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Technology, Commerce, Development, Identity

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Technology, Commerce, Development, Identity

Andrea M. Matwyshyn*

Traditional paradigms of technology regulation ask how technology-mediated space[1] is different from non-technology mediated space. Regulation rarely focuses on how technology makes a user develop differently than she/he otherwise would and what those differences might mean for regulatory approaches. Yet, this is perhaps the most important inquiry regulators should undertake as they grapple with crafting law that guides future generations of technology developers and users.

Human development[2]-centered legislative analyses of new technologies may be rare because a flawed assumption is widely held in the law regarding the nature of human development. Human development has traditionally been conceptualized as a linear proposition—a steady upward trajectory with expected outcomes based on age. We use bright line age restrictions in many contexts, for example, presuming adults are more developed than children.[3]

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1. When I speak of technology-mediated space, I mean the totality of all human exchanges that rely on technology to facilitate them in material part. For example, all exchanges through the Internet are "technology mediated", as are automated teller withdrawals, airport check-in procedures, and credit card transactions in real space.

2. *See, e.g.*, Biology Online, *available at* http://www.biology-online.org/dictionary/Human_development (last visited Apr. 11, 2007) (human development is "continuous sequential changes which occur in the physiological and psychological functions during the individuals [sic] life").

3. For example, only people aged eighteen or over are typically allowed

The premise for this approach is founded in the traditional developmental psychology theory of Jean Piaget[4] and his progeny. However, more recent theories of developmental psychology point out the flaws in reliance on linear paradigms.[5] The major shortcoming of the linear approach is its failure to acknowledge the role that the environment and cultural tools,[6] such as technology, play in development. Variations in developmental context result in fundamentally different developmental outcomes.[7] This variation presents a critical question for the future of technology regulation. By changing the technology tools of an environment, users' development is fundamentally altered, and regulation focused on a particular technology tool becomes obsolete.[8] These dynamics are better

to vote in political elections in the United States.

4. Key works of Jean Piaget include B. INHELDER & J. PIAGET, THE EARLY GROWTH OF LOGIC IN THE CHILD: CLASSIFICATION AND SERIATION (E. A. Lunzer & D. Papert, trans., W. W. Norton & Company, Inc. 1964); BÄRBEL INHELDER & J. PIAGET, THE GROWTH OF LOGICAL THINKING FROM CHILDHOOD TO ADOLESCENCE: AN ESSAY ON THE CONSTRUCTION OF FORMAL OPERATIONAL STRUCTURES (Anne Parsons & Stanley Milgram, trans., Basic Books, Inc. 1958); J. PIAGET, BIOLOGY AND KNOWLEDGE (Beatrix Walsh, trans., Univ. of Chicago Press 1971) (1967); J. PIAGET, THE CHILD'S CONCEPTION OF NUMBER (C. Gattegno & F. M. Hodgson, trans., Routledge & Kegan Paul Ltd. 1952) (1941); JEAN PIAGET, THE CHILD'S CONCEPTION OF THE WORLD (1928); J. PIAGET, THE CHILD'S CONSTRUCTION OF REALITY (1955); JEAN PIAGET, INTRODUCTION A L'ÉPISTÉMOLOGIE GÉNÉTIQUE: TOMES 1-3 (Presses Universitaires de France, 1950); J. PIAGET, LOGIQUE ET CONNAISSANCE SCIENTIFIQUE (1967); J. PIAGET, THE MORAL JUDGMENT OF THE CHILD (Marjorie Gabain, trans., Kegan Paul, Trench, Trubner & Co., 1932); J. PIAGET, THE ORIGINS OF INTELLIGENCE IN CHILDREN (Margaret Cook, trans., Int'l Univ. Press, Inc. 1953) (1936); J. PIAGET, SOCIOLOGICAL STUDIES (Leslie Smith, ed., Terrance Brown et al., trans., Routledge 1995) (1965); J. PIAGET, STUDIES IN REFLECTING ABSTRACTION (Robert L. Campbell, ed. & trans., Psychology Press 2001) (1977) [hereinafter PIAGET, REFLECTING ABSTRACTION].

5. *See, e.g.*, LEV VYGOTSKY, THOUGHT AND LANGUAGE (1962).

6. The term "cultural tool" is loosely defined as a tool which permits an individual to accomplish more than she/he otherwise could and arose out of the work of developmental psychologist Lev Vygotsky. For a discussion of cultural tools, see James V. Wertsch & Peeter Tulviste, *L. S. Vygotsky and Contemporary Developmental Psychology*, *in* AN INTRODUCTION TO VYGOTSKY SECOND EDITION 59, 67 (Harry Daniels ed. 2d ed., 2005)

7. For example, a teenager with a laptop and an email account living in Minneapolis can befriend a person living in Ghana and learn information about life in Ghana otherwise unavailable to this teen. The cumulative learning arising out of these technology facilitated experiences alter the developmental process of this Minneapolis teenager.

8. For example, the Controlling the Assault of Nonsolicited Pornography and Marketing Act (CAN-SPAM Act) fell prey to this flawed assumption.

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

addressed by nonlinear developmental psychology than by traditional linear paradigms.

This article introduces nonlinear developmental paradigms of contextualist and ecological developmental psychology theory to the debate over technology regulation. It argues that technology regulation presents a strong example of the dangers and inefficiencies of blindly adopting an approach to regulating human conduct based solely on linear developmental assumptions. This article specifically explores the legal implications of technology-mediated human development using the technology policy arena of corporate child data security contracting regulation.

Section I introduces the major debates in current legal literature regarding technology regulation and describes the role of linear developmental assumptions in certain existing regulatory paradigms. Section II presents an introduction to nonlinear developmental psychology theory, contrasts it to linear theory, and describes the pivotal role that technology tools play in developmental outcomes. Section III uses the example of the Children's Online Privacy Protection Act (COPPA)[9] and the corporate child data protection contracting obligations thereunder to illustrate the practical shortcomings of always presuming developmental linearity in regulatory paradigms. Section IV argues that technology regulation should first and foremost be understood as the regulation of human development; it usually requires a nonlinear developmental paradigm as its starting point. Only regulation which adopts a focus on user behaviors in social context can succeed; regulation focusing on technology creation, on the

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Controlling the Assault of Nonsoliticed pronography and Marketing Act of 2003, Pub. L. No. 108-187, 117 Stat. 2699 (2003) (codified at 15 U.S.C. §§ 7701-7713 and 18 U.S.C. § 1037). The definition of the types of technology communications regulated by the CAN SPAM Act are limited to email communications and do not consider the same regulatory concerns posed by, for example, unsolicited instant messaging communications. As such, the legislation has limited efficacy because the technology used for the communications adapts to accommodate the existence of a technology specific regulatory paradigm. Developers of code simply generated work around solutions for the content and users continue to receive unwanted technology mediated communications. For a discussion of definitional shortcomings of "spam" under the CAN SPAM Act and technology adaptation see, e.g., Andrea M. Matwyshyn, *Penetrating the Zombie Collective: Spam as an International Security Issue*, 3 SCRIPT-ED 4 (2006); Andrea M. Matwyshyn, *Spam and Security: Recognizing the Connection and Assessing Legal Strategy After the CAN-SPAM Act*, 5 ILB 307 (March 2004).

9. Children's Online Privacy Protection Act, 15 U.S.C. §§ 1651-6506 (2000).

other hand, will not. Our regulatory paradigms must be sensitive to these emergent[10] human development dynamics.

I. TRADITIONAL REGULATION PARADIGMS FOR TECHNOLOGY-MEDIATED COMMERCE: IS TECHNOLOGY SPECIAL?

Society has undergone an economic and cultural shift driven by technology.[11] Both industry pundits[12] and the U.S Department of Commerce assert that the "new economy" is not a myth and that a fundamental, information technology-driven change has occurred.[13] In a 2002 report, the Department of Commerce[14] indicated that despite the recession within the

10. Emergence is order that arises from the interactions of individual actors within a complex system, demonstrating a global pattern that could not have been forecast simply from understanding the behavior of one particular actor. *See* STEVEN JOHNSON, EMERGENCE: THE CONNECTED LIVES OF ANTS, BRAINS, CITIES AND SOFTWARE 18 (Scribner 2001).

11. Lee Price & George McKittrick, *Setting the Stage: The "New Economy" Endures Despite Reduced IT Investment*, *in* DIGITAL ECONOMY 2002 1, 5 (U.S. Dep't of Commerce 2002), *available at* https://www.esa.doc.gov/reports/DE2002r1.pdf.

12. *See, e.g.*, ASPEN INSTITUTE, WHEN PUSH COMES TO PULL: THE NEW ECONOMY AND CULTURE OF NETWORKING TECHNOLOGY (2006), *available at* http://www.aspeninstitute.org/atf/cf/%7BDEB6F227-659B-4EC8-8F84-8DF23CA704F5%7D/2005InfoTechText.pdf

13. *See* Price & McKittrick, *supra* note 11, at 5 ("The central feature of the [technology-driven] 'new economy' has been a higher growth rate of productivity, which in turn has brought faster gains in our standards of living.").

14. David Henry & Donald Dalton, *Information Technology Industries in the New Economy*, *in* DIGITAL ECON. 2002 23, 23-24 (U.S. Dep't of Commerce 2002), *available at* https://www.esa.doc.gov/reports/DE2002r1.pdf. The information technology industry is credited with 29% of the United States' economy's real growth, and 26% of such growth in 2000. *Id.* at 25-26. During 2001, "as employment dropped by 1.4 percent in the total private sector, employment gained 0.5 % in telecom services and 1.4 % in computer software and services." Price & McKittrick, *supra* note 11, at 4-5. As of 2003, the most recent year in which a report was published, "IT producing industries became once again an important ingredient in an overall U.S. economic expansion." David Henry & Donald Dalton, *Information Technology Producing Industries—Hopeful Signs in 2003*, *in* DIGITAL ECON. 2003 9, 9 (U.S. Dep't of Commerce 2003), *available at* https://www.esa.doc.gov/2003.cfm (follow Digital Economy 2003 Chapter 1 hyperlink). Similarly, as of 2002, seven of the ten fastest growing occupations were projected to be in the information technology industry. Sandra D. Cooke, *Jobs in the New Economy*, *in* DIGITAL ECON. 2002 41, 48 (U.S. Dep't of Commerce 2002), *available at* https://www.esa.doc.gov/reports/DE2002r1.pdf . Meanwhile, in late 2002, Silicon Valley began to recover from the technology bust of 2000-2001. Jim Hopkins, *Hints of recovery in Silicon Valley*, USA TODAY, Dec. 11, 2002, at 3B.

industry, information technology producers still contributed disproportionately to the United States' economic growth and continued to grow at double digit rates.[15] Most people consider familiarity with computers an essential element of the ability to achieve future economic success.[16] This section briefly reviews the historical legal debate surrounding three key sets of technology policy issues from the last ten years. In each set of issues, judges and regulators have been asking themselves whether technology regulation is "special." In other words, judges have been forced to confront the question of whether current regulatory paradigms can expand to successfully address technological innovation. This question remains unresolved for each set of issues, questioning the success of current regulatory paradigms. A new set of regulatory paradigms may be needed, one that is able to evolve alongside and simultaneously with the technology interactions it governs.

A. DO TECHNOLOGY TRANSACTIONS REQUIRE SPECIAL RULES?

Perhaps the earliest case law and legal theory discussions of appropriate paradigms for technology regulation occurred in the context of technology contracting.[17] Technology, both as

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Studies indicate, however, that increasing numbers of workers are not able to acquire access to the technological resources needed to ensure productivity in a progressively digitized world economy. *See* Luc Soete, *ICT's and Employment: The Problem of Job Quality*, 140 INT'L LABOUR REV. 143, 156 (2001). The impact of information and communications technologies on jobs is not yet known and no outcome is inevitable. *See id.* at 160. Technology-driven changes in organizational structures, employment relations, worker autonomy, and work organization will not automatically result in higher job quality. *See id.* at 154-57. In 2000, 800,000 technology jobs were estimated to have gone unfilled because of a dearth of qualified workers. Microsoft Corp., Valuing Diversity, http://www.microsoft.com/issues/essays/2000/11-15diversity.mspx (Published Nov. 15, 2000). This resulted in an estimated opportunity cost of $4 billion per year. *Id.* Although numbers from 2000 may reflect inflated employment resulting from the technology "bubble," the "[g]rowth in demand for high quality digital products and electronically delivered services is expected to fuel the demand for skilled IT workers in the future." Cooke, *supra*, at 59.

15. *Id.*

16. *See, e.g.*, EDUCATIONAL SERVICES & ECONOMIC DEVELOPMENT DIVISION INSTRUCTIONAL RESOURCES AND TECHNOLOGY UNIT, CHANCELLOR'S OFFICE, CALIFORNIA COMMUNITY COLLEGES, TECHNOLOGY II STRATEGIC PLAN 2000-2005 1 (2000), *available at* http://eric.ed.gov/ERICDocs/data/ericdocs2/content_storage_01/0000000b/80/26/03/80.pdf.

17. *See, e.g.*, Step-Saver Data Sys. v. Wyse Tech., 939 F.2d 91 (3d Cir. 1991) (deciding the issue of what constituted the agreed use of the technology).

the subject matter of agreements[18] as well as the technological means of contract formation,[19] presented challenges to traditional contracting paradigms.[20] Similarly, technology exacerbated preexisting doctrinal tensions in contract law with regard to, for example, the tension between the efficiency of form contracting and the desire for personalized assent in contracts.[21]

As the subject matter of transactions, new technology raised questions regarding whether separate default rules under the Uniform Commercial Code (UCC) should be required for software transactions.[22] Proponents of revisions to the UCC argue that software presents a different context from a standard goods transaction and calls for new rules.[23] Those opposed argued that previous rules could grow to encompass changes in types of goods and that attempting to craft technology-specific rules would result in a limited approach that would be outgrown.[24] Ultimately, the UCC Article 2

18. I am referring to debates over agreements such as software and digital content licensing agreements, software and website development agreements, and online services agreements such as hosting agreements. For a discussion of issues in software licenses, see, e.g., Robert Gomulkiewicz, *Getting Serious About User-Friendly Mass Marketing Licensing for Software*, 12 GEO. MASON L. REV. 687 (2004).

19. I am referring to debates over enforceability of, for example, clickwrapped agreements versus browsewrapped agreements such as terms of use. For a discussion of terms of use, see, e.g., Mark Lemley, *Terms of Use*, 91 MINN. L. REV. 459 (2006).

20. Specht v. Netscape, 150 F. Supp. 2d 585, 587 (S.D.N.Y. 2001), *aff'd*, 306 F.3d 17 (2d Cir. 2002) ("Assent may be registered by a signature, a handshake, or a click of a computer mouse transmitted across the invisible ether of the Internet."); ProCD, Inc. v. Zeidenberg, 86 F.3d 1447, 1451-53 (7th Cir. 1996) (in which the use of software was at issue). For a discussion and analysis of the above and other cases dealing with contracts and software use, see Ryan J. Casamiquela, *Contractual Assent and Enforceability in Cyberspace*, 17 BERKELEY TECH. L.J. 475 (2002).

21. *See, e.g.*, ProCD, Inc., 86 F.3d at 1451-53 (pointing out the regularity of purchasing software before agreeing to the terms of use and discussing when a contract is formed).

22. *See, e.g.*, Warren E. Agin & Scott N. Kumis, *A Framework for Understanding Electronic Information Transactions*, 15 ALB. L.J. SCI. & TECH. 277, 298 (2005). Today the digital contracting landscape has been further complicated by the software industry's shift from an off-the-shelf software model to a services-focused model which includes both code and support. *Id.* at 299.

23. Lorin Brennan, *Understanding the Uniform Computer Information Transactions Act and the Uniform Electronic Transactions Act: Why Article 2 Cannot Apply to Software Transactions*, 38 DUQ. L. REV. 459, 534-45 (2000).

24. Peter A. Alces, *W(h)ither Warranty: The B(l)oom of Products Liability*

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

revision was considered impractical by many and it did not gain widespread acceptance.[25] Whether there should be default rules in technology transactions remains unresolved, particularly with regard to default contracting rules for using, sharing and creating open source code.[26]

In the context of legislating rules for technology mediated contract formation, federal[27] and state[28] digital signature

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in Cases of Sufficient Software Design, 87 CAL. L. REV. 269, 277 (1999).

25. The revisions were not approved by the National Conference of Commissioners on Uniform State Laws. *Compare* NAT'L CONFERENCE OF COMM'RS ON UNIFORM STATE LAWS, AMENDMENTS TO UNIFORM COMPUTER INFORMATION TRANSACTION ACT (2002), *available at* http://www.law.upenn.edu/bll/ulc/ucita/UCITA_amds_AM02.pdf , *with* NAT'L CONFERENCE OF COMM'RS ON UNIFORM STATE LAWS, UNIFORM COMPUTER INFORMATION TRANSACTIONS ACT (2002), *available at* http://www.law.upenn.edu/bll/ulc/ucita/2002final.pdf. For a discussion of the proposed revisions to UCC Article 2 addressing software transactions, see Linda J. Rusch, *A History and Perspective of Revised Article 2: The Neverending Saga of a Search for Balance*, 52 SMU L. REV. 1683 (1999); Richard E. Speidel, *Contract Formation and Modification Under Revised Article 2*, 35 WM. & MARY L. REV. 1305 (1994); and Richard E. Speidel, *Revising UCC Article 2: A View from the Trenches*, 52 HASTINGS L.J. 607 (2001).

26. Because of the unique, nonhierarchical method of development presented by open source code, the agreements frequently present a different set of restrictions on code use *See* Agin & Kumis, *supra* note 22, at 329-30. For a discussion of the challenges facing open source contracts, see, for example, Robert W. Gomulkiewicz, *Entrepreneurial Open Source Software Hackers: MySQL and its Dual Licensing*, 9 COMP. L. REV. & TECH. J. 203 (2004); Andrés Guadamuz González, *Open Science: Open Source Licenses in Scientific Research*, 7 N.C. J.L. & TECH. 321 (2006); Stephen M. Maurer et al., *Finding Cures for Tropical Diseases: Is Open Source an Answer?*, 6 MINN. J. L. SCI. & TECH. 169 (2004); David McGowan, *Legal Implications of Open-Source Software*, 2001 U. ILL. L. REV. 241 (2001); Peter P. Swire, *A Theory of Disclosure for Security and Competitive Reasons: Open Source, Proprietary Software, and Government Systems*, 42 HOUS. L. REV. 1333 (2006); Greg R. Vetter, *The Collaborative Integrity of Open-Source Software*, 2004 UTAH L. REV. 563 (2004); and Greg R. Vetter, *"Infectious" Open Source Software: Spreading Incentives or Promoting Resistance?*, 36 RUTGERS L.J. 53 (2004).

27. For a discussion of electronic signature legislation, see, for example, Juan Andres Avellan V., *John Hancock in Borderless Cyberspace: The Cross-Jurisdictional Validity of Electronic Signatures and Certificates in Recent Legislation Texts*, 38 JURIMETRICS J. 301 (1998); Anthony M. Balloon, *From Wax Seals to Hypertext: Electronic Signatures, Contract Formation, and a New Model for Consumer Protection in Internet Transactions*, 50 EMORY L.J. 905 (2001); Carl Carl, et al., *Are Online Business Transactions Executed by Electronic Signatures Legally Binding?*, 2001 DUKE L. & TECH. REV. 5 (2001); Lance C. Ching, *Electronic Signatures: A Comparison of American and European Legislation*, 25 HASTINGS INT'L & COMP. L. REV. 199 (2001-2002); David E. Ewan, et al. *It's the Message, Not the Medium!, Electronic Record and Electronic Signature Rules Preserve Existing Focus of the Law on Content, Not Medium of Recorded Land Title Instruments*, 60 BUS. LAW. 1487 (2005);

legislation established parity for real space and virtual space technology mediated signatures. This legislative statement came relatively early in the mainstreaming and commercialization of the Internet, arriving before users and businesses understood how to fully leverage it. Although financial services companies, particularly brokerage houses, were early adopters of digital signatures, many other companies were sometimes slow to incorporate digital contracting into their procedures.[29] Consequently, digital

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Susanna Frederick Fischer, *Saving Rosencrantz and Guildenstern in a Virtual World? A Comparative Look at Recent Global Electronic Signature Legislation*, 7 B.U. J. SCI. & TECH. L. 229 (2001); Gregory Todd Jones, *Electronic Signatures and Records: Permit the Use of Electronic Signatures and Records Even When a Statute, Regulation or Other Rule of Law Specifies a Non-Electronic Type of Signature or Record*, 18 GA. ST. U. L. REV. 6 (2001); Robert Gilbert Johnston, *Digital Signature and Electronic Document Verification*, 17 J. MARSHALL J. COMPUTER & INFO. L. 721 (1999); R.R. Jueneman & R.J. Robertson, Jr., *Biometrics and Digital Signatures in Electronic Commerce*, 38 JURIMETRICS J. 427 (1998); Stephen Mason, *Electronic Signatures in Practice*, 6 J. HIGH TECH. L. 148 (2006); Marianne Menna, *From Jamestown to the Silicon Valley, Pioneering a Lawless Frontier: The Electronic Signatures in Global and National Commerce Act*, 6 VA. J.L. & TECH 12 (2001); Sarah E. Roland, Note, *The Uniform Electronic Signatures in Global and National Commerce Act: Removing Barriers to E-Commerce or Just Replacing Them with Privacy and Security Issues?*, 35 SUFFOLK U. L. REV. 625 (2001); Thomas J. Smedinghoff & Ruth Hill Bro, *Moving with Change: Electronic Signature Legislation as a Vehicle for Advancing E-Commerce*, 17 J. MARSHALL J. COMPUTER & INFO. L. 723 (1999); Jared Sommer, *Electronic Signatures and the UETA: E-Commerce in an Insecure E-World*, 37 IDAHO L. REV. 507 (2001); Jonathan E. Stern, *The Electronic Signatures in Global and National Commerce* Act, 16 BERKELEY TECH. L.J. 391 (2001); Ashoke S. Talukdar, *Electronic Signatures in E-Heathcare: The Need for a Federal Standard*, 18 J.L. & HEALTH 95 (2003-04); Mike Watson, Comment, *E-Commerce and E-Law; Is Everything E-Okay? Analysis of the Electronic Signatures in Global and National Commerce Act*, 53 BAYLOR L. REV. 803 (2001); Jane K. Winn, *The Emperor's New Clothes: The Shocking Truth about Digital Signatures and Internet Commerce*, 37 IDAHO L. REV. 353 (2001).

28. For a discussion of state level digital signature statutes, see, for example, Robin C. Capehart & Mark A. Starcher, "*Wired Wonderful West Virginia" – Electronic Signatures in the Mountain State*, 104 W. VA. L. REV. 303 (2002); Allison W. Freedman, *The Electronic Signatures Act: Preempting State Law by Legislating Contradictory Technology Standards*, 2001 UTAH L. REV. 807 (2001); Andrew D. Stewart, *Navigating the E-Sign Nebula: Federal Recognition of Electronic Signatures and Impact on State Law*, 24 U. HAW. L. REV. 309 (2001); William E. Wyrough, Jr. & Ron Klein, *The Electronic Signature Act of 1996: Breaking Down Barriers to Widespread Electronic Commerce in Florida*, 24 FLA. ST. U. L. REV. 407 (1997).

29. *See e.g.*, FTC and DOC on Digital Signatures Legislation, http://lists.essential.org/random-bits/msg00194.html (last visited Apr. 11, 2007).

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

signature legislation's full potential perhaps remains unrealized.

Corollary questions also pertain to the logistics of online payment mechanisms in digitally executed contracts. Regulators have not adopted a clear position regarding whether Internet mediated payment methods require the extension of real space default rules for financial transactions and consumer protections. For example, the FDIC stated in an advisory letter that it does not consider PayPal to be a bank. However, various state regulators have begun to question whether PayPal is operating an unauthorized money transmitting service, or illegal banking service.[30] Scholars are at odds on this point as well, debating whether consumer protection necessitates extending the penumbra of real space banking law to cyberspace.[31]

Finally, tensions persist in the age-old form contracting debates over efficiency through adhesion contracts versus fairness through customization and negotiability.[32] The technology context is beginning to disrupt the existing imperfect peace. In particular, end user license agreements (which authorize conduct many technologists consider unethical)[33] now challenge legal lines. For example, digital rights management software which comes bundled with other products engages in conduct that would constitute computer intrusion were it not for consent granted during installation through ostensible acceptance of a form contract.[34] The clash of traditional intellectual property law paradigms with technology contracts presents unresolved questions about whether technology is special, as demonstrated in the dramatic differences in contracting norms between open source and proprietary software licenses.[35]

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30. *See* Troy Wolverton, *Feds: PayPal not a bank*, CNET NEWS.COM, Mar. 12, 2002, http://news.com.com/2100-1017-858264.html.

31. *See, e.g.*, Ronald J. Mann, *Regulating Internet Payment Intermediaries*, 82 TEX. L. REV. 681, 702-15 (2004).

32. For a discussion of the tradeoffs between standardization and customization, see, for example, Margaret Jane Radin, *Online Standardization and the Integration of Text and Machine*, 70 FORDHAM L. REV. 1125 (2002).

33. For a discussion of overreaching in digital rights management software and license agreements, see Andrea M. Matwyshyn, *Technoconsen(t)sus*, __WASH.UL.REV.__ (2007)

34. *Id.*

35. For examples of open source license agreements see, e.g., Nelson, Open Source, Open Source Licenses, http://www.opensource.org/licenses (submitted Sept. 2006). For a discussion of Internet contracting, see, for

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

B. ARE TECHNOLOGY HARMS NOVEL AND DO THEY NEED SPECIAL REDRESS?

Court and scholars have also struggled with the question of whether technology mediated harms are qualitatively and quantitatively different from real-space harms. In other words, the question was whether these harms warranted special redress, and, if yes, how should any such damages be calculated. Specifically, harms relating to speech, dignitary harms, child protection, and intangible property damage vexed judges and scholars.

Because of the novelty and increased anonymity of the Internet, free speech became emboldened in virtual space. Predictably, claims arose out of this emboldened speech.[36] Corporate claims arose relating to alleged harms from various forms of Internet speech—postings or emails of disgruntled or overzealous corporate insiders[37] or outside pump-and-dump fraudsters posting information to financial bulletin boards[38] or other Internet forums.[39]

For consumers, Internet communications raised questions of dignitary harms, unwanted access to personal property, such as intrusion into their hard drives, and unwanted use of personally identifiable information. Internet defamation claims arose. Spam began as merely annoying speech usurping resources but now may be imposing financial harms onto

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example, Clayton P. Gillette, *Pre-Approved Contracts for Internet Commerce*, 42 HOUS. L. REV. 975 (2005); Juliet M. Moringiello & William L. Reynolds, *Survey of the Law of Cyberspace: Internet Contracting Cases 2004-2005*, 61 BUS. LAW. 433 (2005).

36. For a discussion of anonymity on the Internet, see, for example, David L. Sobel, *The Process that "John Doe" is Due: Addressing the Legal Challenge to Internet Anonymity*, 5 VA. J.L. & TECH. 3 (2000); Thomas F. Cotter & Lyrissa Barnett Lidsky, *Authorship, Audiences, and Anonymous Speech* (Minn. Legal Stud. Research Paper No. 06-37, 2006), *available at* http://ssrn.com/abstract=925736.

37. For a discussion of corporate insider technology harms, see Elizabeth A. Rowe, *When Trade Secrets Become Shackles: Fairness and the Inevitable Disclosure Doctrine*, 7 TUL. J. TECH. & INTELL. PROP. 167 (2005).

38. *See, e.g.*, Ian Ballon, Jonathan Eisenberg, *Poison Pen: Chat Board Liars May Be Vulberable to Lawsuits*, 754 PLI/PAT 163 (2003).

39. For a discussion of Internet pump and dump schemes, see David B. Kramer, *The Way It Is and the Way It Should Be: Liability Under §10(B) of the Exchange Act and Rule 10B-5 Thereunder for Making False and Misleading Statements as Part of a Scheme to "Pump and Dump" a Stock*, 13 U. MIAMI BUS. L. REV. 243 (2005).

recipients in new ways.[40] Similarly, forms of spyware,[41] may currently involve conduct closer to computer intrusion[42] than digital speech.[43] Finally, new types of dignitary harms may arise from digital divides in our society.[44] Courts generally

41. For a discussion of the dangers of spam and the shortcomings of regulatory efforts, see, for example, Peter B. Maggs, *Abusive Advertising on the Internet (SPAM) Under United States Law*, 54 AM. J. COMP. L. 385 (2006); Beth Simone Noveck, *Public Participation in Electronic Rulemaking: Electronic Democracy or Notice-and-Spam?*, ADMIN. & REG. L. NEWS, Fall 2004, at 7; and Andrea M. Matwyshyn, *Penetrating the Zombie Collective: Spam as an International Security Issue,* 3 SCRIPT-ED 370 (2006), *available at* http://www.law.ed.ac.uk/ahrc/script-ed/vol3-4/matwyshyn.asp.

41.For a discussion of the dangers of spam and the shortcomings of regulatory efforts, see, for example, Peter B. Maggs, *Abusive Advertising on the Internet (SPAM) Under United States Law*, 54 AM. J. COMP. L. 385 (2006); Beth Simone Noveck, *Public Participation in Electronic Rulemaking: Electronic Democracy or Notice-and-Spam?*, ADMIN. & REG. L. NEWS, Fall 2004, at 7; and Andrea M. Matwyshyn, *Penetrating the Zombie Collective: Spam as an International Security Issue,* 3 SCRIPT-ED 370 (2006), *available at* http://www.law.ed.ac.uk/ahrc/script-ed/vol3-4/matwyshyn.asp.

42. For a discussion of computer intrusion and exceeding authorized access, see Orin S. Kerr, *A User's Guide to the Stored Communications Act, and a Legislator's Guide to Amending It*, 72 GEO. WASH. L. REV. 1208 (2004).

43. *See generally* Ian Ayres & Matthew Funk, *Marketing Privacy*, 20 YALE J. ON REG. 77 (2003); Joshua A. Marcus, *Commercial Speech on the Internet: Spam and the First Amendment*, 16 CARDOZO ARTS & ENT. L.J. 245, 293-97 (1998).

44. Digital divides refer to unequal access to technology that fall along socio-economic and demographic lines; they can be divided into two categories – access divides and production divides. For a discussion of access divides see, e.g., EDUCATION WEEK, TECHNOLOGY COUNTS 2001: THE NEW DIVIDES (May 2001), *available at* http://counts.edweek.org/sreports/tc01/; Andrew G. Celli, Jr. & Kenneth M. Dreifach, *Postcards from the Edge: Surveying the Digital Divide*, 20 CARDOZO ARTS & ENT. L.J. 53 (2002) (arguing that three separate digital divides exist: technology access, capital access, and treatment differences among different consumers in pricing and purchase terms); Patricia F. First & Yolanda Y. Hart, *Access to Cyberspace: The New Issue in Educational Justice*, 31 J.L. & EDUC. 385 (2002) (arguing that existing civil rights laws are applicable to unequal Internet access for identifiable groups); Allen S. Hammond, *The Digital Divide in the New Millennium*, 20 CARDOZO ARTS & ENT. L.J. 135 (2002); William E. Kennard, *Equality in the Information Age*, 51 FED. COMM. L.J. 553 (1999) (arguing that the digital divide is defined by both unequal access to technology and by unequal access to ownership opportunities of broadcast companies); Donald R. Tetreault, *Technology Equity: Are We Asking the Right Questions?*, 66 SCH. BUS. AFFS., Aug. 2001, at 28 (arguing that effectively measuring "technology equity" is critical to determining if it has been achieved); Int'l Roundtable, The Lifelong Learning, New Techs. Gap: Reaching the Disadvantaged, The Lifelong Learning and New Technologies Gap (Dec. 10, 1999) (unpublished manuscript), *available at* http://www.literacyonline.org/products/ili/pdf/IP0001.pdf. For a discussion of production divides, see Andrea M. Matwyshyn, *Silicon Ceilings: Information Technology Equity, the Digital Divide and the Gender Gap Among Information Technology Professionals,* 2 NW. J. TECH. & INTELL. PROP. 35 (2003).

have not provided recourse for unequal access,[45] though the Americans with Disabilities Act may be expanded in the near future to require website accessibility for the disabled.[46] Thus, no consensus exists as to whether harms resulting from technology are unique and warrant different regulatory paradigms.

Technology easily and obviously also exacerbated real space harms in the area of child protection. Several statutory attempts to protect children from online predators, unsuitable content and data mining have been made.[47] However, the approaches have not alleviated the problems faced in this area, and courts have not always been willing to enforce the statutes.[48] Filters and other proactive technological means, rather, are commonly advocated as being more effective than reactive legal measures.[49] Legal scholars diverge as to whether technology focused statutes are the optimal means for minimizing and redressing these harms.[50]

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45. *See* Access Now, Inc. v. Southwest Airlines Co, 385 F.3d 1324 (2004) (holding the ADA does not extend to the Internet because the Internet is not a place of public accomodation). See a discussion of the digital divide in America Online Latino v. AOL Time Warner, Inc., No. 02 Civ.4796 LAK, 2002 WL 31663568 (S.D.N.Y. Nov. 25, 2002).

46. *See* Declan McCullagh, *Judge: Disabilities Act doesn't cover Web*, CNET NEWS.COM, Oct. 21, 2002, http://news.com.com/Judge+Disabilities+Act+doesnt+cover+Web/2100-1023_3-962761.html (reporting that a federal judge ruled that Southwest Airlines does not have to make its web site more accessible to the blind). *But see, e.g.*, Nat'l Federation of the Blind v. Target Corporation, Case 3:06-cv-01802-MHP Document 62 Filed 09/06/2006, N.D. Cal.(2006); OUT-LAW News, *Target Lawsuit Tests Limits of US Web Accessibility Law*, Dec. 9, 2006, http://www.out-law.com/page-7285.

47. *See, e.g.*, Children's Online Privacy Protection Act (COPPA), 15 U.S.C. §§ 6501–06 (2000); Child Online Protection Act (COPA), 47 U.S.C. § 231 (2000); Children's Internet Protection Act (CIPA) 114 Stat. 2763A-335 (2000); Children's Online Privacy Protection Rule, 16 C.F.R. § 312 (2006).

48. *See, e.g.*, *United States v. American Library Association., Inc.*, 539 U.S. 194, 200-01 (2003), *rev'g* 201 F. Supp. 2d 401 (E.D. Pa. 2002).

49. For a discussion of filters, see *United States v. American Library Association., Inc.*, 539 U.S. 194, 200-01 (2003), *rev'g* 201 F. Supp. 2d 401 (E.D. Pa. 2002).

50. For a discussion of technology and child protection, see, for example, William D. Araiza, *Captive Audiences, Children and the Internet*, 41 BRANDEIS L.J. 397 (2003); Jared Chrislip, *Filtering the Internet Like a Smokestack: How the Children's Internet Protection Act Suggests a New Internet Regulation Analogy*, 5 J. HIGH TECH. L. 261 (2005); Dannielle Cisneros, *"Virtual Child" Pornography on the Internet: A "Virtual" Victim*?, 2002 DUKE L. & TECH. REV. 19; Cathleen A. Cleaver, *Cyberchaos vs. Ordered Liberty: Protecting Children from Pornography on the Internet*, 1 TEX. REV. L. & POL. 61 (1997); Mehagen

Scholars and judges have considered redress for technology harms through speech restrictions, intellectual property statutes, computer intrusion statutes and the trespass to chattels[51] doctrine. Yet, the unwillingness of courts to robustly calculate damages in cases of digital harm[52] and the

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Doyle, *Bad Apples in Cyberspace: The Sexual Exploitation and Abuse of Children over the Internet*, 21 WHITTIER L. REV. 119 (1999); F. Barrett Faulkner, *Applying Old Law to New Births: Protecting the Interests of Children Born Through New Reproductive Technology*, 2 J. HIGH TECH. L. 27 (2003); Rick Gallagher, *Downward Departures: Curing the Lenient Sentencing of Internet Child Pornographers and Statutory Rapists*, 5 U.C. DAVIS J. JUV. L. & POL'Y 111 (2000); Mitchell P. Goldstein, *Congress and the Courts Battle Over the First Amendment: Can the Law Really Protect Children from Pornography on the Internet?*, 21 J. MARSHALL J. COMPUTER & INFO. L. 141 (2003); Steven D. Hinckley, *Your Money or Your Speech: The Children's Internet Protection Act and the Congressional Assault on the First Amendment in Public Libraries*, 80 WASH. U. L.Q. 1025 (2002); Adam Horowitz, *The Constitutionality of the Children's Internet Protection Act*, 13 ST. THOMAS L. REV. 425 (2000); Eric Hwang, *Child Pornography on the Internet*, 2002 UCLA J.L. & TECH. NOTES 7 (2002); Susan Hanley Kosse, *Try, Try Again: Will Congress Ever Get It Right? A Summary of Internet Pornography Laws Protecting Children and Possible Solutions*, 38 U. RICH. L. REV. 721 (2004); Susan S. Kreston, *Computer Search and Seizure Issues in Internet Crimes against Children Cases*, 30 RUTGERS COMPUTER & TECH. L.J. 327 (2004); Ronald J. Krotoszynski, Jr., *Childproofing the Internet*, 41 BRANDEIS L.J. 447 (2003); Philip G. Peters, Jr., *Harming Future Persons: Obligations to the Children of Reproductive Technology*, 8 S. CAL. INTERDISC. L.J. 375 (1999); Madeleine Mercedes Plasencia, *Internet Sexual Predators: Protecting Children in the Global Community*, 4 J. GENDER RACE & JUST. 15 (2000); Audrey Rogers, *Playing Hide and Seek: How to Protect Virtual Pornographers and Actual Children on the Internet*, 50 VILL. L. REV. 87 (2005); Cortney Scott, *The Children's Internet Protection Act: Filtering Freedom or Protecting Young Minds?*, 2003 UCLA J.L. & TECH. NOTES 28 (2003); Felix Wu, *United States v. American Library Ass'n: The Children's Internet Protection Act, Library Filtering, and Institutional Roles*, 19 BERKELEY TECH. L.J. 555 (2004).

51. For a discussion of Internet trespass, see Michael R. Siebecker, *Cookies and the Common Law: Are Internet Advertisers Trespassing on our Computers?*, 76 S. CAL. L. REV. 893 (2003).

52. For a discussion of calculating damages in technology intrusion contexts, see George Roach & William J. Michiels, *Damages Is the Gatekeeper Issue for Federal Computer Fraud*, 8 TUL. J. TECH. & INTELL. PROP. 61 (2006). For example, in the context of intentional violations where an individual exceeds authorized access to a computer or network, no statutory damages are available under the Computer Fraud and Abuse Act (CFAA). 18 U.S.C. § 1030 (2000). In addition, the approach used to assess damages varies from court to court. Under section 1030(g) of the CFAA, a private right of action is available for any victim who suffers "damage or loss" due to a violation of the CFAA. Damage, as defined under § 1030(e)(8) of the statute, requires either (A) losses aggregating $5,000 during any 1-year period to one or more individuals; (B) impairment to medical diagnosis or treatment; (C) physical injury to any person; or (D) a threat to public health or safety. Many plaintiffs have encountered problems meeting the $5,000 threshold for damages. Two schools of thought exist regarding the proper interpretation of the CFAA damage

hesitation to expand civil doctrines such as trespass to chattels into technology contexts calls into question the judiciary's commitment to providing legal redress for harms from digital speech. This judicial reluctance may have in part catalyzed the dramatic increases in intangible property harms such as identity theft[53] and trade secret theft[54] of the last ten years.

C. IS THE INTERNET A SEPARATE LEGAL SPACE NEEDING SPECIAL LEGAL RULES?

The final great theoretical debate in technology legal theory revolves around equivalency of virtual and physical geography—should the Internet be legally characterized as a separate space or merely as an extension of physical space for

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requirements in § 1030(g) for "damage or loss." While "damage" is defined and requires a plaintiff to meet a threshold of $5,000, the term "loss" is not adequately defined in a fashion that allows courts to meaningfully and consistently interpret the statute. Courts have also differed as to whether damages to multiple plaintiffs in a class action lawsuit can be aggregated in order to meet the $5,000 threshold and the extent to which loss of goodwill can be included in calculations. But under the Electronic Communications Privacy Act, minimum statutory damages are indicated on the basis of an escalating series of violations; minimum damages start at $50, and quickly rise to $10,000. 18 U.S.C. § 2520 (2000). However, a debate exists in the courts whether courts have the discretion not to award any damages in some cases. *See, e.g.*, Culbertson v. Culbertson, 143 F.3d 825, 827 (4th Cir. 1998) (holding that courts have discretion); Reynolds v. Spears, 93 F.3d 428, 434 (8th Cir. 1996) (same); Nalley v. Nalley, 53 F.3d 649, 652 (4th Cir. 1995) (same). *But see* Desilets v. Wal-Mart Stores, Inc., 171 F.3d 711, 714-16 (1st Cir. 1999) (suggesting in dicta that courts must award damages); Rogers v. Wood, 910 F.2d 444, 448 (7th Cir. 1990) (holding that courts must award a minimum of $10,000 in statutory damages per violation), *reh'g denied*, 914 F.2d 260 (1990); Menda Biton v. Menda, 812 F. Supp. 283, 285 (D. Puerto Rico 1993) (holding that courts must award damages).

53. *See, e.g.*, Declan McCullagh & Anne Broache, *Class action suit over ID theft tossed out*, Oct. 12, 2006, http://news.com.com/Class+action+suit+over+ID+theft+tossed+out/2100-7348_3-6125028.html.

54. For a discussion of trade secret theft and technology related damages see, e.g., Rowe, *supra* note 37. For a discussion of intangible corporate assets generated through technology, see Estelle Derclaye, *An Economic Analysis of the Contractual Protection of Databases*, 2005 U. ILL. J.L. TECH. & POL'Y 247 (2005). Scholarly opinions on redress for technology–mediated intellectual property harms and privacy harms have been ample on both sides of these arguments. *See, e.g.*, Vincent R. Johnson, *Cybersecurity, Identity Theft, and the Limits of Tort Liability*, 57 S.C. L. REV. 255 (2005); Lynn M. LoPucki, *Did Privacy Cause Identity Theft?*, 54 HASTINGS L.J. 1277 (2003); Lynn M. LoPucki, *Human Identification Theory and the Identity Theft Problem*, 80 TEX. L. REV. 89 (2001); Daniel J. Solove, *Identity Theft, Privacy, and the Architecture of Vulnerability*, 54 HASTINGS L.J. 1227 (2003).

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

regulatory purposes?[55] In other words, is technology best characterized as a limitation on or an extension of social control, sovereignty, and autonomy legal frameworks that exist in real space. This debate over this legal characterization of virtual space began at the time the first browsers came into existence.[56] A clear divergence of opinion existed in the scholarly community over both the legitimacy of the Internet as a separate space and the legitimacy of Internet regulation as a separate field of legal study.[57]

This theoretical debate has its practical incarnation in the case law of Internet jurisdiction and enforcement of judgments. The lines of geographic sovereignty became ambiguous as far away courts sometimes granted litigants general[58] or personal jurisdiction over residents of other states based on Internet contacts.[59] Internationally, foreign courts and regulatory

55. For a discussion of the debate, see generally Jack L. Goldsmith, *Against Cyberanarchy*, 65 U. CHI. L. REV. 1199, 1199-1200 (1998); David R. Johnson & David Post, *Law and Borders—The Rise of Law in Cyberspace*, 48 STAN. L. REV. 1367 (1996); and Andrew L. Shapiro, *The Disappearance of Cyberspace and the Rise of Code,* 8 SETON HALL CONST. L.J. 703, 709 (1998). *See also* Charles Fried, *Perfect Freedom or Perfect Control?*, 114 HARV. L. REV. 606, 618 (2000).

56. Mosaic was developed in 1993 by two University of Illinois graduate students, Marc Andersen and Eric Bina. JOHN CASSIDY, DOT CON 51 (2002). Immediately following the launch of Mosaic, use of the World Wide Web increased. *See id.*

57. *Compare*, Frank Easterbrook, *Cyberspace and the Law of the Horse*, 1996 U. CHI. LEGAL F. 207 (1996), *with* Lawrence Lessig, *The Law of the Horse: What Cyberlaw Might Teach*, 113 HARV. L. REV. 501 (1999).

58. General jurisdiction refers to the situation where a court asserts jurisdiction over a defendant whose continuous activities in the forum are unrelated to the cause of action sued upon but the defendant's contacts are sufficiently substantial and of such a nature as to make the state's assertion of jurisdiction reasonable *See, e.g.*, Patrick J. Borchers, *The Problem with General Jurisdiction*, 2001 U. CHI. LEGAL F. 119, 137-39 (2001) (arguing that the concept of general jurisdiction is fatally flawed, particularly in the context of the Internet, but should not be abandoned).

59. For a discussion of various possible approaches to Internet jurisdiction, see, for example, Michael A. Geist, *Is There a There There? Toward Greater Certainty for Internet Jurisdiction*, 16 BERKELEY TECH. L.J. 1345 (2001); Andrea M. Matwyshyn, *Of Nodes and Power Laws: A Network Theory Approach to Internet Jurisdiction Through Data Privacy*, 98 NW. U. L. REV. 493 (2004); Henry H. Perritt, Jr., *Towards a Hybrid Regulatory Scheme for the Internet*, 2001 U. CHI. LEGAL F. 215 (2001); Martin H. Redish, *Of New Wine and Old Bottles: Personal Jurisdiction, the Internet and the Nature of Constitutional Evolution*, 38 JURIMETRICS J. 575, 609 (1998); Allan R. Stein, *Frontiers of Jurisdiction: From Isolation to Connectedness*, 2001 U. CHI. LEGAL F. 373; Allan R. Stein, *The Unexceptional Problem of Jurisdiction in Cyberspace*, 32 INT'L LAW, 1167 (1998); Mary Twitchell, *Why We Keep Doing Business with Doing-Business Jurisdiction*, 2001 U. CHI. LEGAL F. 171 (2001).

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

bodies adjudicate matters with foreign defendants engaging in technology-mediated international conduct. Foreign defendants refuse to appear or to assert lack of jurisdiction even in the face of default judgments,[60] exposing the limits of international judgment reciprocity.

Similarly, technology complicated tax nexus determinations; questions of tax nexus required determining whether the Internet was a separate transactional space or whether territorial tax paradigms applied. In particular, practical difficulties arose in determining whether adequate contacts existed for purposes of nexus between certain Internet goods and services and a certain jurisdiction. For example, one vexing tax question pertains to whether and where software, especially downloaded software, should be taxed. Should it be taxed at the point of residence on a server or at the place of ultimate download by a user? Similarly, taxation of webbased software services present unresolved legal questions that turn on where in physical space the Internet services are "performed". [61]

D. LACK OF RESOLUTION IN LEGAL PARADIGMS MAY LEAD TO BREAKDOWNS OF USER TRUST

To date, none of these sets of legal questions have been conclusively resolved by either courts or legislatures. Technology businesses and users continue to exist in a state of regulatory uncertainty. As a result, one of the most serious threats to the future of technology-mediated commerce is a breakdown of user trust in technology.[62]

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60. *See, e.g.*, Joris Evers, *Spam fighter hit with $11.7 million judgment,* CNET NEWS.COM, Sept. 14, 2006, http://news.com.com/Spam+fighter+hit+with+11.7+million+judgment/2100-7350_3-6116009.html (noting that defendant UK-based Spamhaus "didn't mount a defense in the case; the ruling was a default judgment in absence of counterarguments").

61. For a discussion of the technology and tax nexus, see, for example, Walter J. Baudier, *Internet Sales Taxes From Borders to Amazon: How Long Before All Your Purchases Are Taxed?*, 2006 DUKE L. & TECH. REV. 5 (2006); Eric A. Ess, *Internet Taxation Without Physical Representation? States Seek Solution to Stop e-Commerce Sales Tax Shortfalls*, 50 ST. LOUIS U. L.J. 893 (2006); Pamela Swidler, *The Beginning of the End to a Tax-Free Internet: Developing an E-Commerce Clause*, 28 CARDOZO L. REV. 541 (2006). For a discussion of the difficulties in crafting a functional international regime for coordinated taxation of Internet purchases, see, e.g., Yariv Brauner, *An International Tex Regime in Crystallization*, 56 TAX L.REV. (2003).

62. For a discussion of trust and the Internet, see Tamar Frankel,

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

Trust arises through predictability and certainty in transactions and recourse.[63] However, as demonstrated by the preceding discussion, courts, legislators, and scholars have not reached consensus on any of the three major sets of technology regulation questions debated in the last decade. This lack of consensus suggests that it is necessary to re-examine the underlying regulatory assumptions regarding humans' relationship with technology. Perhaps the regulatory focus should move away from regulating the technology itself and move toward regulating the ways humans interact with technology tools. A focus on proactively guiding human development of users rather than a focus on reactively restricting particular technologies may hold more promise. Legislative approaches are usually compartmentalized around either restricting a particular technology or resolving a particular legal issue. Rarely is a technology user's perception or development presented as a focus of the overall regulatory picture.

Technology regulation frequently presumes that users are a one-dimensional, linear, and stagnant piece of the regulatory picture. This assumption is based in early developmental psychology theory. However, this approach is not informed by later bodies of human development theory which view humans and their development as inherently dynamic and multidimensional.

This flawed assumption about the linear nature of human development may be part of the reason for the inability to craft successful regulatory and judicial approaches to technology-mediated exchanges. Legislators and judges should seek to create a new regulatory picture that supports the dynamic levels of complexity that users experience in technology mediated exchange. The new regulatory focus becomes users' development.[64] Nonlinear developmental theory contemplates

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Trusting and Non-trusting on the Internet, 81 B.U. L. REV. 457 (2001).

63. *Id.*

64. Complexity here refers to complexity theory, the idea that systems exist where a large number of similar but independent actors who persistently move, respond, and evolve in relation to each other in an increasingly sophisticated manner. For a discussion of complexity theory, see, for example, David G. Post & David R. Johnson, *"Chaos Prevailing on Every Continent": Toward a New Theory of Decentralized Decision-making in Complex Systems*, 73 CHI.-KENT L. REV. 1055 (1998). *See also, e.g.*, Erica Beecher-Monas & Edgar Garcia-Rill, *Danger at the Edge of Chaos: Predicting Violent Behavior in a Post-Daubert World*, 24 CARDOZO L. REV. 1845 (2003); Susan W. Brenner, *Toward a Criminal Law for Cyberspace: Distributed Security*, 10 B.U. J. SCI. & TECH. L. 1 (2004); Jim Chen, *Webs of Life: Biodiversity Conservation as a*

this set of emergent interactions and may prove instructive for beginning to craft new dynamic regulatory paradigms.

II. NONLINEAR DEVELOPMENTAL PSYCHOLOGY, TECHNOLOGY, AND CONSTRUCTING COMMERCIAL IDENTITY

Human development theory or developmental psychology theory can be divided into linear and nonlinear developmental theory.[65] Linear developmental theory presumes that all humans develop in a similar fashion, demonstrating an upward developmental trajectory that is tied to chronological age. Nonlinear developmental theory adopts the opposite approach. It asserts that chronological age cannot necessarily be tied to assumptions about development because development is an inherently social process that occurs in a particular real-world context.[66] Consequently, a linear approach to technology regulation presumes a homogeneity in the consumer population regarding individuals' sophistication and comfort level with technology based on their chronological age. Chronologically older individuals should demonstrate more proficiency than those of chronologically younger age.[67] A nonlinear approach would not make these assumptions. Linear developmental psychology is reflected in the work of theorist Jean Piaget,[68] while nonlinear developmental psychology theory is perhaps best reflected in the work of Lev Vygotsky,[69] Urie

Species of Information Policy, 89 IOWA L. REV. 495 (2004); Susan P. Crawford, *The Biology of the Broadcast Flag*, 25 HASTINGS COMM. & ENT. L.J. 603 (2003); Robert A. Creo, *Mediation 2004: The Art and the Artist*, 108 PENN. ST. L. REV. 1017 (2004); Daniel A. Farber, *Probabilities Behaving Badly: Complexity Theory and Environmental Uncertainty*, 37 U.C. DAVIS L. REV. 145 (2003); Scott H. Hughes, *Understanding Conflict in a Postmodern World*, 87 MARQ. L. REV. 681 (2004); J.B. Ruhl & James Salzman, *Mozart and the Red Queen: The Problem of Regulatory Accretion in the Administrative State*, 91 GEO. L.J. 757 (2003); Kevin Werbach, *Supercommons: Toward a Unified Theory of Wireless Communication*, 82 TEX. L. REV. 863 (2004).

65. For an overview of developmental psychology theory, see PATRICIA H. MILLER, THEORIES OF DEVELOPMENTAL PSYCHOLOGY (W.H. Freeman and Company 1993) (1983).

66. JAMES V. WERTSCH, VYGOTSKY AND THE SOCIAL FORMATION OF MIND (1985).

67. *Id.*

68. For a discussion of Piaget's work, see, for example J. FLAVELL, THE DEVELOPMENTAL PSYCHOLOGY OF JEAN PIAGET (1967).

69. For a discussion of Vygotsky's work, see, for example, ALEX KOZULIN, VYGOTSKY'S PSYCHOLOGY: A BIOGRAPHY OF IDEAS (1990); FRED NEWMAN & LOUIS HOLZMAN, LEV VYGOTSKY: REVOLUTIONARY SCIENTIST (1993); THE

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

Bronfenbrenner, [70] Albert Bandura,[71] and Erik Erikson.[72]

A. LINEAR DEVELOPMENTAL THEORY

Linear developmental psychology theory, as demonstrated by the work of Jean Piaget, creates an age-contingent, lock-step trajectory for human development.[73] Piaget divided development into four periods with distinct stages therein, and named these periods of development the sensorimotor period, the preoperational period, the concrete operational period, and the formal operational period.[74] The sensorimotor stage lasts from birth to age two and is characterized by a child moving from simple reflexes to organized behaviors that are oriented toward interacting with the external world through goal oriented exploration behaviors and object permanence[75] skills.[76] The preoperational period, which spans age two until age seven, follows, and during this period one develops semiotic function—the ability to use symbols.[77] Differentiation of other people from the self is incomplete, however, even though one is

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VYGOTSKY READER (Rene Van der Veer & Jaan Valsiner, eds., 1994); RENE VAN DER VEER & JAAN VALSINER, UNDERSTANDING VYGOTSKY. A QUEST FOR SYNTHESIS (1991); NIKOLAI VERESOV, UNDISCOVERED VYGOTSKY: ETUDES ON THE PRE-HISTORY OF CULTURAL-HISTORICAL PSYCHOLOGY (1999); JAMES V. WERTSCH, VYGOTSKY AND THE SOCIAL FORMATION OF MIND (1985).

70. For a discussion of Urie Bronfenbrenner's work, see Susan S. Lang, *Urie Bronfenbrenner, Father of Head Start Program and Pre-eminent 'Human Ecologist,' Dies at age 88*, Sept. 26, 2005, http://www.news.cornell.edu/stories/Sept05/Bronfenbrenner.ssl.html.

71. For a discussion of Albert Bandura's work, see Barry J. Zimmerman & Dale H. Schunk, *Albert Bandura: The Scholar and His Contributions to Educational Psychology*, *in* EDUCATIONAL PSYCHOLOGY: A CENTURY OF CONTRIBUTIONS 431-54 (Barry J. Zimmerman & Dale H. Schunk eds., 2003).

72. For a discussion of Erik Erikson's work, see ERIK ERIKSON, THE ERIK ERIKSON READER (Robert Coles, ed., 2001).

73. Linear developmental theories presume a lock-step approach to development that has only recently started to fall out of favor. *See, e.g.,* CONSTRUCTING AND RECONSTRUCTING CHILDHOOD: CONTEMPORARY ISSUES IN THE SOCIOLOGICAL STUDY OF CHILDHOOD, 4 (A. James & A. Prout eds., 1997).

74. MILLER, *supra* note 65, at 42.

75. Object permanence refers to the knowledge that an object exists even if not in line of sight. *See, e.g.*, Economic and Social Research Council, *R000238995 - Object Permanence and A not B Errors: What They Tell Us About Infant Development*, http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/Plain_English_Summaries/social_stability_exclusion/social_exclusion/index321.aspx?ComponentId=9839&SourcePageId=11719 (last visited Apr. 11, 2007).

76. *See* MILLER, *supra* note 65, at 43-51.

77. *See id.* at 51-56.

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

able to interpret the world in terms of the self in a loosely logical manner.[78] The concrete period comes next, and lasts between ages seven and eleven.[79] The concrete period is marked by the ability to perform logical mental operations, which are internalized and can be reversed.[80] Finally, the formal operational period from age eleven to age fifteen is a time characterized by abstract thinking where mental operations are not necessarily tied to concrete objects.[81] At this point in a linear developmental paradigm adulthood arrives and development stops.[82] Therefore, adulthood signals the highest level of development in a linear paradigm, when full development is "achieved."[83]

B. NONLINEAR DEVELOPMENTAL AND IDENTITY THEORY

Other developmental theorists have developed nonlinear approaches that hold important contrary insights to the views of Piaget and other linear developmental theorists.[84] Unlike the lockstep approach of linear theorists, nonlinear theorists take a dynamic approach. An individual interacts with and within a particular social context to generate development in an emergent manner.

Lev Vygotsky, the founder of contextualist developmental theory and a contemporary of Piaget, introduced the importance of analyzing development in a cultural context.[85] The smallest unit of analysis for Vygotsky is the child in a particular social context, an inherently variable construction across environments and individuals.[86] Learning and

78. *Id.* at 53-54.

79. *See id.* at 56.

80. *See id.* at 56-59.

81. *See id.* at 60-62.

82. Piaget's model of cognitive development ends with the acquisition of formal operational intelligence during teen years. For a discussion of various linear developmental paradigms see, e.g., ADULT DEVELOPMENT: VOLUME I: COMPARISONS AND APPLICATIONS OF DEVELOPMENTAL MODELS (Michael L. Commons et. al, eds., 1987).

83. *See* PIAGET, REFLECTING ABSTRACTION, *supra* note 3*; see generally* MILLER, *supra* note 65.

84. The works of Lev Vygotsky, Urie Bronfenbrenner, Albert Bandura and Erik Erikson provide important insights into the way development and identity are inherently dialectical and interactionist joint constructions.

85. *See* LEV VYGOTSKY, THOUGHT AND LANGUAGE (Alex Kozulin, ed. & trans., 1986).

86. LEV VYGOTSKY, MIND AND SOCIETY: THE DEVELOPMENT OF HIGHER MENTAL PROCESSES,86-90 (1978).

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

development occurs on the person-society border through an individual interacting inside the "zone of proximal development".[87] The zone of proximal development refers to the gap between the actual developmental level of the child at the time and the higher level of the child's potential development with help from adults or more advanced peers.[88] Help in development comes not only from humans in the environment but also from self-help using cultural tools such as computers.[89] For Vygotsky, humans master themselves from the outside through psychological and technical tools, which allow individuals to achieve more in their specific context.[90] These tools, however, also vary depending on culture and social contexts.[91] In other words, the focus of assessment using a Vygotskian developmental paradigm is less on the static notion of who the child currently is and, rather, more on the dynamic question of who the child can become, depending on context and tools.

An elaboration on the evolving, nonlinear nature of social contexts that shape development can be found in the work of Urie Bronfenbrenner.[92] Bronfenbrenner presents an ecological model[93] that illustrates the importance of reviewing multiple levels of social context.[94] Specifically, he identifies four levels of analysis: (1) macrosystem; (2) mesosystem; (3) exosystem; and (4) microsystem.[95] Analysis at the macrosystem level requires examination of culture as a whole, along with belief

87. *Id.*
88. *Id.*
89. *Id.*
90. *Id.*
91. *Id.*
92. *See, e.g.*, URIE BRONFENBRENNER, THE ECOLOGY OF HUMAN DEVELOPMENT: EXPERIMENTS BY NATURE AND DESIGN (1979) [hereinafter BRONFENBRENNER, ECOLOGY]; URIE BRONFENBRENNER, INFLUENCES ON HUMAN DEVELOPMENT (1975); URIE BRONFENBRENNER, INFLUENCING HUMAN DEVELOPMENT (1973); URIE BRONFENBRENNER, ON MAKING HUMAN BEINGS HUMAN (1981); URIE BRONFENBRENNER, TWO WORLDS OF CHILDHOOD (1973); URIE BRONFENBRENNER, TWO WORLDS OF CHILDHOOD - US AND USSR (1975); R. MYERS & URIE BRONFENBRENNER, THE TWELVE WHO SURVIVE: STRENGTHENING PROGRAMMES OF EARLY CHILDHOOD DEVELOPMENT IN THE THIRD WORLD (1992).
93. An ecological model is a model which conceptualizes a dynamic set of interactions in a living system. For a discussion of ecological models, see, e.g., James Moore, *Predators and Prey: A New Ecology of Competition*, HARV. BUS. REV., May/June 1993, at 75.
94. *See* BRONFENBRENNER, ECOLOGY, *supra* note 92.
95. *See id.* at 7-8.

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

systems and ideologies underlying cultural rules and norms.[96] In other words, the analysis focuses on the mechanisms of social governance and the worldview prevalent in civil society. Analysis at the mesosystem level focuses attention on interpersonal dynamics and the dynamics between the individual and secondary settings, such as the workplace.[97] Analysis at the exosystem level contemplates the interactions outside of the primary sphere of analysis but which, nevertheless, affect or are affected by what happens in the primary setting.[98] At the microsystem level, analysis is primarily focused on individuals and their psychological development in a particular context.[99] The individual interacts within and across all four levels and consequently develops because of these interactions.

Albert Bandura's Social Learning Theory presents a consonant analysis. The theory views the interaction between individuals and environments as a three way exchange in which the person, an entity with unique characteristics, performs a behavior in an environment which responds back to the person and the behavior in a process of reciprocal determinism; it is an idiosyncratic interaction.[100] According to Bandura, models[101] can serve to instruct, motivate, disinhibit, inhibit, socially facilitate, and arouse emotion in a process of vicarious reinforcement.[102] Essentially, development is a process of quantitative change, during which learning episodes gradually accumulate over time.[103] Although Social Learning Theory does not directly address historical or cultural context, it reflects the tradition of Vygotsky and the contextualist

96. *See id.* at 258.

97. *Id.* at 209.

98. *Id.* at 237.

99. *Id.* at 56.

100. *See* ALBERT BANDURA, SOCIAL FOUNDATIONS OF THOUGHT AND ACTION: A SOCIAL COGNITIVE THEORY, 15 (1986); *See also* ALBERT BANDURA, SOCIAL LEARNING THEORY, 200-208 (1977); ALBERT BANDURA & R.H. WALTERS, ADOLESCENT AGGRESSION (1959); ALBERT BANDURA, AGGRESSION: SOCIAL LEARNING ANALYSIS (1973); ALBERT BANDURA, PRINCIPLES OF BEHAVIOR MODIFICATION (1969); PSYCHOLOGICAL MODELING: CONFLICTING THEORIES (Albert Bandura ed., 1971); ALBERT BANDURA & R.H. WALTERS, SOCIAL LEARNING AND PERSONALITY DEVELOPMENT (1963); SELF-EFFICACY IN CHANGING SOCIETIES (Albert Bandura ed., 1995); and ALBERT BANDURA, SELF-EFFICACY: THE EXERCISE OF CONTROL (1997).

101. BANDURA, SOCIAL LEARNING THEORY, *supra* note 100, at 40-50.

102. *See id.* at 117–19.

103. *Id.*

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

approach. It recognizes the dialectical process of development where individuals work within and are shaped by an environment; a triadic reciprocal determinism occurs among behavior, cognitive factors and the environment.[104] Also, as in the theory of Vygotsky, there is no endpoint to development, and universal behaviors are rare.[105] Thus, children are developmentally malleable but only within constraints of biology and environment.

Finally, Erikson frames development through identification of eight stages/dichotomies of human development and identity formation: (1) basic trust versus mistrust; (2) autonomy versus shame; (3) initiative versus guilt; (4) industry versus inferiority; (5) identity versus role confusion; (6) intimacy versus isolation; (7) generativity versus stagnation; and (8) ego integrity versus despair.[106] Erikson's first three stages represent early stages when the individual is not yet capable of interacting with (borrowing a Vygotskian phrase) "cultural tools" such as the Internet.[107] The eighth stage is similarly a stage in which the individual is primarily conquering internal dynamics, and, therefore, interaction with culture, its tools, and other individuals is not the primary focus of the stage.[108] Conversely, in the intermediate stages, the individual is learning from and making a place in society.[109] The child becomes a different person in each stage with different cognitive capacities and progressively achieves a greater ability to interact with a wider range of people.[110] For Erikson, the ego can only remain strong through interactions with cultural institutions that enable the development of the child's capacities and potential.[111] As in all nonlinear theory, Erikson's stages are not bound to chronological age.

These four schools of nonlinear developmental theory offer useful analytical lenses for (re)theorizing and assessing technology regulation.

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104. *See id.* at 194–96.

105. Because self-beliefs play a key role in development, trajectories are inherently varies. For a discussion of the role of and variations of self-beliefs in development see, e.g., ALBERT BANDURA, SELF-EFFICACY: TOWARD A UNIFYING THEORY OF BEHAVIORAL CHANGE (1977).

106. *See* ERIK ERIKSON, CHILDHOOD AND SOCIETY 247-74 (1950).

107. *See generally id.* at 247-58.

108. *See id.* at 268.

109. *See* ERIK ERIKSON, CHILDHOOD AND SOCIETY 247-74 (1950).

110. *See id.* at 258–59.

111. *See generally id.* at 190–204.

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

C. LESSONS FROM NONLINEAR DEVELOPMENTAL THEORY FOR TECHNOLOGY COMMERCE

Nonlinear developmental theory offers five concrete lessons for crafting successful technology regulation. First, nonlinear developmental theory instructs us that human development and learning is always situated; the zone of proximal development varies across individuals. Second, development is an emergent[112] phenomenon. Third, learning and development do not always cleanly map on to chronological age. Fourth, regulating the way that humans interact with technology means contemplating multiple layers of context that cooperate or conflict to generate development. Finally, technology is merely a tool that assists humans in achieving more than they otherwise could; the regulatory and developmental focus should always remain human-centric.[113]

Nonlinear developmental theory reminds us of the importance of regulatory context or the situated learning of the individuals whose conduct the law tries to govern. Development is not something that happens to humans in a preordained manner; rather development is an interactive process that occurs on the person/society border. Therefore, the society a person experiences pushes the course of his or her development and vice versa. Learning and development of both children and adults occurs at different paces across different individuals, contingent in each case upon social context in the Vygotskian "zone of proximal development".[114] Therefore, the variations within the context of development must be considered when crafting regulatory paradigms. The same biological individual in two different social contexts will arrive at two different developmental outcomes. A successful regulatory paradigm will consider both.

Similarly, humans exist in a particular emergent social context. The social context–including the technology itself—changes in frequently unpredictable ways. Thus, regulating in

112. Emergence, generally, is order that arises from the interactions of individual actors within a complex system, demonstrating a global pattern that could not have been forecast simply from understanding the behavior of one particular actor. See STEVEN JOHNSON, EMERGENCE: THE CONNECTED LIVES OF ANTS, BRAINS, CITIES AND SOFTWARE (2001).

113. *See supra* notes 100-102.

114. *See* VYGOTSKY, *supra* note 85, at 187. For more on the zone of proximal development, see generally RENÉ VAN DER VEER & JAAN VALSINER, UNDERSTANDING VYGOTSKY: A QUEST FOR SYNTHESIS 336–43 (1991).

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

a manner predicated on static assumptions about people and technology results in law destined for quick obsolescence. Both human behavior and technology will evolve in response to law. Law must be capable of evolving as well.

Nonlinear developmental theory reveals that effects on individuals' development and behavior are emergent across multiple layers of context.[115] As Bronfenbrenner's ecological model asserts, a human is inherently embedded in multiple systemic layers that influence developmental outcomes and behaviors.[116] It is through the convergence of these multiple layers of influences that development and corresponding behaviors arise. Thus, a law pushing on development in the macrosystemic layer will influence an individual, but three additional layers of influence coexist in the space. Multiple developmental layers must coincide in pushing in the direction sought by the regulation. The influence of the exosystem of social norms, the mesosystem of peer groups and the economic exchange, and the microsystem of the individual's current state of development all come into play. Viewing the lessons of the model in the context of crafting effective regulation, without considering the impact of regulation on each of these interrelated layers, regulation can frequently be circumvented or ignored, or it may impact behavior in unanticipated and undesirable ways.[117]

Development does not always map onto chronological age. An adult user whose only interactions with a software application occur once a week for an hour in a library on a shared machine experiences technology development and learning differently than does the ten year old child with a

116. Bronfenbrenner's ecological model is represented as a series of concentric circles—or, as Bronfenbrenner characterized it, "like a set of Russian dolls"—with the microsystem level in the innermost circle and macrosystem in the outermost circle. *See* BRONFENBRENNER, ECOLOGY, *supra* note 92, at 3.

117. For example, the CAN-SPAM Act, a macrosystem rule which aimed to regulate communication on the mesosystem level, lacked adequate macrosystem and mesosystem enforcement mechanisms. No private right of action was created by the law and agencies empowered to enforce it suffer from limited resources. Spammers have recognized this lack of enforcement and adapted to a behavior of either defiance of the law or feigned compliance. This feigned compliance consists of spammers including an opt-out footer at the bottom of emails that is not honored. Instead it is used as a method of verifying that a user checks the email account. For a discussion of spammer noncompliance with CAN SPAM see, e.g., Matwyshyn n.9 *supra*. *See also, e.g.*, BRIAN S. MCWILLIAMS, SPAM KINGS (2004).

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

laptop in her bedroom. Technology can both equalize abilities and exacerbate differences. The adult with illegible handwriting is as easily understandable in email as the adult with clear penmanship. But, comfort with technology frequently maps onto number of hours spent interacting with computers—something driven by access to computing resources, which is a function of financial resources.[118]

New technologies should be analyzed merely as tools in a Vygotskian sense. They enable a user to accomplish more than the user ordinarily could without the tool. As such, the conduct that arises from this assisted action is not new; it is merely amplified conduct. As with any amplification, the waves of the conduct reach further and more potently than if the conduct had not been amplified. This broader reach necessitates a different legislative approach. Regulating technology creation is not the answer; regulating humans, their conduct, and use of that technology is a more promising approach.

Finally, the broader identity development goals of the individual provide context for the conduct of the individual. At various stages of life, developmental progress intersects with identity goals, creating another lens guiding individual behavior and developmental outcomes. Because these identity goals are inherently social in nature, two layers of context push on the individual. First, the context shaping development through interactions, and, second, the context in which the individual attempts to work toward identity goals.[119] For example, when resolving the Eriksonian conflict of generativity[120] versus stagnation, an individual may seek to generate something greater than herself by turning to technology tools such as the Internet that have previously influenced her development. Technology regulation is not (and should not be) about regulating the creation of the technology

118. Several studies have demonstrated a correlation between time spent using computers and positive attitudes toward technology. *See, e.g.*, Traci L. Anderson, *Relationships Among Internet Attitudes, Internet Use, Romantic Beliefs, and Perceptions of Online Romantic Relationships*, 8 CYBERPSYCHOL. & BEHAV. 521 (2005). Lacking access to technology, therefore, by itself creates disadvantage.

119. *See supra* notes 117-18.

120. Generativity is the concern over accomplishing a lasting impact on society through socially valuable work that guides the next generation of humanity. For a discussion of generativity *see*, *e.g.,* Dan P. McAdams, R.I. Logan, *What is generativity?*, *in* THE GENERATIVE SOCIETY 15-31 (E. de St. Aubin et. al., eds. 2004).

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

itself. Rather, technology regulation should consider humans' use of tools. .

These humans, perhaps unlike the technology itself, can demonstrate extreme levels of variation; however, they provide a more efficacious, though more complicated, point for regulation. Because different environments generate different developmental and learning experiences, humans' experience with technology varies. For some humans, technology-mediated contexts immediately cause consternation or resignation in ways that wholly real space contexts do not. For other humans, however, no palpable difference exists between technology-mediated and real space interactions. For still a third group of people, real space contexts are more likely to cause discomfort than virtual ones. Technology is merely a tool, and, like every tool, some people are better at wielding it than others. This multimodal distribution of technology comfort and proficiency does not map chronological age, nor is it absent among the regulators and judges crafting our technology regulation paradigms.

Placing these five lessons in regulatory context, COPPA demonstrates how ignoring these five lessons of contextualist developmental theory can result in regulatory suboptimality.

III. CASE STUDY: CHILDREN'S DATA SECURITY CONTRACTING AND THE CHILDREN'S ONLINE PRIVACY PROTECTION ACT

The case study of COPPA, intended to safeguard information about children that websites collect for commercial leveraging, demonstrates the shortcomings of a legislative approach driven by linear assumptions about development.

A. LEGAL HISTORY OF COPPA

The technology tool of the Internet has caused society to reconceptualize the value of user data and, consequently, the role that privacy and personal information control play within our society.[121] Widespread Internet access has caused consumers to start to reevaluate the importance of control over their personal information and their children's information.[122] Meanwhile, corporate entities have begun to place a premium

121. *See, e.g.*, ROBERT O'HARROW, NO PLACE TO HIDE (2005).

122. *See, e.g.*, H.R. REP. NO. 106-74, pt. 3, at 106–07 (1999) (noting that "the privacy of data about personal financial information has become an increasingly significant concern of consumers").

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

on consumer information, particularly in corporate acquisitions.[123] As the technology boom hit in the late 1990's and the European Union worked on adopting the EU Data Directive[124] in member states, Congress chose to address data protection in a segmented fashion, starting with Internet child data protection and COPPA.[125]

COPPA became effective in April 2000.[126] COPPA requires that websites targeting children under the age of thirteen provide notice of privacy practices and obtain verifiable parental consent prior to collecting data from the child.[127] The statute also empowers the Federal Trade Commission (FTC) to promulgate additional regulations to require the operator of a website subject to COPPA to establish and maintain reasonable procedures "to protect the confidentiality, security, and integrity of personal information collected from children."[128] Additionally, commentary to the promulgated regulations states the appropriate security measures for protecting children's data include, without limitation or proscription, "using secure web servers and firewalls; deleting personal information once it is no longer being used; limiting employee

123. For a discussion of the transformation of user data into a marketable commodity, see Jessica Litman, *Information Privacy/Information Property*, 52 STAN. L. REV. 1283 (2000).

124. Council Directive 95/46/EC, On the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of Such Data, 1995 O.J. (L 281) 31 (E.C.).

125. Child Online Privacy Protection Act of 2000, 15 U.S.C. §§ 6501-06 (2000); *see also* Children's Online Privacy Protection Rule, 16 CFR Part 312 (2006). For a discussion of COPPA, see, for example, Gaia Bernstein, *When New Technologies Are Still New: Windows of Opportunity for Privacy Protection*, 51 VILL. L. REV. 921 (2005); Andrea M. Matwyshyn, *Material Vulnerabilities: Data Privacy, Corporate Information Security and Securities Regulation*, 3 BERKELEY BUS. L.J. 129 (2005); Edward L. Palmer & Lisa Sofio, *Food and Beverage Marketing to Children in School,* 39 LOY. L.A. L. REV. 33 (2006); Marcy E. Peek*, Information Privacy and Corporate Power: Towards a Re-Imagination of Information Privacy*, 37 SETON HALL L. REV. 127 (2006); Susan P. Stuart, *Lex-Praxis of Educational Informational Privacy for Public Schoolchildren*, 84 NEB. L. REV. 1158 (2006).

126. 15 U.S.C. §§ 6501-06; *see also* 16 C.F.R § 312.1 (2006). Commentators have observed that COPPA was a reaction to the failure of self-regulation, particularly subsequent to the Kids.com advisory letter where the FTC set forth standards for privacy policies on websites targeting children. For a discussion of the Kids.com FTC letter, see Parry Aftab, *How COPPA Came About*, INFORMATIONWEEK, Jan. 19, 2004, http://www.informationweek.com/story/showArticle.jhtml?articleID=17300888.

127. 15 U.S.C. § 6502(b)(1)(a)(i)–(ii) (2000).

128. 15 U.S.C. § 6502(b)(1)(D) (2000).

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

access to data and providing those employees with data-handling training; and carefully screening the third parties to whom such information is disclosed."[129] COPPA leaves much discretion in data security to the individual website operator and creates no external reporting mechanism to monitor internal security improvements of website operators subject to COPPA. [130]

Specifically, COPPA stipulates that prior to collection of data from a child under thirteen, a website "operator"[131] must obtain "verifiable parental consent".[132] The preferred medium for this verifiable parental consent is receipt of a fax from the parent. An email exception[133] was originally crafted as an interim measure to be phased out over time. This email exception evolved into a "sliding scale approach" which is still applied by the FTC in COPPA inquiries.[134] Depending on the character of the data collection and the intended use, the FTC's analysis varies. For example, the need to obtain verifiable parental consent does not pertain equally to all child data gathering; the situation where a website collects data for a one-

129. Children's Online Privacy Protection Rule, 64 Fed. Reg. 59,888, 59,906 (Nov. 3 1999). Sadly, this articulation of the technology specifications is suboptimal. For example, the implementing regulations instruct companies to use "secure servers", but servers cannot be inherently "secure" or "vulnerable." Securing a server is a process that is ongoing. Perhaps a better phraseology would be to have required companies to take all steps identified by a leading security research firm as the fundamental exercise of care in attempting to secure a server on an ongoing basis.

130. *Id*. However, encryption was deemed to be potentially cost prohibitive and left to the discretion of entities, as was the suggested use of contractual provisions requiring minimum standards of data care from third parties granted access to the collected children's data.

131. Operator is broadly defined under the COPPA statute and implementing regulations. They encompass anyone who meaningfully handles children's data. *See* 15 U.S.C. §§ 6501-06 (1998); *see also* Children's Online Privacy Protection Rule, 16 C.F.R. § 312.2 (2007).

132. Verifiable parental consent was ideally constructed as a process involving e.g. faxing parental signatures to each website permitted to collect a child's data. *See* 15 U.S.C. §§ 6501-06 (1998); *see also* Children's Online Privacy Protection Rule, 16 C.F.R. § 312.5 (2005). This process allows for easy circumvention as no independent means of authenticating the parental signature would exists.

133. Because of the cumbersome nature of the faxing, email verification of parental consent was subsequently permitted. *See* 15 U.S.C. §§ 6501-6506 (1998); *see also* Children's Online Privacy Protection Rule, 16 C.F.R. § 312.5 (2005). Though this exception was originally intended to be phased out, it has persisted. Email verification is susceptible to even easier child circumvention than fax verification.

134. *See* BNA, *FTC Decides to Retain COPPA Rule With No Change After Review of Comments*, 7 COMP. TECH. L. REP. 127 (2006).

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

time use and does not permanently connect the child with the information does not necessitate the same degree of consent verifiability.[135] Additionally, a safe-harbor program exists where third party certificate authorities can attest compliance of websites with COPPA.[136] The FTC is empowered to institute regulatory prosecutions against entities violating COPPA. These prosecutions result in fines and consent decrees. Amounts of fines have varied, with the most recent levied at $1,000,000 against Xanga.com, a social networking website.[137] Prior prosecutions have been few in number, and previous fines have not exceeded $500,000.[138]

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135. *See* 15 U.S.C. §6501-6506 (1998); Children's Online Privacy Protection Rule, 16 C.F.R. § 312 (2007). In particular, one of the COPPA exceptions provides for one time collection, provided the information is subsequently destroyed. *See* 15 U.S.C. §§ 6501-06; *see also* Children's Online Privacy Protection Rule, 16 CFR § 312. In practice, companies frequently learned how to live within the exceptions to the extent possible to avoid compliance.

136. *See* Federal Trade Commission, Privacy Initiative: Safe Harbor Program, http://www.ftc.gov/privacy/privacyinitiatives/childrens_shp.html (last visited Apr. 11, 2007).

137. *See* United States v. Xanga.com, Inc., No. 06-CIV-682(SHS) (S.D.N.Y. Sept. 7, 2006), *available at* http://www.ftc.gov/os/caselist/0623073/xangaconsentdecree.pdf. On September 7, 2006, the FTC and Xanga.com settled the regulatory action. Xanga.com acknowledged that it failed to notify parents and obtain consent before collecting, using, and disclosing the information of users it knew to be under thirteen. Despite the user agreement's statement that children under thirteen could not join, children could register using a birth date showing they were younger than thirteen. After Xanga.com allegedly knew of their age-specific registration, the company failed to put in place measures to prevent collection of their personal information. Xanga.com also failed to notify the children's parents of the company's information practices or provide parents with access to and control over the information collected on their children. *Id.*

138. *See* United States v. Bonzi Software, Inc., No. CV-04-1048 RJK (W.D. Cali., Feb. 18, 2003), *available at* http://www.ftc.gov/os/caselist/bonzi/040217decreebonzi.pdf; United States v. UMG Recordings, Inc., No. CV-04-1050 JFW (C.D.Cali., Feb. 18, 2003) *available at* http://www.ftc.gov/os/caselist/umgrecordings/040217cagumgrecordings.pdf; United States v. Hershey Foods Corp., No. 4:03-CV-00350-JEJ (M.D.Pa. Feb. 27, 2003), *available at* http://www.ftc.gov/os/2003/02/hersheyconsent.htm; United States v. Mrs. Fields Famous Brands, Inc., No. 2:03-CV-00205 (D.Utah Feb. 27, 2003), *available at* http://www.ftc.gov/os/2003/02/mrsfieldsconsent.htm; United States v. The Ohio Art Co., No. _____ (N.D.Ohio, Apr. 22, 2002), *available at* http://www.ftc.gov/os/2002/04/ohioartconsent.htm; United States v. Pop Corn Co. No. _____ (N.D.Iowa, Feb. 14., 2002), *available at* http://www.ftc.gov/os/2002/02/popcorncnsnt.pdf; United States v. Lisa Frank, Inc., No. _____ (E.D.Va., Oct. 2, 2001), *available at* http://www.ftc.gov/os/2001/10/lfconsent.pdf; United States v. Looksmart, Ltd.,

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

During the first six years of its effectiveness, COPPA has received mixed reviews at best. The deterrent effect of prosecutions appears to have been limited. A large number of websites which are governed by COPPA are simply noncompliant and are willingly to risk prosecution rather than investing effort in an attempt to comply with COPPA. As demonstrated by several studies, compliance is generally under 60%,[139] and even websites that attempt compliance are frequently easily circumvented in their age verification process.[140]

Businesses have complained that the cost of COPPA compliance associated with monitoring usage, drafting privacy policies, and obtaining proof of parental consent runs as much as $200,000 per year by some estimates.[141] In some cases, companies have deemed the costs of compliance prohibitive and simply ceased operations.[142] For example, some websites removed highly interactive elements from their sites shortly after COPPA's passage, alleging that compliance costs rendered certain lines of business unsustainable. [143]

COPPA protects the data of children who wish to have their data protected.[144] For children who simply wish content access, in many instances immediate workarounds are readily available. Often the child merely needs to log in again and

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No. 01-606-A (E.D.Va., April 19, 2001), *available at* http://www.ftc.gov/os/2001/04/looksmartorder.pdf; United States v. Monarch Servs., Inc., et al. No. AMD 01-CV-1165 (D.Md., April 19, 2001), *available at* http://www.ftc.gov/os/2001/04/girlslifeorder.pdf; United States v. Bigmailbox.Com, Inc., et al., No. 01-605-A (E.D.Va., April 19, 2001), *available at* http://www.ftc.gov/os/2001/04/bigmailboxorder.pdf.

139. *See, e.g.*, JOSEPH TUROW, THE ANNENBERG PUB. POLICY CTR. OF THE UNIV. OF PA., PRIVACY POLICIES ON CHILDREN'S WEBSITES: DO THEY PLAY BY THE RULES? (2001)., http://www.asc.upenn.edu/usr/jturow/PrivacyReport.pdf. Two studies of COPPA compliance by the University of Pennsylvania's Annenburg Public Policy Center and by the Center for Media Education reported that although most of the sites they reviewed had privacy policies and limit the information collected from children, these privacy statements did not include required disclosures and used language that was difficult to understand. *Id.*

140. *See, e.g.*, NetFamily News, Newsletter, Apr. 21, 2000, *available at* http://www.netfamilynews.org/nl000421.html.

141. *See* Ben Charny, *The Cost of COPPA: Kids' Site Stops Talking*, ZDNET, Sep. 12, 2000, http://news.zdnet.com/2100-9595_22-523848.html; Art Wolinsky, WiredKids, From Safety and Privacy to Literacy and Empowerment, Sep., 2000, http://www.infotoday.com/mmschools/sep00/wolinsky.htm

142. Charny, *supra* note 141; Wolinsky, *supra* note 141.

143. *Id.*

144. *See, e.g.*, Net Family News, *supra* note 140.

provide a false birth date to gain access to the material to which they were denied access.[145]

As such, the business-focused crafting of the statute ignored the practical realities of child-technology and child-parent interactions. COPPA adopted a clearly linear, static view in addressing children's activities online. Its shortcomings result in part from this paradigm

B. COPPA IS NOT GROUNDED IN A NONLINEAR DEVELOPMENTAL THEORY

As discussed previously, developmental psychology has moved toward studying individuals in a social context instead of focusing on decontextualized traits. Fundamentally, individuals eventually internalize the intellectual life of the people around them, and humans create themselves and their cognitive development through activity. Looking to our culture's "tools", primarily the Internet, which bridge the physical and social world for the child, learning is always situated and the zone of proximal development varies across individuals. COPPA's framework presents a static framework that does not take into account these nonlinear insights.

First, COPPA presumes that parents are more developmentally advanced than their children regarding technology. COPPA is predicated on the idea that an adult parent's proficiency with technology surpasses that of her child, an assumption research demonstrates is unsustainable.[146] Technology learning and development do not always cleanly map on to chronological age. Parents frequently feel their ability to monitor their children's activities online is limited.[147]

Second, the age of capacity to consent to data gathering stipulated in COPPA, age thirteen, appears to have been selected arbitrarily. During early adolescence, large divergences in development are visible, perhaps even more so than in later life. Even assuming a linear paradigm, since the issue at hand relates to data security contracting, a logical age of consent might mirror contractual capacity generally. Assuming the linear paradigm of contract law, the usual age of

145. *Id.*

146. *See, e.g.*, Stefanie Olsen, *Parents shaky about kids' safety online,* CNET NEWS.COM, Aug. 10, 2006, *available at* http://news.com.com/Parents+shaky+about+kids+safety+online/2009-1025_3-6104028.html

147. *Id.*

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

contractual capacity is eighteen.

Third, COPPA takes into account only one computing context, the home, and presumes a parent is available during the child's Internet time. However, children frequently access the Internet and give away information about themselves using computers at school, at friends' houses, in the home when parents are not present, and in the library. Therefore, a regulatory paradigm presuming parental presence does not reflect the reality of children's situated learning in multiple contexts.

Fourth, both technology use and development are emergent phenomena. COPPA did not take into account the norms of corporate conduct that would arise to circumvent its restrictions. Because COPPA grants no private rights of action to parents, enforcement of COPPA is the sole province of the FTC, which is an understaffed and overburdened agency. As demonstrated by widespread noncompliance, companies frequently run a risk-benefit calculus regarding the likelihood of prosecution and decide to risk regulatory action rather than invest in compliance structure.

Finally, COPPA presents a technology-focused regulatory design; the focus is on each website that chooses to collect children's data. As technology evolves, a website-centric approach is destined for obsolescence. A more promising regulatory design would be constructed in a human-centric manner focusing on the child and the child's information. Such an approach would not only demonstrate greater versatility and regulatory longevity, but systemic efficiencies would result over the current system. In lieu of each website needing to institute a separate age verification process for each child, and each parent approving each website, a child-focused approach could be constructed in such a manner to allow for a single parental approval and a single website registration. In this way, economies of scale could be created through a child data protection structure focused on the child rather than on the website operator. Such an approach would also acknowledge that parents may be less knowledgeable and need more protection than their children, sub-optimally suited for a role of gatekeeper.

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

IV. THE FUTURE OF TECHNOLOGY COMMERCE REGULATION: NONLINEAR DEVELOPMENTAL PARADIGMS AND THE EMERGENCE OF THE ECONOMIC CYBORG

As the example of the COPPA illustrates, lessons of nonlinear developmental psychology offer promising insights for crafting future generations of technology regulation. The evolutionary nature of nonlinear developmental paradigms allow for the flexibility to regulate both an evolving technology context and an emergent developmental context for consumers. As consumers become more technology proficient, their use of technology tools will change. Consequently, their development and identity formation will follow a different path from prior generations of consumers.

Turning to Erikson's insights regarding identity development, the dualities of industry versus inferiority, identity versus role confusion, intimacy versus isolation, and generativity versus stagnation will be resolved in new ways by future generations. Successful regulation will be sensitive to these human dynamics. The ability of individuals to work effectively, find a place in society, connect with others and create things outside themselves all play out through use of technology tools. The future holds a world where progressively more individuals' work will involve technology creation and use. In our post-information revolution economy, consumer transactional behaviors are moving into technology-mediated space. Growing numbers of people in the United States have Internet access,[148] and online spending is increasing by approximately 25% annually.[149] Consumer economic identity is increasingly characterized by a hybrid real space-virtual space set of economic and social behaviors; consumer spending through e-commerce is growing.[150] Meanwhile, digital entrepreneurship and content creation is on the rise. Growing numbers of individuals are participating in technology-

148. *See* NAT'L TELECOMM. AND INFO. ADMIN., FALLING THROUGH THE NET: TOWARD DIGITAL INCLUSION (Oct. 2000), *available at* http://www.ntia.doc.gov/ntiahome/fttn00/contents00.html.

149. *See, e.g.*, Bloomberg News, *Online shopping jumps 25 percent from 2005*, OCREGISTER.COM, Dec. 14, 2006, http://www.ocregister.com/ocregister/money/article_1382582.php.

150. *See* Christopher Saunders, *Consumer Confidence in Internet Grows*, E-COMMERCE-GUIDE.COM, Sept. 30, 2002, http://ecommerce.Internet.com/news/news/article/0,,10375_1472681,00.html.

MATWYSHYN A. Technology, Commerce, Development, Identity. MINN. J.L. SCI. & TECH. 2007;8(2):515-549.

mediated content creation.[151] A successful technology regulatory regime will be sensitive to all of these emergent dynamics. It will assist users in leveraging technology tools toward guiding their own development and viewing themselves as commercial cyborgs—technologically-empowered consumers and citizens. This developmental evolution is critical to building commercial trust in the future information technology-mediated economy.

151. JOHN B. HORRIGAN, PEW INTERNET & AM. LIFE PROJECT, HOME BROADBAND ADOPTION 2006, HOME BROADBAND ADOPTION IS GOING MAINSTREAM AND THAT MEANS USER-GENERATED CONTENT IS COMING FROM ALL KINDS OF INTERNET USERS (2006), *available at* http://www.pewInternet.org/pdfs/PIP_Broadband_trends2006.pdf.