

GENETICS, ETHICS, AND EDUCATION

Advances in human genetics and genomics are beginning to move outside the traditional realm of medicine and into the classroom. How will educational officials react when asked to incorporate personalized genomic information into the educational program?

This volume bridges the divide between science, education, and ethics around the emergent integration of genomics and education. By pairing comprehensive analysis of the issues with primers on the underlying science, the authors put all relevant parties on a level field to facilitate thorough consideration and educated discussion regarding how to move forward in this new era, as well as how best to support the future of education and the future of all students. The volume is unique in bringing together not only scholarly experts but also parents and laypersons. In doing so, it gives voice and understanding to a broad spectrum of disciplines that have a stake in the future of education.

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Genetics, Ethics, and Education

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CONTENTS

<i>List of Figures</i>	<i>page</i> ix
<i>List of Tables</i>	x
<i>List of Contributors</i>	xi
<i>List of Abbreviations</i>	xiii
Introduction	1
<i>Susan Bouregy, Elena L. Grigorenko, Mei Tan, and Stephen R. Latham</i>	
1 What Is Heritability and Why Does It Matter?	15
<i>Mei Tan</i>	
2 Molecular Genetics and Genomics	45
<i>Sergey A. Kornilov</i>	
3 Can (and Should) We Personalize Education Along Genetic Lines? Lessons from Behavioral Genetics	63
<i>Kathryn Asbury, Kaili Rimpfeld, and Eva Krapohl</i>	
4 Early Adversity and Epigenetics: Implications for Early Care and Educational Policy	86
<i>Katherine Beckmann and Kieran O'Donnell</i>	
5 Intelligence: The Ongoing Quest for Its Etiology	107
<i>Elena L. Grigorenko and Samuel D. Mandelman</i>	
6 A Behavioral Genetic Perspective on Non-Cognitive Factors and Academic Achievement	134
<i>Elliot M. Tucker-Drob and K. Paige Harden</i>	

viii	<i>Contents</i>	
7	Precision Education Initiative: The Possibility of Personalized Education <i>Callie W. Little, Connie Barroso, and Sara A. Hart</i>	159
8	Using Genetic Etiology to Intervene with Students with Intellectual Disabilities <i>Robert M. Hodapp and Marisa H. Fisher</i>	183
9	Ethical Implications of Behavioral Genetics on Education <i>Victoria J. Schenker and Stephen A. Petrill</i>	202
10	Genomic Literacy and the Communication of Genetic and Genomic Information <i>Kimberly A. Kaphingst</i>	221
11	Legal Issues Associated with the Introduction of Genetic Testing to the Education System <i>David Peloquin and Mark Barnes</i>	243
12	Ethical Risks and Remedies in Social-Behavioral Research Involving Genetic Testing <i>Celia B. Fisher</i>	263
13	Development of the Personal Genomics Industry <i>Jorge L. Contreras and Vikrant G. Deshmukh</i>	284
14	Ethical Issues in Using Genomics to Influence Educational Practice <i>Susan Bouregy and Krista Bouregy</i>	309
15	Teaching and Genetic/Genomic Variation: An Educator's Perspective <i>Judi Randi</i>	325
16	Will the Next Einstein Get Left in the Petri Dish? Be Careful What You Wish for in the Designer Baby Era <i>Carolyn D. Cowen</i>	352
	Conclusion: How Might School Systems Use Genetic Data? <i>Stephen R. Latham</i>	383
	<i>Index</i>	395

FIGURES

1.1 Classical twin design	<i>page</i> 21
6.1 A conceptual model for the mutual relations between interests, proximal environments, and achievement	138
9.1 Genetic effects on academic achievement	213
16.1 Learning differences are byproducts of a complex mechanism – a dynamic gene-brain-environment interplay	370

TABLES

1.1	Pearson correlations of between-twin pairs of increasing likeness in performance on four indicators of intelligence	<i>page 23</i>
1.2	Biological social background and capability of adopted children to achieve in higher education	23
1.3	Results from Hallmayer and colleagues (2011), concordance estimates	33
6.1	Status of empirical support for specific non-cognitive factors as mechanisms of gene–environment transactions for academic achievement	150
10.1	Research priorities in genomic literacy and its component domains	232

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xii

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ABBREVIATIONS

A	adenine
AATD	alpha-1 antitrypsin deficiency
ACE	allelic variance (A), with contributions from shared (C) and unshared (E) environments
ACLA	American Clinical Laboratory Association
ACOG	American Congress of Obstetricians and Gynecologists
ACT	American College Testing
AD	atherosclerosis
ADHD	attention-deficit hyperactivity disorder
ADI-R	Autism Diagnostic Interview – Revised
ADOS	Autism Diagnostic Observation Schedule
APA	American Psychiatric Association
APOE ₄	alipoprotein E ₄
ART	alternative reproductive technique
ASD	autism spectrum disorder
ASRM	American Society for Reproductive Medicine
C	cytosine
CADDRE	California Center for Autism and Developmental Disabilities Research and Epidemiology
CAP	Colorado Adoption Project
CDC	Centers for Disease Control and Prevention
CDCV	common disease/common variant
CDRV	common disease/rare variant
CLIA	Clinical Laboratory Improvement Amendments of 1988
CMS	Centers for Medicare and Medicaid Services
CNP	copy number polymorphism
CNV	copy number variants

COMT	catechol-O-methyltransferase gene
CRISPR	clustered regularly interspaced palindromic repeats
CVD	cardiovascular disease
DDS	Department of Developmental Services
DIPBEC	Diagnosis of Psychotic Behavior in Children
DNA	deoxyribonucleic acid
DOE	Department of Energy
DOHaD	Developmental Origins of Health and Disease
DSM-IV	<i>Diagnostic and Statistical Manual of Mental Disorders</i> , 4th Edition
DSM-IV-TR	<i>Diagnostic and Statistical Manual of Mental Disorders</i> , 4th Edition, Text Revision
DSM-V	<i>Diagnostic and Statistical Manual of Mental Disorders</i> , 5th Edition
DTC	direct-to-consumer
DTCGT	direct-to-consumer genetic/genomic testing
DZ	dizygotic
EBN	evidence-based nutrition
EEG	electroencephalography
EGDS	Early Growth and Development Study
EPD	experience-producing drive
EPO	European Patent Office
ERPs	event-related potentials
ESTs	expressed sequence tags
EU	European Union
FAPE	Free Appropriate Public Education
FDA	Food and Drug Administration
FDCA	Food, Drug, and Cosmetic Act
FERPA	Family Educational Rights and Privacy Act
FH	familial hypercholesterolemia
fMRI	functional magnetic resonance imaging
FTC	Federal Trade Commission
G	guanine
GAO	US Government Accountability Office
GAT	genetic ancestry testing
GCTA	genome-wide complex trait analysis
GINA	Genetic Information Nondiscrimination Act
GPA	grade point average
GT	genetic testing
GWAS	genome-wide association studies

GxE	gene × environment interactions
HGP	Human Genome Project
HIPAA	Health Insurance Portability and Accountability Act
HPA	hypothalamic pituitary adrenal axis
HUGO	Human Genome Organization
IDEA	Individuals with Disabilities Education Act
IDEIA	Individuals with Disabilities Education Improvement Act
IEP	Individualized Educational Program/Plan
IQ	intelligence quotient
IRB	Institutional Review Board
IVF	in vitro fertilization
LD	learning disability
LD	linkage disequilibrium
LDT	laboratory developed test
MAF	minor allele frequency
MRI	magnetic resonance imaging
MRT	mitochondrial replacement techniques
MZ	monozygotic
NIEHS	US National Institutes of Environmental Health Sciences
NIH	US National Institutes of Health
NGS	next-generation DNA sequencing
OGOD	one gene one disorder
PCR	polymerase chain reaction
PGD	preimplantation genetic diagnosis
PGS	personal genome service
PKU	phenylketonuria
PMA	premarket approval process
PTSD	posttraumatic stress disorder
RAC	Recombinant DNA Advisory Committee
RD	reading disability
REAL-G	Rapid Estimate of Adult Literacy in Genetics
rGE	genotype–environment correlations
RRR	relative recurrence risk
RTI	response to intervention
SAT	Scholastic Aptitude Test
SB	Stanford-Binet Intelligence Scales
SES	socioeconomic status
SLD	specific learning disorder

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xvi *Abbreviations*

SNP	single nucleotide polymorphism
SNV	single nucleotide variant
SRCD	Society for Research in Child Development
T	thymine
WAIS-R	Wechsler Adult Intelligence Scale – Revised
WES	whole-exome sequencing
WGS	whole-genome sequencing