUTR): An update. *Twin Research and Human Genetics*, *16*(1), 344-350.
10. Hopwood, C.J., Keel, P.K., Burt, S.A., Neale, M., Boker, S., Sisk, C.L., & Klump, K.L. (2013). Interpersonal problems associated with Multidimensional Personality Questionnaire traits in women during the transition to adulthood. *Assessment*, *20*(1), 60-67.
11. Klump, K.L., Keel, P.K., Racine, S.E., Burt, S.A., Sisk, C.L., Neale, M., Boker, S., & Hu, J.Y. (2013). The interactive effects of estrogen and progesterone on changes in emotional eating across the menstrual cycle. *Journal of Abnormal Psychology*, *122*(1), 131-137.
12. Racine, S.E., Culbert, K.M., Burt, S.A., & Klump, K.L. (2014). Advanced paternal age at birth: Phenotypic and etiologic associations with eating disorder risk in offspring. *Psychological Medicine*, *44*(5), 1029-1041.
13. White, E., Slane, J.D., Klump, K.L., Burt, S.A., Pivarnik, J.M. (2014). Sex differences in adolescent twins' body composition and physical activity. *Journal of Physical Activity and Health*, *11*(6), 1187-1193.
14. Burt, S.A., Wildey, M., & Klump, K.L. (2015). The quality of the inter-parental relationship does not moderate the etiology of child conduct. *Psychological Medicine*, *45*(2), 319-332.
15. O'Connor, S.M., Burt, S.A., & Klump, K.L. (2016). What drives the association between weight-conscious peer groups and disordered eating? Disentangling genetic and environmental selection from pure socialization effects. *Journal of Abnormal Psychology*, *125*(3), 356-368.

## **6. Grants:**

1. **NIMH, R01**; "Gene-Environment Interactions in Childhood Conduct Problems"; Burt (PI); Klump (Co-I); \$1,125,000 (direct costs); 7/1/08 – 6/30/14.
2. **NIMH, Administrative Supplement for R01**; "Gene-Environment Interactions in Childhood Conduct Problems"; Burt (PI); Klump (Co-I); \$40,356 (direct costs); 5/7/13 – 11/5/13.
3. **NIMH, R01**; "A Twin Study of Ovarian Hormones and Disordered Eating"; Klump (PI); Burt (Co-I); \$1,976,079 (direct costs); 9/16/08 – 6/30/14.
4. **NIMH, Administrative Supplement for R01**; "A Twin Study of Ovarian Hormones and Disordered Eating"; Klump (PI); Burt (Co-I); \$112,876 (direct costs); 7/1/12 – 6/30/13.
5. **NICHD, R01**; "Integrating Contextual, Proximal, and Individual Risks for Child Conduct Problems"; Burt (PI); Klump (Co-I); \$1,853,074 (direct costs); 7/25/10 – 5/31/16.
6. **NICHD, R01 Administrative Supplement**; "Integrating Contextual, Proximal, and Individual Risks for Child Conduct Problems"; Burt (PI); Klump (Co-I); \$99,998 (total costs); 6/1/2013 – 5/31/16.
7. **NIMH, R01**; "The Effects of Estradiol on Genetic Risk for Disordered Eating during Puberty"; Klump (PI); Burt (Co-I); \$2,445,440 (direct costs); 9/30/10 – 4/30/16.
8. **MSU, Strategic Partnership Grant (SPG)**; "The Children of Twins Registry"; Burt (Co-PI); Klump (Co-PI); \$400,000 (direct costs); 7/1/12 – 6/30/16.

9. **NIEHS, R21**; “Consequences of Prenatal Toxicant Exposure on Fetal Brain Function”; Burt (Co-PI); Thomason (Co-PI); \$451,156 (total costs); 7/1/2015-6/30/2017.
10. **The Avielle Foundation**; “Elucidating Neurodevelopmental Pathways to Violence and Antisocial Behavior”; Burt (Co-PI); Hyde (Co-PI); \$80,000 (total costs); 11/1/2015 – 10/31/2017.
11. **The Michigan Bloodspot Environmental Epidemiology Project**, University Research Corridor Pilot Project Program; “Confirming Uterine Influences on Adverse Health Outcomes in Childhood: A Twin-Sibling Study”; Burt (PI); Klump (Co-I); \$25,000 (direct costs); 1/7/13 – 1/6/14.