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Integrating Work from Genetics and the Social Sciences: Part Two

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This is the second issue of *Biodemography and Social Biology* in which all of the articles link genetic factors to social and behavioral circumstances. An earlier issue (Vol. 59, No. 1, 2013) was also devoted to a series of articles on genetics. Promoting work that clarifies the links between genetic factors and social and behavioral conditions is one of the aims of this journal; genetics clearly falls within the journal focus on links between social and biological factors in populations. Many of the methodological approaches, techniques for dealing with analysis, and results from genetics data are novel for researchers who are primarily social scientists, leading us to include articles that clarify how such research is done, research that might be considered to have null findings, and research with exciting substantive findings.

The recent growth in available genetic data in large population studies has resulted in a dramatic expansion of recent work in this area, with important research coming out on an almost-daily basis. As evidence of the wealth of genetic data now available to social scientists, this issue contains analysis of data from several large population datasets, including the Health and Retirement Study (HRS), the Social Environment and Biomarkers of Aging Study (SEBAS) in Taiwan, the Multi-Ethnic Study of Atherosclerosis (MESA), and the National Longitudinal Study of Adolescent Health (Add Health).

Some of the articles in the issue were initially presented or developed at the fourth annual Integrating Genetics and the Social Sciences Conference (IGSS), which was held in October of 2013 at the Institute of Behavioral Science on the campus of the University of Colorado, Boulder. The conference, as well as the submission of some of the articles for this issue, was organized by Jason Boardman of the University of Colorado. This series of conferences at the University of Colorado has played an important role in promoting the integration of research by social and biological scientists with interests in interdisciplinary work at the intersection of genetics and social science. However, some of the articles in the issue were not presented at the conference and represent the increasing flow to the journal of articles that include genetic analysis.

The articles included represent multiple types of genetic indicators: candidate genes, genome-wide association study (GWAS) results, and telomere lengths. They also reflect multiple analytic questions: gene associations, GxE interactions, mechanisms mediating between social and behavioral factors and outcomes, and the identification of ancestry and relationships using genetic markers. They also reflect multiple methodological and analytic approaches to the measurement of genetics and the study of associations.

One of the takeaway messages from these articles is that we have not identified strong genetic markers that affect many of the outcomes of interest. Daw and Boardman evaluate

how subsequent trajectories of alcohol and smoking behavior are influenced by school-level behaviors and whether there is an interactive effect of a genetic marker and the school-level environment. They conclude that the interaction they observe is likely caused by factors such as stratification.

Three articles included in the issue address using GWAS data to explain outcomes of interest to social and behavioral scientists. Belsky and Israel make the case that most of the outcomes of interest to social scientists are polygenic in nature, with small effects from many genes rather than large effects from a few genes. They clarify how the standards of significance for genetic effects used in the biological sciences are likely to be inappropriate for explaining such traits, and they propose genetic polygenic risk scores (PRS) as a method of addressing these challenges. Harrati provides an example of the problem identified by Belsky and Israel in her analysis of risk aversion in the Health and Retirement Study. In this study, no single-nucleotide polymorphisms (SNPs) are found to be statistically significantly associated with risk preferences at the level of 5×10^{-8} or better. Levine and her co-authors conclude that chronically high depressive symptoms are a polygenic trait. In their analysis, they adopt the use of PRS scores with sets of genes with somewhat lower levels of significance, as suggested by Belsky and Israel. In their analysis of mean levels of depression over multiple waves, they find that this PRS is predictive of the outcome but accounts for a very small proportion of the variance.

Two articles in this issue examine telomere length. Vasunilashorn and Cohen are interested in mechanisms through which psychological stress affects cellular senescence as indicated by telomere length. They suggest that one mechanism is an imbalance of anabolic and catabolic biochemical factors. Needham and her co-authors attempt to explain the longer telomere length found among females in terms of gendered differences in behavior and biology. They find that gender differences in smoking and processed meat consumption partially mediate gender differences in telomere length, whereas gender differences in biological factors do not appear to play a role.

Finally, the article by Li and Guo addresses an issue that is very demographic in nature—data quality. They provide some innovative genetic approaches to correcting and providing data on race, gender, and relationships.

Even in the year between the first issue devoted to genetics and this issue, the incorporation of genetics into social and behavioral analysis has developed markedly. The articles published to date in this and other journals lay the groundwork for further progress.