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DISABILITY-SELECTIVE ABORTION AND THE AMERICANS WITH DISABILITIES ACT

Dov Fox* and Christopher L. Griffin, Jr.†

This Article examines the influence of the Americans with Disabilities Act (ADA) on affective attitudes toward children with disabilities and on the incidence of disability-selective abortion. Applying regression analysis to U.S. natality data, we find that the birthrate of children with Down syndrome declined significantly in the years following the ADA's passage. Controlling for technological, demographic, and cultural variables suggests that the ADA may have encouraged prospective parents to prevent the existence of the very class of people it was designed to protect. We explain this paradox by showing the way in which specific ADA provisions could have given rise to demeaning media depictions and social conditions that reinforced negative understandings and expectations among prospective parents about what it means to have a child with a disability. We discuss implications for antidiscrimination law and prenatal testing policy.

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I. INTRODUCTION

Former Alaska Governor Sarah Palin’s decision to give birth to a child with Down syndrome put prenatal testing and children with disabilities in the national spotlight.¹ This Article examines the decision that thousands of other parents have made to continue a pregnancy after receiving a positive test for Down syndrome.² Our empirical and sociological analysis locates a likely feature of reproductive decision making in an unlikely place: antidiscrimination law. Specifically, we measure and explain what impact, if any, the Americans with Disabilities Act³ (ADA) had on the incidence of selective abortion on the basis of Down syndrome in the United States from 1989 to 2002.

The Article proceeds in four parts. Part II draws on expressive law theory to explain the connection among the ADA, social attitudes toward people with disabilities, and the practice of disability-selective abortion. Expressive law theory claims that law communicates messages about social norms in addition to assigning penalties for noncompliance.⁴ Where communities are connected by shared cultural understandings, legal statements can change social norms in ways

¹ Palin’s son Trig appeared on news broadcasts and the cover of *People* magazine. See PEOPLE, *Cover Story: Sarah Palin’s Family Drama: The Republican VP Candidate Is Raising a Baby with Down Syndrome and Coping with Her Teenage Daughter’s Pregnancy—While Running for Office*, PEOPLE, Sept. 22, 2008; see also Julie Bosman et al., *In Palin, Families of Disabled Children See a Potential White House Friend*, N.Y. TIMES, Nov. 3, 2008, at A19 (describing how Palin could be seen on her campaign plane “leaning over Trig, cooing and feeding him from a bottle”); John Fritze, *A Spotlight for Special Needs Parents Hope Palin Lifts Awareness of Down Syndrome*, USA TODAY, Sept. 8, 2008, at A6 (discussing the disability issues that parents hoped Palin would address as the mother of a child with Down syndrome); Jennifer Steinhauer & Amy Harmon, *Parents of Special-Needs Children Divided over Palin’s Promise To Help*, N.Y. TIMES, Sept. 7, 2008, at A25 (reporting how “the camera panned to her baby, Trig” during an early campaign appearance).

² See, e.g., Amy Harmon, *Prenatal Test Puts Down Syndrome in Hard Focus; The DNA Age: In Their Shoes*, N.Y. TIMES, May 9, 2007, at A1.

³ 42 U.S.C. §§ 12101–12300 (2006).

⁴ See Wibren van der Burg, *The Expressive and Communicative Functions of Law, Especially with Regard to Moral Issues*, 20 L. & PHIL. 31, 43 (2001).

that are not reflected in the plain meaning of the text. These changes derive from the expressive effects of law. Specifically, antidiscrimination law can generate unexpected social costs for behavior that is completely unrelated to the law's protections and regulations. We call these costs expressive externalities.

Part III presents twin hypotheses about how the ADA's expressive externalities might have impacted the incidence of Down-selective abortion. Each theory relies on the process by which the ADA shaped parental attitudes toward people with disabilities. The first hypothesis suggests that the ADA strengthened parents' understandings of people with disabilities as equal members of the political community. On this account, the ADA—by enhancing the rights and opportunities of people with disabilities—made having an affected child a less daunting prospect. In turn, parents would have been encouraged to continue a pregnancy after receiving a positive test for fetal disability. The second hypothesis suggests a less heartening expressive function. This theory would suggest that the ADA triggered collateral effects that increased negative exposure to people with Down syndrome. Specifically, off-putting social contact with and critical media coverage of people with Down syndrome after the ADA's passage could have convinced parents that children with disabilities were burdensome or defective.

Part IV tests the relative strength of these hypotheses through regression analysis. Our empirical model suggests that the second hypothesis has greater relevance for Down syndrome than other prevalent conditions. The statistical results, which control for demographic characteristics and prenatal care histories, suggest that the birthrate of children with Down syndrome fell by between 13 and 18 per 100,000 relative to the pre-ADA period of 1989–1990.⁵ Additional data on amniocentesis screenings confirm that Down syndrome birthrates declined at the same time that prenatal testing rates remained constant.⁶ In fact, more children with Down syndrome were born when amniocentesis screening rates dropped.⁷ These findings suggest that parental choices, rather than other exogenous explanations, were responsible for the decline in Down syndrome births in the mid-1990s.

In Part V, we consider the plausibility of these findings by examining a range of legal, material, economic, technological, social, familial, and medical factors that might reasonably have informed prenatal testing and selective abortion for Down syndrome. The connection between civil rights legislation and private decision making yields insight into the far-reaching influence of antidiscrimination law on remote social behaviors. Scholars and lawmakers should consider not only the unintended social meanings that state action can convey, but also the possible effects these meanings can confer on those whom the law was designed to protect.⁸

⁵ See *infra* Part IV.

⁶ See *infra* Part IV.

⁷ See *infra* Part IV.

⁸ For a discussion on the paradoxical effects of antidiscrimination law in the context of employment, see Ian Ayres & Peter Siegelman, *The Q-Word as Red Herring: Why Disparate Impact Liability Does Not Induce Hiring Quotas*, 74 TEX. L. REV. 1487, 1497–98 (1996); Paul Oyer & Scott Schaefer, *Sorting, Quotas, and the Civil Rights Act of 1991*:

The Article concludes with policy recommendations and proposals for further research.

II. DISABILITY RIGHTS AND EXPRESSIVE EXTERNALITIES

A. *The ADA and Prenatal Testing*

The ADA is a sweeping federal antidiscrimination law that combines some of the most celebrated and influential provisions of earlier civil rights legislation, including Titles II and VII of the Civil Rights Act of 1964,⁹ several provisions of the Fair Housing Act of 1968,¹⁰ and section 504 of the Rehabilitation Act of 1973.¹¹ The goals of the 101st Congress in enacting the ADA were no less than revolutionary.¹² The ADA affirmed the rights of people with disabilities to work,¹³ seek redress for discrimination,¹⁴ and exercise the responsibilities of citizenship.¹⁵ The law has three parts:¹⁶ Title I prohibits disability discrimination in employment;¹⁷ Title II guarantees access to public services;¹⁸ and Title III guarantees access to public accommodations¹⁹ for persons who are (or are perceived to be) impaired in a legally recognized way.²⁰

Who Hires When It's Hard To Fire?, 45 J.L. & ECON. 41, 42–43 (2002); Richard A. Posner, *The Efficiency and Efficacy of Title VII*, 136 U. PA. L. REV. 513, 517–19 (1987) (arguing that disparate-treatment liability makes employers reluctant to hire individuals from protected classes due to increasing costs of employing those group members).

⁹ 42 U.S.C. §§ 2000a, 2000e (2006).

¹⁰ *Id.* § 3601.

¹¹ 29 U.S.C. § 794 (2006).

¹² See Robert L. Burgdorf, Jr., *The Americans with Disabilities Act: Analysis and Implications of a Second-Generation Civil Rights Statute*, 26 HARV. C.R.-C.L. L. REV. 413, 493 (1991) (“A prominent innovative feature of the ADA is the unprecedented scope of activities and entities it regulates.”).

¹³ See Gregory S. Kavka, *Disability and the Right to Work*, in AMERICANS WITH DISABILITIES: EXPLORING IMPLICATIONS OF THE LAW FOR INDIVIDUALS AND INSTITUTIONS 174, 176 (Leslie P. Francis & Anita Silvers eds., 2000) [hereinafter AMERICANS WITH DISABILITIES].

¹⁴ See Mark C. Weber, *Beyond the Americans with Disabilities Act: A National Employment Policy for People with Disabilities*, 46 BUFF. L. REV. 123, 135–38 (1998).

¹⁵ See JUDITH N. SHKLAR, AMERICAN CITIZENSHIP: THE QUEST FOR INCLUSION 63–101 (1991).

¹⁶ For an itemized analysis and legislative history of the ADA’s various provisions, see generally Burgdorf, *supra* note 12.

¹⁷ 42 U.S.C. § 12111 (2006).

¹⁸ *Id.* § 12131.

¹⁹ *Id.* § 12181.

²⁰ Individuals can qualify for protection in three ways under the ADA’s definition of disability. See *id.* § 12102(2)(A)–(C). First, a person can show evidence of a known physical or mental condition or impairment that “substantially limits one or more . . . major life activities.” See *id.* § 12102(2)(A); 29 C.F.R. § 1630.2(i) (1997). Major life activities include “caring for oneself, performing manual tasks, walking, seeing, hearing, speaking,

The ADA's antidiscrimination record has been mixed.²¹ On the one hand, ADA specifications for mass transit have led to widespread accommodations on

breathing, learning, and working." 29 C.F.R. § 1630.2(i). A "substantial" limitation on the major life activity of working prohibits the individual from performing a class of job activities compared with an average person with comparable skills and training. *See id.* § 1630.2(j)(3)(i). The second way people can qualify for ADA protection is to "have a record of" such a condition. 42 U.S.C. § 12102(2)(B). A record of disability means an individual "has a history of, or has been misclassified as having, a mental or physical impairment that substantially limits one or more major life activities." 29 C.F.R. § 1630.2(k); *see also id.* pt. 1630, app. § 1630.2(k). The third way to qualify as "disabled" under the ADA is to give evidence of being "regarded as" having a substantially limiting condition. 42 U.S.C. § 12102(2)(C). This "regarded as" prong might include, for example, an asymptomatic individual who is denied an employment opportunity because of a supervisor's or coworker's negative attitudes or behavior toward that individual's supposed psychiatric illness, predisposition for cancer, or human immunodeficiency virus (HIV). *See Abbott v. Bragdon*, 107 F.3d 934, 939 (1st Cir. 1997) ("We hold unhesitatingly that HIV-positive status, simpliciter, whether symptomatic or asymptomatic, comprises a physical impairment under the ADA."), *rev'd on other grounds*, 524 U.S. 624 (1998); *see generally* Michael D. Moberly, *Perception or Reality? Some Reflections on the Interpretation of Disability Discrimination Statutes*, 13 HOFSTRA LAB. L.J. 345, 348 (1996) (reviewing perceived disability case law arising under state regulations).

The Americans with Disabilities Act Amendments Act of 2008 (ADAAA) was signed into law by President George W. Bush on September 25, 2008. 42 U.S.C.A. § 12101 (2008). The impact that this Act will have on courts' interpretation of disability under the ADA, as of the time of this Article's publication, remains to be seen. But there is reason for optimism. The ADAAA affirms that the definition of disability should be construed in favor of broad coverage to the extent permitted by the terms of the ADA. The ADAAA retains the ADA's basic definition of "disability" as an impairment that substantially limits one or more major life activities, a record of such an impairment, or being regarded as having such an impairment. *Id.* § 12102. But it changes the way that these statutory terms should be interpreted in several ways that are intended to make it easier for an individual seeking protection under the ADA to establish that he or she has a disability within the meaning of the ADA. *See id.* § 12101-02.

Among the most significant changes, the ADAAA states that: an episodic impairment or one in remission is a disability if it would substantially limit a major life activity when active; expands the definition of "major life activities" by including a range of activities (e.g., walking, reading, bending, and communicating) and bodily functions (e.g., "functions of the immune system, normal cell growth, digestive, bowel, bladder, neurological, brain, respiratory, circulatory, endocrine, and reproductive functions"); clarifies that mitigating measures other than "ordinary eyeglasses or contact lenses" shall not be considered in assessing whether an individual has a disability; changes the definition of "regarded as" so that it no longer requires a showing that the employer perceived the individual to be substantially limited in a major life activity; and provides that individuals covered only under the "regarded as" prong are not entitled to reasonable accommodation. *See id.* § 12102.

²¹ *See* RUTH COLKER, *THE DISABILITY PENDULUM: THE FIRST DECADE OF THE AMERICANS WITH DISABILITIES ACT 69-70* (2005).

bus, rail, and other forms of public transportation.²² Employment provisions have effectively eliminated disability inquiries and pre-employment physical examinations.²³ Telecommunications mandates have resulted in the establishment of a nationwide relay system enabling use of telephone services by those with hearing or speech impairments.²⁴ On the other hand, voluntary noncompliance and private discrimination remain largely unchanged.²⁵ Scholars disagree about the ADA's impact on the employment and poverty rate among individuals with disabilities.²⁶ This Article departs from traditional antidiscrimination analysis by focusing on heretofore unexamined effects of the ADA on selective abortion of fetuses with Down syndrome.²⁷

Prenatal testing can disclose single-gene mutations associated with more than 400 conditions.²⁸ These conditions range from severe physical and mental

²² See Stephen F. Befort & Holly Lindquist Thomas, *The ADA in Turmoil: Judicial Dissonance, the Supreme Court's Response, and the Future of Disability Discrimination Law*, 78 OR. L. REV. 27, 32 (1999).

²³ *Id.*

²⁴ *Id.*

²⁵ Peter David Blank & Mollie Weighner Marti, *Attitudes, Behavior and the Employment Provisions of the Americans with Disabilities Act*, 42 VILL. L. REV. 345, 369 (1997).

²⁶ See, e.g., Daron Acemoglu & Joshua D. Angrist, *Consequences of Employment Protection? The Case of the Americans with Disabilities Act*, 109 J. POL. ECON. 915, 929, 932 (2001) (concluding that employment declined among all men and women under age forty after the ADA became effective); Thomas DeLeire, *The Wage and Employment Effects of the Americans with Disabilities Act*, 35 J. HUM. RES. 691, 694–95 (2000) (finding that male employment rates fell by 7.2 percentage points after the ADA was passed with no corresponding effect on wages); John J. Donohue III et al., *Assessing Post-ADA Employment: Some Econometric Evidence and Policy Considerations* (John M. Olin Center for Studies in Law, Economics, and Public Policy, Research Paper No. 358), available at <http://ssrn.com/abstract=1282307> (using longitudinal data to conclude that the ADA had no discernible effects on either relative wages or employment levels); Christine Jolls & J.J. Prescott, *Disaggregating Employment Protection: The Case of Disability Discrimination* (Nat'l Bureau of Econ. Research, Working Paper No. 10740, 2004) (presenting alternative empirical results denying a relationship between the ADA's enactment and declining employment among the disabled).

²⁷ We discovered no previous scholarship exploring the effect of law on selective abortion. For empirical studies of selective abortion, see generally Allyson J. Peller et al., *Trends in Congenital Malformations, 1974-1999: Effect of Prenatal Diagnosis and Elective Termination*, 104 OBSTETRICS & GYNECOLOGY 957 (2004); Kenneth B. Schechtman et al., *Decision-Making for Termination of Pregnancies with Fetal Anomalies: Analysis of 53,000 Pregnancies*, 99 OBSTETRICS & GYNECOLOGY 216 (2002).

²⁸ Advances in reproductive biotechnology will bring tests for many more conditions and will reduce the time, inconvenience, invasiveness, medical risk, and cost for pregnant women. Wylie Burke, *Genetic Testing*, 347 NEW. ENG. J. MED. 1867, 1871 (2002).

impairments such as anencephaly²⁹ and Tay-Sachs³⁰ (untreatable diseases that result in childhood mortality), to relatively minor conditions such as color blindness³¹ or polydactyly,³² a heritable trait involving an extra finger. Some parents seek information about fetal disability for reassurance or to prepare for children with physical or mental impairments.³³ However, prenatal tests are requested primarily to identify and abort fetuses that carry genetic mutations associated with disability.³⁴ Since no cure or treatment is available for most anomalies identified at the prenatal stage,³⁵ prospective parents who receive a positive test for fetal conditions such as spina bifida, muscular dystrophy, sickle cell anemia, fragile X, and Down syndrome are faced with the decision either to terminate the pregnancy or to bring to term a child with a known impairment.³⁶ Down syndrome, also called trisomy 21, is a genetic condition caused by the presence of an extra chromosome.³⁷ The phenotypic characteristics associated with the condition include mild to severe mental retardation and distinctive physical features.³⁸

There are legal, social, and medical reasons why Down syndrome provides a fitting case to test the possible effects of the ADA on selective abortion. First,

²⁹ See Jianmin Chen et al., *Disruption of the MacMARCKS Gene Prevents Cranial Neural Tube Closure and Results in Anencephaly*, 25 PROC. NAT'L ACAD. SCI. 6275-6276 (1996).

³⁰ See Ivo Tews et al., *Bacterial Chitinase Structure Provides Insight into Catalytic Mechanism and the Basis of Tay-Sachs*, 3 NATURE STRUCTURAL BIOLOGY 638, 644-46 (1996).

³¹ See Jeremy Nathans et al., *Molecular Genetics of Human Visual Pigments*, 26 ANN. REV. GENETICS 403, 407-09 (1992).

³² See Laura A. Lettice et al., *Disruption of a Long-Range Cis-acting Regulator for Shh Causes Preaxial Polydactyly*, 99 PROC. NAT'L ACAD. SCI. 7548, 7549-50 (2002).

³³ For certain genetic disorders, such as those that cause high levels of cholesterol, detection before birth significantly increases the promise of effective treatment and prevention. In rare cases, early diagnosis can preclude years of unpleasant monitoring procedures, such as the regular colonoscopies required for diagnoses of familial adenomatous polyposis, a condition that frequently remains concealed for several years. See Norman M. Ford, *Ethical Aspects of Prenatal Screening and Diagnosis*, in GENETICS AND ETHICS: AN INTERDISCIPLINARY STUDY 197, 198-200 (Gerard Magill ed., 2004) (describing various procedures for prenatal screening and diagnosis).

³⁴ See Nancy Press & C.H. Browner, *Why Women Say Yes to Prenatal Diagnosis*, 45 SOC. SCI. & MED. 979, 979 (1997).

³⁵ In utero surgery may one day be used, albeit in an exceedingly small number of cases, to repair neural tube defects (myelomeningoceles). See A.J. Eggink et al., *In Utero Repair of an Experimental Neural Tube Defect in a Chronic Sheep Model Using Biomatrices*, 20 FETAL DIAGNOSIS & THERAPY 335, 339 (2005).

³⁶ See, e.g., George F. Will, *Golly, What Did Jon Do?*, NEWSWEEK, Jan. 29, 2007, at 72.

³⁷ See Charles J. Epstein, *Down Syndrome (Trisomy 21)*, in THE METABOLIC AND MOLECULAR BASES OF INHERITED DISEASE 749, 793 (C.R. Scriver et al. eds, 1995).

³⁸ *Id.* at 794.

unlike many other conditions with a significant biological etiology,³⁹ Down syndrome typically counts as a disability under the ADA.⁴⁰ Second, Down syndrome is a condition with which most people are at least somewhat familiar, in that they have seen a person with Down syndrome, could identify the physical features that typically accompany the condition, or are aware the condition is associated with a certain level of mental retardation.⁴¹ Down syndrome is for this reason exceptional among genetic disorders such as hemophilia, color blindness, or Klinefelter syndrome, insofar as many people will have formed, or would have reason to form, attitudes and opinions about the lives of people with Down syndrome.⁴²

Third, persons with Down syndrome continue to encounter prejudice and discrimination because of their condition. For example, the legislative history of the ADA recounts the case of a child with Down syndrome being banned from a New Jersey zoo because a zookeeper feared that her presence would frighten the chimpanzees.⁴³ Finally, among all genetic anomalies, Down syndrome is the genetic condition that occurs most frequently within the U.S. population,⁴⁴ the condition for which Americans test most routinely before birth,⁴⁵ and the condition

³⁹ Courts have denied disability status to persons with various impairments and conditions. *See, e.g.*, *Albertson's, Inc. v. Kirkingburg*, 527 U.S. 555, 565 (1999) (visual impairment); *Murphy v. United Parcel Serv., Inc.*, 527 U.S. 516, 518 (1999) (hypertension); *Sutton v. United Airlines, Inc.*, 527 U.S. 471, 476 (1999) (myopia); *Chenoweth v. Hillsborough County*, 250 F.3d 1328, 1330 (11th Cir. 2001) (inability to drive); *EEOC v. Sara Lee Corp.*, 237 F.3d 349, 351(4th Cir. 2001) (seizure disorder); *Arnold v. City of Appleton*, 97 F. Supp. 2d 937, 938 (E.D. Wis. 2000) (epilepsy); *Todd v. Academy Corp.*, 57 F. Supp. 2d 448, 449–50 (S.D. Tex. 1999) (epilepsy with “light” seizures).

⁴⁰ *See, e.g.*, 28 C.F.R. pt. 36, app. B (2008) (“It would violate this section to establish exclusive or segregative eligibility criteria that would . . . limit the seating of individuals with Down’s syndrome to only particular areas of a restaurant.”). *But see* *Littleton v. Wal-Mart Stores, Inc.*, No. 05-12770, 2007 WL 1379986, at *3–4 (11th Cir. May 11, 2007) (holding that individuals with intellectual and developmental disabilities—what the court calls “mental retardation”—do not count as “disabled” for purposes of the ADA).

⁴¹ *See* Deborah J. Fidler & Robert M. Hodapp, *Craniofacial Maturity and Perceived Personality in Children with Down Syndrome*, 104 AM. J. MENTAL RETARDATION 410, 419 (1999).

⁴² C. Julian-Reynier et al., *Attitudes Towards Down’s Syndrome: Follow Up of a Cohort of 280 Cases*, 32 J. MED. GENETICS 597, 599 (1995).

⁴³ H.R. REP. NO. 101-485, pt. 2, at 30 (1990) (citing Joseph P. Shapiro, *A New ‘Common Identity’ for the Disabled*, WASH. POST, Mar. 29, 1988, at Z18).

⁴⁴ Down syndrome occurs in 1 out of every 733 live births. National Down Syndrome Society, *Down Syndrome Fact Sheet*, <http://www.ndss.org> (select “About Down Syndrome” and “Down Syndrome Fact Sheet”) (last visited Sept. 1, 2009). More than 400,000 people in the United States have Down syndrome. *Id.*

⁴⁵ *See* Glenn E. Palomaki et al., *Maternal Serum Screening for Down Syndrome in the United States: A 1995 Survey*, 176 AM. J. OBSTETRICS & GYNECOLOGY 1046, 1051 (1997); David S. Newberger, *Down Syndrome: Prenatal Risk Assessment and Diagnosis*, AM.

on the basis of which fetuses are aborted at the highest rate.⁴⁶ The American College of Obstetricians and Gynecologists (ACOG) set thirty-five as the recommended age at or above which pregnant women should receive an amniocentesis because, at that age, the average woman's chance of having a baby with Down syndrome equals her chance of having a miscarriage associated with the procedure.⁴⁷

B. Legal Theories of Expressivism

The past decade has witnessed a renaissance in expressivist scholarship, both in traditional legal circles and in the law and economics community. We suggest a potential shortcoming in this literature—namely, a failure to appreciate the negative effects of law on social attitudes and practices orthogonally related to the law's intended regulatory context. This subpart argues that antidiscrimination law exerts a more wide-ranging influence than expressivist scholars have recognized. We propose a broader understanding to account for these effects and introduce a concept called “expressive externalities,” which captures the social costs of behavior the law does not regulate. The concept of expressive externalities serves two functions in this Article. First, it informs our hypothesis about how the ADA influenced Down-selective abortion.⁴⁸ Second, it bolsters the explanatory power of expressive law theory more generally.

Following the lead of Lawrence Lessig,⁴⁹ legal scholars including Cass Sunstein,⁵⁰ Dan Kahan,⁵¹ Elizabeth Anderson,⁵² and Richard Pildes⁵³ have argued

FAMILY PHYSICIAN, Aug. 15, 2000, available at <http://www.aafp.org/afp/20000815/825.html>.

⁴⁶ See, e.g., Caroline Mansfield et al., *Termination Rates After Prenatal Diagnosis of Down Syndrome, Spina Bifida, Anencephaly, and Turner and Klinefelter Syndromes: A Systematic Literature Review*, 19 *PRENATAL DIAGNOSIS* 808, 811 (1999) (reporting UK abortion rates of 92 percent following a prenatal diagnosis of Down syndrome).

⁴⁷ See Nancy C. Rose, *Maternal Serum α -Fetoprotein Screening for Chromosomal Abnormalities: A Prospective Study in Women Aged 35 and Older*, 170 *AM. J. OBSTETRICS & GYNECOLOGY* 1073, 1078–80 (1994).

⁴⁸ See *infra* Part IV.

⁴⁹ See Lawrence Lessig, *The Regulation of Social Meaning*, 62 *U. CHI. L. REV.* 943, 947 (1995) [hereinafter Lessig, *Regulation of Social Meaning*] (discussing the ways in which “governments, as well as others, act to construct the . . . social meanings . . . that surround us”); see also Lawrence Lessig, *Social Meaning and Social Norms*, 144 *U. PA. L. REV.* 2181, 2188 (1996) [hereinafter Lessig, *Social Meaning and Social Norms*] (“[T]he meaning perspective adds a technique for changing the costs associated with certain behaviors by altering the interpretive context in which those behaviors exist.”).

⁵⁰ See Cass R. Sunstein, *On the Expressive Function of Law*, 144 *U. PA. L. REV.* 2021, 2025 (1996).

⁵¹ Under Kahan's original discussion of expressive law, punishments themselves can impart social meanings beyond the expression of retribution. See Dan M. Kahan, *What Do Alternative Sanctions Mean?*, 63 *U. CHI. L. REV.* 591, 598 (1996) [hereinafter Kahan, *Alternative Sanctions*] (claiming that “the signification of punishment is moral

that laws may have subtle yet meaningful effects on public norms and associated behaviors. According to an expressivist account of law, regulations can discourage undesirable practices in ways that transcend the expected effects of punitive sanctions for noncompliance.⁵⁴ Laws also influence the populace by “making statements”⁵⁵ and “moralizing”⁵⁶ through language “designed to affect social norms and . . . ultimately to affect both judgments and behavior.”⁵⁷ Expressivist theories assume that legal discourse takes place in settings shaped by social norms and cultural meanings. Without these conditions, the only “messages” communicated would be the rules codified in the law. However, when a new law interacts with existing normative frameworks, it can generate changes in social behavior “because either the law induces [individuals] to change their tastes . . . , or [because the law] creates a fear of bearing social sanctions . . . , or because of pressure brought to bear upon them through societal sanction.”⁵⁸ The point is that social responses to official sanctions are informed by more than the ordinal relationship between pain and gain.

The confluence of legal statements and social norms can drive a wedge between the intentions of lawmakers and the consequences of the laws they enact.⁵⁹ Given shared understandings about the legal meaning within a particular

condemnation” and that “[b]y imposing the proper form and degree of affliction on the wrongdoer, society says, in effect, that the offender’s assessment of whose interests count is wrong”). Kahan later revised his views on the expressive functions of criminal punishment. See Dan M. Kahan, *What’s Really Wrong with Shaming Sanctions*, 84 TEX. L. REV. 2075, 2089 (2006) (acknowledging “mistakes about the expressive political economy of imprisonment”).

⁵² See Elizabeth S. Anderson & Richard H. Pildes, *Expressive Theories of Law: A General Restatement*, 148 U. PA. L. REV. 1503, 1531–63 (2000) (claiming that constitutional law should account for the expressive component of state action).

⁵³ *Id.*

⁵⁴ See generally Alex Geisinger, *A Belief Change Theory of Expressive Law*, 88 IOWA L. REV. 35 (2002) (identifying a mechanism through which law affects norms by altering prior beliefs about outcomes); Richard H. McAdams, *An Attitudinal Theory of Expressive Law*, 79 OR. L. REV. 339 (2000) [hereinafter McAdams, *Attitudinal Theory*] (attempting in part to explain political disputes by the effect of attitudes signaled by symbolic government action on behavior); Richard H. McAdams, *A Focal Point Theory of Expressive Law*, 86 VA. L. REV. 1649 (2000) [hereinafter McAdams, *Focal Point Theory*] (showing how laws can generate convergence independent of formal sanctions). *But cf.* Matthew D. Adler, *Expressive Theories of Law: A Skeptical Overview*, 148 U. PA. L. REV. 1363, 1462–93 (2000) (arguing that expressive accounts of law do not follow from moral theories).

⁵⁵ Sunstein, *supra* note 50, at 2024.

⁵⁶ Kahan, *Alternative Sanctions*, *supra* note 51, at 603.

⁵⁷ Sunstein, *supra* note 50, at 2025.

⁵⁸ Michael Ashley Stein, *Under the Empirical Radar: An Initial Expressive Law Analysis of the ADA*, 90 VA. L. REV. 1151, 1173 (2004) (reviewing DAVID M. ENGEL & FRANK W. MUNGER, *RIGHTS OF INCLUSION: LAW AND IDENTITY IN THE LIFE STORIES OF AMERICANS WITH DISABILITIES* (2003)).

⁵⁹ See Anderson & Pildes, *supra* note 52, at 1537–38.

social context, laws can convey conceptions of social status even if they do not explicitly target a disfavored group.⁶⁰ Nor need recipients of a law's message accept it as valid for the law to have expressive power.⁶¹ Under the Jim Crow regime, for example, racial segregation of public facilities sent a clear message that "blacks [were] untouchable, a kind of social pollutant from which 'pure' whites must be protected."⁶² Even if a majority of the white population rejected this notion, collective awareness "that segregation laws express contempt for blacks" was sufficient to ensure "these laws constitute blacks as a . . . stigmatized caste."⁶³ The historical and cultural meaning of racial segregation sent the message that blacks were not worthy of equal concern and respect.⁶⁴

Expressivist theories enrich our understanding of the interaction between law and social norms. However, expressivist scholars often fail to appreciate how law can transmit meanings that affect social attitudes and practices wholly unrelated to the law's substantive provisions.⁶⁵ Individuals often internalize messages at a tangent to the mandates embedded in the text.⁶⁶ Such collateral effects are highly plausible given the complexity of modern social interaction. We draw on this ordinary observation to support a potentially extraordinary proposition: The Americans with Disabilities Act may have had a significant impact on the incidence of disability-selective abortion, a social practice completely beyond the scope of the text or legislative history.

C. *Economic Theories of Expressivism*

Expressivist theories sometimes draw on the language of microeconomics to articulate the relationship between legal intervention and preference formation. If we think of political and social interaction among citizens as a repeated game in which the players choose strategies over time, then collective norms and values emerge when a sufficient number of players pursue the same strategies.⁶⁷ However,

⁶⁰ *See id.*

⁶¹ *See id.* at 1528.

⁶² *Id.*

⁶³ *Id.*

⁶⁴ The phrase "equal concern and respect" comes from RONALD DWORKIN, *TAKING RIGHTS SERIOUSLY* 273 (1977).

⁶⁵ *See, e.g.,* Lessig, *Regulation of Social Meaning*, *supra* note 49, at 965–66, 968–71, 1019–33 (relating the expressive effects of dueling laws and civil rights statutes in the American South to the expressivist effects of smoking regulation and life-threatening sex).

⁶⁶ *See infra* Part III.C.

⁶⁷ For an introduction to game theoretic concepts, see ROBERT GIBBONS, *GAME THEORY FOR APPLIED ECONOMISTS* 55–129 (1992), which covers repeated games with complete information and HAL R. VARIAN, *INTERMEDIATE MICROECONOMICS: A MODERN APPROACH* 512–38 (6th ed. 2003), which applies formal models to games of cooperation, competition, coexistence, and commitment.

modern advances in game theory stress that information and payoff structures can lead to multiple equilibria, in which case no unique convention emerges.⁶⁸

Robert Cooter has shown how law might direct preferences, payoffs, and behavior toward common understandings of its expressive content.⁶⁹ In one of Cooter's models, society achieves behavioral stability (in economic terms) when the relative proportions of individuals respecting norms and those flouting convention equalize payoffs between the two groups.⁷⁰ He depicts a simple graph with a downward sloping payoff to "rightdoers" and "wrongdoers" as the percentage of wrongdoers in society increases.⁷¹ At a unique point, no individual can gain by altering her level of compliance; this is the economic definition of equilibrium. But self-enforcement mechanisms, through which individuals "punish" each other for deviant behavior, can raise this equilibrium payoff. Under conditions in which "some people respond [to a new law] by devoting more resources to upholding it,"⁷² the introduction of expressive law analysis can change our understanding of payoff structures and, in turn, change the incentive equilibrium for individual behavior.

Patricia Funk's recent analysis of mandatory voting laws in Switzerland is one of the few empirical studies of the expressive function of law.⁷³ She identifies the expressive effect of a legal change by detecting a time series break, an unmistakable, systematic shift that differentially affected Swiss geographical districts.⁷⁴ However, Funk studies contributions to public goods rather than

⁶⁸ Some theorists suggest that a particular equilibrium, known as a focal point, may eventually dominate. For a description of how focal points provide clues for coordinating behavior, see THOMAS C. SCHELLING, *THE STRATEGY OF CONFLICT* 57–58 (1980).

⁶⁹ Robert Cooter, *Expressive Law and Economics*, 27 *J. LEGAL STUD.* 585, 586 (1998).

⁷⁰ *Id.*

⁷¹ *Id.* at 590.

⁷² *Id.* at 593.

⁷³ Patricia Funk, *Is There an Expressive Function of Law? An Empirical Analysis of Voting Laws with Symbolic Fines*, 9 *AM. L. & ECON. REV.* 135, 139 (2007) (asserting that her study is "one of the first empirical tests of expressive law").

⁷⁴ Funk tests whether the "natural experiment" caused by the repeal of mandatory voting laws in four Swiss Cantons (districts) affected voter turnout. *Id.* at 138. The reported regression results indicate a 6 to 10 percentage point decrease in participation following abolition. *Id.* Given that the monetary penalty for noncompliance was less than one dollar, Funk interprets "the observed turnout drop . . . as support for a certain . . . 'expressive effect of law'" because the "legal statement that citizens should vote apparently caused certain citizens to follow [it], most likely out of civic duty or fear of social sanctions." *Id.* at 138–39. Funk ultimately fails, however, to identify an expressive effect from the change in voting law. Her empirical model does not follow the convention of comparing treatment and control groups before and after the legal change. Instead, she only estimates whether Cantons with mandatory voting laws *at any time* had higher turnout rates than those without such measures. The lack of a temporal element in her model means that Cantonal differences could have already existed *before* the laws changed. If they did, then the law had no effect at all, much less an expressive one.

antidiscrimination law, which should be of equal empirical interest to expressivist scholars.

D. An Expressivist Account of the ADA

A basic introduction to externalities is instructive for our discussion of expressive externalities. Economists have long recognized that private costs and benefits can diverge from those borne by society at-large.⁷⁵ Because individuals often fail to account for the side effects of their activity, they externalize costs and benefits on other members of society. Classic examples in the marketplace are manufacturing waste that pollutes another's land downstream (negative externality), and spillover effects from obtaining a college education (positive externality). This principle applies to legal activity as well; legislators may fail to consider the full range of behavioral influences transmitted by their statements and actions.

Based on extensive interviews with parents and genetic counselors, Dorothy Wertz identified eight factors that determine parents' "revealed preferences" for childbirth rather than disability-selective abortion: (1) guilt over rejecting a child with a disability; (2) the quality of life from infancy through adulthood for a child with a disability; (3) whether the pregnancy is "wanted," independent of fetal disability; (4) optimism that children with disabilities will be cured or treated of the disabilities with which they are born; (5) spousal compromises; (6) financial constraints; (7) risk; and (8) the effect of a child with disabilities on existing children.⁷⁶ Each of these factors could be thought of as a component in the parents' "reproductive utility function," i.e., the mental calculus that determines the relative appeal of terminating a pregnancy as opposed to bringing a fetus with disabilities to term. Certainly none would be directly influenced by the ADA's explicit provisions.⁷⁷ Any relationship between the law and the reproductive utility function would have to emerge from something like the expressivist channels discussed in Parts III(A) and III(B).

Prospective parents might be aware of the ADA, for example, and internalize a message that is unintended by or even inimical to the law's textual provisions. Or they may be unaware that an antidiscrimination law has passed, but the law's effect on social expectations and interactions might manifest itself in one or more of the factors in the reproductive utility function. For example, when the ADA called national attention to the plight of people with disabilities, it may have led doctors—at least those engaged in genetic counseling sessions with prospective

⁷⁵ See, e.g., James M. Buchanan & Wm. Craig Stubblebine, *Externality*, 29 *ECONOMICA* 371, 371–72 (1962); R.H. Coase, *The Problem of Social Cost*, 3 *J.L. & ECON.* 1, 42–44 (1960); Otto A. Davis & Andrew Whinston, *Externalities, Welfare, and the Theory of Games*, 70 *J. POL. ECON.* 241, 241 (1962).

⁷⁶ Dorothy C. Wertz, *How Parents of Affected Children View Selective Abortion*, in 1 *ISSUES IN REPRODUCTIVE TECHNOLOGY: AN ANTHOLOGY* 175–82 (Helen Bequaert Holmes ed., 1992).

⁷⁷ See 42 U.S.C. §§ 12111, 12131, 12181 (2006).

patients—to emphasize the long-standing but newly publicized stereotypes and discrimination faced by people with disabilities. The resulting effect on attitudes about the expected quality of life for children with disabilities (Wertz’s second factor) might be strong enough relative to the other seven factors to persuade many prospective parents to terminate the pregnancy.

Conventional expressivist accounts miss a critical element that this Article tries to correct. According to the traditional logic of expressivist legal theory, people tend to have minimal knowledge or awareness of a law’s mandates.⁷⁸ A person might nevertheless internalize a message that is not stated in a statute’s text and have that message shape her norms or behavioral responses. Such awareness of the law, however, would be limited to those who have a stake in the law’s application and enforcement. In tort law, for example, an insurance company might transmit information to policyholders based on the company’s understanding of how the law shifts incentives, perhaps in ways that increase moral hazard.⁷⁹ Our conceptual innovation here is to recognize that expressivist changes to social customs and attitudes can emerge *without knowledge of a specific law* but still *because of the law’s existence*. This scenario is most likely to occur when the affected social practices are completely unrelated to the substantive provisions of the law.

To understand the possible mechanism at work, consider a law intended to “clean up” professional baseball by forbidding the use of a new performance-enhancing drug. Reproachful congressional hearings that precede the law’s enactment cause fans to question the sport’s integrity. After a federal ban on the performance-enhancing drugs, major league ticket sales decline by 40 percent nationwide. Retail sales of products endorsed by high-profile athletes identified as drug users also fall dramatically. Without knowing more, one might suppose that the drop in attendance and merchandise sales was caused by an expressive effect of the anti-drug law. The government expressed a judgment about drug use in professional baseball, and the receipt of this message persuaded some fans not to attend professional games or buy merchandise associated with discredited athletes. These behavioral responses were caused not by the explicit threat of legal sanctions against drug use, but rather by the implicit message that baseball is a tainted activity.

Now imagine that, after the drug ban’s passage and the ensuing drop in attendance, parents who are altogether unaware of the law begin to steer their children away from Little League baseball. They may interpret the declining attendance at professional ballparks as a social verdict that baseball is boring or behind the times. Within a few years, reduced youth talent prevents some

⁷⁸ See, e.g., Sunstein, *supra* note 50, at 2026 (arguing that “people support a law . . . because they believe that it is intrinsically valuable for the relevant ‘statement’ to be made”).

⁷⁹ See, e.g., Joseph E. Stiglitz, *The Contributions of the Economics of Information to Twentieth Century Economics*, 115 Q.J. ECON. 1441, 1453 (2000) (describing moral hazard as a scenario in which, “if individuals are insured against a risk, they have inadequate incentives to take actions to avoid the risk”).

secondary schools from fielding baseball teams, and their districts' athletic associations remove baseball from the schedule. This second scenario also fits within the expressivist paradigm, but a key feature differentiates the influence on youth sports from the decline in professional ticket and merchandise sales. The law was never intended to censure, regulate, or otherwise affect *non*professional sports teams or athletes. Nevertheless, it is highly plausible that the professional drug ban is the "but-for" cause of a shift in attitudes about the sport generally and the accompanying decline in high school baseball.

One way to think about these related but distinct expressivist channels is the difference between *direct expressivism* (on ticket sales) and *indirect expressivism* (on youth participation). The basis for this distinction lies in the different kinds of public response a new law generates. Although the ban on performance-enhancing drugs did not prescribe a boycott of professional baseball, the public understood the law as direct government censure of the sport. In the youth sports arena, however, waning interest was an indirect by-product of the attitudinal changes that the law communicated with respect to professional baseball. Parents who removed their children from Little League teams did so not because of their understanding or interpretation of the drug ban itself, but because of the law's predictable effects on public views about baseball.

When a law's passage, enactment, and enforcement give rise to significant changes in social practices unrelated to the law's mandates, the law generates what we call an *expressive externality*. Recall that the economic concept of externalities focuses on costs or benefits that accrue to third parties because of another agent's activity (downstream pollution killing fish or improved education leading to a more productive workforce). Similarly, laws can "externalize" costs and benefits on individuals, social groups, or behavior wholly outside the law's purview.

Returning to our analysis of disability rights, we might identify the ADA's expressive externalities on the practice of disability-selective abortion using the reproductive utility function. The ADA may have caused a sufficiently large change in the eight factors in that function to shift parental preference orderings between abortion and childbirth. While positive expressive externalities can produce interesting welfare gains, we focus on *negative* expressive externalities (hereinafter "expressive externalities"). An expressive externality of the ADA relevant to disability-selective abortion would exist if some side effect of the law led prospective parents to choose abortion more often than childbirth after a positive fetal diagnosis for Down syndrome.⁸⁰

III. THE ADA AND DISABILITY-SELECTIVE ABORTION

Part III presents competing hypotheses about expressive externalities the ADA could have generated with respect to the practice of disability-selective abortion. These hypotheses juxtapose the ADA's exalted ideals against its often complicated social assimilation. The first hypothesis (the "uplifting ADA")

⁸⁰ See *infra* Part V.

suggests that the ADA's affirmation of social equality and disability rights discouraged disability-selective abortion by tempering negative attitudes toward people with disabilities. According to this theory, by barring employment discrimination and assuring access to public services and accommodations, the ADA conveyed to parents the promise that prospective children with disabilities would lead happy and productive lives. The second hypothesis (the "disappointing ADA") suggests that by increasing awareness of and exposure to people with disabilities, the ADA created feelings of discomfort or animus. When the ADA was passed, the media often reported unfavorable stories about people with disabilities, which might have convinced parents that children with disabilities would not be accepted into the world as social equals. Each hypothesis makes a rival claim about the expressivist effects that the ADA could have had on social attitudes and reproductive behavior in the 1990s.

For any law to have a systematic expressive effect on social behavior, there must be some mechanism by which people internalize the law's meaning. The hypotheses we present therefore suggest potential pathways through which this transmission could have occurred. These mechanisms do not, however, supersede the ADA's function as the source of expressive content. Consider the proposition advanced by John Donohue and Steven Levitt in their study of abortion and crime: the legalization of abortion prevented potential criminals from existing and eventually violating the law.⁸¹ This Article connects reproduction outcomes to a legal change, namely the ADA's passage and enforcement. Similarly, Donohue and Levitt ascribe birth outcomes and falling crime rates to a revolutionary 7-2 Supreme Court decision that made no mention of abortion's possible impact on public safety.⁸² The primary difference between the studies is that Justice Blackmun's opinion in *Roe* was crafted to communicate an explicit constitutional right to private reproductive decision making, whereas, in drafting the ADA, lawmakers were silent on the issue of selective abortion. The link we propose between the ADA and disability-selective abortion follows the same basic logic as the proposition offered by Donohue and Levitt. Our argument, like theirs, suggests that legal transformations can reach social attitudes and behaviors that have no connection to the law's content.

A. The "Uplifting ADA"

The sweeping goals of participatory⁸³ and distributive⁸⁴ justice that the 101st Congress identified in enacting the ADA indicate that the law aimed to combat

⁸¹ See John J. Donohue III & Steven D. Levitt, *The Impact of Legalized Abortion on Crime*, 116 Q.J. ECON. 379, 380 (2001).

⁸² See *Roe v. Wade*, 410 U.S. 113 (1973).

⁸³ See IRIS MARION YOUNG, *JUSTICE AND THE POLITICS OF DIFFERENCE* 173 (1990) (defining social equality as requiring the "full participation and inclusion of everyone in a society's major institutions"). The ADA facilitates participatory justice by requiring the redesign of practices that exclude individuals with disabilities. See 42 U.S.C. § 12101(a)(8) (2006) (stating that "[t]he Nation's proper goals regarding individuals with disabilities are

attitudinal bias as much as it sought to eliminate physical barriers.⁸⁵ Supreme Court jurisprudence affirms the view that implicit attitudes contribute significantly to the exclusion and devaluation of people with disabilities. In *Alexander v. Choate*, the Court recognized that discrimination against people with disabilities is “most often the product, not of invidious animus,” but rather of thoughtless or indifferent attitudes.⁸⁶ Similarly, in *School Board of Nassau County v. Arline*, the Court noted that “society’s accumulated myths and fears about disability and disease are as handicapping as are the physical limitations that flow from actual impairment.”⁸⁷ The ADA’s emphasis on social prejudice therefore might have improved perceptions about people with disabilities.

This first hypothesis suggests that positive effects on co-workers’ attitudes toward people with disabilities in the employment sphere could have collateral effects in the reproductive sphere. It might be that by prohibiting discrimination in the workplace, the ADA counteracted disability prejudice, which relies on the assumption that individuals with disabilities are less capable than able-bodied workers who perform similar functions.⁸⁸ In their book-length study of workers with disabilities, David Engel and Frank Munger argue that the ADA has powerfully shaped attitudes about persons with disabilities.⁸⁹ Engel and Munger provide testimonial evidence that the ADA produces discursive shifts altering both how individuals with disabilities think about their own capabilities and also how others regard them. The law does so by recasting people with disabilities as successful individuals who need only the opportunity to demonstrate their

to assure equality of opportunity, full participation, independent living, and economic self-sufficiency for such individuals”).

⁸⁴ See Richard J. Arneson, *Disability, Discrimination, and Priority*, in AMERICANS WITH DISABILITIES, *supra* note 13, at 18, 25–27 (describing the responsibility-catering, welfarist, and prioritarian conceptions of distributive justice). The ADA facilitates distributive justice by mandating reasonable accommodations in employment for individuals with disabilities. See 42 U.S.C. § 12112(b)(5)(A) (establishing that discriminatory practices include failure to provide reasonable accommodations to otherwise qualified individuals with disabilities).

⁸⁵ See Anita Silvers, *The Unprotected: Constructing Disability in the Context of Antidiscrimination Law*, in AMERICANS WITH DISABILITIES, *supra* note 13, at 126, 128; Anita Silvers, *Reconciling Equality to Difference: Caring (f)or Justice for People with Disabilities*, 10 HYPATIA 30, 47–53 (1995) (arguing that exclusion of disabled persons results from lack of social and political power rather than any biological inability).

⁸⁶ 469 U.S. 287, 295 (1985); see also MARTHA MINOW, MAKING ALL THE DIFFERENCE: INCLUSION, EXCLUSION AND AMERICAN LAW 319 (1990) (arguing that the meaning of disability is embedded in networks of social relationships).

⁸⁷ 480 U.S. 273, 284 (1987).

⁸⁸ See Harold E. Yuker, *Variables That Influence Attitudes Toward People with Disabilities: Conclusions from the Data*, 9 J. SOC. BEHAV. & PERSONALITY 3, 22 (1994).

⁸⁹ DAVID M. ENGEL & FRANK W. MUNGER, RIGHTS OF INCLUSION: LAW AND IDENTITY IN THE LIFE STORIES OF AMERICANS WITH DISABILITIES 94–104 (2003). *But see* Stein, *supra* note 58, at 1167 (calling Engel and Munger’s methodology into question on account of narrow interview sampling and possible selection bias).

abilities.⁹⁰ Consider Engel and Munger's discussion of Barry Swygert, a man paralyzed by a spinal tumor and who relied on knowledge about ADA protections to reclaim his "ambitious" career plans and "reconstitute his identity" as a self-conscious "rights-bearer."⁹¹

Causal mechanisms between attitudes in the employment and reproductive spheres might draw on three relevant psychological theories. First, intergroup cooperation theory⁹² posits that sustained contact with disabled persons in the workplace could reduce prejudice against others with disabilities.⁹³ Positive attitudes emerge under conditions of equal social status, mutual goals, sustained intimate contact, and institutional support for equality.⁹⁴ Second, cognitive dissonance theory predicts that people change their attitudes to reduce the tension they experience when those attitudes contradict some action.⁹⁵ On this account, positive employment experiences among people with disabilities will cause co-workers to match positive attitudes to achieve cognitive consistency.⁹⁶ Third, self-perception theory suggests that when people have weak or ambiguous attitudes, they develop stronger attitudes to match their own behavior and the circumstances under which it occurs.⁹⁷ Self-perception theory predicts that when employment conditions support qualified employees with disabilities, a co-worker with weak or

⁹⁰ ENGEL & MUNGER, *supra* note 89, at 116–22.

⁹¹ *Id.* at 98–102; *cf. id.* at 73–77 (describing Raymond Militello, a man with a learning disability who regards the ADA as giving disabled persons unjustifiable preferences).

⁹² See, e.g., Barbara Armstrong et al., *Effects of Cooperative vs. Individualist Learning Experiences on Interpersonal Attraction Between Learning-Disabled and Normal-Progress Elementary School Students*, 6 CONTEMP. EDUC. PSYCH. 102, 110 (1981) (arguing that cooperative behavior positively affects children's attitudes toward other children with disabilities in a school setting); John E. Rynders et al., *Producing Positive Interaction Among Down Syndrome and Nonhandicapped Teenagers Through Cooperative Goal Structuring*, 85 AM. J. MENTAL DEFICIENCY 268, 272–73 (1980).

⁹³ See Robert Bogdan & Steven J. Taylor, *Relationships with Severely Disabled People: The Social Construction of Humanness*, 36 SOC. PROBS. 135, 143–46 (1989); Marcia D. Horne, *Modifying Peer Attitudes Toward the Handicapped: Procedures and Research Issues*, in ATTITUDES TOWARD PERSONS WITH DISABILITIES 203 (Harold E. Yuker ed., 1988).

⁹⁴ See Harold E. Yuker, *The Effects of Contact on Attitudes Toward Disabled Persons: Some Empirical Generalizations*, in ATTITUDES TOWARD PERSONS WITH DISABILITIES, *supra* note 93, at 262.

⁹⁵ See LEON FESTINGER, A THEORY OF COGNITIVE DISSONANCE 3, 18 (1957).

⁹⁶ Elliot Aronson & Judson Mills, *The Effect of Severity of Initiation on Liking for a Group*, 59 J. ABNORMAL & SOC. PSYCH. 177, 180–81 (1959).

⁹⁷ See Daryl J. Bem, *Self-Perception: An Alternative Interpretation of Cognitive Dissonance Phenomena*, 74 PSYCH. REV. 183, 198 (1967).

ambiguous attitudes toward people with disabilities will come to believe that his favorable behaviors reflect positive attitudes toward individuals with disabilities.⁹⁸

To the extent that prospective parents are included among employees who develop more positive attitudes about the capacities and opportunities of people with disabilities, perhaps they would be more willing to bring a child with a disability to term rather than seek an abortion. It could also be that, as compliance with the ADA became routine, non-discriminatory employment practices created a positive transformation in disability norms more generally. Positive attitudes toward people with disabilities could then have seeped into the public consciousness, with effects including more positive attitudes about the prospect of raising a child with such disabilities. We do not mean to suggest that this is a complete or correct story about the ADA and disability-selective abortion. We mention it here only as one possible theory to account for the ADA's effect on social norms and practices that we discuss in the next Part.

Indeed, social science research describes how civil rights for blacks evolved in informal, extralegal ways after the school desegregation mandates.⁹⁹ People who grow up in racist cultures often absorb stereotypes that reside in their psyches and influence behavior in subtle but pernicious ways. Similarly, federal rights laws can subconsciously affect public attitudes in ways that diminish implicit biases.¹⁰⁰ Accordingly, scholars have argued that racial antidiscrimination law was accompanied by a reduction in racial prejudice.¹⁰¹ However, two salient differences emerge between the civil rights movement and the disability rights movement. First, each set of events generated drastically different cues for public observation. The 1964 Civil Rights Act “was preceded by images of courageous Freedom Riders, marches, bus boycotts, lynchings . . . and Martin Luther King, Jr. . . . delivering his ‘I Have a Dream’ speech.”¹⁰² The “disability rights movement,” by contrast, “[was] not powered by such compelling imagery.”¹⁰³ The social movement preceding the enactment of the ADA had no charismatic social leader, and its most visible demonstration was described as “a pathetic event [where] crippled children and others crawl[ed] up the Capitol steps.”¹⁰⁴ Consider, further,

⁹⁸ See Mollie Weighner Marti & Peter David Blanck, *Attitudes, Behavior, and ADA Title I*, in *EMPLOYMENT, DISABILITY, AND THE AMERICANS WITH DISABILITIES ACT: ISSUES IN LAW, PUBLIC POLICY, AND RESEARCH* 356, 371 (Peter David Blanck ed., 2000).

⁹⁹ See, e.g., Robert L. Crain & Rita E. Mahard, *The Effect of Research Methodology on Desegregation-Achievement Studies: A Meta-Analysis*, 88 AM. J. SOC. 839, 840–53 (1983) (reviewing ninety-three research studies).

¹⁰⁰ See Charles R. Lawrence III, *The Id, the Ego, and Equal Protection: Reckoning with Unconscious Racism*, 39 STAN. L. REV. 317, 322 (1987) (drawing on psychological studies to criticize the intent requirement in antidiscrimination law).

¹⁰¹ *Id.* at 332.

¹⁰² Joseph P. Shapiro, *Disability Rights as Civil Rights: The Struggle for Recognition*, in *THE DISABLED, THE MEDIA, AND THE INFORMATION AGE* 59, 61–62 (Jack A. Nelson ed., 1994).

¹⁰³ *Id.* at 62.

¹⁰⁴ Richard Harwood, *When Readers Are Wrong*, WASH. POST, Mar. 25, 1990, at C6.

that President Johnson addressed a joint session of Congress—and a national television audience—before introducing the Voting Rights Act of 1965, calling his proposal a fulfillment of the Emancipation Proclamation and a matter of human rights.¹⁰⁵ President Bush held a signing ceremony for the ADA on the White House lawn and compared the Act to the dismantling of the Berlin Wall.¹⁰⁶ Just one year earlier, however, he had vetoed the bill that would eventually become the Civil Rights Act of 1991.¹⁰⁷ The difference between Johnson’s commitment to civil rights legislation and Bush’s tepid—or even contradictory—record on disability rights, could have contributed to different public responses. The social movement and executive actions that supported disability rights legislation in 1990 were far less emotionally resonant and politically potent than the events surrounding black civil rights in the mid-1960s. This is not to say that the uplifting account might not be correct, but only that there is reason to explore an alternative hypothesis about the possible effect of the ADA on selective abortion on the basis of disability, specifically Down syndrome.

B. *The “Disappointing ADA”*

A less optimistic theory suggests that the ADA transmitted or reinforced negative expressive content about people with disabilities. We discuss two potential ADA-induced sources for such outcomes: 1) an increased likelihood that prospective parents would be exposed to the impairments of persons with disabilities; and 2) popular media coverage of the ADA. The “disappointing ADA” hypothesis supposes a strong relationship between the ADA and public attitudes toward individuals with disabilities. The national spotlight shone brightly on persons with disabilities after the law’s enactment, and the ADA required important changes to the workplace and public accommodations. During this time, able-bodied citizens might have become more aware of the disability “problem” through greater exposure to people with disabilities. Hanoch Livneh has identified six channels through which negative attitudes about disability may arise, three of which are particularly relevant to changes brought on by the ADA’s passage.¹⁰⁸ The first channel, what Livneh calls “conscious-unconscious,” includes causes that are fully known to the observer, or those of which he or she might be completely unaware.¹⁰⁹ In this scenario, increased interaction with people with disabilities in

¹⁰⁵ See President Lyndon B. Johnson, Special Message to the Congress: The American Promise (Mar. 15, 1965), available at <http://www.lbjlib.utexas.edu/johnson/archives.hom/speeches.hom/650315.asp>.

¹⁰⁶ Gaylord Shaw, *Knocking Down a Barrier*, NEWSDAY, July 27, 1990, at 7.

¹⁰⁷ Linda Hamilton Krieger, *The Content of Our Categories: A Cognitive Bias Approach to Discrimination and Equal Employment Opportunity*, 47 STAN. L. REV. 1161, 1274 (1995).

¹⁰⁸ See Shaila Rao, *Faculty Attitudes and Students with Disabilities in Higher Education; A Literature Review*, 38 C. STUDENT J. 191, 192–93 (2004).

¹⁰⁹ *Id.* at 193.

the context of public transportation or the workplace may lead to overt animus or implicit biases.

The second channel, “past experience-present situation,” connects early childhood experiences to present situations and interactions.¹¹⁰ If an able-bodied person attended school with a student in a wheelchair and observed or participated in the humiliation of that student, the able-bodied person might develop negative perceptions of persons with disabilities as an adult. Finally, “internally originated-externally originated” sources arise from interaction between an able-bodied person’s demographic or personality traits and those linked to a person with a disability or to the disability itself.¹¹¹ This theory captures the complex ways in which persons without disabilities view differences in physical appearance, mental capacity, and economic potential as foreign to their own identity.¹¹² Witnessing a colleague with disabilities use a special restroom or waiting on a bus while someone in a wheelchair uses an electric ramp might generate unfavorable perceptions about how those with disabilities cause social inconvenience or how they struggle to adjust to ordinary activities. These observations may not have occurred as publicly or frequently before the ADA’s employment discrimination,¹¹³ public services,¹¹⁴ and public accommodations¹¹⁵ mandates came into effect.

Empirical work in psychology and education quantified the extent to which negative attitudes arose, especially through workplace contact. Survey data, for example, show that Americans consider mental retardation a less stable condition than depression or psychosis, where stability measures the likelihood for positive response to counseling and medication.¹¹⁶ As workplace dynamics shifted after the ADA’s passage, formal integration did not assure social acceptance. A 1995 study found that “although persons with mental retardation were accepted within the workplace, few were befriended outside of the work setting.”¹¹⁷ Thus, in direct contrast to the uplifting account in Part III(A), workplace interaction could have exacerbated already exclusionary opinions about persons with disabilities. One study published shortly after the ADA’s passage concluded that overt animus was not a necessary condition for these adverse social consequences: “[W]orkers without mental retardation initiated interactions with nondisabled co-workers three

¹¹⁰ *Id.*

¹¹¹ *Id.*

¹¹² *Id.*

¹¹³ 42 U.S.C. § 12111 (2006).

¹¹⁴ *Id.* § 12131.

¹¹⁵ *Id.* § 12181.

¹¹⁶ See Patrick W. Corrigan et al., *Stigmatizing Attributions About Mental Illness*, 28 J. COMMUNITY PSYCHOL. 91, 98 (2000).

¹¹⁷ Phyllis A. Gordon et al., *Attitudes Regarding Interpersonal Relationships with Persons with Mental Illness and Mental Retardation*, 70 J. REHABILITATION 50, 51 (2004) (citing Frank R. Rusch et al., *Interaction of Persons with Severe Mental Retardation and Their Nondisabled Co-workers in Integrated Work Settings*, 19 BEHAV. MODIFICATION 59 (1995)).

times more often than with co-workers with mental retardation.”¹¹⁸ Such negative social views “were not necessarily derogatory but also were not those of equals.”¹¹⁹ So-called “interaction strain” occurs when non-disabled individuals struggle with self-consciousness and appropriate reactions to persons with disabilities.¹²⁰ This phenomenon could also have shaped negative perceptions about disability as a result of the ADA and thereby enhanced the perceived difficulty of raising a child with disabilities.

Consider the plausible reflections of a prospective parent who has received a prenatal diagnosis for a genetic disability such as Down syndrome. Regardless of their precise origins, unfavorable cognitive associations with disability brought on by the ADA would very likely affect one’s forecast about life with or for a child with a disability. Enhanced exposure to individuals with disabilities through ADA-related mandates and accommodations could prompt unenthusiastic attitudes toward people with disabilities generally, and toward the specific prospects of one’s own child. The diminished physical or mental capacity of a child with a disability could also remind a parent of his or her own mortality and that “[a]nyone can become a person with a disability virtually in a matter of seconds.”¹²¹ Such attitudes might “reflect an awareness that persons without disabilities are vulnerable to death, injury, and disease—a vulnerability most . . . are eager to forget.”¹²² Prospective parents who can see past the disability itself may still worry about external perceptions: “[W]ill [the parents] be considered second rate by association?”¹²³ Parents may be more likely to terminate a pregnancy on the basis of disability when they fear social reproach from others who regard the choice to bear children with disabilities as negligent or irresponsible. Following enactment of the ADA, *The New York Times* published a story about the pregnancy of Los Angeles news anchor Bree Walker-Lampley, who announced on air that she had ectrodactyly, a hereditary condition that causes webbing of the fingers and toes.¹²⁴ The article noted that many in the public were outraged over Lampley’s decision to continue her pregnancy and thus risk “bringing a disabled child into the world.”¹²⁵

¹¹⁸ *Id.* (citing B. Ferguson et al., *Type and Frequency of Social Interaction Among Workers with and Without Mental Retardation*, 97 AM. J. ON MENTAL RETARDATION 530 (1993)).

¹¹⁹ *Id.*

¹²⁰ *See id.* (citing Fred Davis, *Deviance Disavowal: The Management of Strained Interaction by the Visibly Handicapped*, 9 SOC. PROBS. 120 (1961); Joseph H. Evans, *Changing Attitudes Towards Disabled Persons: An Experimental Study*, 19 REHABILITATION COUNSELING BULL. 572 (1976)).

¹²¹ Jane West, *The Social and Policy Context of the Act*, 69 MILBANK Q. 3, 10 (1991).

¹²² *Id.*

¹²³ *Id.*

¹²⁴ *See* Steven A. Holmes, *Radio Talk About TV Anchor’s Disability Stirs Ire in Los Angeles*, N.Y. TIMES, Aug. 23, 1991, at B18.

¹²⁵ *Id.* An empirical study of attitudes toward mothers of children with Down syndrome sheds light on the social pressure that parents in other countries face to avoid having a child with Down syndrome. British researchers Theresa Marteau and Harriet

A crucial feature of this social interaction narrative is that *prospective parents need not even know of the ADA's existence for the law to affect reproductive decisions*. This point reflects precisely where our concept of expressive externalities departs from the traditional theory of expressive law. According to the latter, individuals must recognize specific legislative provisions before they can ascribe expressive content to them. Expressive externalities, however, arise when laws generate social meaning in domains upon which the law has no bearing and not necessarily with awareness of the causal chain. In the pollution example,¹²⁶ a fisherman downstream from the factory need not know the identity of the polluting company or that a polluting factory was constructed miles up the river. He still incurs the cost of contaminated water that the factory owner externalized. In our baseball hypothetical, parents who removed their children from youth leagues did not have to be aware of the drug ban. They need only have sensed public rejection of professional teams. Similarly, if there is reason to believe that increased contact with people with disabilities afforded by the ADA exacerbated adverse affective attitudes toward them, then prospective parents need not have learned about the ADA for the law to have influenced their reproductive decisions. The law's positive effect on employment and public accommodation norms could in this way "externalize" negative views about people with disabilities because the ADA led parents to encounter circumstances that gave rise to feelings of discomfort, pity, or abhorrence.

Another mechanism might account for the "disappointing ADA" hypothesis. This second explanation turns on the fact that ADA-related media stories tended to depict people with disabilities in an unfavorable light. Mainstream media outlets

Drake tracked survey participants in three countries over three years to determine how society ascribes responsibility for the birth of a child with Down syndrome. Theresa Marteau & Harriet Drake, *Attributions for Disability: The Influence of Genetic Screening*, 40 SOC. SCI. & MED. 1127, 1128–29 (1995); cf. Sue Hall et al., *Parents' Attributions of Blame for the Birth of a Child with Down Syndrome: A Pilot Study*, 12 PSYCH. & HEALTH 579 (1997) (interviewing mothers and fathers of children with Down syndrome and finding that a significant minority blamed health professionals or the health care system for not preventing the birth of their children during the prenatal stage). Marteau and Drake interviewed more than 930 pregnant women, geneticists, obstetricians, and a general sample of men and women from Germany, Portugal, and England. Marteau & Drake, *supra* at 1128–29. Respondents were presented with two vignettes about the gestational histories of children who were born with Down syndrome. *Id.* at 1129. In the first, the child's mother declined a genetic test that could have identified the extra Down-causing chromosome, on which basis she could have decided to abort the fetus. *Id.* at 1128–29. In the second vignette, the mother was not offered the test. *Id.* Marteau and Drake found that in the four respondent groups from all three countries, the mother's screening history was the single most important factor influencing attributions of blame for the birth of a child with Down syndrome. *Id.* at 1129. Women declining the offer of testing were assigned overwhelmingly greater blame for the birth of a Down child than were women who were not offered tests and subsequently gave birth to a child with Down syndrome. *Id.* at 1129–30.

¹²⁶ See *supra* Part III.C.

played a significant role in diffusing national and local news in the early 1990s.¹²⁷ Editorial and journalistic decisions about whether to cover and how to frame disability rights developments shaped popular discourse and influenced public attitudes about what it means to have a disability in America.¹²⁸ When landmark legislation such as the ADA appeared before Congress, it “needed a messenger to convey its intent to the public. That messenger was the news media.”¹²⁹ Given extensive media coverage of the ADA’s passage and preceding legislative debates, widely circulating newspapers and magazines served as “norm entrepreneurs,”¹³⁰ drawing on the ADA’s salience to construct new cognitive frames and public understanding about people with disabilities.¹³¹

Evidence from the early 1990s suggests that the media often portrayed people with disabilities either as economic burdens or as “supercrips,” i.e., extraordinary because they function despite having a disability.¹³² The empirical work of media content analysts John Clogston and Beth Haller builds a plausible bridge between

¹²⁷ Coverage of the ADA “moved [the disability rights movement] into the consciousness of the whole of U.S. society.” BETH A. HALLER, NEWS COVERAGE OF DISABILITY ISSUES: FINAL REPORT FOR THE CENTER FOR AN ACCESSIBLE SOCIETY (1999), available at <http://www.accessiblesociety.org/topics/coverage/0799haller.htm>. For a summary of ADA media coverage, see Abby Ellin, *Seeking Laws for Disability of the Attitude*, N.Y. TIMES, July 26, 2000, at G1; Janine Jackson, *A Right, Not a Favor: Coverage of Disability Act Misses Historical Shift*, EXTRA! Nov./Dec. 2000, <http://www.fair.org/index.php?page=1048> (last visited Sept. 1, 2009) (showing how media coverage tends to portray the ADA “as mainly a regulatory issue affecting private businesses, rather than a human rights issue facing society as a whole”); Mary Leonard, *Disability Act’s Progress, Limits Marked*, BOSTON GLOBE, July 14, 2000, at A1; Carolyn Lochhead, *Collecting on a Promise: Disabled Say They Are Still in Fight for Rights 10 Years After Disabilities Act*, S.F. CHRON., July 26, 2000, at A1 (discussing judicial implementation of the ADA’s access mandates); *Disabilities Act a Decade Later: Activists Cautiously Celebrate 10 Years of Progress* (ABC television broadcast July 26, 2000); *Is the Disabilities Act Working?: Critics Argue Law Vague and Misused* (CNN television broadcast July 25, 2000), available at <http://archives.cnn.com/2000/LAW/07/25/ada.anniversary/index.html>; *The Washington Post Special Report: The Americans with Disabilities Act*, <http://www.washingtonpost.com/wp-dyn/nation/specials/socialpolicy/ada/> (last visited Sept. 1, 2009).

¹²⁸ See HALLER, *supra* note 127.

¹²⁹ Beth Haller, *How the News Frames Disability: Print Media Coverage of the Americans with Disabilities Act*, in EXPANDING THE SCOPE OF SOCIAL SCIENCE RESEARCH ON DISABILITY 55, 55 (Barbara M. Altman & Sharon N. Barnartt eds., 2000).

¹³⁰ See Martha Finnemore & Kathryn Sikkink, *International Norm Dynamics and Political Change*, 52 INT’L ORG. 887, 895–97 (1998) (explaining how norms develop according to a three-stage life cycle: norm emergence, norm cascade, and norm internalization).

¹³¹ As Haller notes, “news stories about disability . . . can sway public opinion about . . . the cultural representations of people with disabilities in general.” HALLER, *supra* note 127.

¹³² See John S. Clogston, *Disability Coverage in American Newspapers*, in THE DISABLED, THE MEDIA, AND THE INFORMATION AGE, *supra* note 102, at 45, 47.

the passage of the ADA and ensuing attitudes about persons with disabilities.¹³³ Clogston's model of disability coverage classifies news articles as either "traditional" or "progressive."¹³⁴ "Traditional" depictions describe individuals with disabilities "as dysfunctioning in a medical or economic way," while "progressive" portrayals emphasize civil rights and cultural pluralism.¹³⁵ Clogston's assessment of 363 articles from the first quarter of 1990 indicated that "medical treatment and institutionalization, government and private support programs, and victimization" dominated 60 percent of disability-related stories.¹³⁶ In addition, 55 percent of the headlines used language consistent with the traditional model, often "refer[ring] to persons with disabilities with adjectives substituting for nouns (*disabled, blind, etc.*)."¹³⁷ One can glean the ADA's influence on affective attitudes through the media from a *Seattle Times* profile published in 1992. That article lamented the story of a young woman with Down syndrome in light of the new law: "At 22, Cathleen Haight has entered adulthood. She yearns to do things she thinks a woman should do . . . yet her mind is that of a 10-year-old."¹³⁸ "The Americans with Disabilities Act . . . is expected to increase employment of the disabled," the profile continued, "though it may be some time before the change is felt."¹³⁹

Focusing more closely on the relationship between media sources and disability-related stories, Haller concluded that the business community's prevailing view about people with disabilities colored news reporting in ways that strongly typecast them as costly to society.¹⁴⁰ Building on previous media studies,¹⁴¹ Haller maintained that a journalist's choice of sources for an article substantially affects the piece's ultimate tone and message about people with

¹³³ For comparable studies of disability portrayals in the media, see DORIS ZAMES FLEISCHER & FRIEDA ZAMES, *THE DISABILITY RIGHTS MOVEMENT: FROM CHARITY TO CONFRONTATION* 207–10 (2001); CHARLES A. RILEY II, *DISABILITY AND THE MEDIA: PRESCRIPTIONS FOR CHANGE* 69–108 (2005); Jack A. Nelson, *Broken Images: Portrayals of Those with Disabilities in American Media*, in *THE DISABLED, THE MEDIA, AND THE INFORMATION AGE*, *supra* note 102, at 1.

¹³⁴ Clogston, *supra* note 132, at 46.

¹³⁵ *Id.*

¹³⁶ *Id.* at 48.

¹³⁷ *Id.* at 49.

¹³⁸ Vanessa Ho, *Cathleen Haight Wants To Live the Life of a 22-Year-Old, but She Faces Different Challenges—Special Hopes and Needs*, *SEATTLE TIMES*, Aug. 6, 1992, at F1.

¹³⁹ *Id.*

¹⁴⁰ See Beth Haller, *Balancing Acts: Government, Business, and Disability Sources in News Representations of the ADA* (1996) (unpublished manuscript).

¹⁴¹ See, e.g., PHILLIP J. TICHENOR, GEORGE A. DONOHUE & CLARICE N. OLIEN, *COMMUNITY CONFLICT & THE PRESS* 79–80 (1980) (asserting that news media echo the views of a community's power-holding elite); Pamela J. Shoemaker, *The Communication of Deviance*, in *8 PROGRESS IN COMMUNICATION SCIENCES* 151, 172 (Brenda Dervin & Melvin J. Voigt eds., 1987) (stating that "journalists' normative judgments . . . will draw and define the attention of those who control social change. The journalist acts as a surrogate judge of deviance for his or her audience members").

disabilities.¹⁴² In a follow-up empirical study, Haller found that businesspeople or business groups accounted for more than half (55.2 percent) of all sources in ADA-related news and feature articles appearing in twelve major newspapers and magazines between 1988 and 1993.¹⁴³ She also discovered that two of the top three reasons given for the ADA's passage were architectural access (26.5 percent) and labor market opportunities (18.3 percent).¹⁴⁴ Business sources argued that "[m]aking society accessible for disabled people is not really worth the cost and overburdens businesses. . . . Accessibility is not profitable."¹⁴⁵ Small and midsized operators, in particular, expressed dismay that "the government [was] largely out of touch with . . . their cost of doing business" and that "the Americans with Disabilities Act [would] cost them more and thus have a negative impact on their businesses."¹⁴⁶ Media backlash was not limited to the business community. Three years after the ADA's passage, a national youth sports leader asked in the *Chicago Tribune*:

To accommodate a child in a wheelchair, are you now creating danger for the other kids? I think you are[;] . . . there's nothing built into the Americans with Disabilities Act that protects the safety of those who aren't disabled. The easy solution, if there is enough of a pool, is to create a separate league.¹⁴⁷

Negative media messages related to the ADA could have been the very messages received and internalized by prospective parents considering whether to give birth to a child with a disability. We offer this claim, as with the others presented in Part III, as no more than hypotheses, without further evidence or argument. Nor are the "uplifting" or "disappointing" hypotheses necessarily exhaustive or mutually exclusive accounts of the ADA's expressivist function, if any exists. The ADA may have produced no discernible effect on reproductive behavior at all, or the uplifting and disappointing accounts could have operated simultaneously to shape attitudes and practices in complex ways that led to counterbalance or dominance by one of the competing narratives. We test these hypotheses through empirical examination in Part IV and through analytical reasoning in Part V.

¹⁴² Haller, *supra* note 140.

¹⁴³ Haller, *supra* note 129, at 65.

¹⁴⁴ *Id.* at 64.

¹⁴⁵ *Id.* at 61.

¹⁴⁶ Wilma Randle, *Small Businesses Grow into a Major Player Series: Back to Business. Another Report on the Struggle by Different Sectors of the U.S. Economy to Hone Their Competitive Edge*, CHI. TRIB., Dec. 6, 1992, at 1.

¹⁴⁷ Mary Hill & Andy Trees, *Dream on Hold for Boy with Down's*, CHI. TRIB., May 21, 1993, at 1.

IV. THE EMPIRICS OF DISABILITY-SELECTIVE ABORTION

In Part IV, we analyze whether either of the two hypotheses in Part III finds support in empirical data on Down syndrome birthrates after a positive fetal diagnosis for the condition. Our econometric approach resembles a program evaluation for which it is standard to estimate regression coefficients from a reduced form equation. We do so here. This technique measures variation in critical variables over time and across states that might have generated variation in the Down syndrome birthrate. We study birthrate patterns not only because currently available abortion data contain little to no information about fetal characteristics, but also because medical treatment has not successfully and independently reduced prenatal disability rates. Any decline in the Down syndrome birthrate would more likely follow from increased termination rates rather than more miscarriages¹⁴⁸ or medical interventions on behalf of the affected fetus. In Part IV(A), we describe the data used to test the hypotheses from Part III. Section IV(B) presents and interprets our empirical results.

Our analysis yields suggestive evidence that the ADA led to a short-term decline in the Down syndrome birthrate. By 1993, the birthrate fell by between 13 and 18 per 100,000 relative to the pre-ADA period when controlling for demographic and medical care variables. We do not find any significant effect for two lesser-known disabilities for which screening technologies also exist. When we compare birthrate changes for infants with spina bifida and cleft palate before and after the ADA's passage, no coefficient in the fully specified model is significant. In addition, the signs switch from negative to positive between the unadjusted and fully specified regression models. The decline in Down syndrome birthrates coincided with steady amniocentesis rates and increased sharply at the same time screening became less frequent. These collective findings suggest persuasively that the ADA's effect on reproductive decision making was in large part responsible for the mid-1990s decline in the birthrate of children with Down syndrome.

As Donohue and Levitt emphasized in their study of abortion and crime,¹⁴⁹ the explanation we offer here likewise represents one of several plausible accounts. A skeptical reader might even accept our statistical findings but still not agree with our narrative premise. In fact, labor economist Daniel Hamermesh, who has used the Donohue and Levitt study in the classroom, stated: "I've gone over [the] paper in draft, in its printed version, at great length, and for the life of me I can't see

¹⁴⁸ Genetic tests for Down syndrome usually are performed fifteen to sixteen weeks into the gestation period. See Wylie Burke, *Genetic Testing*, 347 NEW ENG. J. MED. 1867, 1871 (2002). After that point, the likelihood of miscarriage is about 1 to 3 percent. See, e.g., Statistics, <http://www.pregnancyloss.info/info-howcommon.htm> (last visited Sept. 1, 2009).

¹⁴⁹ Donohue & Levitt, *supra* note 81, at 380 ("While acknowledging that [a number of other factors] may have also served to dampen crime, we consider a novel explanation for the sudden crime drop of the 1990s: the decision to legalize abortion over a quarter century ago.").

anything wrong with it[.] . . . On the other hand, I don't believe a word of it."¹⁵⁰ We do not wish to equate what we demonstrate in this Article to what Donohue and Levitt achieved in their study, which has withstood several rounds of scholarly criticism¹⁵¹ and has been confirmed by alternative data sources¹⁵² over the seven years since its publication.¹⁵³ To the extent that our empirical and conceptual analyses are sound, however, the endurance of Donohue and Levitt's bold claim lends credibility to the facially improbable connection we propose between the ADA and selective abortion on the basis of disability.

A. Data

1. Sources

Beginning in 1968, the Centers for Disease Control and Prevention (CDC), through the National Center for Health Statistics (NCHS), collected samples of birth records from the fifty states and the District of Columbia.¹⁵⁴ In the early years of the program, "[d]ata were obtained from a 50-percent sample of certificates."¹⁵⁵ However, "[s]tarting in 1972 all records were included for States that participated in the Vital Statistics Cooperative Program (VSCP)."¹⁵⁶ "The number of States participating in the VSCP increased from 6 in 1972 to 46 in 1984," and "beginning in 1985, all States and the District of Columbia participated."¹⁵⁷ The CDC data files contain information from every field on the birth certificate, including demographic information about the child's parents and various indicators of

¹⁵⁰ Stephen J. Dubner, *The Probability that a Real-Estate Agent is Cheating You (and Other Riddles of Modern Life)*, N.Y. TIMES MAG., Aug. 3, 2003, at 24.

¹⁵¹ See, e.g., Christopher L. Foote & Christopher F. Goetz, Comment, *The Impact of Legalized Abortion on Crime: Comment*, 123 Q.J. ECON. 407, 421–22 (2008); Ted Joyce, *Did Legalized Abortion Lower Crime?*, 39 J. HUM. RESOURCES 1, 1–3 (2004).

¹⁵² See, e.g., Cristian Pop-Eleches, *The Impact of an Abortion Ban on Socioeconomic Outcomes of Children: Evidence from Romania*, 114 J. POL. ECON. 744, 769–70 (2006) (attributing declines in educational and labor market outcomes for Romanian children to the 1966 ban on abortion); Anindya Sen, *Does Increased Abortion Lead to Lower Crime? Evaluating the Relationship between Crime, Abortion, and Fertility*, 7 B.E. J. ECON. ANALYSIS & POL'Y 1, 31–32 (2007) (refining the Donohue and Levitt theory using Canadian fertility data).

¹⁵³ See, e.g., James M. Poterba, *Steven D. Levitt: 2003 John Bates Clark Medalist*, 19 J. ECON. PERSP. 181, 188–90 (2005) (citing the Donohue and Levitt study as a major factor in the American Economic Association's awarding Levitt the John Bates Clark Medal, which is given every two years to one American economist under the age of forty who has made a significant contribution to economic thought).

¹⁵⁴ NCHS–NVSS–Description, <http://www.cdc.gov/nchs/births.htm> (last visited Sept. 1, 2009).

¹⁵⁵ Natality Data, Public-Use Data Files, http://www.cdc.gov/nchs/products/elec_prods/subject/natality.htm (last visited Sept. 1, 2009).

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*

maternal and newborn health. Of particular interest for our study is information on the obstetric practices of parents who chose to bring a child with a disability to term. If the ADA had some effect on the incidence of Down-selective abortion, we hypothesize that the empirical model will detect changes in the frequency of fetal diagnoses of Down syndrome. It should be noted that birth certificates before 1989 specified *whether* the newborn had a congenital anomaly; only after a 1989 change in the design of birth certificates did medical attendants record *specific* disabilities. For this reason, we use data from 1989—the first year for which prenatal screening data also appear—through 2002, the last year for which birth certificate data are available. The information contained on these birth certificates has been transcribed into electronic data files, which are accessible through the Inter-University Consortium for Political and Social Research (ICPSR).¹⁵⁸

One might object that using just one year of data to identify the pre-ADA period limits the value of any attempt at before-and-after econometric specification. There are two reasons why this objection should not be overstated. First, because it generally takes nine months to carry a child from fertilization until birth, any changes in reproductive decision making that could be attributed to the law's passage would not appear in the Down syndrome birthrate until after approximately 1991, one year after the ADA was passed. Our analysis therefore assumes that the years 1989 and 1990 form the “pre-ADA” period. Second, and more important, any expressive externalities from the ADA would operate with some delay. The impact of “cascading” norms emerges only after sufficient social pressure builds toward a tipping point for conformity around emergent attitudes and behaviors.¹⁵⁹ However, because we cannot claim with any certainty when the externality reached its peak effect, we examine changes relative to the 1989–90 period for each year from 1991 to 2002. We elaborate in Part IV(B)(1) on reasons for the break in the birthrate trend between 1990 and 1991.

2. Summary Statistics

The raw natality data between the years 1989 and 2002 include a wide array of demographic and physical characteristics for 56,068,370 births.¹⁶⁰ As the summary statistics in Table 1 show, about 52 children with Down syndrome were born per 100,000 across the United States over the period 1989–2002. We also document, for comparison purposes,¹⁶¹ the spina bifida birthrate, which averaged about 25 per 100,000 over the same period. The full list of explanatory variables

¹⁵⁸ Inter-University Consortium for Political and Social Research, Natality Detail File Series, <http://www.icpsr.umich.edu/cocoon/ICPSR/SERIES/00036.xml> (last visited Sept. 1, 2009).

¹⁵⁹ See Cass R. Sunstein, *Behavioral Analysis of Law*, 64 U. CHI. L. REV. 1175, 1187 (1997); Cass R. Sunstein, *Social Norms and Social Rules*, 96 COLUM. L. REV. 903, 945–46 (1996).

¹⁶⁰ In addition to recoding variables for missing or undocumented values, we remove all births to foreign residents.

¹⁶¹ See *infra* Part IV.B.2.

culled from the NCHS natality files (also appearing in Table 1) controls for factors that are unrelated to or mildly correlated with passage of the ADA and might have induced variation in reproductive outcomes.¹⁶² Research published soon after the ADA's passage suggests potential relationships between these covariates and Down syndrome birthrates.¹⁶³ First, we might expect the incidence of disability-selective abortion to be higher among white women relative to minorities because, according to one anthropological study, "about half of minority women [in New York City] [did] not keep their appointments for counseling or prenatal diagnosis."¹⁶⁴ In addition, some research found that "college-educated, upper-income career women [were] less willing to risk having a disabled child than women with less education and income."¹⁶⁵ Thus, we would expect the numerical sign on college education to be negative, implying a lower probability of Down syndrome births.

The remaining variables capture the fertility and medical histories of women choosing to give birth during our observation period. As with maternal and gestational age,¹⁶⁶ one might expect that a greater number of preexisting children will reduce the probability that women carry a fetus with a disability to full term, especially if their living children are not impaired.¹⁶⁷ One of the key indicators for

¹⁶² An ideal model would include information on news media reports given the empirical evidence reported by Clogston and Haller. *See supra* notes 127–145 and accompanying text. The utility of such data, however, seems rather low in a regression model given that the quantity of positive and negative news reports omits the essential, qualitative characteristics that Clogston and Haller also emphasize.

¹⁶³ *See* Wertz, *supra* note 76, at 167–70.

¹⁶⁴ *Id.* at 170 (citing Rayna Rapp, *Constructing Amniocentesis: Maternal and Medical Discourses*, in *UNCERTAIN TERMS: NEGOTIATING GENDER IN AMERICAN CULTURE* 28 (Faye Ginsburg & Anna Lowenhaupt Tsing eds., 1990); Rayna Rapp, *The Power of "Positive" Diagnosis: Medical and Maternal Discourses on Amniocentesis*, in *CHILDBIRTH IN AMERICA: ANTHROPOLOGICAL PERSPECTIVES* 103 (Karen L. Michaelson ed., 1988); Rayna Rapp, *Chromosomes and Communication: The Discourse of Genetic Counseling*, 2 *MED. ANTHROPOLOGY Q.* 143 (1988)).

¹⁶⁵ *See* Wertz, *supra* note 76, at 170 (citing KRISTIN LUKER, *ABORTION AND THE POLITICS OF MOTHERHOOD* (1984); Diane Beeson & Mitchell S. Golbus, *Decision Making: Whether or Not To Have Prenatal Diagnosis and Abortion for X-linked Conditions*, 20 *AM. J. MED. GENETICS* 107 (1985)).

¹⁶⁶ *See* Ralph L. Kramer et al., *Determinants of Parental Decisions After the Prenatal Diagnosis of Down Syndrome*, 79 *AM. J. MED. GENETICS* 172, 172–74 (1998) (analyzing all cases of Down syndrome at a tertiary care center from 1989–1997 with respect to maternal age, parity, gestational age, sonographic findings, insurance status, and race, and finding that when Down syndrome is diagnosed prenatally, the choice of termination is related to maternal age and gestational age, but only gestational age is a significant independent predictor of pregnancy termination).

¹⁶⁷ *See* David T. Helm et al., *Prenatal Diagnosis of Down Syndrome: Mothers' Reflections on Supports Needed from Diagnosis to Birth*, 36 *MENTAL RETARDATION* 55, 60 (1998) (discussing the perceived challenges of raising a child with a disability alongside other children).

assessing our central hypothesis is the percentage of births subject to amniocentesis. This captures trends for the most commonly used Down syndrome diagnostic test.¹⁶⁸ Finally, we detail the medical care sought by women who chose to give birth to a child with Down syndrome. Presumably, the chances of detecting Down syndrome should increase (at a diminishing marginal rate) with the number of prenatal medical consultations.

B. Results

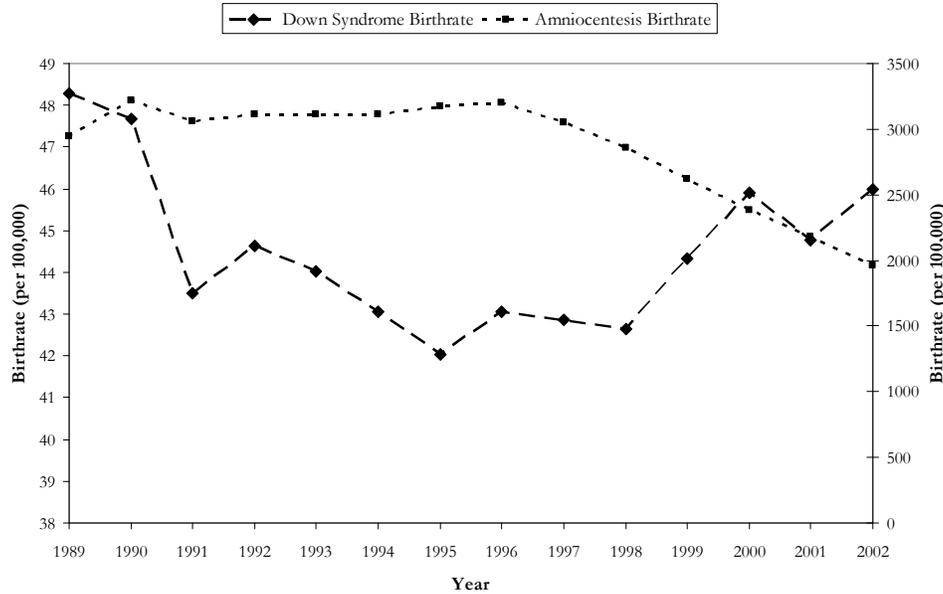
1. Graphical Evidence

Figure 1 displays two national time series: the birthrate of infants with Down syndrome and the number of births screened through amniocentesis (each per 100,000) from 1989 to 2002. The natality files include separate variables for each congenital anomaly listed on the birth certificate. These variables are multinomial, taking one of four values: “reported,” “not reported,” “not on certificate,” and “not classifiable.”¹⁶⁹ We assume that the latter two categories are comparable to “no reported condition,” which appeared in the aggregated anomaly variable before 1989. Thus, we recast the Down syndrome indicator as a dichotomous one, coding only “reported” values as positive diagnoses.

¹⁶⁸ See Nicholas J. Wald et al., *Antenatal Screening for Down's Syndrome*, 4 J. MED. SCREENING 181, 223 (1997).

¹⁶⁹ Natality Data, Public-Use Data Files, http://www.cdc.gov/nchs/products/elec_prods/subject/natality.htm (last visited Sept. 1, 2009).

Figure 1: Down Syndrome Birthrates and Conditional Amniocentesis Rates (1989–2002)



Source: National Center for Health Statistics Annual Natality Files.

Two features of the time series stand out in Figure 1. First, the Down syndrome birthrate trend, measured on the left axis, breaks sharply after 1990, falling about 9 percent from 48 children per 100,000 to 43 in 1991. Despite small increases in 1992 and 1996, the birthrate falls to a low of 42 per 100,000 in 1995. Starting in 1998, however, the share of Down syndrome births rises and nearly reaches its pre-ADA level by 2002.

On the secondary vertical axis, we measure the number of births for which the mother underwent an amniotic screening (again, per 100,000). The trend in the late 1980s through the mid-1990s appears relatively constant, remaining at an average of 3,100 screenings per 100,000 live births. The amniocentesis rate, however, drops steadily from 1997 through 2002. This decline in prenatal screening accompanies a rise in Down syndrome births. Before 1997, however, the Down syndrome birthrate fell off in the absence of any change in screening patterns.

Figure 1 represents the foundation for the following empirical analysis. It will also help determine whether either of the hypotheses in Part III has explanatory power, and if so, which dominates. The sharp downward trend in the Down syndrome birthrate through the mid-1990s implies that the data potentially support the “disappointing ADA” theory. However, its influence was most likely a short-term phenomenon, since the birthrate rebounded between 1995 and 2002. Several factors could explain the trend reversal in 1995, including the eventual emergence of an “uplifting ADA” story or, more simply, a gradual weakening of the ADA’s

negative externality. Nevertheless, the final data point in Figure 1 lies below the 1989–1990 levels, which indicates that the initial negative expressive effect was not completely eliminated by 2002. Thus, the available data suggest that overall Down syndrome births remained lower than they would have been had the ADA not been enacted.

Second, the amniocentesis birthrate line in Figure 1 could be misleading in ways that crucially affect interpretation about selective abortion. We claim that the amniocentesis rate remained fairly constant through the mid-1990s, but the data, by definition, exclude screenings that resulted in terminations. Thus, if amniocentesis rates increased in the 1990s and abortions after Down syndrome diagnoses increased, these screenings would not appear in Figure 1 even though they occurred. However, “[a]bout 98 percent of the women who have amniocentesis will receive the . . . news that their fetuses are free of the conditions for which they have been tested. The other 2 percent will . . . confront the . . . news that their fetus has a disability.”¹⁷⁰ Thus, under the assumption that parents are more likely to bear children without prenatal disabilities, all else equal, deriving the amniocentesis birthrate from live births should not be confounded significantly by selective abortion practices. This assumption permits reasonable inference about changes in the overall amniocentesis rate with changes in the amniocentesis birthrate.

2. Regression Results

Having explored the general time trends of Down syndrome birthrates as well as the incidence of amniocentesis during the observation period, we now turn to multivariate regression analysis. The first set of models is based on the following equation:

$$BR_{st} = \beta_0 + \sum_{j=1991}^J \beta_{j-1990} I_j + \delta Z_{st} + \sigma + \varepsilon_{st} \quad (1).$$

BR_{st} is the Down syndrome birthrate in state s and year t ; I_j is an indicator variable for each year j ($J = 2002$); Z_{st} is a vector of control variables for each state-year pair, and σ represents state fixed effects. Since our observation period begins in 1989, the year effects are estimated relative to the pre-ADA period from 1989 to 1990. For example, the coefficient for the variable I_{1995} (β_5) represents the change in the Down syndrome birthrate, all else constant, between 1995 and the pre-ADA years.

Before discussing the results, we explain the rationale for the empirical specification in (1). Analyses of legal interventions on social and economic

¹⁷⁰ Rayna Rapp, *The Power of “Positive” Diagnosis: Medical and Maternal Discourses on Amniocentesis*, in REPRESENTATIONS OF MOTHERHOOD 204, 205 (Donna Bassin et al. eds., 1994).

outcomes often rely on difference-in-differences models. In these models, the first difference compares outcomes for “control” and “treated” observations, and the second difference usually compares the first difference before and after the law’s effective date. Had we been able to obtain individual-level data on reproductive decisions, including whether disability-selective abortion occurred, we naturally would have followed the difference-in-differences framework. The “treated” observations would include all mothers who underwent amniotic screening, and the pre-ADA period for the second difference would remain observations from the years 1989 and 1990.¹⁷¹ Because of our data limitations, which required aggregation to a larger unit of analysis (the state of residence), sensible difference-in-differences analysis options would generate sample selection bias. For example, we might restrict the data to Down syndrome births and use difference-in-differences to examine changes before and after the ADA for women who did and did not use amniocentesis. However, this method would eliminate the relative frequency of Down syndrome births to non-Down syndrome births—the very data we need to show whether the ADA affected the selective abortion rate in either direction.

Column 1 of Table 2 shows results from the most parsimonious possible model, i.e., one that calculates raw (unadjusted) differences across time. As shown in Figure 1, the Down syndrome birthrate declined immediately after passage of the ADA. Nevertheless, the year-by-year decline does not achieve statistical significance until 1993, and the magnitude of these decreases remains high through 1999. However we explain these findings, the point estimate for 1995 (-11) is astounding; such a change represents one half of one standard deviation. Columns 2 and 3 add demographic and medical controls, respectively, via the vector Z_{st} as well as state fixed effects to capture unobserved heterogeneity (especially variation in religious affiliation and general health in the state population). In most cases, the absolute value of the annual estimates increases (implying larger declines) and remains statistically significant through the period 1993–97. Finally, Column 4 represents the most fully specified model captured by (1). In this version, all the coefficient estimates from 1993 through 1998 are between 13 and 18 in absolute value. Thus, relative to the pre-ADA period 1989–90, the declines in successive years represent substantial changes in the birthrates of children with Down syndrome.

Point estimates for all control variables used in the four variations on (1) are presented in the second half of Table 2. Column 4 indicates that maternal age, prenatal visits, and amniocentesis rates are all positively correlated with Down syndrome birthrates. None of these factors, however, is statistically significant. On average, married, white, and college-educated women, as well as women with more living children, are less likely to give birth to a child with Down syndrome. The negative sign on the two significantly estimated variables (race and birth

¹⁷¹ Even still, we would not have access to individual-level decisions whether to give birth or terminate a pregnancy over time. Without such information, an individual-level difference-in-differences analysis would be meaningless.

order) further validates our empirical model. That is, the negative coefficient on maternal race and birth order supports two findings: first, that white women are more likely to have access to and use screening technologies; and, second, that parents are more likely to abort a Down syndrome fetus the more children they already have.

How do these results, which examine patterns in birthrates, relate to our analysis of selective abortion practices? First, note that Columns 2–4 in Table 2 include the number of births (per 100,000) subjected to amniotic screening as a control variable. Given that this rate remained relatively constant during the years between 1992 and 1997, one would not expect a variable with minimal variation to affect estimates of the β coefficients. Once the rate of amniocentesis began to fall, though, the declines relative to 1989–90 no longer are statistically significant. We interpret this result as highly suggestive evidence that antidiscrimination law engendered an expressive effect on Down syndrome births. Controlling as well for a host of factors that likely correlate with reproductive decisions, we still find robust decreases in the incidence of newborns with disabilities after passage of the ADA *while prenatal screening frequencies remained virtually invariant*. Finally, if the law actually produced expressive externalities—as opposed to some other account that could better explain the observed birthrate drops—we would not expect to observe these collateral effects as soon as the law was passed.¹⁷²

As Figure 1 suggested, and the regression results confirmed, the expressive externality (if it operated) was confined to the short term, from roughly 1993 through 1998. This appears not only through the lack of statistical significance after 1998 but also through the upswing in the Down syndrome birthrate beginning in the late 1990s. These findings can be explained in one of two ways, neither of which can be tested formally with the available data.¹⁷³ First, the salience of negative attitudes about Down syndrome could have dissolved over time such that the expressive externality ceased to affect reproductive decisions systematically after a certain period. Second, it might be the case that positive externalities emerged and outweighed any negative expressive effects. Either way, although the Down syndrome birthrate rose after the mid-1990s, it remained below the pre-ADA levels observed in 1989 and 1990. Thus, even if the negative expressive externalities operate only in the short term, its effects may continue to have meaningful long-term effects on reproductive outcomes.

No advances in prenatal or postnatal medical therapy have exogenously reduced the rate at which children with disabilities are brought to term. Conditional upon a fetus developing Down syndrome, the only way that parents can prevent the birth of a child with disabilities is to terminate the pregnancy.¹⁷⁴ This important fact rules out any variation in birthrates attributable to causes outside of parental choice, and controls for any preferences or genetic propensities that would

¹⁷² See *supra* note 159 and accompanying text.

¹⁷³ We are grateful to Jack Balkin for bringing this point to our attention.

¹⁷⁴ See Nancy J. Roizen & David Patterson, *Down's Syndrome*, 361 LANCET 1281, 1282 (2003).

correlate with a higher probability of Down syndrome births. Abortion rates are not the only measure of revealed preference for raising children with Down syndrome. Parents could decide to bring a child with Down syndrome to term and then place the child in an adoption agency. Further insight can be gleaned from analysis of the rate at which biological parents chose to place children with Down syndrome up for adoption and the rate at which adoptive parents chose to adopt children with Down syndrome. We consider adoption figures in the context of socioeconomic changes, changes in adoption laws, and other confounding variables.¹⁷⁵ The absence of adoption data in our study means that the observed decline in Down syndrome birthrates represents a lower bound on parental disinclinations to raise a child with this disability. The existence of the adoption alternative, however, does not complicate our empirical findings with respect to birthrates. Since adoption rates are conditional on birthrates, our data also capture some of the ADA's effect on adoption. Parental decisions to place a child with Down syndrome up for adoption may have increased or decreased after 1990. Regardless, our findings indicate that there were significantly fewer children born with Down syndrome that could have been placed with adoption agencies.

We interpret these regression results as evidence of an expressive externality because statistically significant declines in the Down syndrome birthrate coincided with a relatively constant amniocentesis rate. Ruling out the effect of changing medical diagnostics and personal characteristics, the "residual" explanation for falling birthrates could be the cascading norm shift regarding selective abortion set off by the ADA. On the other hand, the eventual birthrate increase that occurred when amniocentesis rates fell was statistically *insignificant*; otherwise, there would be more support for the proposition that changes in amniocentesis rates drove changes in Down syndrome birthrates. The magnitudes of our estimated coefficients (up to 18 per 100,000) might appear insignificant in absolute terms, but declines of this size are quite substantial relative to the pre-ADA distribution of Down syndrome birthrates.¹⁷⁶ The numerical significance of the post-ADA birthrate drop (13 to 18 per 100,000) relative to the pre-ADA mean (52 per 100,000) serves to underscore the importance of these results.

¹⁷⁵ Although we controlled for demographic changes in race and class over the period we investigated, these factors surely influenced prenatal testing rates. In a 1980 study of genetic testing among prospective parents in the state of Georgia, for example, prenatal diagnosis was used by 60 percent of urban white women over forty, but by just 0.5 percent of rural black women over forty. See David C. Sokol et al., *Prenatal Chromosome Diagnosis: Racial and Geographic Variation for Older Women in Georgia*, 244 JAMA 1355, 1356–57 (1980); see also Rayna Rapp, *Refusing Prenatal Diagnosis: The Meanings of Bioscience in a Multicultural World*, 23 SCI., TECH. & HUM. VALUES 45, 67 (1998) ("With better access [to information about prenatal testing], middle-class women are also less able to achieve any distance from the biomedical discourse within which their own rationality is forged. Those without much privileged scientific education are most likely to reject testing altogether . . .").

¹⁷⁶ See *infra* tbl. 1.

If our narrative about expressive externalities and Down syndrome birthrates is plausible, then we should not expect to observe similar changes for other congenital anomalies that generated significantly less social anxiety and received much less media coverage.¹⁷⁷ In Tables 3 and 4, we amend the baseline model to account for variation in the birthrates of spina bifida¹⁷⁸ and cleft palate,¹⁷⁹ two other high-frequency congenital abnormalities.¹⁸⁰ These data provide a relatively clean comparative test for whether social or medical salience, which we posit is a necessary condition for expressive externalities to emerge, motivated the decline in the Down syndrome rate. In Table 3, Column 1, the unadjusted annual differences suggest that negative expressive externalities might have generated similar effects for children with spina bifida. Although the coefficient estimates are not as large (in absolute value) as with Down syndrome, the results between 1998 and 2002 are either statistically significant or marginally insignificant. The significance of these results vanishes, however, when we include the full set of control variables in Column 4. No annual point estimate is statistically significant in that specification. More important, the Column 1 estimates were so fragile that most negative coefficients became positive with the introduction of controls. In Table 4, no coefficient estimate for cleft palate is estimated with enough precision to echo the expressive effects detected for Down syndrome. Together, Tables 3 and 4 indicate that the case of Down syndrome was uniquely affected by the ADA's passage.

It may be worth trying to distinguish parental attitudes about the prospect of children with mental disabilities as opposed to physical disabilities. One reason to think the reproductive calculus varies depending on whether the disability in

¹⁷⁷ As expected, Down syndrome received far more extensive media coverage during the relevant period than spina bifida, cleft lip/palate, or other genetic anomalies. A search of the *New York Times*, *Los Angeles Times*, *Washington Post*, and *Chicago Tribune* between 1988 and 1993 reveals that Down syndrome, spina bifida, and cleft lip/palate appeared in 1028, 436, and 156 articles, respectively.

¹⁷⁸ Spina bifida is a neural tube disorder involving an incompletely formed spinal cord. The condition results in varying degrees of paralysis and is sometimes associated with cognitive problems. Hope Northrup & Kelly Volcik, *Spina Bifida and Other Neural Tube Defects*, 30 CURRENT PROBS. PEDIATRICS 317, 327–29 (2000).

¹⁷⁹ Cleft palate is a genetic abnormality in which the two plates that form the roof of the mouth are not fully connected. The condition is usually correctable through surgery, but may cause problems with feeding, speech, and socialization. Francesco Carinci et al., *Genetics of Nonsyndromic Cleft Lip and Palate: A Review of International Studies and Data Regarding the Italian Population*, 37 CLEFT PALATE-CRANIOFACIAL J. 33, 35–36 (2000).

¹⁸⁰ The remaining conditions reported in the natality data are anencephalus, hydrocephalus, microcephalus, "other" central nervous system anomalies, heart malformations, "other" circulatory conditions, rectal atresia, tracheo conditions, omphalocele, "other" gastrointestinal anomalies, malformed genitalia, renal agenesis, "other" urogenital anomalies, polydactyl/syndactyly/adactyly, club foot, diaphragmatic hernia, "other" musculoskeletal anomalies, "other" chromosomal anomalies, and "other" congenital anomalies. See Natality Data, Public-Use Data Files, http://www.cdc.gov/nchs/products/elec_prods/subject/natality.htm (last visited Sept. 1, 2009).

question is predominantly mental or physical in nature relates to the labor market. Children with predominantly physical disabilities might be expected to obtain competitive jobs more easily (relative to children with predominantly mental disabilities) as adults in a twenty-first century employment market that increasingly values information processing skills over physical talents or sensory abilities. The distinction between mental and physical disabilities is not altogether straightforward in the case of Down syndrome, however, which typically results in both varying levels of mental retardation and a range of physical impairments.¹⁸¹ At any rate, the cognitive limitations that people tend to associate with the condition buttress our expressivist interpretation of the ADA. Considering Wertz's eight factors, prospective parents may believe that future employers will consider adults with Down syndrome too unproductive (Wertz's second factor) or focus on the fact that medical treatment cannot reverse the physical or cognitive limitations associated with Down syndrome (her fourth factor). However, it seems plausible that the overall salience of a disability matters more for any effect that expressive externalities have on the reproductive utility function than whether the disability is primarily mental or physical. Our empirical analysis does not test this hypothesis directly.

Given the strong correlation between maternal age and the likelihood of a fetus developing Down syndrome,¹⁸² we divide all birth records into two groups with age thirty-five as a cutoff. We use thirty-five as a threshold because the medical community traditionally has recommended amniocentesis for women who are at least that age and also because "[m]ore than 90 percent of all children and 70 to 80 percent of children with Down's syndrome are born to women younger than 35 years of age."¹⁸³

Table 5 suggests that most of the negative expressive effects estimated for Down syndrome actually arose in the younger maternal cohort. In this table we present only the unadjusted and fully specified models for both groups. As Column 2 shows, declines in the Down syndrome birthrate were much steeper and lasted longer for women younger than thirty-five than among the entire set of births. On average, between 1993 and 1999 the birthrate drop was about 16 per 100,000. Column 4, describing the same changes in Down syndrome births for women age thirty-five and older, shows even higher point estimates over the same period. However, the noisiness of the data (due to the lower frequency of births among women older than thirty-five) renders all of the coefficients insignificant. Although this noise prevents us from drawing firm conclusions, Table 5 would seem to support our interpretation that the ADA produced a negative expressive effect. Since women younger than thirty-five give birth to the vast majority of Down

¹⁸¹ J.R. Korenberg et al., *Down Syndrome Phenotypes: The Consequences of Chromosomal Imbalance*, 91 PROC. NAT'L. ACAD. SCI. 4997, 5000 (1994).

¹⁸² See Ernest. B. Hook et al., *Chromosomal Abnormality Rates at Amniocentesis and in Live-Born Infants*, 249 J. AM. MED. ASS'N 2034, 2036-38 (1983).

¹⁸³ Susan P. Pauker & Stephen G. Pauker, *Prenatal Diagnosis: Why Is 35 a Magic Number?*, 220 NEW ENG. J. MED. 1151, 1151 (1994).

syndrome children, and about 90 percent of pregnant women carrying a fetus diagnosed with the condition choose termination,¹⁸⁴ the substantial declines observed in Table 5 likely were due to selective abortion.¹⁸⁵

To be clear, we do not claim to have detected a causal statistical relationship between the ADA and changes in the Down syndrome birthrate. We have used the best available natality information simply to show that shifts in otherwise stable birthrate patterns could plausibly have followed from passage of the ADA. Our regression analysis shows significant declines in the Down syndrome birthrate while controlling for a multitude of critical variables correlated with reproductive decisions. The absence of data on actual Down-selective terminations and of comprehensive interview responses by prospective parents who face this decision caution against drawing broad conclusions. Nevertheless, these findings are sufficiently robust to suggest that the “disappointing” hypothesis we proposed in Section III(B) has greater independent plausibility or net influence than the “uplifting” hypothesis from Section III(A). Further investigation into other family planning spheres such as adoption or artificial reproductive technologies might weaken or reinforce this conclusion.¹⁸⁶

V. THE ANALYTICS OF DISABILITY-SELECTIVE ABORTION

A complex array of legal, material, economic, technological, social, familial, and medical factors might reasonably inform prenatal testing and selective abortion for Down syndrome.¹⁸⁷ Technological factors include the predictive accuracy, procedural invasiveness, and medical risks of diagnostic techniques,¹⁸⁸ as well as the gestational age for which effective prenatal testing is available.¹⁸⁹ Legal factors

¹⁸⁴ Harmon, *supra* note 2.

¹⁸⁵ Another possibility is that amniocentesis rates by age changed over the 1990s such that women under thirty-five switched to less invasive procedures such as the triple screen/AFP test. If so, this technological shift might explain the relative decrease in Down syndrome births among younger women. However, our natality data show that amniocentesis rates remained steady among both the younger cohort (about 2 percent) and the older cohort (about 15 percent) during the early to mid-1990s.

¹⁸⁶ See *infra* Part VI.

¹⁸⁷ See D.I. Bromage, *Prenatal Diagnosis and Selective Abortion: A Result of the Cultural Turn?*, 32 MED. HUMAN. 38, 39–41 (2006) (describing a range of influences that may be brought on women who are carriers of genetic diseases).

¹⁸⁸ See Jennifer A. Bubb & Anne L. Matthews, *What’s New in Prenatal Screening and Diagnosis?*, 31 PRIMARY CARE: CLINICS OFF. PRAC. 561, 563 (2004) (describing current methods for prenatal genetic screening and diagnosis including carrier testing, maternal serum screening, ultrasonography, as well as diagnostic alternatives to amniocentesis including chorionic villus sampling and preimplantation diagnosis).

¹⁸⁹ See Susan Michie et al., *Prenatal Tests: How Are Women Deciding?*, 19 PRENATAL DIAGNOSIS 743, 744–46 (1999) (assessing systematic decision making for genetic testing at sixteen weeks’ gestation).

might include informed-consent laws¹⁹⁰ and other government regulations;¹⁹¹ public funding;¹⁹² or tort litigation¹⁹³ with respect to genetic testing and abortion. Relevant material factors include the availability of institutions that provide genetic testing;¹⁹⁴ the required waiting period for genetic testing services,¹⁹⁵ and challenges with transportation or child care to allow for medical services.¹⁹⁶ Economic factors might include social status;¹⁹⁷ availability of insurance coverage, government funding, or personal funds to pay for genetic testing¹⁹⁸ or abortion services;¹⁹⁹ financial ability to support a child with a genetic disability or disease;²⁰⁰ and the anticipation of denied coverage or increased costs for health and life insurance for avoidable or preexisting conditions.²⁰¹ Salient social issues include pressure by nonfamilial individuals;²⁰² ethnic, cultural, and religious

¹⁹⁰ Jean Gekas et al., *Informed Consent to Serum Screening for Down Syndrome: Are Women Given Adequate Information?*, 19 *PRENATAL DIAGNOSIS* 1, 3–6 (1999).

¹⁹¹ See Ellen Wright Clayton, *What the Law Says About Reproductive Genetic Testing and What It Doesn't*, in *WOMEN AND PRENATAL TESTING: FACING THE CHALLENGES OF GENETIC TECHNOLOGY* 131, 177 (Karen H. Rothenberg & Elizabeth J. Thomson eds., 1994).

¹⁹² *Id.* at 137.

¹⁹³ *Id.* at 151–52.

¹⁹⁴ See Dorothy C. Wertz & John C. Fletcher, *Feminist Criticism of Prenatal Diagnosis: A Response*, 36 *CLINICAL OBSTETRICS & GYNECOLOGY* 541, 543–44 (1993).

¹⁹⁵ Marilyn L. Poland et al., *Barriers to Receiving Adequate Prenatal Care*, 157 *AM. J. OBSTETRICS & GYNECOLOGY* 297, 302 (1987).

¹⁹⁶ *Id.* at 300.

¹⁹⁷ Babak Khoshnood et al., *Advances in Medical Technology and Creation of Disparities: The Case of Down Syndrome*, 96 *AM. J. PUB. HEALTH* 2139, 2143 (2006) (concluding that Down syndrome risk does not vary according to socioeconomic status).

¹⁹⁸ See Laurie Nsiah-Jefferson, *Reproductive Genetic Services for Low-Income Women and Women of Color: Access and Sociocultural Issues*, in *WOMEN AND PRENATAL TESTING*, *supra* note 191, at 234–35.

¹⁹⁹ See R. Alta Charo & Karen H. Rothenberg, “*The Good Mother*”: *The Limits of Reproductive Accountability and Genetic Choice*, in *WOMEN AND PRENATAL TESTING*, at 195. The concern about unequal access to abortions was echoed by Justice Ginsburg in a recent interview. Emily Bazelon, *The Place of Women on the Court*, *N.Y. TIMES MAG.*, July 12, 2009, at 22, 47 (quoting Justice Ginsburg) (“The states that had changed their abortion laws before Roe [to make abortion legal] are not going to change back. So we have a policy that affects only poor women . . .”).

²⁰⁰ See generally Babak Khoshnood et al., *Socioeconomic and State-Level Differences in Prenatal Diagnosis and Live Birth Prevalence of Down’s Syndrome in the United States*, 51 *REV. EPIDEMIOLOGY* 617 (2003) (examining the impact of socioeconomic differences in prenatal testing on disparities in the live birth prevalence of congenital anomalies).

²⁰¹ See Philip Jacobs & Suzanne McDermott, *Family Caregiver Costs of Chronically Ill and Handicapped Children: Method and Literature Review*, 104 *PUB. HEALTH REPS.* 158, 159–60 (1989).

²⁰² See Deborah Kaplan, *Prenatal Screening and Its Impact on Persons with Disabilities*, 36 *CLINICAL OBSTETRICS & GYNECOLOGY* 605, 609–11 (1993).

differences in parental attitudes toward genetic testing or abortion;²⁰³ and knowledge about the possibility, benefits, and risks of genetic testing.²⁰⁴ Expectations imposed by family members,²⁰⁵ the prospective impact of a genetically affected child on the family unit,²⁰⁶ and costs and burdens to primary caregivers of children with genetic disabilities²⁰⁷ may also play a role. Finally, medical factors might include the delivery of genetic information by physicians and counselors,²⁰⁸ maternal and gestational age,²⁰⁹ and personal anxiety about genetic testing or abortion.²¹⁰

At first glance, any of these potential influences seems capable of explaining changes in prenatal testing or selective abortion rates. On closer inspection, however, it appears less likely that these factors, either independently or in combination, fully account for the Down syndrome birthrate decline in the years after the ADA's passage. We consider the potential influence of each factor in turn, beginning with prenatal diagnostic technology.

Although the technology of prenatal testing developed dramatically both in the decades prior to the enactment of the ADA and since the year 2000, the 1990s saw few technological advances in fetal testing.²¹¹ The oldest and most common

²⁰³ See Rayna Rapp, *Women's Responses to Prenatal Diagnosis: A Sociocultural Perspective on Diversity*, in *WOMEN AND PRENATAL TESTING*, *supra* note 191, at 219.

²⁰⁴ See Ruth S. Cowan, *Aspects of the History of Prenatal Diagnosis*, 8 *FETAL DIAGNOSIS & THERAPY* 10, 11–14 (1993) (discussing the history of amniocentesis and chorionic villus sampling).

²⁰⁵ See James R. Sorenson & Dorothy C. Wertz, *Couple Agreement Before and After Genetic Counseling*, 25 *AM. J. MED. GENETICS* 549, 553–54 (1986) (suggesting that most couples confront disagreement with respect to reproductive plans).

²⁰⁶ See Peter G. Pryde et al., *Prenatal Diagnosis: Choices Women Make About Pursuing Testing and Acting on Abnormal Results*, 36 *CLINICAL OBSTETRICS & GYNECOLOGY* 496, 503 (1993).

²⁰⁷ See Abby Lippman, *Prenatal Genetic Testing and Screening: Constructing Needs and Reinforcing Inequities*, 17 *AM. J.L. & MED.* 15, 41–44 (1991).

²⁰⁸ See Amy S. Kaiser et al., *The Effects of Prenatal Group Genetic Counseling on Knowledge, Anxiety and Decisional Conflict: Issues for Nuchal Translucency Screening*, 22 *J. OBSTETRICS & GYNECOLOGY* 246, 252 (2002) (concluding that anxiety metrics among those studied did not change significantly before counseling compared with after counseling).

²⁰⁹ See Ralph L. Kramer et al., *Determinants of Parental Decisions After the Prenatal Diagnosis of Down Syndrome*, 79 *AM. J. MED. GENETICS* 172, 174 (1998) (determining that surveyed patients who chose abortion following a positive fetal test for Down syndrome tended to be older and earlier in their pregnancy than those electing to continue their pregnancy).

²¹⁰ See Rita B. Black, *Prenatal Diagnosis and Fetal Loss: Psychosocial Consequences and Professional Responsibilities*, 35 *AM. J. MED. GENETICS* 586, 587 (1990).

²¹¹ Before prenatal testing, information about congenital disability in reproductive decision making was limited to carrier screening, which cannot diagnose particular defects in prenatal lives, but only identify recessive genes that would place individuals at an

fetal testing technique is amniocentesis.²¹² First developed in the 1950s, the procedure became routine by the 1970s, and since then it has undergone no significant technical refinements.²¹³ Just as in the 1970s, amniocentesis is currently performed in the second trimester of pregnancy, at sixteen to eighteen weeks into the gestation period.²¹⁴ The procedure involves the insertion of a hollow needle through the abdomen of a pregnant woman to remove a sample of the amniotic fluid surrounding the developing fetus.²¹⁵ The fluid contains fetal cells that can be examined to determine fetal sex, the number of cellular chromosomes, and specific genetic disorders.²¹⁶ The risk of fetal loss, approximately 0.5 percent, has remained roughly constant since the 1970s.²¹⁷

Another diagnostic procedure, chorionic villus sampling (CVS), was introduced in the early 1980s.²¹⁸ In CVS, a small tube is inserted through the vagina and cervix and into the placenta, from which a small amount of tissue is removed.²¹⁹ CVS can be performed several weeks earlier than amniocentesis, but it poses a higher risk of fetal loss, namely about 1 percent.²²⁰ CVS has advanced little in technical precision, invasiveness, or risk, however, since its pre-ADA inception,²²¹ decreasing the likelihood that the advent of this procedure had a significant impact on amniocentesis or selective abortion rates in the mid-1990s.²²² Similarly, a prenatal technique called the triple screen,²²³ a maternal blood

increased risk of having a child born with a disability. RUTH SCHWARTZ COWAN, *HEREDITY AND HOPE: THE CASE FOR GENETIC SCREENING* 10 (2008).

²¹² See R. Douglas Wilson, *Amniocentesis and Chorionic Villus Sampling*, 12 *CURRENT OPINION IN OBSTETRICS & GYNECOLOGY* 81, 81 (2000) (“Invasive prenatal diagnosis continues to be the gold standard for pregnancies.”).

²¹³ See COMMITTEE ON ASSESSING GENETIC RISKS, *ASSESSING GENETIC RISKS: IMPLICATIONS FOR HEALTH AND SOCIAL POLICY* 76 (Lori B. Andrews et al. eds., 1994).

²¹⁴ See Jane E. Brody, *Experts Explore Safer Tests for Down Syndrome*, *N.Y. TIMES*, Jan. 23, 2001, at F6.

²¹⁵ See Andrews et al., *supra* note 213, at 83.

²¹⁶ See *id.*

²¹⁷ See *id.*

²¹⁸ See M.J.J. Vekemans & Tracy B. Perry, *Cytogenetic Analysis of Chorionic Villi: A Technical Assessment*, 72 *HUM. GENETICS* 307, 307 (1986).

²¹⁹ See *id.*

²²⁰ See ELENA O. NIGHTINGALE & MELISSA GOODMAN, *BEFORE BIRTH: PRENATAL TESTING FOR GENETIC DISEASE* 35–36 (1990) (noting that the risk of miscarriage from this procedure is about the same as amniocentesis).

²²¹ See *THE MERCK MANUAL OF DIAGNOSIS AND THERAPY* 2146 (Mark H. Beers et al. eds., 18th ed. 2006).

²²² Boaz Weisz & Charles H. Rodeck, *An Update on Antenatal Screening for Down's Syndrome and Specific Implications for Assisted Reproduction Pregnancies*, 12 *HUM. REPRODUCTION UPDATE* 513, 518 (2006). Moreover, testing for the effects of CVS on disability-selective abortion—as done with amniocentesis—is not possible due to the lack of information on the test in the U.S. natality data.

²²³ This test is also known as the Triple Test, Multiple Marker Screening, or AFP Plus. See Triple Screen Test, American Pregnancy Association, <http://www.americanpregnancy.org/triple-screen-test>

screening test for fetal levels of alpha-fetoprotein protein, estriol hormone, and human chorionic gonadotropin hormone,²²⁴ had gained widespread use by the late-1990s, but it was not generally available in U.S. hospitals before 1998.²²⁵ It therefore seems unlikely that technological advances in diagnostic procedures can explain significant changes in reproductive decision making during the years between 1992 and 1998.

Legal changes may seem like a more plausible candidate, but reproduction law likewise saw few significant changes during the mid-1990s.²²⁶ Informed-consent laws and public funding of prenatal testing could have a range of plausible medical, material, and economic consequences tending to influence reproductive decision making. These factors may affect the availability of genetic testing providers, the required waiting period for genetic testing services, the delivery of genetic information to prospective parents by physicians and counselors, and the ability to pay for prenatal diagnosis.²²⁷ While amniocentesis is expensive, at a cost of a little more than \$1,000 in the early 1990s,²²⁸ most insurance plans covered prenatal tests long before the enactment of the ADA, especially for women older than thirty-five.²²⁹

In the years between 1990 and 1992, up to and until the Supreme Court reaffirmed the abortion right in *Planned Parenthood of Southern Pennsylvania v. Casey*,²³⁰ a small number of states passed laws making abortion more accessible or less expensive when the parent wished to avoid having a child with a disability. In the early 1990s, Maryland,²³¹ Kansas,²³² Texas,²³³ and Utah²³⁴ enacted statutes

pregnancy.org/prenataltesting/tripletest.html (last visited Sept. 1, 2009).

²²⁴ See Laurence A. Cole et al., *Hyperglycosylated Human Chorionic Gonadotropin (Invasive Trophoblast Antigen) Immunoassay: A New Basis for Gestational Down Syndrome Screening*, 45 *CLINICAL CHEMISTRY* 2109, 2109 (1999).

²²⁵ See George J. Knight et al., *Integrated Serum Screening for Down Syndrome in Primary Obstetric Practice*, 25 *PRENATAL DIAGNOSIS* 1162, 1162 (2005).

²²⁶ See Martha A. Field, *Killing "The Handicapped"—Before and After Birth*, 16 *HARV. WOMEN'S L.J.* 79, 110–113 (1993).

²²⁷ See Clayton, *supra* note 191, at 177.

²²⁸ See Paul S. Heckerling & Marion S. Verp, *A Cost-Effectiveness Analysis of Amniocentesis and Chorionic Villus Sampling for Prenatal Genetic Testing*, 32 *MED. CARE* 863, 867 (1994) (combining cost of counseling, ultrasound, procedure, and cytogenetic analyses for amniocentesis).

²²⁹ See generally J.P. Moatti et al., *Socio-cultural Inequities in Access to Prenatal Diagnosis: The Role of Insurance Coverage and Regulatory Policies*, 10 *PRENATAL DIAGNOSIS* 313, 315 (1990) (stating the majority of women in the study had amniocentesis covered by some type of insurance).

²³⁰ 505 U.S. 833 (1992).

²³¹ Maryland permitted abortion until twenty-six weeks' gestation if "[t]here is substantial risk of the birth of the child with grave and permanent physical deformity or mental retardation." *MD. PUB. HEALTH CODE ANN. § 20-208* (1991).

²³² Kansas permitted abortion in the third-trimester if "there is substantial risk . . . that the child would be born with physical or mental defect." *KAN. STAT. ANN. § 21-3407* (1991).

permitting late-term abortion only on narrow grounds, including diagnosis of fetal disability. During those same years, Washington,²³⁵ Minnesota,²³⁶ and California²³⁷ passed laws subsidizing prenatal tests. Tennessee,²³⁸ Iowa,²³⁹ and Maryland²⁴⁰ fund abortions to prevent disability but not for other reasons. Among reproductive laws passed before 1992 that affect parents' decisions to undergo prenatal testing or to continue a pregnancy following a positive test for fetal disability, few statutes have since been repealed or substantially amended, and few similar laws were enacted before 2000.²⁴¹

A plausible legal influence on selective abortion is the Family Medical Leave Act of 1993 (FMLA), which requires employers for most of the nation's workers to provide up to twelve weeks of unpaid leave of absence to care for the birth of a child, among other familial needs.²⁴² Some might speculate that the FMLA's protections for women in the workforce could incentivize having children at an earlier age and that resulting changes in maternal age patterns could in turn affect

²³³ Texas permitted abortion after viability if the fetus "has a severe and irreversible abnormality, as identified through reliable diagnostic procedures." TEX. REV. CIV. STAT. ANN. art. 44956 (1991).

²³⁴ Utah permitted abortion in the final term "if the unborn child would be born with grave defects." UTAH CODE ANN. §§ 76-7-301-317.1 (1992).

²³⁵ Washington required insurers who provide maternity benefits to include prenatal tests within the benefits package. Washington also required maternity benefits to include prenatal tests. *See* WASH. REV. CODE ANN. § 48.44.344 (1990) (group health care services contract to cover prenatal diagnosis); *Id.* § 48.46.375 (1990) (HMOs to cover prenatal diagnosis).

²³⁶ Minnesota also required maternity benefits to include prenatal tests. *See* 1991 MINN. CH. LAWS 33, § 36 (some insurance benefits to cover prenatal diagnosis) (codified at MINN. STAT. ANN. ch. 62K).

²³⁷ California also required maternity benefits to include prenatal tests. *See* CAL. INS. CODE § 10123.9 (1991) (group policy coverage of prenatal diagnosis); *id.* § 11512.18 (1991) (nonprofit hospital service plan coverage of prenatal diagnosis).

²³⁸ Tennessee gave public funding for abortion in cases where the fetus is "medically determined to have severe physical deformities or abnormalities or severe mental retardation" 1992 TENN. PUB. ACTS 1018, § 10, Item 4(3).

²³⁹ Iowa funded abortion when the "fetus is physically deformed, mentally deficient, or afflicted with a congenital illness." 1991 IOWA ACTS 267, §§ 103, b & 210, o(2).

²⁴⁰ Maryland subsidized abortion to avoid "congenital defect or serious deformity or abnormality." 1992 MD. LAWS 64, § 1, 32.17.01.02.

²⁴¹ *See Senator Jackie Speier Promotes New State Law to Save Lives and Prevent Birth Defects*, CALIF. CHRON., Oct. 31, 2006, at A8. *But cf.* Reva B. Siegel, *Dignity and the Politics of Protection: Abortion Restrictions Under Casey/Carhart*, 117 YALE L.J. 1694, 1706–96 (2008) (discussing abortion bans on the South Dakota ballot in 2006 and 2008, and recent informed consent restrictions in other states).

²⁴² During the leave period, health insurance coverage must be continued and the employee must be restored to his or her original position upon return. *See* Family Medical Leave Act of 1993, 29 U.S.C. §§ 2601–2654 (1988 & Supp. V 1993).

rates of fetal testing and termination.²⁴³ The FMLA offers no special provisions for children with disabilities, however, and natality data indicate that average maternal age is, at any rate, a statistically insignificant predictor of Down syndrome birthrates,²⁴⁴ making the FMLA an unlikely influence on disability-selective abortion rates in the 1990s.

Some states recognize “wrongful life” or “wrongful birth” torts, which might be thought to influence parental decisions to continue a pregnancy following prenatal testing for Down syndrome.²⁴⁵ In three states—California,²⁴⁶ New Jersey,²⁴⁷ and Washington²⁴⁸—a child born with a serious genetic disability may sue a physician if its parents show that they would have aborted had they been informed of the potential disability.²⁴⁹ In these lawsuits, genetic professionals can be held liable for birth defects if physicians or counselors did not meet the standard

²⁴³ See, e.g., Pinka Chatterji & Sara Markowitz, *Does the Length of Maternity Leave Affect Maternal Health?*, 72 S. ECON. J. 16, 17–38 (2005) (examining the impact of the length of maternity leave on maternal health).

²⁴⁴ See *infra* tbl.1.

²⁴⁵ Malpractice claims for wrongful life and wrongful birth are more common than claims for failure to inform of the risk of miscarriage from amniocentesis. See Wendy Fritzen Hensel, 40 HARV. C.R.-C.L. L. REV. 141, 151 (2005). This is likely due to the care with which testing providers characteristically discuss and document the details and risks of amniocentesis with their patients. See, e.g., *Bedel v. Univ. of Cinn. Hosp.*, 669 N.E.2d 9, 13–16 (Ohio Ct. App. 1995) (affirming the dismissal of an informed consent action alleging a physician’s failure to disclose the risks of miscarriage attending amniocentesis because the patient was verbally informed of the risk and signed three consent forms). Causes of action for misdiagnosing prenatal genetic disorder are also uncommon. See, e.g., *Martinez v. Long Island Jewish Hillside Med. Ctr.*, 512 N.E.2d 538, 538–39 (N.Y. 1987) (reversing the lower court’s dismissal of a claim for emotional distress against a physician for incorrectly diagnosing a fetal brain abnormality and reasoning that the plaintiff’s decision to terminate the pregnancy caused her psychological injury flowing from her belief that abortion is a sin except in unusual circumstances).

²⁴⁶ See *Curlender v. Bio-Science Labs.*, 165 Cal. Rptr. 477, 487 (Cal. Ct. App. 1980) (reasoning that disability-selective abortion is a desirable means of reducing the “increasingly large part of the overall health care burden” represented by children with congenital disabilities (quoting Note, *Father and Mother Know Best: Defining the Liability of Physicians for Inadequate Genetic Counseling*, 87 YALE L.J. 1488, 1496, 1499 (1978)). The *Curlender* court acknowledged in dicta that its reasoning would support a cause of action by a seriously disabled child against his parents for choosing to bring him into the world. *Id.* at 487–89. If parents make a conscious and informed choice to carry a seriously disabled child to term, the majority reasoned, nothing should “protect [them] from being answerable for the pain, suffering and misery which they have wrought upon their offspring.” *Id.* at 488.

²⁴⁷ See *Procanik v. Cillo*, 478 A.2d 755, 760 (N.J. 1984).

²⁴⁸ See *Harbeson v. Parke-Davis*, 656 P.2d 483, 497 (Wash. 1983).

²⁴⁹ The “adequate disclosure” requirement in medical informed consent law was established in *Canterbury v. Spence*, 464 F.2d 772, 782 (D.C. Cir. 1972) (involving a physician who failed to warn his patient of a risk of paralysis that could result from back surgery).

of care in offering prenatal testing to a high-risk patient, if they failed to diagnose a detectable defect through prenatal testing, or if they failed to inform the patient about a detected defect.²⁵⁰ Success in such suits requires parents to prove that they would have terminated the pregnancy had they learned of the genetic disorder in time to abort.²⁵¹ In 2007, a Florida couple was awarded \$21 million after a physician failed to prenatally diagnose their son with Smith-Lemli-Opitz syndrome, an obscure congenital disorder that inhibits the production of cholesterol.²⁵² Recognition of such suits could affect reproductive decision making to the extent that expected liability encourages physicians to endorse prenatal testing more often. However, all such state tort law has been on the books since before 1985,²⁵³ so it is unlikely this would have had a large effect on reproductive decision making in the 1990s.

No federal agency weighed in on the practice of genetic testing between 1982 and 2007. The American College of Obstetricians and Gynecologists (ACOG), which receives federal funds from the National Institutes of Health,²⁵⁴ released a technical bulletin in 1982 stating that “routine maternal serum prenatal screening of all [pregnant women] is of uncertain value.”²⁵⁵ Maternal serum screening is indeed a prenatal diagnostic technique with limited predictive capability.²⁵⁶ While the Food and Drug Administration approved the use of maternal serum screening for neural tube defects in 1983,²⁵⁷ it has never approved the use of that particular procedure to screen prenatally for Down syndrome.²⁵⁸ The ACOG prominently

²⁵⁰ See James Coplan, *Wrongful Life and Wrongful Birth: New Concepts for the Pediatrician*, 75 PEDIATRICS 65, 68 (1985).

²⁵¹ See *id.*

²⁵² See *Fla. Couple Wins \$21 Million in ‘Wrongful Birth’ Suit*, FOXNEWS, July 24, 2007, <http://www.foxnews.com/story/0,2933,290570,00.html>.

²⁵³ See, e.g., *Procanik v. Cillo*, 478 A.2d 755, 760–63 (N.J. 1984); *Harbeson*, 656 P.2d at 487–95; *Curlender v. Bio-Science Labs.*, 165 Cal. Rptr. 477, 486–90 (Cal. Ct. App. 1980).

²⁵⁴ See David Korn, *Data on NIH Funding to Medical School Departments Years 1984–1997*, COUNCIL OF ACADEMIC SOCIETIES MEMORANDUM (Aug. 3, 1998).

²⁵⁵ See American College of Obstetricians and Gynecologists (ACOG), Technical Bulletin No. 67, *Prenatal Detection of Neural Tube Defects* (1982). ACOG claimed that in the absence of high-quality laboratory, counseling, ultrasound, and amniocentesis services, the procedure “could simply increase cost and parental anxiety . . . and possibly lead to unnecessary abortions.” See *id.*

²⁵⁶ James E. Haddow et al., *Prenatal Screening for Down’s Syndrome with Use of Maternal Serum Markers*, 327 NEW ENG. J. MED. 588, 588–93 (1992) [hereinafter Haddow et al., *Prenatal Screening*]. The procedure consists of measuring four chemical markers present in a pregnant woman’s blood, abnormal levels of which may indicate increased risk for certain birth defects and genetic diseases. See James E. Haddow et al., *Screening of Maternal Serum for Fetal Down’s Syndrome in the First Trimester*, 338 NEW ENG. J. MED. 955, 955 (1998) [hereinafter Haddow et al., *Screening of Maternal Serum*].

²⁵⁷ James L. Mills & Lucinda England, *Food Fortification To Prevent Neural Tube Defects: Is It Working?*, 285 J. AM. MED. ASS’N 3022, 3022 (2001).

²⁵⁸ See Haddow et al., *Prenatal Screening*, *supra* note 256, at 588.

revisited the issue of prenatal testing for fetal disability in December 2007, when the organization recommended that hospitals and physicians be required to expand their offer of prenatal testing for Down syndrome and other common genetic disorders to pregnant women of all ages, not just to those thirty-five and older.²⁵⁹ While these most recent ACOG recommendations are very likely to influence amniocentesis and selective abortion rates in the future, their release in 2007 makes it implausible that they would have affected parental decision making during the period from 1992 to 2002.

The legal doctrine of informed consent could have influenced testing and abortion rates, insofar as it affects the delivery of genetic information to prospective parents by physicians and counselors.²⁶⁰ A seminal medical ethics textbook notes that the “primary justification advanced for requirements of informed consent has been to protect autonomous choice.”²⁶¹ Guided by the principle of autonomy, universities began offering degree programs in genetic counseling.²⁶² These courses were designed to help aspiring professionals educate patients about their genetic risks and testing options and to assist prospective

²⁵⁹ See Press Release, American College of Obstetricians and Gynecologists, New Recommendations for Down Syndrome: Screening Should Be Offered to All Pregnant Women (Jan. 2, 2007), available at http://www.acog.org/from_home/publications/press_releases/nr01-02-07-1.cfm; see also ACOG Practice Bulletin No. 88: Invasive Prenatal Testing for Aneuploidy, 110 OBSTETRICS & GYNECOLOGY 1459, 1465 (2007). The Senate Health, Education, Labor, and Pensions Committee responded by proposing legislation that would require prospective parents who receive a diagnosis of Down syndrome or any other genetic condition be provided with information about the condition as well as support services and networks that offer assistance in raising a child with the condition. See Prenatally and Postnatally Diagnosed Conditions Awareness Act of 2008, S. 1810, 110th Cong. § 2(1) (“It is the purpose of this Act to . . . increase patient referrals to providers of key support services for women who have received a positive diagnosis for Down syndrome, or other prenatally or postnatally diagnosed conditions, as well as to provide up-to-date information on the range of outcomes for individuals living with the diagnosed condition, including physical, developmental, educational, and psychosocial outcomes . . .”). The final bill, signed into law by President George W. Bush on October 8, 2008, provides for the establishment of “resource telephone hotlines” and “a national registry, or network of local registries, of families willing to adopt newborns with Down syndrome . . .” *Id.* § 3(b)(1)(B)(i), (iv). The law importantly requires health care providers receiving grants and other funds from the federal government to offer “[u]p-to-date, evidence-based, written information concerning the range of outcomes for individuals living with the diagnosed condition” and “[c]ontact information regarding support services” such as the hotlines established in § 3(b)(1)(B)(i) and educational programs at the national and local levels. *Id.* § 3(c)(1)(A)–(B).

²⁶⁰ See Susan J. Hayflick & M. Patrice Eiff, *Role of Primary Care Providers in the Delivery of Genetics Services*, 1 COMMUNITY GENETICS 18, 20 (1998) (explaining that genetic counselors begin by obtaining information including family history, medical history, and pregnancy history).

²⁶¹ TOM L. BEAUCHAMP & JAMES F. CHILDRESS, PRINCIPLES OF BIOMEDICAL ETHICS 77 (5th ed. 2001).

²⁶² *Id.*

parents in making reproductive decisions consistent with their values and goals.²⁶³ Since its inception, the field of genetic counseling has sought to distinguish its ideals from those of twentieth-century eugenics.²⁶⁴ It is not surprising, therefore, that the profession quickly adopted a nondirective approach that rejects specific recommendations in favor of a balanced and impartial presentation of all relevant information.²⁶⁵ Yet neither the professional ideals of genetic counseling nor the legal principle of informed consent has undergone significant changes over the past quarter century.²⁶⁶ The basic goal of nondirectiveness has not changed since the 1980s.²⁶⁷

The foregoing discussion suggests that legal, economic, medical, and technological factors cannot plausibly account for the large changes in Down syndrome birthrates observed during the 1990s.²⁶⁸ We cannot, of course, rule out these alternative explanations in the absence of considerably more rigorous research and analysis. Moreover, it may be that the social attitudes underlying changes in state reproductive laws *themselves* contributed to an increase in termination rates. One plausible explanation, however, is the “disappointing ADA” account we presented in Part III. We hypothesized that the ADA, through its influence on social interaction and media coverage, reinforced negative affective attitudes toward people with disabilities in general and toward those with Down syndrome in particular.²⁶⁹

We have not attempted to prove that any specific mechanism causally links the ADA to declining birthrates among children with Down syndrome. We have argued that two accounts of expressive externalities merit further investigation. The first is the ADA’s influence on increased interpersonal contact with people with disabilities. The second is the media’s framing of stories about people with disabilities. Our quantitative and qualitative results suggest that the ADA, as filtered through complex social networks and the media, may have contributed to the decline in Down syndrome birthrates from 1993 to 1998.²⁷⁰

²⁶³ See Robert Wachbroit & David Wasserman, *Patient Autonomy and Value-Neutrality in Nondirective Genetic Counseling*, 6 STAN. L. & POL’Y REV. 103, 104 (1995).

²⁶⁴ See Seymour Kessler, *The Psychological Paradigm Shift in Genetic Counseling*, 27 SOC. BIOLOGY 167, 168, 182 (1980) (discussing the shift from a genetic counseling model focusing on managing human heredity to the current model focusing on helping patients resolve problems and make decisions).

²⁶⁵ See Sonia M. Suter, *Value Neutrality and Nondirectiveness: Comments on “Future Directions in Genetic Counseling,”* 8 KENNEDY INST. ETHICS J. 161, 162 (1998).

²⁶⁶ See H.H. Chiang et al., *Informed Choice of Pregnant Women in Prenatal Screening Tests for Down’s Syndrome*, 32 J. MED. ETHICS 273, 274 (2006).

²⁶⁷ See Beth A. Fine, *The Evolution of Nondirectiveness in Genetic Counseling and Implications of the Human Genome Project*, in PRESCRIBING OUR FUTURE: ETHICAL CHALLENGES IN GENETIC COUNSELING 101, 105–06 (Dianne M. Bartels et al. eds., 1993).

²⁶⁸ See *supra* Part V.B.I.

²⁶⁹ See *supra* Part IV.B.

²⁷⁰ See *supra* Part V.B.I.

We suggest that policymakers supplement the passage of certain civil rights laws with public education campaigns on behalf of the protected group in question. Where reproductive practices are affected, physicians should refer parents who receive an unexpected diagnosis to resources such as local support groups, national disability organizations, and parents who have children with disabilities. Future research might apply our expressive approach to explore the impact civil rights laws protecting women or homosexuals may have had on the incidence of prenatal selection based on sex or sexual orientation. Other studies might consider the expressive effects of antidiscrimination or immigration law on the rate at which biological parents place particular groups of children up for adoption, or the rate at which parents choose to adopt these children over others once they enter state custody.

VI. CONCLUSION

This Article has considered whether, why, and how the Americans with Disabilities Act influenced the birthrate of infants with Down syndrome. Part II drew on expressive law theory to explain the connection between the ADA, social attitudes toward people with disabilities, and the practice of disability-selective abortion. We introduced the concept of expressive externalities to capture the social cost of legal actions unrelated to behavior the law was designed to regulate.

Part III presented competing hypotheses of the ADA's expressive effects for disability-selective abortion. The first hypothesis—what we called “the uplifting ADA”—suggests that the ADA encouraged parents to bring fetuses with Down syndrome to term by promoting new rights and opportunities for people with disabilities. The second hypothesis—“the disappointing ADA”—conjectured that the ADA paradoxically might have promoted disability-selective abortion if social interactions reinforced negative attitudes toward people with disabilities or if the media portrayed people with disabilities as incurring undesirable costs for society.

The econometric analysis in Part IV showed that Down syndrome birthrates decreased significantly and steadily from 1993 to 1998. The decline of 13 to 18 Down syndrome births per 100,000 was robust, even with the inclusion of demographic and health-related control variables and against the backdrop of highly stable prenatal screening rates. We did not find supportive evidence for a similar effect among infants with spina bifida and cleft palate. Part IV provided support for our argument about the expressivist effects of the ADA on Down-selective abortion, by accounting for variables related to technology, law, and medicine.

These conclusions yield important implications for reproduction and antidiscrimination law. First, we should be clear that we do not believe our findings justify restrictions on a woman's constitutional right to terminate a pregnancy for any reason, at least until the third trimester.²⁷¹ One reason not to

²⁷¹ See *Planned Parenthood of Se. Pa. v. Casey*, 505 U.S. 833, 843–53 (1992) (reaffirming the holding in *Roe v. Wade*, 410 U.S. 113 (1973)).

restrict abortions that are sought for particular purposes is that such prohibition carries costs that may outweigh any benefits of prevention. For example, attempts to criminalize disability-selective abortion could authorize easily abused inquiries into the legitimate reasons that women have for seeking abortions.²⁷² This is important because a woman's right to avoid the obligations and expectations that attend childbearing and childrearing is properly protected as a matter of moral and legal equality.²⁷³ The short-term effects we observe on disability-selective abortion nevertheless may give reason to advance public education campaigns²⁷⁴ to correct misleading social perceptions about the eight components of the disability-based reproductive utility function.²⁷⁵

Our expressive approach for analyzing the effects of disability law on social attitudes and reproductive behavior has fruitful and straightforward applications for other inquiries. Promising areas for additional research include adoption on the basis of race or disability, and prenatal selection for sex or for sexual orientation (to the extent that sexual orientation has a genetic basis).²⁷⁶ Future studies might investigate whether expressive externalities increase the rate at which biological parents place children with disabilities up for adoption, or whether expressive externalities decrease the rate at which adoptive parents choose to raise such children. Related projects might explore whether the second wave feminist movement had any impact on sex selection, or how the evolving legal and social

²⁷² See Martha Minow, *Beyond State Intervention in the Family: For Baby Jane Doe*, 18 U. MICH. J.L. REFORM 933, 937 (1984).

²⁷³ See, e.g., Kenneth L. Karst, *The Supreme Court 1976 Term Foreword: Equal Citizenship Under the Fourteenth Amendment*, 91 HARV. L. REV. 1, 57–59 (1977); Ruth Bader Ginsburg, *Some Thoughts on Autonomy and Equality in Relation to Roe v. Wade*, 63 N.C. L. REV. 375, 382–83 (1985); Catharine A. MacKinnon, *Reflections on Sex Equality Under Law*, 100 YALE L.J. 1281, 1311–24 (1991); Reva Siegel, *Reasoning from the Body: A Historical Perspective on Abortion Regulation and Questions of Equal Protection*, 44 STAN. L. REV. 261, 347–80 (1992).

²⁷⁴ See Heidi Zhou, *Doctors Urged to Rethink Options after Prenatal Down Syndrome Diagnosis*, NEWS 8 AUSTIN, Oct. 12, 2007, available at <http://www.news8austin.com/content/headlines/?ArID=193564&SecID=2> (discussing a campaign to educate health workers that was launched by the Down Syndrome Association of Central Texas).

²⁷⁵ See *supra* Part III.C.

²⁷⁶ A team of scientists at the National Institutes of Health reported discovering a “statistically significant correlation between the inheritance of genetic markers . . . and sexual orientation in a selected group of homosexual males.” Dean H. Hamer et al., *A Linkage Between DNA Markers on the X Chromosome and Male Sexual Orientation*, 261 SCIENCE 321, 321 (1993); see also Ivanka Savic & Per Lindström, *PET and MRI Show Differences in Cerebral Asymmetry and Functional Connectivity Between Homo- and Heterosexual Subjects*, 105 PROC. NAT'L ACAD. SCI. 9403, 9407 (finding that homosexual and heterosexual orientation appear to be linked to genetic brain structures rather than factors after birth).

status of homosexuals could influence selective abortion on the basis of sexual orientation, if such techniques became possible.²⁷⁷

Selective adoption patterns offer a fresh look at the impact of disability law on decisions to raise children with disabilities. A measurable increase in the rate at which children with disabilities are put up for adoption would presumably indicate that parents are less willing to rear them. Similarly, if adoptive parents tend to select healthy children over similarly situated children with disabilities, we would observe an ex post version of the fertility decisions examined between 1989 and 2002. Variation in preferences for male versus female children across countries and cultures is well-documented.²⁷⁸ In the last decade, fertility clinics have embraced a new technology that permits parents to choose a boy or girl *prior to fertilization*.²⁷⁹ This process, known as MicroSort, enjoys a 74 percent and 88 percent success rate in producing boys and girls, respectively.²⁸⁰ Expressive externalities could stimulate demand for one sex over the other if changes in law bring about changes in the relative value parents ascribe to male and female children. Even greater expressive externalities could attend the widespread passage of gay marriage laws in the wake of the U.S. Supreme Court decision in *Lawrence v. Texas*.²⁸¹

This Article has explored the surprising ways that antidiscrimination law can change social behavior in spheres completely unrelated to those that the law regulates. We puzzled through this phenomenon by considering the relation between the Americans with Disabilities Act and selective abortion following a positive test for Down syndrome. We examined the paradoxical possibility that the ADA could have served to prevent the existence of people with disabilities, the very class of persons the law was meant to protect. Our analysis does not indict the ADA or antidiscrimination law generally. Instead, we have called attention to the way that antidiscrimination law can, at least in the short-term, transform social interaction and media portrayals in ways that reinforce “society’s accumulated myths and fears about disability and disease.”²⁸² As the Nobel Prize-winning economist who popularized the concept of externalities observed almost fifty years ago:

²⁷⁷ Jonathan Tolins’s recent, acclaimed Broadway production *The Twilight of the Golds* imagines a world in which fetuses can be screened for sexual orientation. Jonathan Tolins, *The Twilight of the Golds*, in *THE LAST SUNDAY IN JUNE AND OTHER PLAYS* 103 (2004).

²⁷⁸ See Dorothy C. Wertz & John C. Fletcher, *Fatal Knowledge? Prenatal Diagnosis and Sex Selection*, 19 *HASTINGS CTR. REP.* 21, 24 (1989); John A. Robertson, *Preconception Gender Selection*, 1 *AM. J. BIOETHICS* 1, 2 (2001).

²⁷⁹ See Keith L. Blauer, *Human Sperm Sorting Method is Showing Success at Separating the Girls from the Boys*, 16 *GENETICS & IVF INST. NEWSL.* 2 (2002).

²⁸⁰ See MicroSort Gender Selection, <http://www.microsort.com> (last visited Sept. 1, 2009).

²⁸¹ 539 U.S. 558 (2003).

²⁸² *Sch. Bd. of Nassau County v. Arline*, 480 U.S. 273, 284 (1987).

[I]n choosing between social arrangements within the context of which individual decisions are made, we have to bear in mind that a change in the existing system which will lead to an improvement in some decisions may well lead to a worsening of others.²⁸³

Heeding Coase's insight does not mean that antidiscrimination law—or any other legal provision—will necessarily generate controversial trade-offs. Our analysis suggests, however, that we would do well to contemplate the attitudinal and behavioral changes implicated by major legal changes. Our growing power over genetic testing and reproductive biotechnology gives special reason to attend to such collateral effects. Accounting for expressive externalities can enhance our understanding of the complex ways that people make decisions and help secure the promise of civil rights and self-respect for those in need of the law's protection.

²⁸³ Coase, *supra* note 75, at 44.

APPENDIX

Table 1: Summary Statistics (1989–2002)

	Mean	Standard Deviation
Down syndrome births (per 100,000)	52.20	24.57
Spina bifida births (per 100,000)	25.48	15.79
White mothers (%)	79.67	15.65
Married mothers (%)	69.08	7.66
College-educated mothers (%)	21.64	6.34
Mother's age at birth	26.71	1.03
Birth order (including newborn child)	2.02	0.11
Births subject to amniocentesis (%)	2.91	1.56
Number of prenatal visits	11.35	0.69

Source: National Center for Health Statistics Annual Natality Detail Files.

Notes: The summary statistics are derived from the set of state-year observations such that $N = 714$.

**Table 2: Estimated Annual Changes in Down Syndrome Birthrates
(1989–2002)**

	(1)	(2)	(3)	(4)
1991	-3.69 (3.19)	-4.93 (3.34)	-3.67 (3.20)	-5.17 (3.19)
1992	-3.80 (2.77)	-5.96 (3.95)	-4.00 (2.81)	-6.57 (3.69)
1993	-8.80** (3.79)	-11.72** (4.72)	-9.24** (3.96)	-13.33*** (4.64)
1994	-8.16** (3.54)	-11.46 (6.26)	-9.21** (3.88)	-14.39** (6.21)
1995	-11.00*** (3.99)	-14.36** (6.33)	-12.46*** (4.29)	-18.21*** (6.09)
1996	-6.24 (3.75)	-10.25 (6.79)	-7.45 (3.82)	-13.76** (6.22)
1997	-9.92** (4.00)	-14.80** (7.22)	-10.47** (4.42)	-17.67** (6.67)
1998	-10.32*** (3.71)	-15.62** (7.48)	-9.94** (4.40)	-17.51** (7.21)
1999	-7.69** (3.95)	-13.47 (8.40)	-6.59 (4.93)	-14.93 (8.05)
2000	-1.41 (3.85)	-8.23 (9.23)	0.84 (4.94)	-8.61 (9.11)
2001	-5.24 (3.48)	-12.50 (9.79)	-2.15 (5.08)	-12.01 (9.51)
2002	-4.10 (3.70)	-11.97 (10.04)	-0.11 (5.36)	-10.88 (9.73)
Demographic Controls?	No	Yes	No	Yes
Health Controls?	No	No	Yes	Yes
N	714	714	714	714

Source: National Center for Health Statistics Annual Natality Detail Files.

Notes: The dependent variable in each OLS regression is the birthrate for infants with Down syndrome in each state and year. All regressions except Column 1 include state fixed effects. Robust standard errors are clustered at the state level. Demographic controls include: (a) average age at childbirth of mother in state s , year t ; (b) share of women who are white giving birth in state s , year t ; (c) share of women with some college education or less, at childbirth in state s , year t ; and (d) share of married women at childbirth in state s , year t . Medical and health controls include: (a) average live birth order (including the current birth) in state s , year t ;

(b) average number of prenatal visits in state s , year t ; and (c) share of live births subject to amniocentesis in state s , year t . ** = significance at the 5% level and *** = significance at the 1% level.

Table 2 (Cont.): Estimated Annual Changes in Down Syndrome Birthrates (1989–2002)

	(1)	(2)	(3)	(4)
Average Maternal Age	-	6.18 (6.29)		9.14 (6.70)
Percentage Married	-	-8.79 (49.56)		-24.60 (52.19)
Percentage White	-	-141.26** (58.01)		-156.79*** (55.42)
Share with College Education	-	11.05 (83.60)		-3.63 (73.39)
Average Birth Order	-		-41.76 (23.58)	-71.03*** (25.26)
Average Number of Prenatal Visits	-		2.02 (3.12)	2.77 (3.17)
Share using Amniocentesis	-		312.95 (170.21)	252.07 (180.87)

Source: National Center for Health Statistics Annual Natality Detail Files.

Notes: The dependent variable in each OLS regression is the birthrate for infants with Down syndrome in each state and year. All regressions except Column 1 include state fixed effects. Robust standard errors are clustered at the state level. ** = significance at the 5% level and *** = significance at the 1% level.

**Table 3: Estimated Annual Changes in Spina Bifida Birthrates
(1989–2002)**

	(1)	(2)	(3)	(4)
1991	-1.97 (1.64)	-1.03 (1.94)	-1.78 (1.63)	-1.27 (1.93)
1992	-2.38 (2.77)	-0.15 (2.83)	-2.01 (2.87)	-0.48 (2.77)
1993	2.04 (2.76)	5.34 (3.21)	2.48 (2.94)	5.11 (3.25)
1994	-0.74 (2.01)	3.83 (3.61)	-0.42 (2.16)	3.45 (3.83)
1995	2.23 (2.14)	8.15 (3.96)	2.59 (2.57)	7.89 (4.11)
1996	0.73 (2.55)	7.56 (4.25)	1.33 (2.79)	7.32 (4.50)
1997	-2.88 (2.61)	4.51 (4.48)	-1.62 (2.94)	4.89 (4.71)
1998	-6.93 ^{***} (2.31)	0.92 (4.48)	-5.07 (2.58)	1.80 (4.52)
1999	-5.36 (2.75)	3.18 (4.80)	-2.98 (3.42)	4.71 (4.83)
2000	-4.48 (2.36)	4.52 (5.04)	-1.39 (3.22)	6.82 (5.12)
2001	-5.03 (2.83)	4.74 (5.05)	-1.45 (3.62)	7.48 (4.99)
2002	-5.16 ^{**} (2.40)	5.49 (5.49)	-0.96 (3.50)	8.90 (5.64)
Demographic Controls?	No	Yes	No	Yes
Health Controls?	No	No	Yes	Yes
N	714	714	714	714

Source: National Center for Health Statistics Annual Natality Detail Files.

Notes: The dependent variable in each OLS regression is the birthrate for infants with spina bifida in each state and year. All regressions except Column 1 include state fixed effects. Robust standard errors are clustered at the state level. Demographic controls include: (a) average age at childbirth of mother in state s , year t ; (b) share of women who are white giving birth in state s , year t ; (c) share of women with some college education or less, at childbirth in state s , year t ; and (d) share of married women at childbirth in state s , year t . Medical and health controls include: (a) average live birth order (including the current birth) in state s , year t ;

(b) average number of prenatal visits in state s , year t ; and (c) share of live births subject to amniocentesis in state s , year t . ** = significance at the 5% level and *** = significance at the 1% level.

Table 3 (Cont.): Estimated Annual Changes in Spina Bifida Birthrates (1989–2002)

	(1)	(2)	(3)	(4)
Average Maternal Age	-	-4.45 (3.83)		-5.28 (5.82)
Percentage Married	-	16.99 (52.16)		1.95 (52.74)
Percentage White	-	-46.44 (35.24)		-33.63 (33.80)
Share with College Education	-	-62.95 (33.79)		-60.58 (34.89)
Average Birth Order	-		-30.23 (18.25)	-16.79 (23.46)
Average Number of Prenatal Visits	-		-1.95 (2.34)	-0.95 (2.59)
Share using Amniocentesis	-		218.52 (133.54)	261.18 ^{**} (112.21)

Source: National Center for Health Statistics Annual Natality Detail Files.

Notes: The dependent variable in each OLS regression is the birthrate for infants with spina bifida in each state and year. All regressions except Column 1 include state fixed effects. Robust standard errors are clustered at the state level. ** = significance at the 5% level and *** = significance at the 1% level.

**Table 4: Estimated Annual Changes in Cleft Palate Birthrates
(1989–2002)**

	(1)	(2)	(3)	(4)
1991	-2.26 (4.10)	0.35 (4.17)	-2.21 (4.04)	0.14 (3.89)
1992	-6.60 (4.11)	-2.44 (5.43)	-6.71 (4.27)	-2.92 (5.30)
1993	-0.07 (4.02)	5.77 (5.96)	-0.09 (4.18)	5.52 (6.19)
1994	1.25 (4.35)	9.13 (7.52)	0.79 (5.31)	8.53 (7.83)
1995	-2.83 (4.76)	6.46 (7.66)	-3.39 (5.70)	5.91 (8.15)
1996	0.30 (5.11)	10.72 (9.60)	0.02 (6.08)	10.45 (10.02)
1997	-2.57 (5.48)	7.90 (8.94)	-1.59 (6.71)	8.84 (9.14)
1998	-2.95 (4.50)	8.34 (9.21)	-0.51 (5.90)	10.66 (9.56)
1999	-7.15 (4.49)	4.77 (9.22)	-3.30 (6.82)	8.63 (9.57)
2000	-3.94 (4.71)	8.04 (10.55)	1.71 (7.08)	13.88 (11.18)
2001	-3.13 (4.92)	9.83 (10.63)	3.77 (7.33)	17.08 (10.88)
2002	-2.18 (5.14)	11.88 (12.56)	6.33 (7.75)	20.90 (12.98)
Demographic Controls?	No	Yes	No	Yes
Health Controls?	No	No	Yes	Yes
N	714	714	714	714

Source: National Center for Health Statistics Annual Natality Detail Files.

Notes: The dependent variable in each OLS regression is the birthrate for infants with cleft palate in each state and year. All regressions except Column 1 include state fixed effects. Robust standard errors are clustered at the state level. Demographic controls include: (a) average age at childbirth of mother in state s , year t ; (b) share of women who are white giving birth in state s , year t ; (c) share of women with some college education or less, at childbirth in state s , year t ; and (d) share of married women at childbirth in state s , year t . Medical and health controls include: (a) average live birth order (including the current birth) in state s , year t ;

(b) average number of prenatal visits in state s , year t ; and (c) share of live births subject to amniocentesis in state s , year t . ** = significance at the 5% level and *** = significance at the 1% level.

Table 4 (Cont.): Estimated Annual Changes in Cleft Palate Birthrates (1989–2002)

	(1)	(2)	(3)	(4)
Average Maternal Age	-	-1.62 (7.65)		-5.65 (10.51)
Percentage Married	-	119.71 (85.74)		109.21 (98.74)
Percentage White	-	-138.50** (66.94)		-136.38** (67.50)
Share with College Education	-	-46.68 (97.44)		-36.59 (99.81)
Average Birth Order	-		-54.16 (40.94)	-41.22 (47.29)
Average Number of Prenatal Visits	-		-0.26 (4.36)	2.46 (5.03)
Share using Amniocentesis	-		584.71** (243.03)	589.23** (248.52)

Source: National Center for Health Statistics Annual Natality Detail Files.

Notes: The dependent variable in each OLS regression is the birthrate for infants with cleft palate in each state and year. All regressions except Column 1 include state fixed effects. Robust standard errors are clustered at the state level. ** = significance at the 5% level and *** = significance at the 1% level.

Table 5: Annual Changes in Down Syndrome Birthrates by Maternal Age (1989–2002)

	Under 35		At least 35	
	(1)	(2)	(3)	(4)
1991	-6.15** (2.51)	-6.73** (2.85)	12.60 (18.28)	8.81 (19.82)
1992	-4.94 (2.89)	-6.42 (4.03)	-7.99 (14.73)	-13.93 (20.49)
1993	-11.32*** (3.31)	-13.61*** (4.50)	-4.16 (13.97)	-11.87 (21.48)
1994	-12.20*** (3.29)	-15.42** (5.92)	-3.64 (13.58)	-11.64 (20.55)
1995	-13.35*** (3.39)	-17.19*** (6.19)	-22.88 (14.99)	-30.19 (30.55)
1996	-11.08*** (3.64)	-14.66** (7.24)	-4.56 (15.46)	-12.91 (26.59)
1997	-13.98*** (3.38)	-17.49** (7.13)	-17.97 (16.95)	-26.69 (35.43)
1998	-14.17*** (2.90)	-16.84** (7.08)	-20.42 (13.22)	-28.33 (35.89)
1999	-15.86*** (3.32)	-18.15** (8.03)	9.56 (13.34)	1.81 (36.48)
2000	-12.93*** (2.94)	-14.85 (8.77)	40.33** (19.21)	31.74 (32.16)
2001	-13.50*** (3.27)	-14.85 (9.68)	9.08 (10.97)	0.96 (41.10)
2002	-14.73*** (3.17)	-15.77 (9.66)	28.75 (15.37)	20.39 (43.79)
Demographic Controls?	No	Yes	No	Yes
Health Controls?	No	Yes	No	Yes
N	714	714	714	714

Source: National Center for Health Statistics Annual Natality Detail Files.

Notes: The dependent variable in each OLS regression is the birthrate for infants with Down syndrome in each state and year. All regressions except Columns 1 and 3 include state fixed effects. Robust standard errors are clustered at the state level. Demographic controls include: (a) average age at childbirth of mother in state s , year t ; (b) share of women who are white giving birth in state s , year t ; (c) share of women with some college education or less, at childbirth in state s , year t ; and (d) share of married women at childbirth in state s , year t . Medical and health controls

include: (a) average live birth order (including the current birth) in state s , year t ; (b) average number of prenatal visits in state s , year t ; and (c) share of live births subject to amniocentesis in state s , year t . ** = significance at the 5% level and *** = significance at the 1% level.