

# Theories of Genetic Ownership

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## ABSTRACT

*Who should own genetic information? A researcher who develops an immortal cell line from a human cancer cell might assert that she owns the result. By contrast, the provider of the cancer cell could likewise claim ownership because the cell line was made possible by her unique genetic information. While settled law clearly holds that certain kinds of genetic research are patentable and that individuals maintain no property interest in their excised cells, people continue to express the intuition that their genetic information belongs to them. Using property law theory, this Essay explores the competing ownership claims of the biotechnology industry and of contributors of genetic material. Its central inquiry is not what the law of genetic ownership is but rather what the law of genetic ownership should be. The Essay argues that the biotechnology industry and people who provide DNA are reasoning from two differing theories of property. Researchers and genetic testing companies adopt a predominantly economic approach to genetic material, in keeping with the labor theory of property. Sources of genetic material, by contrast, regard the ownership of genetic material in dignitary rather than economic terms, stemming from property's personhood theory. Building off these insights, the Essay concludes that a third property theory—welfare maximization—could reconcile these conflicting claims to genetic information, thereby better balancing the interests of researchers and individuals who provide genetic material.*

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## INTRODUCTION

Owning genetic information is big business. Just this summer, the genealogical data company Ancestry, which began offering its direct to consumer DNA ancestry test in 2012, launched a website called AncestryHealth.<sup>1</sup> The website provides a free service that will integrate the company's genealogical and genetic data to create a comprehensive family health history.<sup>2</sup> And the company has not been shy about its intent to sell that valuable information to medical researchers. One executive boasted that Ancestry is "definitely in conversations with multiple groups to assess the value and interest of the information for medical research."<sup>3</sup> Ancestry is, however, not alone. The company is following in the footsteps of its notorious cousin 23andMe.

Earlier this year, direct-to-consumer genetic testing company 23andMe announced that it had signed the first of approximately ten multi-million dollar deals to sell access to its customer databases to pharmaceutical and biotech companies.<sup>4</sup> This agreement comes as no real surprise, as commentators have long predicted that the company's true purpose was not to sell affordable genetic tests but to collect potentially lucrative data.<sup>5</sup> Importantly, the 600,000 of 23andMe's

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<sup>1</sup> Anna Nowogrodzki, *Ancestry Moves Further into Consumer Genetics*, M.I.T.TECH REV., July 16, 2015, available at <http://www.technologyreview.com/news/539321/ancestry-moves-further-into-consumer-genetics/>.

<sup>2</sup> *Id.*

<sup>3</sup> *Id.*

<sup>4</sup> Matthew Herper, *Surprise! With \$60 Million Dollar Genentech Deal, 23andMe Has a Business Plan*, FORBES, available at <http://www.forbes.com/sites/matthewherper/2015/01/06/surprise-with-60-million-genentech-deal-23andme-has-a-business-plan/>.

<sup>5</sup> See Charles Seife, *23andMe Is Terrifying, But Not for the Reasons the FDA Thinks*, SCIENTIFIC AMERICAN, Nov. 27, 2013, available at <http://www.scientificamerican.com/article/23andme-is-terrifying-but-not-for-reasons-fda/>; see also David P. Hamilton, *23andMe: Will the Personal-Genomics Company Need Big Pharma to Make Money?*, VENTUREBEAT.COM, Nov. 19, 2007, available at <http://venturebeat.com/2007/11/19/23andme-will-the-personal-genomics-company-need-big-pharma-to-make-money/> ("To put it

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800,000 customers who are in the database formally consented to have the company share their genetic information with third parties.<sup>6</sup> The individuals in the database are therefore considered donors.<sup>7</sup> However, obtaining proper consent for the donations has not shielded the company from criticism. One commentator pointed out “I would have thought that donating my genome meant that it would be donated, not sold, for research.”<sup>8</sup> And an article on the new business venture warned consumers, “If you’re paying a cut rate to have 23andMe sequence your DNA, you are 23andMe’s product.”<sup>9</sup>

These critiques of 23andMe’s lawful and ethical conduct sound in the registers of commercialization and commodification. In other words, they invoke the language of property. But who should own genetic information? This question has haunted human genetic and genomic research since it first began. Human beings are 99.9% genetically similar.<sup>10</sup> However, the remaining 0.1% is extremely powerful. That tiny bit of difference accounts for all of human

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bluntly, the real money is likely to lie in selling corporations — specifically, drug companies — access to the aggregate genetic information 23andMe amasses from its customers.”).

<sup>6</sup> Herper, *supra* note 6. According to company, eighty percent of its customers consent to sharing their genetic data. Lydia Ramsey, *23andMe CEO Defends Practice of Sharing Genetic Info with Pharma Companies*, BUS. INSIDER, July 7, 2015, available at <http://finance.yahoo.com/news/23andme-ceo-defends-practice-sharing-164857907.html>.

<sup>7</sup> Donors, who simply hand over their biological material, do not have the same protections as research subjects, who participate in studies. The reasoning goes, if you donate your car, you relinquish control of how it is used, so the same principle should apply to genetic information. See *Greenberg v. Miami Children’s Hosp.*, 264 F. Supp. 2d 1064 (S.D. Fla. 2003) (explaining with respect to donors of biological material “the voluntary nature of their submission warrants different treatment” than research subjects).

<sup>8</sup> William Chang, Comment, Jan. 8, 2015, available at <http://www.inquisitr.com/1739794/23andme-see-how-this-company-is-making-millions-selling-customer-dna-information-to-big-pharma/>.

<sup>9</sup> See Sarah Zhang, *Of Course 23andMe’s Plan Has Been to Sell Your Genetic Data All Along*, GIZMODO.COM, Jan. 6, 2015, available at <http://gizmodo.com/of-course-23andmes-business-plan-has-been-to-sell-your-1677810999>.

<sup>10</sup> See Remarks on Completion of the First Survey of the Human Genome Project, Administration of William J. Clinton, June 26, 2000, at 1501 (declaring “all human beings, regardless of race, are more than 99.9 percent the same”).

variation and variation is precisely what interests genetic and genomic researchers most. As a result, that tiny bit of difference is also immensely valuable—valuable because it is what makes individuals unique and valuable because it can be very lucratively commercialized.

American legal theory construes property not as physical objects but rather as associations of rights.<sup>11</sup> It is precisely this construction that allows individuals to enjoy intellectual property rights—rights in various creative works, including scientific research—that may have no tangible, physical form. Traditionally recognized property rights include the rights to possess, to use, to exclude others from possessing or using, and to transfer.<sup>12</sup> Practically speaking then, in many contexts, owners can use, donate, sell, alter, and destroy their property.<sup>13</sup> Importantly, an individual does not have to enjoy the full panoply of property rights to have a legally recognized property interest.<sup>14</sup> For instance, in cases with highly limited property rights, courts will sometimes refer to the plaintiffs as having “quasiproperty interests.”<sup>15</sup> Yet to understand property in this way requires a theory for when we confer which associated rights and, of course, why. Thus, property theories serve a variety of functions. They justify the recognition of property rights and articulate the boundaries of those rights.<sup>16</sup> Property theories also serve allocation

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<sup>11</sup> Anthony M. Honoré, *Ownership*, in OXFORD ESSAYS IN JURISPRUDENCE (Anthony G. Guest ed. 1961); see also GREGORY S. ALEXANDER & EDUARDO M. PEÑALVER, AN INTRODUCTION TO PROPERTY THEORY 1-3 (2012); Pilar N. Ossorio, *Property Rights and Human Bodies*, in WHO OWNS LIFE? 224-25 (David Magnus et al. eds. 2002) (describing property as “not the thing itself, but rather the bundle of rights in an object”); Sonia M. Suter, *Disentangling Privacy from Property*, 72 GEO. WASH. L. REV. 737, 750-53 (2004) (describing the evolution of property law); Jeffery Lawrence Weeden, *Genetic Liberty, Genetic Property: Protecting Genetic Information*, 4 AVE MARIA L. REV. 611, 639-42 (2006).

<sup>12</sup> Ossorio, *supra* note 11, at 225.

<sup>13</sup> See R. Alta Charo, *Body of Research—Ownership and Use of Human Tissue*, 355 NEW ENG. J. MED. 1517, 1519 (2006).

<sup>14</sup> Ossorio, *supra* note 11, at 225 (explaining that “[c]alling something property does not necessarily mean that its owner has all possible rights to its exclusive use, donation, sale, alteration and destruction”).

<sup>15</sup> Catherine M. Valerio Barrad, *Genetic Information and Property Theory*, 87 NW. U. L. REV. 1037, 1060-61 (1993) (describing quasiproperty interests in dead bodies); Ossorio, *supra* note 11, at 230.

<sup>16</sup> Margaret Jane Radin, *Property and Personhood*, 34 STAN. L. REV. 957, 958 (1982).

and legitimization functions by explaining how and why those property rights should be distributed amongst potential stakeholders.<sup>17</sup> This Essay engages with three dominant theories in American property law: (1) property as labor, (2) property as personhood, and (3) property as welfare maximization.

Despite widespread assertions of genetic ownership, no scholarship has systematically applied property theories to the current state of genetic data.<sup>18</sup> This lack of scholarly attention

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<sup>17</sup> ALEXANDER & PEÑALVER, *supra* note 11, at xx.

<sup>18</sup> While this Essay does not make the normative claim that genetic information *should* be genetic information, some authors have advocated property (or property-like) rights in either genetic information or genetic material. *See, e.g.*, Barrad, *supra* note 15 (arguing that “[t]he courts should recognize that an individual has protectable property interests in the information encoded in his genetic material”); Leigh M. Harlan, *When Privacy Fails: Invoking a Property Paradigm to Mandate the Destruction of DNA Samples*, 54 DUKE L.J. 179 (2004) (arguing for property rights in genetic material in response to police DNA dragnets); Radhika Rao, *Genes and Spleens: Property, Contract, or Privacy Rights in the Human Body?*, 35 J.L. MED. ETHICS 371 (2007) (rejecting both privacy and traditional property paradigms and purposing a model of property as stewardship); Erik B. Seeney, *Moore 10 Years Later—Still Trying to Fill the Gap: Creating a Personal Property Right in Genetic Material*, 32 NEW. ENG. L. REV. 1131 (1998) (arguing for a right to personal property in genetic material); Weeden, *supra* note 11 (advocating property rights in genetic information to ensure genetic liberty).

Others have explicitly argued against understanding genetic information as property. *See, e.g.* Molly A. Holman & Stephen R. Munzer, *Intellectual Property Rights in Genes and Gene Fragments: A Registration Solution for Expressed Sequence Tags*, 85 IOWA L. REV. 735 (2000) (advocating a registration system as an alternative to patents for express sequence tags); Richard A. Spinello, *Property Rights in Genetic Information*, 6 ETHICS & INFO. TECH. 29 (2004) (arguing against property interests in genetic information and genetic source material); Suter, *supra* note 11 (advocating for privacy protections over property protections).

More broadly, scholars have considered whether there should be property rights in the body itself, bodily material, or personal information. *See, e.g.*, Barbro Björkman & Sven Ove Hansson, *Bodily Rights & Property Rights*, 32 J. MED. ETHICS 209 (2005) (discussing a person’s property-related rights in her biological material); James Rule & Lawrence Hunter, *Toward Property Rights in Personal Data*, in VISIONS OF PRIVACY: POLICY CHOICES FOR THE DIGITAL AGE (Colin J. Bennett & Rebecca Grant, eds. 1996); Ossorio, *supra* note 11 (discussing arguments for and against recognizing ownership interests in human bodies); Muireann Quigley, *Property and the Body:*

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represents a significant gap in both the literature of property law and the literature of genetics and the law. With regard to property law, applying accepted theories to the novel context of genetic information demonstrates their versatility and continued relevance for an evolving area of the law. For genetics and the law, property theory represents a previously undertheorized lens for understanding how and why the law should safeguard interests in genetic information. Moreover, even if property is not the ideal legal paradigm, the stubborn persistence of property rhetoric in this area warrants a deeper exploration of property's theoretical foundations, as applied to genetic ownership.

This Essay primarily concerns itself with private property, the property of individual persons or entities, opposed to collective or community property, property shared by multiple owners. But that is not to say that the only property interests that might exist in genetic information must be individualized. Some scholars have in fact advocated treating genetic information as a shared resource. After all, recall that human beings are 99.9 percent similar. Thus, the majority of the human genome is common to us all. While it is possible to understand genetic information in collective ownership terms, this Essay instead focuses on the individual interests of the sources of genetic material and of the biotechnology industry.<sup>19</sup>

To that end, understanding genetic information in property theory terms could help resolve competing ownership claims.<sup>18</sup> This Essay argues that the biotechnology industry and contributors of genetic material are approaching genetic ownership through differing conceptions of property.<sup>20</sup> Researchers and genetic testing companies

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*Applying Honoré*, 33 J. MED. ETHICS 631 (2007) (using Honoré standard incidents of ownership to argue in favor of recognizing property interests in the body); James Rule & Lawrence Hunter, *Toward Property Rights in Personal Data*, in VISIONS OF PRIVACY: POLICY CHOICES FOR THE DIGITAL AGE 170 (Colin J. Bennett & Rebecca Grant, eds. 1996) (proposing "property right over commercial exploitation of personal information").

However, no one has systematically applied the three major property theories to explain the current conflicts between the biotechnology industry and sources of genetic material in fact stem because the two groups are reasoning from different theories of ownership. In so doing this Essay fills an important gap in the current literature.

<sup>19</sup> Others have gone even further arguing that genetic information should fall within the common dominion of humankind. See Holman & Munzer, *supra* note 17, at 839.

<sup>20</sup> Conflicting genetic ownership claims are long overdue for meaningful, theoretical inquiry. Alexander and Peñalver explain:

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construe property through an economic lens, focused on monetization, research control, and profitability. Individuals who provide DNA, however, construe property through a dignitary lens, centered on unauthorized use and the potential for stigma and other negative social consequences. The biotech field is therefore using a labor theory, asserting that the efforts of researchers and employees produced the resulting genetic or genomic knowledge, whereas individuals who provide genetic material are using a personhood perspective, alleging that the uniqueness of the genetic information renders it their own.

A welfare-maximization view of genetic ownership would provide an alternate framework that could perhaps resolve the competing interests of the biotech industry and individuals who contribute genetic material. In some cases, prioritizing researchers and genetic testing companies would maximize social welfare by encouraging further scientific advances. Yet under different circumstances—for example, if research participation significantly decreased—prioritizing the ownership rights of providers of DNA would be more welfare enhancing. Thus, while the tensions between the biotech industry and the sources of genetic material may seem intractable, adopting a welfare-maximization theory of ownership could better balance the interests of these two kinds of parties.

Hence, the primary aim of this Essay is theoretical. It applies existing property theories to the realm of genetic information and explores how those insights could reconcile conflicting claims of genetic ownership. It does not seek to provide a comprehensive overview of the exceedingly complex legal status of genetic property, a worthwhile objective to be sure.<sup>21</sup> Instead it seeks to answer the previously neglected normative questions: Who *should* own genetic information and why?

This Essay fills that important gap in the literature in three Parts. Part I outlines the basic contours of property law and theory and explains why it is essential to understand genetic information in property terms. Part II describes the competing ownership claims of

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Theory matters. At the base of every single property debate are competing theories of property—different understandings of what private property is, why we have it, and what its proper limitations are. In these disputes, theory as such may not be explicitly articulated, but it is always near the foundation of the disagreement.

ALEXANDER & PEÑALVER, *supra* note 11, at xi.

<sup>21</sup> Jessica L. Roberts, *The Law of Genetic Property* (in progress).

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the biotech industry and contributors of genetic material over the relevant genetic information. It then explains that these two groups are grounding their claims in two different property theories, labor theory and personhood theory, respectively. Part III attempts to resolve this tension by suggesting a third property theory—welfare maximization—as means for striking a balance between these conflicting ownership claims. Finally, the Essay concludes by considering how the welfare-maximization theory might play out in practice, with a focus on how to promote more harmonious research relationships in the future.

## I. INTRODUCTION TO GENETIC OWNERSHIP

Despite clear invocations of ownership language, whether genetic information should give rise to legally cognizable property interests remains highly contested. While some scholars have advocated property rights in the body generally or genetic information specifically, others scholars have been reluctant to explicitly construe genetic information as the property of individuals who contribute genetic material out of the fear of the commodification, disaggregation, and objectification of human beings. This Part provides a brief description of American property law and the theories that undergird it. It goes to explain why understanding legal protections for genetic information in property terms is a worthwhile exercise, despite previous scholarly hesitation.

### A. *What is Property?*

Tony M. Honoré wrote that “[o]wnership is one of the characteristic institutions of human society.”<sup>22</sup> Beyond its legal implications, property also serves important human values.<sup>23</sup> Yet despite the ubiquity of notions of property and ownership, those terms are surprisingly hard to define.<sup>24</sup> To start, property has both lay and

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<sup>22</sup> Honoré, *supra* note 11, at 107.

<sup>23</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 5.

<sup>24</sup> Some scholars even propose it is impossible to define. John E. Cribbet stated that the question ‘What is property?’ is ‘unanswerable.’ Weeden, *supra* note 11, at 639; *see also* ALEXANDER & PEÑALVER, *supra* note 11, at 1 (stating that “some commentators have argued that the concept of property defies definition”); Ossorio, *supra* note 11, at 224.

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legal definitions.<sup>25</sup> But even within law and the legal academy, we have no clear consensus regarding precisely what property *is* or how property rights should be distributed amongst individuals. Hence, before exploring the ownership status of genetic information, it is useful to define the key terms and to outline the relevant theories related to American property law.

### 1. Definitions of Property

There is no single, widely accepted definition of property or of ownership.<sup>26</sup> “To own” is a transitive verb: It requires an object.<sup>27</sup> One must own *something*. It is therefore not surprising that most non-lawyers frequently think of property in more or less physical terms. Our “property” is things like our cars, our personal belongings, and our homes. Of course, land is another well-known type of property, evinced by the common signs warning against trespass that read “private property.” Thus, the word property frequently describes the object of ownership.<sup>28</sup> Yet the lay understanding of property also has strong symbolic elements. Anyone who has witnessed a child yell “That’s mine!” knows that the child is not just describing the object in question but also her right to control over that object. Property then not only describes the object itself but the relationship between the individual owner and the object that is owned.<sup>29</sup> Specifically, property expresses a right to control—including the ability to restrict access by others—regardless of whether those other individuals have consented to that control.<sup>30</sup> The lay definition of property then tends to encompass both the physical object and the rights over it.

However, according to widely accepted American legal theory, property is not physical but conceptual. Thus, property as a legal matter moves away from the object of ownership itself and focuses primarily on the ability to assert control.<sup>31</sup> However, lawyers see

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<sup>25</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 2; *see also* Weeden, *supra* note 11, at 639.

<sup>26</sup> Ossorio, *supra* note 11, at 224-225.

<sup>27</sup> Honoré, *supra* note 11, at 129.

<sup>28</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 2-3; Honoré, *supra* note 11, at 129.

<sup>29</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 2; Honoré, *supra* note 11, at 129; *see also* Ossorio, *supra* note 11, at 224; Weeden, *supra* note 11, at 638.

<sup>30</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 2-3; *see also* Suter, *supra* note 11, at 751; Weeden, *supra* note 11, at 639.

<sup>31</sup> Suter, *supra* note 11, at 753 (explaining the right to control as central to both Blackstonian and Hohfeldian conceptions of property).

property as far more complex than most lay people. The legal perspective views what might at first appear to be a singular interest—the right to control—as consisting of the aggregated legal interests that a particular person may exercise with respect to a particular object against the rest of the world.<sup>32</sup> Understanding property as a set of legal relations or a collection of rights has become popularly known as the “bundle of sticks approach.”<sup>33</sup> If property consists of a bundle of various rights, those interests can be disaggregated and examined. This view of property is particularly useful to lawyers because of its flexibility and its capacity to capture conflicts between parties on even very narrow issues of ownership.<sup>34</sup>

Much of the appeal of understanding property as a “bundle,” and not a unified interest, stems from the ability to “unbundle” those component rights and to tailor them to the particular object of ownership.<sup>35</sup> Different kinds of objects under different conditions might then invoke different sorts of property interests.<sup>36</sup> For example, the property interests in a single piece of land might include the typical ownership rights to exclude people from entering, to charge them for entering, and to sell the land, as well as rights associated with a mining concession.<sup>37</sup> Similarly, patents are a distinct form of property that confers the right to exclude others from making, using, selling, and importing but does not convey positive rights to make, use, sell, or import.<sup>38</sup> Thus, different forms of property have different sets of associated legal interests. Consequently, no single set of rights uniformly applies across all situations and to all kinds of property. Defining property by attempting to identify the kinds of interests present in the property bundle has therefore begun the subject of rich scholarly inquiry and debate.

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<sup>32</sup> Barrad, *supra* note 15, at 1057-58 (describing property according to Hohlfeld and the Restatements).

<sup>33</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 2; Björkman & Hansson, *supra* note 18, at 210 (citing HENRY SIDGWICK, *ELEMENTS OF POLITICS* (1891)); Ossorio, *supra* note 11, at 224-25.

<sup>34</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 2. *But see id.* at 3 (quoting J.E. Penner, *The Idea of Property in Law*) (“[O]n the ‘bundle of rights’ picture, ‘property’ is not really a useful concept of any kind. It doesn’t help judges understand what they’re doing when they decide cases, because it doesn’t effectively characterized any particular sort of legal relation.”).

<sup>35</sup> Björkman & Hansson, *supra* note 18, at 209-10.

<sup>36</sup> Ossorio, *supra* note 11, at 225.

<sup>37</sup> Björkman & Hansson, *supra* note 18, at 210 (citing HENRY SIDGWICK, *ELEMENTS OF POLITICS* (1891)).

<sup>38</sup> Ossorio, *supra* note 11, at 226.

While lawyers and legal scholars might agree that property is best understood in terms of aggregated legal interests, they differ with respect to exactly how to characterize the component rights. Henry Sidgwick identified three interests in the property bundle: the right to exclusive use, the right to destroy, and the right to alienate.<sup>39</sup> Other variations include adding a right to possess (which may be implicit in the right to use), a right to exclude others, and a right to transfer (which coincides with Sidgwick's right to alienate).<sup>40</sup> Honoré provides a more complex account. He identifies what he calls the eleven standard incidents of ownership.<sup>41</sup> In addition to the right to possess (including the rights to exclude and to remain in control) and the right to use, Honoré adds the right to manage, the right to income from the object of ownership, the right to capital (including the right to alienate, as well as the rights "to consume, waste, or destroy"), the right to security over time, the right of transmissibility and the absence of term, the duty to avoid harm, the liability for the execution of debts, and the characteristic of residuarity, meaning that when limited interests, such as those of a lessor, the property interest reverts back to the owner.<sup>42</sup> In analyzing the various permutations of rights that could make up a given bundle, some legal scholars have attempted to identify a single definitive feature of ownership that defines property, such as the right to exclude<sup>43</sup> or the right to sell.<sup>44</sup> However, selecting one interest as definitive of property inevitably fails because it is possible to identify examples of property regimes that either lack or subordinate that supposedly definite right.<sup>45</sup> Property law scholars therefore not only lack consensus regarding the precise number and type of rights in the bundle, but also about their relative importance.

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<sup>39</sup> Björkman & Hansson, *supra* note 18, at 210.

<sup>40</sup> Ossorio, *supra* note 11, at 225 (right to use; the right to exclude others from possessing, using, or occupying; and the right to transfer (to sell or give away—to alienate)").

<sup>41</sup> Honoré, *supra* note 11, at 113; *see also* ALEXANDER & PEÑALVER, *supra* note 11, at 4 (quoting Anthony (Tony) M. Honoré, *Ownership, in READINGS IN THE PHILOSOPHY OF LAW* (Jules L. Coleman, ed. 1999)) (describing the eleven incidents).

<sup>42</sup> Honoré, *supra* note 11, at 116-27.

<sup>43</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 3; *id.* at 5 (quoting James Penner, *The Idea of Property in Law*).

<sup>44</sup> Björkman & Hansson, *supra* note 18, at 211.

<sup>45</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 4

Property rights are rarely universal or absolute.<sup>46</sup> While commentators cannot agree on the specific kinds of rights within the bundle or their significance, property law scholars tend to agree that ownership does not require enjoying all the relevant rights to control a particular object. In other words, one need not have the entire range of possible property rights at all possible times to assert a property interest. For instance, the Restatement of Property includes a definition of “complete property”—that is, having all the ownership rights with respect to a particular object.<sup>47</sup> The person who has complete property is the “owner of the object.”<sup>48</sup> But the Restatement also recognizes that a person who enjoys “one or more interests” can also be designated as an “owner.”<sup>49</sup> Similarly, in writing about his standard incidents of ownership, Honoré explained that no individual incident is necessary for the designation of ownership but that several taken together will be sufficient.<sup>50</sup> For Honoré, even full ownership requires simply most—not necessarily all—standard incidents.<sup>51</sup> Moreover, people who enjoy only a few rights in a particular thing might still have legitimate—while limited—property-like interests, sometimes known as “quasiproperty” rights.<sup>52</sup>

Constructing property as a non-exclusive, flexible bundle of rights allows us to convey ownership over things that lack a physical form, such as a song, an episode of a television show, a brilliant design innovation, or perhaps—for the purposes of this Essay—genetic information. Thus, understanding property in this way allows us to invoke the familiar language and principles of property law to own things that we cannot touch or sometimes see. In other words, it provides the basis for the field of intellectual property. While untethering property from the tangible world allows for broad ownership claims, scholars also warn this level of abstraction threatens to sever the concept of property from the objects that are owned, potentially causing us to lose sight of what Michael Heller calls the ‘thingness’ of property or its connection to the objects of

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<sup>46</sup> Ossorio, *supra* note 11, at 225.

<sup>47</sup> Barrad, *supra* note 15, at 1058.

<sup>48</sup> *Id.*

<sup>49</sup> *Id.*

<sup>50</sup> Honoré, *supra* note 11, at 113; *see also* ALEXANDER & PEÑALVER, *supra* note 11, at 4;

<sup>51</sup> Quigley, *supra* note 18, at 632.

<sup>52</sup> *Supra* note 15; *see also* Weeden, *supra* note 11, at 642.

ownership that remains so central to its lay understanding.<sup>53</sup> Not surprisingly then, scholars have responded with other property definitions, designed to strike a balance between the physical and the conceptual, such as the functionalist approach.<sup>54</sup>

In sum, while most people have a basic understanding of property and what it means to own a particular object, the precise legal contours of these concepts remain fuzzy and amorphous. In fact, the lack of consensus has led some to argue that notions of property and ownership have ceased to be practically useful.<sup>55</sup> Yet while there may be no singular definition of property, Gregory Alexander & Eduardo Peñalver maintain that “someone familiar with the concept will be able to recognize systems of property with sufficient accuracy that the concept is not devoid of meaning.”<sup>56</sup> Invocations of property and ownership, therefore, still have legal and social value.

## 2. Theories of Property

For the purpose of this Essay, I adopt the widely accepted bundle of rights approach to property. Yet settling on a definition of property does nothing to explain who (or what) *should own* a

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<sup>53</sup> See ALEXANDER & PEÑALVER, *supra* note 11, at 3 (quoting Michael Heller, *Boundaries of Private Property*, at 1193).

<sup>54</sup> For example, Jeremy Waldron would describe property as the area of law concerned with resource allocation. According to Waldron resource allocation consists of “determining peacefully and reasonably predictably who is to have access to which resources for what purposes when.” ALEXANDER & PEÑALVER, *supra* note 11, at 6 (quoting Jeremy Waldron, *Private Property*). He asserts that property consists of “rules governing access to and control of material resources” that are “organized around the idea that resources on the whole separate objects each assigned and therefore belonging to some particular individual.” *Id.* However, as Alexander & Peñalver point out, “[s]uch a functional definition of property helps to differentiate a domain of legal or social institutions as ‘property,’ but it is neutral as to exactly how rights are allocated (in customized bundles or standard blocks with essential features) and as to the normative foundations for structuring the institution in one way rather than another.” *Id.*

<sup>55</sup> See *id.* at 2 (quoting Thomas C. Grey, *The Disintegration of Property*, in NOMOS XXII: PROPERTY (J. Roland Pennock & John W. Chapman, eds. 1980)) (“It seems fair to conclude from a glance at the range of current usages that the specialists who design and manipulate the legal structures of the advanced capitalist economies could easily do without using the term ‘property’ at all.”).

<sup>56</sup> *Id.* at 5.

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particular object, artistic work, or idea. For the answers to these questions we must turn to property theory.

Property theory serves at multiple functions. First and foremost, property theory justifies the existence of property as a valuable social institution and defines the scope of those rights.<sup>57</sup> Additionally, it can also tell us what kinds of things are worth owning and the relative importance of the ownership interests vested in different kinds of property.<sup>58</sup> Secondly, theories of property present frameworks for how to distribute those property interests.<sup>59</sup> Put simply, a property theory tells us who should own what. And finally, property theory legitimizes a particular ownership regime by offering an explanation as to why that regime's allocation of ownership interests is appealing or fair.<sup>60</sup> Thus, property theories are at once generative, descriptive, normative, and validating. While there are potentially unlimited theories of property, this Essay focuses on three widely accepted ownership theories: (1) labor theory; (2) personhood theory; (3) welfare-maximization theory.

*a. Labor Theory*

The labor theory holds that one is entitled to property when her labor is what produced it.<sup>61</sup> Often credited to the highly influential work of John Locke,<sup>62</sup> moral desert serves as the foundation of the labor theory of property: One enjoys a moral entitlement to the fruits of her labor.<sup>63</sup> In *Two Treatises of Government*, Locke famously wrote:

Though the Earth, and all inferior Creatures be common to all Men, yet every Man has a Property in his own Person. This no Body has any Right to but himself. The Labour of his Body and the Work of his Hands, we may

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<sup>57</sup> Radin, *supra* note 16, at 958.

<sup>58</sup> *Id.* at 978-79.

<sup>59</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 6.

<sup>60</sup> *Id.* at 7.

<sup>61</sup> *Id.* at 36-56 (discussing labor theory); *see also* Barrad, *supra* note 15, at 1070-71; Radin, *supra* note 16, at 958, n.3; Spinello, *supra* note 18, at 37.

<sup>62</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 35 (stating that “[n]o single person has had more of an impact on property thought in the English-speaking world than John Locke”). *But see* Holman & Munzer, *supra* note 17, at 833 (asserting that “[t]he principle [of labor desert] should not be identified with Locke’s views on property”).

<sup>63</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 37.

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say, are properly his. Whatsoever then he removes out of the State that Nature hath provided, and left it in, he hath mixed his Labour with and joined to it something that is his own, and thereby makes it his Property. It being by him removed from the common state nature placed it in, it hath by this labour something annexed to it, that excludes the common right of the other man.<sup>64</sup>

According to Locke, we all have an exclusive right to property in ourselves, which cannot be separated from our persons; therefore, if we own ourselves, we have a claim to our labor, and anything of value we generate through our contributions—i.e., through mixing our labor with the elements of the natural world—is then rightfully ours.<sup>65</sup> Put simply, a person owns something because she created the object of ownership or gave it its value.

However, Locke's labor theory is actually more complex than could initially appear. It incorporates concepts of natural law, justice, and autonomy. As conceived by Locke, labor theory contains certain natural law elements: God gave humanity dominion over the earth in common.<sup>66</sup> Then to assert an individual right to ownership, one must mix that which is hers—her labor—with the commons.<sup>67</sup> Furthermore, Locke also incorporates justice into his theory. First, he recognizes that individuals invest in labor primarily to reap its rewards and, consequently, denying someone access to the very benefits that she produced would be unfair.<sup>68</sup> Yet, a principle of charity tempers this entitlement. If a person produces a surplus, Locke maintains that it is appropriate to redistribute that surplus to keep other members of society from the ravages of extreme poverty.<sup>69</sup> Finally, there are also notions of autonomy and consent within Locke's theory. His notion of property requires that the individual person agrees to follow the property laws enacted by the majority.<sup>70</sup>

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<sup>64</sup> JOHN LOCKE, TWO TREATISES OF GOVERNMENT.

<sup>65</sup> Barrad, *supra* note 15, at 1070-71.

<sup>66</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 36-37.

<sup>67</sup> *Id.*

<sup>68</sup> Spinello, *supra* note 18, at 37.

<sup>69</sup> LOCKE, *supra* note 64.

<sup>70</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 43. However, contemporary proponents of labor theory envision a different role for the government. *Id.* at 56 ("Instead of a theory for limited private property rights in the service of an argument for majoritarian government, twentieth century Lockeans have offered us a theory of limited majoritarian government in the service of private property rights.").

Despite Locke's central role in property theory, he is not without his critics. For instance, sometimes the contribution of an individual's labor is de minimus to the value of a particular object of ownership. For example, imagine a person picks apples, gathers acorns, or kills a deer.<sup>71</sup> How can she claim ownership over these items based on her labor? She did not create the apples, the acorns, or the deer through her own efforts. Locke might answer that, while the individual's labor did not produce a substantial portion of the items' inherent values, her labor is nonetheless what enabled their consumption or use.<sup>72</sup> Thus labor theory is not based in generating an object of ownership's value but rather in enabling its usefulness.

Other criticisms are harder to answer. Robert Nozick famously asked why adding one's labor creates—rather than destroys—a person's ownership interest.<sup>73</sup> He uses the example of owning a can of radioactive tomato juice (thereby allowing him to track its whereabouts) and dumping that can into the sea.<sup>74</sup> Nozick then queries whether under Locke's labor theory: “[D]o I thereby come to own the sea, or have I foolishly dissipated my tomato juice?”<sup>75</sup> Nozick therefore reveals that Locke premises his theory on the notion that mixing something that a person owns with something that she does not own expands rather than dilutes or eliminates her property interests. Yet from a practical perspective, simply adding labor is not sufficient to transfer ownership. If it were, people would cease to own their suits anytime they took them to be altered or cleaned.<sup>76</sup> Moreover, it is unclear just how much labor a person must mix with the natural world to assert an ownership claim. A single person is rarely responsible for creating an object of ownership or rendering it useful. As Alexander and Peñalver observe, “[h]uman labor is almost always cooperative. . . .”<sup>77</sup> Thus, how do we know which interests go to which contributor of labor?

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<sup>71</sup> *Id.* at 49.

<sup>72</sup> *Id.*

<sup>73</sup> Robert Nozick, *Anarchy, State, and Utopia*; see also ALEXANDER & PEÑALVER, *supra* note 11, at 46.

<sup>74</sup> Robert Nozick, *Anarchy, State, and Utopia*; see also ALEXANDER & PEÑALVER, *supra* note 11, at 46.

<sup>75</sup> Robert Nozick, *Anarchy, State, and Utopia*; see also ALEXANDER & PEÑALVER, *supra* note 11, at 46.

<sup>76</sup> Ossorio, *supra* note 11, at 235.

<sup>77</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 48.

*b. Personhood Theory*

A second widely accepted property theory, property as personhood, maintains that having ownership or control over certain items is necessary to one's self-development and fulfillment as a human being. Thus, one's personal identity and sense of self entitle her to ownership. Although Margaret Jane Radin created the modern iteration of personhood theory,<sup>78</sup> her work builds off the scholarship of W.F. Hegel.<sup>79</sup>

*Hegelian Personhood Theory*

Hegel views property as essential to self-realization.<sup>80</sup> Specifically, he believes that any meaningful account of freedom or autonomy requires "embodiment," meaning presence in the physical world.<sup>81</sup> According to Hegel, "property is the first embodiment of freedom and so is in itself a substantive end."<sup>82</sup> Free will must reside somewhere in the external world<sup>83</sup> and the recognition of property things is what allows us to "objectify the free will."<sup>84</sup> Hegel explains that "[a] person has as his substantive end the right of putting his will into any and every thing making it his, because it has no such end in itself and derives its destiny and soul from his will."<sup>85</sup> Put simply, to enjoy freedom and to engage in self-realization, we require objects upon which to exercise our free will. Thus, a person can only manifest her true self through engaging with external reality.<sup>86</sup> Because property describes our relationship with things, an understanding of property, at least in Hegel's view, becomes essential to identity and self-fulfillment. Through the acts of possessing, controlling, and owning, an individual can transform her unrealized inner self into fully realized personhood.<sup>87</sup> Hegel's theory, therefore, takes abstract concepts, like freedom and autonomy, and anchors them in tangible

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<sup>78</sup> See generally Radin, *supra* note 16, at 958.

<sup>79</sup> See ALEXANDER & PEÑALVER, *supra* note 11, at 57-65.

<sup>80</sup> *Id.* at 57.

<sup>81</sup> Radin, *supra* note 16.

<sup>82</sup> *Id.* at 973.

<sup>83</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 57.

<sup>84</sup> *Id.* at 61.

<sup>85</sup> *Id.* at 61 (quoting Hegel, *Philosophy of Right*).

<sup>86</sup> Radin, *supra* note 16, at 972-73.

<sup>87</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 61.

reality. Because of the focus on personhood and self-realization, Hegel's account of property is distinctly rights-based.<sup>88</sup>

Yet that is not to say that Hegel's property theory is purely individualistic. To the contrary, it has very strong communitarian elements. In addition to demonstrating how property grounds free will in the physical world, Hegel's personhood theory also reveals property as essential to our relationships with others.<sup>89</sup> As Alexander and Peñalver explain, according to Hegel, "[p]roperty is not the basis for withdrawal from others but precisely the opposite: It is the foundation for socialization with others."<sup>90</sup> Far from engaging in the kind of isolation and disaggregation feared by property critics, Hegel's account of property situates the owner within her social context and creates an obligation for her to act in a way that favors the well-being of her community.<sup>91</sup>

Hegel's theory continues to have present-day appeal. In particular, it acknowledges the intuitive connection many people feel to their property as constitutive of their identities or as central to their self-expression.<sup>92</sup> Additionally, Hegel's theory allows for both individual and collective considerations. Neither individual freedoms nor the common good become property's singular concerns. Instead private property exists in relation to the individual person, as well as the community.<sup>93</sup>

### Intuitive Personhood Theory

In her path-breaking article *Property and Personhood*, Radin argues in favor of what she calls the "personhood perspective," a theory of property grounded in embodiment and the constitution of the self in relation to the physical world.<sup>94</sup> While Radin's theory resembles Hegel's in several key ways,<sup>95</sup> it also bears substantial differences.<sup>96</sup> It is both more and less inclusive. First, Radin's intuitive personhood theory incorporates elements of personhood left

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<sup>88</sup> *Id.* at 57 (contrasting with a utilitarian consequentialist view of property).

<sup>89</sup> *Id.* at 64.

<sup>90</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 65.

<sup>91</sup> *Id.*

<sup>92</sup> *Id.* at 64 (quoting Alan Ryan, *Property and Political Theory*).

<sup>93</sup> *Id.* at 65.

<sup>94</sup> Radin, *supra* note 16, at 958.

<sup>95</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 57.

<sup>96</sup> *Id.*; Radin, *supra* note 16, at 958-59.

unaddressed by Hegel, making her theory more expansive.<sup>97</sup> Yet simultaneously, Radin does not position the individual person within her community and, as a result, says nothing regarding the social role of property, making her theory less comprehensive.<sup>98</sup>

As mentioned, Radin christened her theory, the intuitive personhood perspective. Like Hegel, she recognizes that autonomy by itself is merely an abstract concept, untethered to the world of “things.”<sup>99</sup> She explains that “[t]he premise underlying the personhood perspective is that to achieve proper self-development—to be a person—an individual needs some control over resources in the external environment.”<sup>100</sup> According to Radin, property rights furnish the necessary control to facilitate self-realization.<sup>101</sup> She refers to her theory as “intuitive” because it draws from the lived realities of ownership, mainly that most people own something to which they feel deeply connected, so much so that those objects can become “bound up” with the owner’s notion of self.<sup>102</sup> Radin cites wedding rings, portraits, family heirlooms, and houses as common examples of such objects of ownership.<sup>103</sup> This intuitive view of the connection between property and personhood has support in the realm of social psychology.<sup>104</sup> Radin maintains that acknowledging the relationship between property and the self lays the ground work to “argue that by virtue of this connection the person should be accorded broad liberty with respect to control over that ‘thing.’”<sup>105</sup>

Central to Radin’s theory of property is the notion that not all property is equally valuable across various potential owners. She therefore creates what she calls the “personhood dichotomy,” distinguishing between “personal” and “fungible” property. Under Radin’s definition, personal property is somehow constitutive of the self and thereby irreplaceable.<sup>106</sup> She suggests identifying personal property by assessing the type of pain that would come with its loss: If the pain of loss can be relieved by replacing the lost item, then that

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<sup>97</sup> Radin, *supra* note 16, at 977.

<sup>98</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 69.

<sup>99</sup> Radin, *supra* note 16, at 960.

<sup>100</sup> *Id.* at 957.

<sup>101</sup> *Id.*

<sup>102</sup> *Id.* at 959.

<sup>103</sup> *Id.*

<sup>104</sup> ALEXANDER & PEÑALVER, *supra* note 11.

<sup>105</sup> Radin, *supra* note 16, at 960.

<sup>106</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 66-67.

object is not bound up with the individual's sense of personhood.<sup>107</sup> By contrast, something that is personal property is worth more to the person in question than the mere market price.<sup>108</sup> It has, as they say, sentimental value. In fact, it could well be priceless.<sup>109</sup> On the opposite end of the spectrum is fungible property.<sup>110</sup> Fungible property is held for solely instrumental reasons and is perfectly replaceable with an equally valuable good.<sup>111</sup> Money is the paradigmatic fungible property.<sup>112</sup> Radin refers to personal and fungible property as “theoretical opposites.”<sup>113</sup>

Personhood theory acknowledges the reality that all of us know too well: The very same object can be worth more to one person than another and for reasons apart from monetary worth. Moreover, the personhood dichotomy is also fluid. One might experience the same object as fungible or as personal depending on the timing and context.<sup>114</sup> For example, something seemingly trivial, like a scrap of paper, might take on a strong personal value, because a deceased loved one wrote a note on it. And likewise, we've all probably had stuffed animals that, while deeply constitutive of our childhood identities, we would gladly donate or throw away as adults.

This personhood dichotomy is relevant to Radin's theory because it communicates how to recognize and to distribute property interests. First, she believes that goods that promote self-development (and in her later work human flourishing) warrant greater legal protection.<sup>115</sup> Next, she would propose allocating property interests along a continuum from personal to fungible.<sup>116</sup> She explains that “[i]t then might hold that those rights near one end of the continuum—fungible property rights—can be overridden in some cases in which those near the other—personal property rights—cannot be.”<sup>117</sup> By looking to the centrality of the object to owner's sense of self, the personhood dichotomy avoids treating all property

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<sup>107</sup> Radin, *supra* note 16, at 959.

<sup>108</sup> *Id.*

<sup>109</sup> *Id.*

<sup>110</sup> *Id.* at 959-60.

<sup>111</sup> *Id.*

<sup>112</sup> *Id.*

<sup>113</sup> Radin, *supra* note 16, at 60.

<sup>114</sup> Ossorio, *supra* note 11, at 234.

<sup>115</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 67.

<sup>116</sup> Radin, *supra* note 16, at 986.

<sup>117</sup> *Id.*

interests as the same.<sup>118</sup> Radin concedes that personhood theory is therefore inherently subjective.<sup>119</sup> Furthermore, property in personhood also has aspirational value. Beyond explaining our current system of property entitlement, it can also provide a basis for resolving ownership results and in so doing, either support or critique the existing law.<sup>120</sup> In sum, Radin's intuitive personhood theory of property has three basic propositions: (1) certain kinds of property should be recognized and treated as personal; (2) the law should protect an individual's rights in her personal property against both the government and her fellow citizens' fungible property claims; and (3) in cases of conflicting ownership claims, personal property claims should trump fungible property claims.<sup>121</sup> As its name implies, Radin's theory has strong intuitive appeal. Yet some authors have challenged her normative assertions, asking whether the higher relative value of personal property for a particular individual, even in light of empirical support, makes greater legal protection justifiable.<sup>122</sup>

*c. Welfare-Maximization Theory*

Welfare maximization is the third and final property theory of relevance to this Essay. According to Guido Calabresi and Douglas Melamed, society can distribute legal entitlements along at least three different kinds of metrics: economic efficiency, distributional goals, and justice-oriented concerns.<sup>123</sup> They explain utilitarianism as providing that legal rights and entitlements should go to the individual "who values them most highly."<sup>124</sup>

One can easily apply this framework to property and ownership. Under the welfare maximization (also sometimes referred to as the utilitarian or social utility theory—or theories—of property), lawmakers should shape property rights to generate the most social welfare possible, thereby balancing the interests of the owner against

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<sup>118</sup> *Id.* at 989.

<sup>119</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 67.

<sup>120</sup> Radin, *supra* note 16, at 957.

<sup>121</sup> *Id.* at 1014-1015.

<sup>122</sup> ALEXANDER & PEÑALVER, *supra* note 11.

<sup>123</sup> *Id.* at 30 (citing Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Alienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972)).

<sup>124</sup> *Id.*

the interests of society.<sup>125</sup> Society should therefore structure property institutions to generate the most net utility.<sup>126</sup>

Unlike the labor or personhood theories, which state their ownership claims based on the individual person's relationship to the object of ownership, welfare maximization is consequentialist and focused on group impacts. Welfare-maximization theories assess the desirability of potential outcomes comparatively in terms of their consequences, specifically whether they will maximize social utility or "welfare," however defined.<sup>127</sup> They ask which distribution of property will result in the most relative good. Another distinguishing characteristic of welfare maximization is its focus on the aggregate. The relevant object of inquiry is the benefit to society as a whole, not a single person's individual wellbeing.<sup>128</sup> Utilitarian theories, property and otherwise, can therefore be broken down into two separate yet related inquiries: (1) how to define welfare and (2) how to aggregate that welfare, once defined.<sup>129</sup>

### Utilitarian Theories

As Alexander and Peñalver have pointed out, the welfare-maximization theory of property is not one thing but many. They note that "[r]ather than a single utilitarian theory, it is more appropriate to speak of a number of utilitarian (or even utilitarian-influenced) property theories.<sup>130</sup> The two major schools of welfare-maximization theory are traditional utilitarianism, which defines welfare as a broad notion of happiness, and economic utilitarianism, which defines welfare in terms of money and market value.<sup>131</sup>

The underlying assumption of traditional utilitarianism is that human happiness is good and, as a result, maximizing that happiness should be the objective of all individual and societal decision-making.<sup>132</sup> In terms of property, the ways in which we allocate ownership interests can have an impact on happiness both with respect to the recognition of property generally and with respect to distribution of the various individual rights within the ownership

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<sup>125</sup> Radin, *supra* note 16, at 958.

<sup>126</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 17.

<sup>127</sup> *Id.* at 12.

<sup>128</sup> Barrad, *supra* note 15, at 1072.

<sup>129</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 12.

<sup>130</sup> *Id.* at 11 (emphasis in original).

<sup>131</sup> Barrad, *supra* note 15, at 1072.

<sup>132</sup> *Id.*

bundle.<sup>133</sup> Thus, a particular ownership interest should go to the individual who will use that interest to generate the most aggregate happiness.<sup>134</sup> Yet what makes sense in theory can prove challenging in practice. The difficulty of developing a clear measure of what constitutes that aggregate happiness led to the development of economic utilitarianism.<sup>135</sup>

Because happiness is a difficult thing to calculate many property theorists have adopted wealth as a proxy for welfare.<sup>136</sup> Economic utilitarian therefore adopts a more narrow definition of utility than traditional utilitarianism. According to an economic utilitarian approach, welfare maximization entails allocating property interests in such a way that maximizes a society's net wealth.<sup>137</sup> Economic utilitarianism therefore prescribes maximizing utility with respect to how society allocates various property rights, as well as maximizing the efficient invocation of those rights.<sup>138</sup> The goals of property law then become creating incentives for the efficient use of resources and satisfying individual desires, as they manifest themselves within the market.<sup>139</sup> Hence, economic utilitarian analysis also tends to adopt the bundle of sticks approach because it looks to whether a given shift in a system of property rights would further enhance utility.<sup>140</sup>

Yet to allocate property interests in the way that generates the "most" welfare—whether in terms of happiness or in terms of money—we need a way to calculate and aggregate whatever has been defined as the relevant value. Consequently, to allow for meaningful comparisons, welfare must then be both quantifiable and subject to aggregation.<sup>141</sup> Some have argued that these qualities mean that welfare maximization demands access to data.<sup>142</sup> Alexander and Peñalver assert that "the value of any particular utilitarian prescription will only be as good as the empirical information on which it is based."<sup>143</sup>

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<sup>133</sup> *Id.*

<sup>134</sup> *Id.*

<sup>135</sup> *Id.*

<sup>136</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 17.

<sup>137</sup> *Id.*

<sup>138</sup> Holman & Munzer, *supra* note 17, at 826-27.

<sup>139</sup> Barrad, *supra* note 15, at 1079.

<sup>140</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 30.

<sup>141</sup> *Id.* at 15.

<sup>142</sup> *Id.* at 14-17.

<sup>143</sup> *Id.* at 17.

Both traditional and economic utilitarian theories face hurdles in these regards. At the outset, traditional utilitarianism requires a method for calculating and aggregating happiness,<sup>144</sup> a notoriously difficult endeavor that has been fertile ground for legions of social psychologists and behavioral economists. Furthermore, happiness must be evaluated along a metric that allows comparison between different people. Hence one individual's happiness unit must be equivalent to another's.<sup>145</sup> Defining welfare economically also presents its own challenges. To begin, treating wealth as welfare means that the amount a person is willing to pay for an item stands in for their desire for that particular item.<sup>146</sup> However, differences in relative wealth inevitably affect the amount a person might be willing to pay, regardless of the degree of her preference.<sup>147</sup>

Beyond the difficulties of measuring welfare, welfare maximization has other theoretical and practical shortcomings. To begin, there is an outright clash between welfare-maximization theory and personhood theory. As noted, utilitarianism mandates that welfare be measured in discrete, aggregatable, comparable units.<sup>148</sup> However, an essential element to personhood theory—born out most clearly in Radin's dichotomy between personal and fungible property—is the idea that certain items are so valuable that they cannot be replaced. Thus, personhood theory rejects the notion that all things are substitutable, while welfare maximization theory seems to require it.<sup>149</sup> Additionally, another common criticism of utilitarianism generally, including its application to property, is that, by looking to the aggregate good of society as a whole, the theory fails to meaningfully account for individual interests.<sup>150</sup> Furthermore, while one of the benefits of welfare maximization lies in its flexibility—specifically its ability to parse out certain property rights to certain owners under certain circumstances thereby avoiding an all-or-nothing, universalist approach to ownership<sup>151</sup>—that same quality could also render the theory too complicated to be useful on a practical level. Most, if not all, societies lack the time and resources for unbundling the interests in every given object of ownership and then

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<sup>144</sup> *Id.* at 12-17.

<sup>145</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 15.

<sup>146</sup> *Id.* at 16.

<sup>147</sup> *Id.* at 16.

<sup>148</sup> *Id.* at 32.

<sup>149</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 32.

<sup>150</sup> *Id.* at 31.

<sup>151</sup> *Id.* at 29.

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assessing how the allocation of those rights will impact each individual, for the purpose of determining what produces the most good.<sup>152</sup> Finally, some scholars argue that disaggregating and then redistributing ownership rights holds the potential to undermine the power of the interests themselves, especially with respect to the right to exclude.<sup>153</sup> How much is my right to exclude worth if others enjoy the right to possess and the right to transfer with respect to the very same object of ownership?

However, even skeptics of welfare maximization do not assert that these downsides require the wholesale rejection of utilitarian theories of property. Instead, they maintain that the fair distribution of property interests requires “a broader moral framework.”<sup>154</sup>

### Human Flourishing

Alexander and Peñalver, two such critics of welfare maximization, have advocated human flourishing as precisely the kind of broader moral framework that property theory needs. While human flourishing arguably constitutes a separate and distinct theory of property, for the purposes of this Essay, I treat it as a highly appealing variation on welfare maximization.

Rejecting the baselines of happiness and wealth, Alexander’s and Peñalver’s theory of property adopts human flourishing as its touchstone.<sup>155</sup> Of course, just like the welfare-maximization theories described above, a property theory focused on human flourishing requires defining exactly what it means for a person to flourish. In crafting such a definition, Alexander and Peñalver draw heavily from the work of Aristotle. According to Aristotle, a life well lived is a life of virtue.<sup>156</sup> Thus, human flourishing has a least two axes: (1) being well (well-being) and (2) doing well (virtue).<sup>157</sup> This definition of human flourishing has strong communitarian elements. In terms of what “counts” as virtuous, Aristotle believes that virtuous activities contribute to the common good.<sup>158</sup> Because our ability to flourish inevitably requires access to basic material goods within stable social structures, Alexander and Peñalver dub flourishing “an unavoidably

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<sup>152</sup> *Id.* at 31.

<sup>153</sup> *Id.* at 30.

<sup>154</sup> *Id.* at 33-34.

<sup>155</sup> *Id.* at 80.

<sup>156</sup> *Id.* at 82.

<sup>157</sup> *Id.* at 95.

<sup>158</sup> *Id.* at 83.

cooperative endeavor.”<sup>159</sup> Property creates the opportunity to exercise certain virtues that benefit the community, such as, responsible ownership, friendship, generosity, moderation.<sup>160</sup> A human flourishing account of property would include certain obligations that require owners to exercise their rights in a way that serves the collective good.<sup>161</sup> As a theory of property, human flourishing may at times require redistribution. Thus, Alexander and Peñalver write that “the extreme need of some in the community trumps the property rights other people hold over their surplus resources.”<sup>162</sup>

As mentioned, at least in this author’s opinion, human flourishing as a theory of property bears substantial similarities to welfare maximization. Both have a societal focus, favoring the allocation of property rights that favors the greater good over a distribution that serves individual interests.<sup>163</sup> Alexander and Peñalver note that an Aristotelian theory of property shares commonalities with the utilitarian theories described above.<sup>164</sup> They explain that “[b]ecause the aggregate material resources within a community will plausibly, though indirectly, affect the ability of its members to flourish, utilitarian or welfarist analyses of a particular decision’s consequences for wealth are far from irrelevant within an account of property built around the concept of human flourishing.”<sup>165</sup> Thus, a human flourishing theory of property then appears to be what Matt Adler and Eric Posner would call a version of ‘weak welfarism,’ a type of welfare maximization that acknowledges the moral relevance of welfare yet alongside other social concerns like individual rights or distributive justice.<sup>166</sup>

Insofar as human flourishing is at odds with welfare maximization, it conflicts with particular versions of utilitarianism, mainly economic. Proponents of economic utilitarianism frequently

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<sup>159</sup> *Id.* at 87.

<sup>160</sup> *Id.* at 83.

<sup>161</sup> *Id.* at 95.

<sup>162</sup> *Id.*

<sup>163</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 97 (explaining that in human flourishing “the discussion about how to allocate responsibilities among private communities, the market, and various state actors does not proceed through the lens of individual property rights in the first instance, but, rather through pragmatic discussions about which allocations will best foster opportunities for a society’s members to flourish”),

<sup>164</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 17.

<sup>165</sup> *Id.* at 97.

<sup>166</sup> *Id.* at 97.

employ wealth as the singular definition of welfare. By contrast, human flourishing incorporates plural values, which may at times come into conflict.<sup>167</sup> Because there are infinite pathways to human flourishing, a theory that looks to flourishing as its basis must account for these variations.<sup>168</sup> Thus, much like traditional utilitarian's need to quantify, aggregate, and compare happiness, human flourishing must also confront an "index problem."<sup>169</sup> While acknowledging "that spelling out in a more satisfying way the contours of the process of applying practical reason to social choices implicating plural and incommensurable values remains an important challenge for the human flourishing theory of property, and, indeed for pluralist theories of all kinds,"<sup>170</sup> Alexander and Peñalver maintain that this feature can be understood as a strength of human flourishing rather than a flaw, as a pluralist view of property better reflects the complexities of the human lived experience.<sup>171</sup>

At first blush, ownership and property may seem like rather straightforward concepts. However, philosophers and legal scholars differ not only in how they would distribute ownership interests but in how they define property itself. Through my analysis, I have hoped to demonstrate that whether to recognize ownership in genetic information, by whom, and to what extent would depend upon which definition and theory of property one adopts. Having explored the legal meaning of property and its underlying theories, the following Sub-Part turns to the arguments for and against the ownership of genetic information as a general matter.

### *B. Genetic Information as Property*

Treating genetic information as property has both legal and social implications. With respect to law, designating genetic information as property means that the rules and doctrines of property law would govern its acquisition, use, and transfer.<sup>172</sup> On a societal level, understanding genetic information as property will affect our language and behaviors.<sup>173</sup> It will shape both how we speak and act related to genetic information.

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<sup>167</sup> ALEXANDER & PEÑALVER, *supra* note 11, at 98.

<sup>168</sup> *Id.* at 100.

<sup>169</sup> *Id.* at 101.

<sup>170</sup> *Id.*

<sup>171</sup> *Id.* at 99.

<sup>172</sup> Ossorio, *supra* note 11, at 237.

<sup>173</sup> *Id.*

The law could safeguard interests in genetic information using a variety of protections, including property law, privacy law, or contract law.<sup>174</sup> However, this Essay does not ask which body of law should govern genetic information but rather accepts that both people who provide genetic material and the individuals and companies engaged in genetic research invoke the language of ownership with regard to genetic information. Accepting this reality at face value, the Essay employs property theory to explain ownership conflicts and offer a potential resolution. Thus, I'm not claiming that property is the only or the best framework. Put differently, I am not trying to convince the reader that genetic information *should be* property. Rather I assert that law and society could benefit from a more meaningful inquiry. Consequently, I inquire if genetic information were property, how should those property rights be allocated?

But before exploring the ownership interests at stake in genetic information, it is worth pausing to explain what genetic information is and why it is of both social and personal importance. In lay terms, genes are the units of heredity,<sup>175</sup> the biological mechanisms that allow parents to pass various traits down to their offspring. The collection of our various genetic attributes forms our genetic information. In more technical terms, genes are molecules of deoxyribonucleic acid, DNA, that store genetic information, located (primarily) in the chromosomes found in a cell's nucleus.<sup>176</sup> Genes are made up of combinations of four nucleotide bases—adenine (A), guanine (G), cytosine (C), and thymine (T)—the letters in the genetic alphabet.<sup>177</sup> The combinations of those As, Cs, Ts, and Gs dictate protein production, which is the way in which our genes “express” themselves.<sup>178</sup> These differences in our individual genetic codes are what accounts for a substantial portion of human variation.

Although seemingly abstract, genetic information manifests itself in highly significant ways. In addition to forming the basis of visible traits like eye color and gender, it also speaks to disease proclivities and reproductive risks.<sup>179</sup> Consequently, genetic information does not just pertain to the present; it also speaks to an

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<sup>174</sup> For a discussion of these different types of law, as applied to genetic material and genetic information, see Rao, *supra* 18.

<sup>175</sup> Spinello, *supra* note 18, at 29.

<sup>176</sup> *Id.*; Holman & Munzer, *supra* note 17, at 742-43.

<sup>177</sup> Holman & Munzer, *supra* note 17, at 742-43; Spinello, *supra* note 18, at 29.

<sup>178</sup> Holman & Munzer, *supra* note 17, at 742-43.

<sup>179</sup> Suter, *supra* note 11, at 738-39.

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individual's future.<sup>180</sup> (Yet it is important to emphasize that genetic information communicates probabilities not certainties in the vast majority of cases.<sup>181</sup>) On a personal level, genetic information matters because it is largely unchangeable and may communicate sensitive information about an individual person, as well as her relatives.<sup>182</sup> On a social level, genetic researchers hope that in uncovering the effects of our genetic information, we can improve our lives and health.<sup>183</sup>

Genetic information is distinct from the genetic material from which it is derived. Genetic information is "broadly defined as information about genes, gene products, or one's inherited characteristics that is derived from a genetic test or a person's DNA sample."<sup>184</sup> It is the intangible information about a person's genetic makeup. By contrast, a genetic material is a DNA sample "any human biological specimen such as human tissue or blood from which DNA can be extracted."<sup>185</sup> It is the physical molecules of DNA. Examples of genetic material include blood, tissue, and saliva. One could even obtain genetic material from unsavory items such as used cotton swabs, chewed gum, and discarded napkins. Genetic information is the code you derive from that material, which when tested can reveal information about a person's and her family's migratory ancestry, familial relationships, presence at a crime scene, medical risk, and perhaps even behavioral tendencies.

While some have argued in favor of understanding DNA samples or other bodily derivatives in property terms,<sup>186</sup> for simplicity's sake, this Essay focuses exclusively on genetic material. As a practical matter it is hard to keep track of all the physical genetic material that we discard. Every time we touch a doorknob, drink from a glass, or shake a person's hand, we leave some trace of our genetic material. It seems strange to say we own all of that. Of course, one could argue that we do in fact own that genetic material and are just abandoning it. However, I feel such a broad construction of genetic ownership could threaten to swallow the rule. What good is a property interest in something that we inevitably and so frequently abandon over the course of our daily lives? Moreover, once a

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<sup>180</sup> Spinello, *supra* note 18, at 30.

<sup>181</sup> *Id.*

<sup>182</sup> *Id.* at 29-30.

<sup>183</sup> *Id.* at 29.

<sup>184</sup> *Id.*

<sup>185</sup> *Id.*

<sup>186</sup> See generally Harlan, *supra* 18; Quigley, *supra* note 18.

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researcher or biotech company has access to a person's genetic information and puts that information in a database/databank, the physical sample is significantly less important, as the information itself can be sold and mined.<sup>187</sup> Thus, despite potential ownership claims associated with genetic material, I am focusing here on the ownership of genetic information because as an object of ownership it is both more manageable and more valuable.

Setting aside for now the relatively uncontested legal status of the ownership of genetic information by researchers and the biotech industry described in the following Part, genetic information may initially seem a poor fit for property law. As discussed, lay people tend to associate property with physical objects of ownership, while genetic information by its very nature is intangible. Moreover, American property law does not typically recognize ownership interests in the body or its derivatives. Even Honoré himself proclaimed that “[a] person is not, in most systems, regarded as owning his body, reputation, skill, honour, or dignity. At most he has a simple right to these things, which are therefore not legally ‘things.’”<sup>188</sup> And Calabresi has quipped that in the genetic and genomic age “body parts could rise to the level of inherited wealth.”<sup>189</sup> However, the absence of a legally recognized property interest may not matter on some level, as people experience ownership independent of the law. Regardless of legal status, people may understand certain crucial things, like their bodies and their homes, as “theirs” regardless of what the law might dictate.<sup>190</sup> Moreover, Honoré was writing at a time when technology and law did not allow for the isolation, use, and commercialization of human-derived materials.<sup>191</sup> In the light of these developments, people today arguably have a different relationship with their bodies, including the information contained in their DNA, than they did fifty years ago.<sup>192</sup> Consequently, some scholars have asserted that bioethics could benefit from a deeper exploration of how property

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<sup>187</sup> One student author argues that the ownership of genetic material should go to the source, whereas ownership of the information should go to the entity that would benefit society, such as law enforcement. Harlan, *supra* 18, at 200-201.

<sup>188</sup> Honoré, *supra* note 11, at 130; *see also* Quigley, *supra* note 18, at 632.

<sup>189</sup> *See* Guido Calabresi, *Do We Own Our Bodies?*, 1 HEALTH MATRIX 5, 16 (1991).

<sup>190</sup> Weeden, *supra* note 11, at 641.

<sup>191</sup> Quigley, *supra* note 18, at 632.

<sup>192</sup> *Id.*

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law—particularly the bundle of sticks approach described above—might apply to the human body and its products.<sup>193</sup>

But why invoke the laws and norms of property in conjunction with genetic information? One reason is because property and ownership have long signaled value both in and outside the law.<sup>194</sup> William Blackstone writes that “[t]here is nothing which so generally strikes the imagination, and engages the affection of mankind, as the right of property. . . .”<sup>195</sup> James Madison likewise explains how property stands in for broad constructions of value:

In its larger and juster meaning, property embraces every thing to which a man may attach a value and have a right; and which leaves to every one else the like advantage. In [a limited] sense, a man’s land, or merchandise, or money is called his property. In [a broader] sense, a man has property in his opinions and the free communication of them. He has a property of peculiar value in his religious opinions, and in the profession and practice dictated by them. He has property very dear to him in the safety and liberty of his person. He has an equal property in the free use of his faculties and free choice of the objects on which to employ them. In a word, as a man is said to have a right to his property, he may be equally said to have a property in his rights.<sup>196</sup>

Finally, Murray Rothbard declares that “[i]n the profoundest sense, there are no rights but property rights. . . .”<sup>197</sup> He explains that even human rights can be understood as property rights because “each individual, as a natural fact, is the owner of himself, the ruler of his own person” and that human rights “are, in effect, each man’s property right in his own being, and from this property right stems his right to the material goods that he has produced.”<sup>198</sup> Thus, property talk is shorthand for describing that which is deeply meaningful to us.

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<sup>193</sup> Björkman & Hansson, *supra* note 18, at 210 (citing HENRY SIDGWICK, *ELEMENTS OF POLITICS* (1891)).

<sup>194</sup> Suter, *supra* note 11, at 750.

<sup>195</sup> 2 WILLIAM BLACKSTONE, *COMMENTARIES ON THE LAWS OF ENGLAND* 2 (1766).

<sup>196</sup> James Madison, *Property* (1792), *reprinted in* JAMES MADISON: *WRITINGS* 515 (Jack N. Rakove ed., 1999).

<sup>197</sup> Weeden, *supra* note 11 (quoting MURRAY N. ROTHBARD, *POWER AND MARKET* 238 (2d ed. 1977)).

<sup>198</sup> *Id.*

Furthermore, it not only communicates the value of the object of ownership but also its entitlement to be free from the appropriation and intrusion of others.<sup>199</sup>

Given the intimate nature of what it can communicate, many people value their genetic information as their own and central to a sense of self. Somewhat hyperbolically, one author declares that “[t]here is no information more personal and private, than an individual’s genetic information,” as it “defines who we are as individuals both physically and mentally. . . .”<sup>200</sup> Another proclaims that “[g]enes and the information they contain are fundamental building blocks of a people’s identity.”<sup>201</sup> Along a similar vein, in a statement before the Senate, Senator Pete V. Domenici called the human genome “a blueprint containing the most personal and most private information that any human being can have” and described genetic information as “the essence of our individuality.”<sup>202</sup> More reasonably, Sonia Suter simply writes that “our genetic information is about us, and it is deeply connected to our sense of ourselves.”<sup>203</sup> With its uniqueness and perceived connection to the self, people may naturally assume that they own their genetic information.<sup>204</sup> It is therefore not terribly surprising then that individuals describe genetic information as being “theirs.”<sup>205</sup> Even if they do not explicitly intend to invoke the trappings of property law, they are nonetheless staking

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<sup>199</sup> Suter, *supra* note 11, at 758.

<sup>200</sup> Deborah L. McLochlin, *Whose Genetic Information Is It Anyway? A Legal Analysis of the Effects that Mapping the Human Genome Will Have on Privacy Rights and Genetic Discrimination*, 19 J. COMP. & INFO. L. 609, 609 (2001).

<sup>201</sup> Kara Ching, *Indigenous Self-Determination in an Age of Genetic Patenting: Recognizing an Emerging Human Rights Norm*, 66 FORDHAM L. REV. 687, 687 (1997).

<sup>202</sup> Weeden, *supra* note 11, at 631 (quoting 151 Cong. Rec. S1595, 1595 (daily ed. Feb. 17, 2005) (statement of Sen. Domenici)).

<sup>203</sup> Suter, *supra* note 11, at 737.

<sup>204</sup> *Id.* at 750.

<sup>205</sup> And Professor Allen writes, “If DNA is the human essence ... it arguably ought to belong to the individual from whom it was ultimately derived.” Anita L. Allen, *Genetic Privacy: Emerging Concepts and Values*, in GENETIC SECRETS: PROTECTING PRIVACY AND CONFIDENTIALITY IN THE GENETIC ERA 31, 49 (Mark A. Rothstein ed., 1997).

ownership claims. As Julie Cohen explains, “[p]roperty talk is just how we talk about matters of great importance.”<sup>206</sup>

Arguments in favor of construing genetic information as property of the source of genetic material tend to follow one of two lines of reasoning, one based in equity and the other based in autonomy.<sup>207</sup> Equity-based arguments assert that it is unfair that third parties, like researchers and biotech companies, can enjoy property rights in person’s genetic information when the individual herself has no legally recognized interest.<sup>208</sup> Thus, the law should intervene to remedy this asymmetry and allow the sources of DNA to participate on equal footing in the market. With respect to autonomy, proponents of recognizing property interests for the contributors of genetic material assert that ownership rights provide a more robust vehicle for protecting a person’s interest in controlling the access to and use of her genetic information than is offered by a privacy paradigm.<sup>209</sup> Finally, others have simply asserted that the basic principles and theories of property law readily apply to genetic information,<sup>210</sup> indicating that property could support the inclusion of genetic information.

Yet advocates of recognizing property interests in genetic information for the people who provide DNA has met with significant opposition.<sup>211</sup> Critics object to treating genetic information as property for symbolic and practical reasons. Symbolically, some believe that creating property rights in genetic information overvalues its role in constructing a person’s identity, thereby taking a “reductionist view of personhood.”<sup>212</sup> A related critique is that property interests, especially as constructed as a bundle of rights, threatens to commodify and disaggregate essential elements of the self.<sup>213</sup> Commodification is troubling because it could take things

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<sup>206</sup> Julie E. Cohen, *Examined Lives: Informational Privacy and the Subject as Object*, 52 STAN. L. REV. 1373, 1379 (2000); see also Suter, *supra* note 11, at 750.

<sup>207</sup> Spinello, *supra* note 18, at 29 (articulating a counter argument).

<sup>208</sup> Suter, *supra* note 11, at 746, 809 (articulating counter arguments).

<sup>209</sup> Spinello, *supra* note 18, at 30, 35.

<sup>210</sup> Barrad, *supra* note 15, at 1050-58.

<sup>211</sup> I myself have been critical of treating genetic information as property in my previous work. See Jessica L. Roberts, *The Genetic Information Nondiscrimination Act as an Antidiscrimination Law*, 86 NOTRE DAME L. REV. 597, 618 n. 82 (2011).

<sup>212</sup> Ossorio, *supra* note 11, at 232; see also Suter, *supra* note 11, at 737.

<sup>213</sup> Ossorio, *supra* note 11, at 237; Suter, *supra* note 11, at 737, 799.

traditionally considered to be matters of human dignity and thrust them onto the market. Suter argues that “because of the importance of genetic information to the self, identity, and formation of relationships of trust (800) and intimacy, it diminishes the personal value of our own genetic information to describe it as a commodity.”<sup>214</sup> Of course, the ultimate fear of commodifying anything related to the body lies in the concern that at the bottom of the slippery slopes lurks the commodification of living, fully functioning, intact human beings.<sup>215</sup> Disaggregation arguably severs the genetic information from the whole person.<sup>216</sup> Thus, according to Suter, “[p]roperty language here not only misdescribes genetic information and bodily integrity, but it also does ‘violence’ to a holistic conception of the self.”<sup>217</sup> The concern is thus that recognizing a person’s property interest in genetic information threatens her very personhood through objectification.<sup>218</sup>

Practically speaking, property serves as a challenging paradigm to protect genetic information. As mentioned, genetic information is not tangible. This lack of tangibility means that in some respects it is not rivalrous: An individual maintains the full complement of her genetic information even if a biotech company has that information stored in a database.<sup>219</sup> Yet even if an individual has full access to her genetic profile she could still experience harm if her information is used in an objectionable way, such as in conflict with her core beliefs.<sup>220</sup> But who will police those interests? Because of its intangible and inexhaustible nature, countless parties could have access to the same genetic information at once, leaving open the question who will regulate those entities’ individual property interests, particularly when they conflict.<sup>221</sup> Additionally, an individual shares a substantial portion of her genetic information with her close relatives.<sup>222</sup> Should she then also share her property rights

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<sup>214</sup> Suter, *supra* note 11, at 799-800.

<sup>215</sup> Ossorio, *supra* note 11, at 224.

<sup>216</sup> Suter, *supra* note 11, at 801.

<sup>217</sup> *Id.* at 800.

<sup>218</sup> Ossorio, *supra* note 11, at 228.

<sup>219</sup> Weeden, *supra* note 11, at 644; Ossorio, *supra* note 11, at 232.

<sup>220</sup> Weeden, *supra* note 11, at 644; Ossorio, *supra* note 11, at 224, 232 (describing both spiritual and secular beliefs that could conflict with certain uses of genetic information).

<sup>221</sup> Anita Silvers & Michael Ashley Stein, *An Equality Paradigm for Preventing Genetic Discrimination*, 55 VAND. L. REV. 1341, 1356 (2002).

<sup>222</sup> Silvers & Stein, *supra* note 221, at 1357.

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in that information?<sup>223</sup> Another commonly cited practical impediment to recognizing property interests in genetic information for the contributors of genetic material is the potential of those rights to chill research.<sup>224</sup> Yet as one author points out, this argument against property rights for the providers of DNA would also undermine property rights for the researchers themselves, insofar as their rights could also dampen additional research.<sup>225</sup>

Many of critics of property as a means for protecting genetic information offer privacy as an alternate paradigm. Advocates of privacy assert that it is better suited to protecting interests related to identity and personhood.<sup>226</sup> The preference comes largely from the belief that property safeguards economic interests, whereas non-economic interests like dignity, autonomy, and bodily integrity are privacy's dominion.<sup>227</sup> One scholar splits the difference, advocating privacy under particular circumstances and property under others.<sup>228</sup> However, this either/or construction takes a truncated view of property, looking only to its economic aspects and completely ignoring its identity-related, dignitary, and communitarian attributes.

While labor theory and economic utilitarianism adopt predominantly economic views of property, personhood theory and certain iterations of welfare maximization, like traditional utilitarianism and human flourishing, take far more expansive views on the role and meaning of property. Dismissing property as purely pecuniary and commercial ignores the role property might play in identity construction,<sup>229</sup> as well as happiness and human flourishing. Avoiding property as a potential vehicle for protecting genetic information out of fears of commodification, disaggregation, and objectification simultaneously succumbs unnecessarily to the power of

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<sup>223</sup> Weeden, *supra* note 11, at 656.

<sup>224</sup> Arthur R. Miller, *Personal Privacy in the Computer Age: The Challenge of a New Technology in an Information-Oriented Society*, 67 MICH. L. REV. 1091, 1225 (1969); Spinello, *supra* note 18, at 29. The effect of recognizing genetic property interests on research is described at greater length in Part II.

<sup>225</sup> Spinello, *supra* note 18, at 41.

<sup>226</sup> Allen, *supra* note 205, at 49; Suter, *supra* note 11, at 773-74.

<sup>227</sup> See Ossorio, *supra* note 11, at 229; Suter, *supra* note 11, at 746, 769; *see also* Miller, *supra* note 224, at 1226

<sup>228</sup> Rao, *supra* 18, at 379.

<sup>229</sup> Radin asserts that "the relationship between property and personhood, a relationship that has commonly been both ignored and taken for granted in legal thought." Radin, *supra* note 16, at 957.

market rhetoric<sup>230</sup> and underestimates the relationship between privacy and property. Property and privacy are not mutually exclusive. They can be complementary both conceptually and as types of legal protections.

Recall the arguments from the preceding Sub-Part that some control over the physical world—specifically a notion of property—is necessary to self-realization and human flourishing. In the sense that privacy involves control over intimate matters and property provides a means to exercise autonomy within the physical world, privacy and property seem inextricably linked.<sup>231</sup> In her work on genetic privacy, Anita Allen identifies what she calls “proprietary privacy,” privacy interests that deal with the appropriation and ownership of human personalities.<sup>232</sup> Proprietary privacy reveals the clear connections between property, privacy, and autonomy.<sup>233</sup> Allen explains that “[p]roprietary genetic privacy is suggested by the idea that human DNA is a repository of valuable human personality.”<sup>234</sup> Thus, one way to provide meaningful protection for privacy would be through property protections.<sup>235</sup> In fact, at times, the distinction between property and privacy may collapse completely. When arguing in favor of an antidiscrimination paradigm for protecting genetic information (and by consequence *against* a privacy paradigm), Anita Silvers and Michael Stein actually equate privacy and property, stating that “[o]n the privacy model, a person’s genetic information is her property and,

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<sup>230</sup> Ossorio, *supra* note 11, at 240 (“As Professor Margaret Radin points out in her book *Contested Commodities*, by automatically assuming that we will slide down a slippery slope we are unnecessarily conceding power to market rhetoric. We should not assume that this way of thinking is so seductive or satisfying that once presented it will necessarily become predominate in all spheres of our lives.”).

<sup>231</sup> One student author writes that “[t]he ephemeral right to privacy only has true meaning as a property right.” Weeden, *supra* note 11, at 657.

<sup>232</sup> Allen, *supra* note 205, at 33.

<sup>233</sup> See Quigley, *supra* note 18, at 634 (asserting that a society which truly values individual liberty would not shy away from such consequences and the ensuing responsibilities which stem from the ‘full liberal ownership of our bodies’ that each of us ought to be entitled to”); Radin, *supra* note 16, at 957 (explaining that “the personhood perspective is often implicit in the connections that courts and commentators find between property and privacy or between property and liberty”).

<sup>234</sup> Allen, *supra* note 205, at 49.

<sup>235</sup> See Miller, *supra* note 224, at 1223. *But see id.* at 1224 (invoking the economic/non-economic, property/privacy dichotomy rejected by this Essay above).

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consequently, should be under her control.”<sup>236</sup> Hence, we should not reduce the legal interests in genetic information into a simple binary.<sup>237</sup>

Finally, scholars have asserted that absent complementary property protections, privacy fails a source of legal protection for genetic information. One reason for this failure is the asymmetrical property interests enjoyed by researchers. According to this line of reasoning, even the strongest independent privacy protection is no match for an opposing property right.<sup>238</sup> This reality is at least in part due to the fact that privacy frequently offers the simple choice between disclosure and non-disclosure. It does not provide positive rights to control what happens to that information in the future.<sup>239</sup> Once you give a third party access to your private information, your privacy right largely evaporates. Thus, privacy may be too ephemeral a construct to offering meaningful, long-term protection for genetic information.<sup>240</sup> Property, however, offers a more complex and enduring set of rights.<sup>241</sup> Most significantly, under a property regime, at least some interests would remain after disclosure. In arguing in favor of an individual’s control over her genetic information, Richard Epstein favors conversion over nondisclosure “because it creates cleaner property rights in those cases in which individuals do enter into various kinds of business transactions.”<sup>242</sup>

Yet regardless of whether one agrees with the arguments in favor of recognizing genetic information as property, the tenacity of ownership language with respect to genetic information suggests that personal intuitions about the ownership of genetic information are not going anywhere. To that end, legal scholars should accept property as viable legal framework for protecting genetic information. Exploring the theoretical underpinnings for genetic property interests is an important first step.

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<sup>236</sup> Silvers & Stein, *supra* note 221, at 1355.

<sup>237</sup> Björkman & Hansson, *supra* note 18, at 212.

<sup>238</sup> Rao, *supra* 18, at 380.

<sup>239</sup> *Id.*; see also Roberts, *supra* note 211 at 619 (noting that “GINA does not give us control in deciding when and how our genetic information might be used; it only speaks to conditions under which particular parties cannot use our genetic information”).

<sup>240</sup> Weeden, *supra* note 11, at 659-60.

<sup>241</sup> Rao, *supra* 18, at 380.

<sup>242</sup> Richard A. Epstein, *Steady the Course: Property Rights in Genetic Material*, in PERSPECTIVES ON THE PROPERTIES OF THE HUMAN GENOME 159 (F. Scott Kieff, ed. 2003).

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Every first year law student knows that property consists, not of tangible objects, but of bundles of rights. However, the bundle of rights metaphor, while helpful to understand the complex legal status of ownership, leaves certain questions unanswered. Mainly, it does not tell us which rights exist within a given bundle, who is entitled to those rights, and under what circumstances. For the answers to these important questions, we must look to property theory. While others exist, three primary theories of property law have garnered widespread acknowledgment and acceptance: labor theory, welfare-maximization/utilitarian theory, and personhood theory. Yet despite the frequency of ownership language in the conversations surrounding rights to genetic information, legal scholars have been reluctant to apply these well-known principles to genetic data. However, applying property theory to genetic information has clear benefits. First, it reflects the common intuition—regardless of the actual status of the law—that people *should* have an ownership claim to their genetic data. Second, it creates symmetry between the interests of the biotech industry, which are framed in property terms, and the interests of contributors of genetic material, which are not. And lastly, a property approach could address some of the shortcomings of the privacy model for protecting genetic information.

## II. COMPETING GENETIC OWNERSHIP CLAIMS

When something is of value, property law theory explores how the law should negotiate potentially conflicting ownership claims. While individuals who contribute genetic information may not have legal ownership rights on par with researchers and biotech companies, they nonetheless value their genetic information and experience it as being “theirs.” Part I thus demonstrated that we need for a more meaningful exploration of the property implications of genetic information. Even the scholarship that advocates a property model for protecting genetic information has not methodically applied the widely accepted property theories to the context of genetic information. Regardless of the controversies surrounding the desirability of property as legal framework for protecting genetic information, there are clear reasons for understanding genetic information as property: (1) the popularity and persistence of ownership language and assertions by contributors of genetic material; (2) the asymmetry

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between legal protections of genetic information enjoyed by researchers and those enjoyed by providers of DNA; and finally (3) the failure of other legal paradigms to adequately protect the sources of genetic material from feelings of exploitation.

Part II then turns to the real-world ownership claims of the biotech industry and of individuals who provide genetic material. It looks to the property theories outlined above for answers as to why both types of parties have legitimate ownership claims.<sup>243</sup> The Part concludes that conflicting assertions of genetic ownership between these two classes of individuals arise from their adopting differing property theories as the basis for their claims.

#### A. *Biotech Industry: Labor Theory*

Despite the hesitance to recognize the property interests of contributors of DNA material, described in Part I, the biotech industry has legally recognized ownership interests with respect to the genetic information of donors and subjects. Specifically, under current law, they may patent and commercialize their findings.<sup>244</sup> Patents are designed to serve at least two related purposes (1) to reward researchers for their efforts by affording them property rights in their inventions and (2) to encourage further research and innovation by requiring the inventor to share his invention publically. Thus, a patent can be understood as a bargain, the inventor trades disclosure for exclusive rights.

Patents seek to encourage innovation and scientific progress. Advocates of intellectual property argue that legally recognized property interests are necessary for facilitating development and investment.<sup>245</sup> Recognizing ownership interests in patented innovations accomplishes these goals along two separate metrics. On one hand, patents allow inventors to profit from their work, thereby

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<sup>243</sup> See ALEXANDER & PEÑALVER, *supra* note 11, at 183 (explaining “the theories that have been used to justify ownership of tangible property apply without too much difficulty to the ownership of ideas”).

<sup>244</sup> The United States Constitution gives Congress the power “[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.” U.S. CONST., art. 1, sect. 8, cl. 8. Patents are statutorily created intellectual property that gives patent holders exclusive rights in the patented subject matter for twenty years.

<sup>245</sup> James Boyle, *Enclosing the Genome: What Squabbles in PERSPECTIVES ON THE PROPERTIES OF THE HUMAN GENOME* 98 (F. Scott Kieff, ed. 2003).

creating incentives for both upstream research and downstream product development. The underlying assumptions here are that, without some kind of exclusive opportunity to profit, a researcher or a company would be less inclined to conduct research because of the absence of a tangible benefit or the possibility that hard-earned profits could be lost to potential competitors.<sup>246</sup> Alternatively the researcher or the company might attempt to keep the work secret to preserve a market share.<sup>247</sup> Neither outcome is good for scientific progress. Hence, patents implicitly reject the idea of innovation for innovations sake. Additionally, the possibility of lucrative property rights in resulting inventions could be appealing to funders. Investors view patents as opportunities to gain returns on their investments. Likewise, a researcher who has been named as the inventor on a profitable patent gains recognition in the scientific community and can use that prestige not only to attract more investors but also to secure grants for future research and desirable positions in academia, private corporations, or the government.

Research and innovations related to human genetic information can be patentable innovations. Yet that does not mean granting ownership rights related to genetic information has gone unchallenged. Since the dawn of the modern genetic era in the 1990s, controversy has raged regarding the patentability of genes and the genome.<sup>248</sup> While researchers asserted the need for patents to protect their work and facilitate progress,<sup>249</sup> opponents have argued that patents related to genetic information are potentially harmful in a number of ways. Popular critiques include the fears that gene patents could stifle research by creating an anticommons,<sup>250</sup> restrict access to care for patients, direct research efforts upstream, and lead to the objectification, disaggregation, and commodification of the body.

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<sup>246</sup> Ching, *supra* note 201, at 695-96.

<sup>247</sup> *Id.*

<sup>248</sup> Ching, *supra* note 201, at 695-96.

<sup>249</sup> Ching, *supra* note 201, at 695-96.

<sup>250</sup> Researchers themselves were not always strong supporters of gene patents. See Suter, *supra* note 11, at 745-46 (“Many researchers who would have once been (746) scornful of commercial interests in research projects now embrace the propertization of genetic information and materials as a way to reap the financial rewards of work in this field. In short, genetic information and materials are increasingly viewed as property and valuable commodities.”).

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Given the broad scope of patentable subject matter,<sup>251</sup> individuals and institutions hold patents on a wide variety of items related to genetic research, including synthetic DNA, genetic tests, cell lines, and databases of genetic information.

In the past, researchers have been able to obtain patents on isolated genes. However, this fact has recently changed. When the company Myriad Genetics, Inc. obtained a patent on the isolated genes associated with heightened risks of breast and ovarian cancers, it used those patents to effectively create a monopoly on genetic testing related to those conditions.<sup>252</sup> While the United States Supreme Court upheld some of Myriad's patents,<sup>253</sup> it invalidated the patents on the isolated genes, on the theory that genes are products of nature and not human innovations.<sup>254</sup> Yet even post-Myriad, patents related to genetic information still flourish.

Members of the biotech industry have asserted their ownership claims to oppose recognizing similar property interests related to genetic information for the contributors of genetic material. The most frequent argument made by researchers and genetic testing companies against recognizing ownership interests for the sources of DNA is that acknowledging such rights would chill research,<sup>255</sup> thereby undermining the purpose of granting patents in the first place. Consequently, the biotech industry has lobbied against legislative efforts to grant property rights in genetic material or genetic information to individuals.<sup>256</sup> For instance, when New Jersey considered recognizing a limited property right in tissue samples as a vehicle for safeguarding genetic privacy, pharmaceutical companies objected out of the fear that individuals might attempt to obtain royalties from products that had been developed using their genetic information.<sup>257</sup> Similarly, when Oregon passed a genetic privacy law in 1999 that recognized genetic information as an individual's personal property, researchers claimed that providing such a right

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<sup>251</sup> See *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980). ("Congress intended statutory subject matter to include 'anything under the sun that is made by man.'") (citing S. Rep. No. 82-1979, at 5 (1952); H.R. Rep. No. 82-1923, at 6 (1952)).

<sup>252</sup> *Ass'n for Molecular Pathology v. Myriad Genetics*, 569 U.S. \_\_\_\_ (2013).

<sup>253</sup> *Id.*

<sup>254</sup> *Id.*

<sup>255</sup> Suter, *supra* note 11, at 758.

<sup>256</sup> *Id.* at 761.

<sup>257</sup> Spinello, *supra* note 18, at 33.

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would create a substantial hurdle for genetic research.<sup>258</sup> The Oregon legislature removed the property right from the statute two years later.<sup>259</sup> It is worth pointing out that the biotech industry does not object to treating genetic information as property generally but to acknowledging it as the property of the sources of genetic material.<sup>260</sup> Researchers and genetic testing companies view innovations related to genetic information as rightfully “theirs” and do not want their entitlements hampered by the recognition of conflicting ownership rights by the sources of DNA.<sup>261</sup> Suter observes how such arguments unabashedly adopt the language of property and the market.<sup>262</sup> She explains “it is precisely because they think of genetic information and material as commodities (of value to them) that they have such concerns about initial property entitlements in the source of that information or material.”<sup>263</sup>

This analysis is all to say that members of the biotech industry view their ownership claims related to genetic information in predominantly—if not exclusively—economic terms. To them genetic information and its derivatives are valuable as commodities and having property rights in those commodities allow researchers and institutions to monetize their current efforts and to lay the groundwork for funding future endeavors. Genetic information is, therefore, only valuable as a means to an end. Because genetic information is not independently valuable, members of the biotech industry see their efforts as what gives genetic information its significance. I propose that this line of reasoning, which supports the ownership claims of the biotech industry but not the sources of genetic information, primarily follows the labor theory of property.

Labor theory makes certain assumptions about the kinds of contributions that warrant moral desert. Specifically it looks to “the relative importance of effort, ability, persistence, industriousness, luck, time spent, achievement, the difficulty, unpleasantness, or danger of the work, and other working conditions” and compares the relative efforts of each party to decide what share of the property interest each has earned.<sup>264</sup> Such a framework tends to support the ownership claims of the biotech industry because it was their efforts

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<sup>258</sup> *Id.*

<sup>259</sup> *Id.*

<sup>260</sup> Suter, *supra* note 11, at 748.

<sup>261</sup> *Id.*

<sup>262</sup> *See id.* at 761-62.

<sup>263</sup> *Id.*

<sup>264</sup> Holman & Munzer, *supra* note 17, at 834.

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and expenses that took an individual's genetic information and revealed its scientific or social relevance.<sup>265</sup> Not unlike those who pick apples, gather acorns, or hunt deer, researchers and companies take the raw genetic material and convert it into a more useful form.<sup>266</sup>

Likewise, a labor theory of property would also seem to cut against recognizing ownership interests for the sources of genetic material. To start, a person's labor does not create her genetic information.<sup>267</sup> It existed in relatively the same form since before she was born. Like the apples, the acorns, and the deer, DNA is something that, although present in the natural world, is not in its raw, unconverted form an appropriate object of ownership. Instead, DNA requires that an entity contribute labor and extract value before the genetic information can be made into something worthy of property protection. Thus, when researchers use genetic information to create cell lines or genetic tests or when companies, like 23andMe, aggregate genetic information into extensive databases, the processes of producing the cell line, developing the test, or compiling the data are what makes the otherwise valueless genetic information useful. Members of the biotech industry therefore have claims to the products of their labor, i.e. the cell line, the genetic test, and the database, but the contributors of genetic material do not, as they are just a source of raw materials. According to this reasoning suppliers of DNA have as much right to the patent innovations as trees would to apples or acorns, or a deer might to a venison sausage. (While this reading is—at least in this author's opinion—the most straightforward application of the labor theory of property to issues of genetic ownership, others have arrived at differing conclusions.<sup>268</sup>)

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<sup>265</sup> *Id.* at 805, 832-33 (applying the labor theory to assess—yet ultimately reject—researchers' strong ownership claims to express sequence tags); Harlan, *supra* 18, at 200 (asserting that “a DNA profile is distinctly a product of the technicians who extracted the DNA from the physical sample and subjected it to the chemical analysis that resulted in the profile” and as a result “[t]he profile should, therefore, be recognized as the property of those technicians or their employers”); Ossorio, *supra* note 11, at 236 (Under some theories, such as a labor theory of property acquisition, the researcher or physician who removed the cells/tissues/organs and transformed them from their natural state into something more useful would probably have a greater claim to ownership than the person from whom they were derived.”).

<sup>266</sup> Rao, *supra* 18, at 377.

<sup>267</sup> Barrad, *supra* note 15, at 1071.

<sup>268</sup> For example some authors have argued that Locke would support the recognition of ownership interests in genetic material. *See, e.g.*, Barrad, *supra* note 15, at 1071-72 (“However, Locke based the labor theory of

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It is also worth noting that a purely economic version of utilitarianism might also support this allocation of property rights. Because people are not extracting value from their genetic information, ownership rights should go to the biotech industry, which will use that information to generate wealth. Either way genetic information is understood as a mineable commodity that has value because of its potential market worth.

Importantly, courts that have been asked to resolve ownership controversies related to patents involving genetic information have appeared to adopt the labor theory as their framework. Practically every property law student has read the California Supreme Court case, *Moore v. Regents of the University of California*.<sup>269</sup> In *Moore*,

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property on natural law and natural rights philosophy. Thus, Lockean property theory considers it axiomatic that the individual has property in his body and in his identity, or individuality. According to Locke, the concept of property is an extension of that individuality to the products of one's physical and mental labor. The individuality of the person also exists in the information encoded in his DNA. Genetic material provides the biological warehouse for storing the elements of individual identity. All physical characteristics that embody individuality find their source in the human genome. Since each person's individuality is his property, the embodiment of that identity in the person's genetic information must also be his property. Thus, the labor theory does not justify finding property in genetic material as a consequence of an individual's labor, but rather as a (1072) necessary result of the initial theoretical assumption of property in the person."); Harlan, *supra* 18, at 199-200 ("Labor or libertarian theory asserts that property rights inhere in things that individuals create with their own labor. Under a labor theory analysis, the critical characteristic of DNA is its ability to replicate within the cells of the body. As the individual's body is the sole entity responsible for DNA production, the labor theory (200) postulates that DNA belongs to the body that created it."). Others have asserted that a labor theory undermines certain—although now potentially invalid—genetic patents, when a substantial amount of effort is not involved, see, e.g., Spinello, *supra* note 18, at 37 ("In the case of gene fragments the labor desert view provides no support since little labor is involved in sequencing these fragments."), or when their recognition could impede further research, see, e.g., *id.* at 38 ("But Locke calls for limits on the acquisition of property even when a property right seems to be commensurate with the labor performed. . . . In this context, awarding an exclusive entitlement will interfere with the research activities of other scientists who will find it difficult to pursue related or similar research trajectories. . . . Given that the commons is impaired by the removal of a gene that has been patented, a Lockean justification for genetic patents seems dubious.").

<sup>269</sup> *Moore v. Regents of the Univ. Cal.*, 793 P.2d 479 (Cal. 1990).

researchers—including the doctor who was treating John Moore for hairy cell leukemia—created and patented using tissue from Moore’s removed spleen without Moore’s knowledge or consent.<sup>270</sup> While the court recognized that Moore might have had valid claims for lack of informed consent and/or breach of fiduciary duty, it dismissed his claim for conversion—the unlawful taking of another’s property—holding there could be no conversion and, by consequence no ability to share in the immense profits generated by the cell line that bore his name,<sup>271</sup> because Moore lacked a cognizable interest in his spleen once it left his body.<sup>272</sup> Importantly, *Moore* does not stand for the proposition that the cell lines made from Moore’s genetic information were not property, just that Moore himself had no property rights.<sup>273</sup>

Perhaps the court in *Moore* did not feel compelled to recognize ownership rights because Moore could potentially recover on other legal theories.<sup>274</sup> Yet while rejecting property, *Moore* does not offer an alternative legal paradigm for the rights of contributors of genetic material.<sup>275</sup> Although Moore might have had breach of fiduciary duty or lack of informed consent, no such legal protection exists outside of the clinical setting.

For example, in *Greenberg v. Miami Children’s Hospital*, a group of families of children with Canavan disease approached a researcher to study the condition’s genetic causes.<sup>276</sup> They supplied him with a variety of resources to assist him in his work, including biospecimens and pedigrees of several other Canavan-affected families.<sup>277</sup> After the researcher successfully identified the genetic variation linked to the disease, Miami Children’s Hospital patented the isolated gene and its related applications with the intention of enforcing those patents very restrictively, including through limiting access to testing.<sup>278</sup> The plaintiffs sued for a number of causes of action, alleging they had contributed their genetic information with the belief the research would be made available to the public.<sup>279</sup> One

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<sup>270</sup> *Id.*

<sup>271</sup> Rao, *supra* 18, at 372.

<sup>272</sup> Moore, 793 P.2d.

<sup>273</sup> Rao, *supra* 18, at 372.

<sup>274</sup> Ching, *supra* note 201, at 707.

<sup>275</sup> Rao, *supra* 18, at 372.

<sup>276</sup> *Greenberg v. Miami Children’s Hosp.*, 264 F. Supp. 2d 1064 (S.D. Fla. 2003).

<sup>277</sup> *Id.*

<sup>278</sup> *Id.*

<sup>279</sup> *Id.*

of their arguments was that they proceeded on the assumption, based on experiences within the Tay-Sachs community, that any research on Canavan would remain within the public domain. Citing *Moore*, the federal district court dismissed their conversion claim, stating they had no property interest in their excised cells.<sup>280</sup> However, the *Greenberg* court went one step further. It found because the plaintiffs were donors and not patients the researcher owed them no fiduciary duties.<sup>281</sup> Without fiduciary duties, there can be no claims for breach of fiduciary duty or lack of informed consent.

While post-Myriad, a researcher would be unable to patent the isolated gene, *Greenberg* remains relevant for its application to downstream patents, as well as for the court's reasoning. If *Greenberg* were to happen today, while not able to get an upstream patent on the gene itself, the hospital would still have been able to secure patents further downstream, such as for carrier tests, prenatal tests, gene therapies, and other possible treatments.<sup>282</sup> Furthermore, the court adopted an explicitly economic, labor-oriented view of genetic ownership. First, in rejecting the claim for lack of informed consent and breach of fiduciary duty, the court stated that imposing such duties "would chill medical research" and "would give rise to a type of dead-hand control that research subjects could hold because they would be able to dictate how medical research progresses."<sup>283</sup> With respect to the conversion claim, the court explicitly applied a labor theory of property to conclude that the hospital and the researcher had the only rightful claims to ownership. Quoting a case cited by the plaintiffs, the district court explained: "[W]here information is gathered and arranged at some cost and sold as a commodity on the market, it is properly protected as property.' This seemingly provides more support for property rights inherent in Defendants' research rather than the donations of Plaintiffs' DNA."<sup>284</sup> Radhika Rao has identified the irony in the court's position, writing that "not only did the court reject the Greenbergs' argument that the Canavan gene patent should remain part of the public domain because that was their intent, but instead the court ruled that it was their bodies and their genes—and *not* the gene isolated by Dr. Matalon—that were in the

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<sup>280</sup> *Id.*

<sup>281</sup> *Id.*

<sup>282</sup> See Rao, *supra* 18, at 372.

<sup>283</sup> *Greenberg*, 264 F. Supp. 2d; see also Rao, *supra* 18, at 372.

<sup>284</sup> *Greenberg*, 264 F. Supp. 2d (quoting *Pioneer Hi-Bred v. Holden Foundation*, 1987 WL 341211 (S.D.Iowa, Oct.30, 1987), *aff'd*, 35 F.3d 1226 (8th Cir.1994)); see also Rao, *supra* 18, at 374.

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public domain, free for appropriation by the first researcher who came along and reduced them to private possession.”<sup>285</sup> Like in *Moore*, the court in *Greenberg* did not deny that property interests related to genetic information exist—in fact it expressly affirmed that—instead the court found that the rightful owners are those who contributed their labor, not those who supplied their DNA.<sup>286</sup>

Yet the labor theory is just one way to think about how society should allocate property rights. If we go outside the labor paradigm we can see that contributors of genetic material also have legitimate—albeit not widely legally recognized—ownership claims.

*B. Providers of Genetic Material: Personhood Theory*

As discussed above, U.S. common law affords individuals no property rights in their excised cells. Courts have read this holding to mean that the contributor of the genetic material then has no ownership claim over the resulting research even if her unique genetic information was an essential aspect to its success. However, I propose that the absence of ownership claims in genetic material—or more specifically excised cells—does not foreclose the possibility of an ownership claim in genetic information. While certain physical samples might have value, this Essay’s central concern is not the ownership of the excised cells themselves but rather the ownership of the information they contain. The court’s assessment of Moore’s conversion claim focused primarily on whether he owned his spleen cells after they left his body. However, I propose that the genetic information those cells held is in fact far more enduring and personal. Twenty-five years after the *Moore* decision, we know significantly more about the science of genetics and the connection of genetic information—although perhaps not genetic material—to an individual’s sense of self. While this Essay is not a call to revisit the current law of genetic ownership, it is nonetheless worth noting that a more nuanced interpretation of existing law could support ownership claims for the sources of DNA in their genetic information that those ownership claims, when exercised, could affect the future use of the genetic information.

Yet despite the lack of widely legally recognized interest

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<sup>285</sup> Rao, *supra* 18, at 378 (emphasis in original).

<sup>286</sup> *Id.* at 376 (asserting that “*Moore* and *Greenberg* apply the property law of capture to body parts in much the same way that other courts have applied the law of capture to migratory resources such as oil, water, and wild animals”).

individuals still have the intuition that their genetic information belongs to them. Many of these arguments are based on the notion that owning one's own genetic information is 'natural' or 'a basic right.'<sup>287</sup> Perhaps genetic ownership feels intuitive because, at the advent of the Human Genome Project, researchers presented genetic information as the biological blueprint for our uniqueness as persons.<sup>288</sup> In her work on genetic privacy, Anita Allen writes that "[i]f DNA is the human essence—that is, the thing that makes individuals special and perhaps unique—it arguably ought to belong to the individual from whom it was ultimately derived. If DNA 'belongs' to individual sources, it might belong to them exclusively and inalienably."<sup>289</sup> Likewise, another author asserts "[p]ersonal genetic information is certainly personal property; no other individual or entity has a clearer or more justifiable claim over the information than the person to whom it pertains."<sup>290</sup> Thus, regardless of judicial reluctance to recognize legally cognizable property interests for sources of genetic material, many individuals themselves nonetheless experience their genetic information as uniquely their own.

23andMe absolutely capitalizes on the perceived connection between genetics and identity when marketing their products. The front of its test kit reads "Welcome to You" and its website entices potential consumers with the phrase "23 pairs of chromosomes. One unique you."<sup>291</sup> Considering this framing, it is not terribly surprising that some people now view their genetic information as constitutive of their individuality and, therefore, an element of their personhood.

Even before 23andMe sold its data, these divergent perceptions of genetic ownership have resulted in at least a few highly public conflicts. The Havasupai tribe made headlines when members sued genetic researchers at the Arizona State University (ASU) and University of Arizona (UA) for using their donated biological specimens to conduct research on schizophrenia, inbreeding, and

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<sup>287</sup> See Suter, *supra* note 11, at 750-58 (outlining the arguments in favor of—but ultimately rejecting—the property model for protecting genetic information); see generally Ossorio, *supra* note 11 (reasoning that individuals may be the initial owners of their bodily materials).

<sup>288</sup> See George J. Annas, *Privacy Rules for DNA Databanks: Protecting Coded Future Diaries*, 270 JAMA 2346 (1993).

<sup>289</sup> Allen, *supra* note 205, at 49.

<sup>290</sup> Weeden, *supra* note 11, at 617.

<sup>291</sup> See 23and Me Homepage, available at <https://www.23andme.com>.

population migration.<sup>292</sup> Members of the tribe made particularly desirable research subjects because they were a relatively isolated, and therefore relatively genetically homogenous, population. While they agreed to research regarding diabetes, the litigants asserted that if they had known about the additional research, they would not have consented.<sup>293</sup> Notably, the Arizona District Court that heard one of the cases dismissed the claim for lack of informed consent, finding that (1) tribe members had agreed to having their blood drawn and to broad use, so they could not use the doctrine of informed consent to challenge those subsequent uses and that (2) the Common Rule lacks a private right of action allowing parties to sue for violations of those regulations.<sup>294</sup>

Similar to the Havasupai, for some years now researchers have also targeted indigenous people thought to have uniquely appealing genetic profiles.<sup>295</sup> However, skeptics worry that genetic research using indigenous peoples might amount to “molecular colonialism” or “bio-prospecting” as the genetic material is harvested without compensation and the resulting research will likely either not offer any benefit to the studied population or, even worse, result in stigmatization or other kinds of harms.<sup>296</sup>

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<sup>292</sup> Lori B. Andrews, *Havasupai Tribe Sues Genetic Researchers*, 4 L. & BIOETHICS. RPT. 10 (2014).

<sup>293</sup> Andrews, *supra* note 292. Supporters of the research countered that studying inbreeding and migration patterns are “accepted procedures” for population research. The tribe responded that if that were the case, they should have been made aware of that fact.

<sup>294</sup> See *Tilousi v. Arizona State University Board of Regents*, No. 04-CV-1290-PCT-FJM (D. Ariz. March 3, 2005). The cases ultimately settled. Amy Harmon, *Indian Tribe Wins Fight to Limit the Research of Its DNA*, N.Y. TIMES, Apr. 21, 2001, available at <http://www.nytimes.com/2010/04/22/us/22dna.html?pagewanted=all>. The settlement agreement included provisions that ASU would pay the tribe \$700,000, return all remaining blood samples in its possession, return documents including lab books and genealogy materials containing the research from the blood samples, direct institutional review boards at the other universities involved in the suit not to approve or renew research using the samples, and provide the tribe a list of entities where it had sent the samples.

<sup>295</sup> Indigenous people were of interest to researchers both because of their isolation as well as their potential resistance to disease. Ching, *supra* note 201, at 687-88.

<sup>296</sup> Ching, *supra* note 201, at 697-99, 701; Spinello, *supra* note 18, at 34.

Another controversy occurred just last year when researchers sequenced and published the genome of the well-known HeLa cell line without the permission of the Lacks family, the descendants of Henrietta Lacks, the cell-line's source.<sup>297</sup> Significantly, with respect to both the Havasupai and the HeLa cell genome, researchers were quick to defend the existing practices and assert that the studies had been done in accordance with the existing laws and regulations.<sup>298</sup> Thus, despite the feelings of exploitation experienced by the sources of the genetic information, those who had provided biological material had little legal recourse because the researchers had, at least facially, followed the current standards.

The identity harms related to genetic research described above fall along a spectrum from individual to group. The people who are frustrated with 23andMe's sale of their genetic information are experiencing identity harms as individuals. However, their genetic information is not necessarily valuable to the biotech industry independently. Only when it is combined with the genetic information of thousands of other people does it become something profitable. By contrast, populations might experience collective identity harms from the exploitation of their genetic information, such as in the case of the Havasupai or the indigenous populations. Both the genetic information of the group, as especially useful for research, and the cultural identity of the group, including their beliefs about genetics, are implicated by conducting genetic studies. The experience of the Lacks family falls somewhere in the middle. On the one hand, Henrietta could have experienced an individual identity harm because her unique genetic information was valuable to researchers as the source of an immortal cell line, yet her family also experienced a group

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<sup>297</sup> See Ewen Callaway, *HeLa Publication Brews Bioethical Storm*, NATURE NEWS, Mar. 27, 2013, available at <http://www.nature.com/news/hela-publication-brews-bioethical-storm-1.12689>. Eventually, the family endorsed a case-by-case release of the research. See Ewen Callaway, *Deal Done Over HeLa Cell Line*, NATURE NEWS, Aug. 7, 2013, available at <http://www.nature.com/news/deal-done-over-hela-cell-line-1.13511>. For a highly popular account of the Lacks family's backstory, see REBECCA SKLOOT, *THE IMMORTAL LIFE OF HENRIETTA LACKS* (2011).

<sup>298</sup> See, e.g., Andrews, *supra* note 292 (stating that research on inbreeding and migration is "an accepted procedure"); Rebecca Skloot, *The Immortal Life of Henrietta Lacks, The Sequel*, N.Y. TIMES, available at <http://www.nytimes.com/2013/03/24/opinion/sunday/the-immortal-life-of-henrietta-lacks-the-sequel.html?pagewanted=all> (stating that "[s]everal researchers noted that consent wasn't required to publish the HeLa genome (true)").

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identity harm, as the publication of the HeLa cell genome revealed to the world her family members' otherwise private genetic information.

Unlike the biotech industry, contributors of genetic material have non-economic interests. That is not to say that the sources of DNA are not at all interested in money. Undoubtedly, many might want to share in the profits of a lucrative innovation. Yet contributors of genetic material are not solely concerned with the profitability of the cell lines, genetic tests, and databases. They also have strong dignitary interests, some of which even trump the opportunity to profit from research should it be offered to them.

Like possible identity harms described above, the sources of genetic material can have both individual and socio-cultural objections to certain uses of their genetic information. On an individual level, I might be personally opposed to a use of my genetic information, say if I am categorically against all genetic research related to intelligence, or if the genetic study would reveal something about me I would prefer to leave unknown, like the likelihood I would develop Alzheimer's.<sup>299</sup> At the level of group interest, a particular line of genetic research might undermine the beliefs of my culture. For example, the Havasupai objected to the population migration research on their genetic information because it directly contradicted the tribe's origin story. Similarly, the president of the Guaymi, when approached regarding genetic research on the tribe that could potentially be patented, explained that 'it's fundamentally immoral, contrary to the Guaymi view of nature, and our place in it. To patent human material ... to take human DNA and patent its products ... violates the integrity of life itself, and our deepest sense of morality.'<sup>300</sup> Thus, certain cultures may oppose the commercialization of their genetic information for philosophical or religious reasons.<sup>301</sup>

While the biotech industry has opposed recognizing ownership interests for the sources of genetic material as antithetical to scientific progress, the non-economic nature of those interests could actually have a positive effect on research and patient care. Take, for example, the plaintiffs in *Greenberg*. One parent asserted '[w]e gave our samples to be used for the public good. They were not given to Miami Children's.'<sup>302</sup> So strong was their commitment to affordable access and future research that the *Greenberg* plaintiffs settled their only

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<sup>299</sup> Ossorio, *supra* note 11, at 232.

<sup>300</sup> Ching, *supra* note 201, at 700 (quoting Philip L. Bereano, *Patent Pending: The Race to Own DNA*, SEATTLE TIMES, Aug. 27, 1995, at B5).

<sup>301</sup> *Id.* at 688.

<sup>302</sup> Rao, *supra* 18, at 373.

viable claim, unjust enrichment, for a promise that the hospital holding the patents would allow researchers studying cures for Canavan disease, including creating gene therapy treatments and developing genetic tests, to use the patented gene for free.<sup>303</sup> Hence in that case, non-economic interests actually furthered future research by removing the hurdle of an aggressively enforced patent. The opposition of certain populations, like the Guaymi, to patenting innovations related to genetic information could have similar effects.

Over the years, advocates of research subjects and donors have argued in favor of recognizing a person's ownership rights in her genetic information for a number of different reasons. One reason to support ownership claims for the sources of genetic material is simply because of the intuition that an individual owns her DNA.<sup>304</sup> James Boyle explains the logic behind the expectation that a person owns her genetic information as follows: 'You can't own this gene because I owned it first. My genetic information is my property. Your gene sequences came originally from a source and the source's claims should be recognized, either instead of or as well as the person seeking the patent.'<sup>305</sup> He notes that this type of objection can come from individuals, families, or population groups.<sup>306</sup> Practically speaking, society might want to acknowledge ownership claims for contributors of genetic material to avoid potential exploitation.<sup>307</sup> As explained in the preceding Sub-Part, legally recognized property rights in genetic information tend to be lop-sided, favoring the economic, labor-based interests of the biotech industry. Thus, equity would seem to support acknowledging a corresponding right for the contributors of DNA.<sup>308</sup> Likewise, acknowledging property rights for providers of genetic

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<sup>303</sup> Rao, *supra* 18, at 374.

<sup>304</sup> Allen, *supra* note 205, at 50 (quoting Robert F. Weir & Jay R. Horton, *DNA Banking and Informed Consent* (paper on file with author Allen)).

<sup>305</sup> Boyle, *supra* note 245, at 103-104.

<sup>306</sup> *Id.*

<sup>307</sup> Allen, *supra* note 205, at 50.

<sup>308</sup> See Kojo Yelapaala, *Owning the Secret of Life: Biotechnology and Property Rights Revisited*, 32 MCGEORGE L. REV. 111, 132 (2000) (asserting that "[a]s long as the Court was wedded to the notion of property rights, it appears fundamentally inequitable and immoral for it to have categorically excluded Moore from those rights without a complete analysis of the underlining property theories.").

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material could avoid some of the concerns related to genetic colonialism or bio-prospecting.<sup>309</sup>

Given the non-economic, identity, and dignity-related concerns at play, the property theory most suited to allocating ownership interests to the sources of genetic material would be personhood. In arguing for a privacy paradigm over a property paradigm, Suter asserts that, to individuals like the plaintiffs in *Greenberg*, “[genetic] information had personal value; to the researchers, it was simply a commodity.”<sup>310</sup> But Suter gets this wrong.<sup>311</sup> What she identifies is not necessarily a conflict between property and privacy but instead could be understood as a clash between the labor theory of property (or economic utilitarianism) and the personhood theory of property.

One point of departure for using the personhood theory to assert ownership interests for sources of genetic material is to argue that individuals enjoy property rights in their physical bodies. Radin herself asserts that personhood theory could support bodily ownership claims: “If property in one’s body is not too close to personhood to be considered property at all, then it is the clearest case of property for personhood.”<sup>312</sup> She explains that according to an embodiment theory, “the body is quintessentially personal property because it is literally constitutive of one’s personhood. If the body is property, then objectively it is property for personhood.”<sup>313</sup> Then it might stand to reason that all items derived from the body would likewise be personal property, at least once they are extracted.<sup>314</sup> However, the unique, individualized nature of genetic information might give it a special claim to being personal property.

As Radin points out, “[o]ne element of the intuitive personhood perspective is that property for personhood gives rise to a stronger moral claim than other property.”<sup>315</sup> Genetic information is highly

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<sup>309</sup> Spinello, *supra* note 18, at 34; *see also* Ching, *supra* note 201, at 697-99, 701.

<sup>310</sup> Suter, *supra* note 11, at 741.

<sup>311</sup> And she is not alone. *See* Rao, *supra* 18, at 378 (“Furthermore, property law favors those who plan to commodify and commercialize human genes over those who resist commodification in order to make genetic resources freely available to all. Thus, the *Greenberg* court also rejected the plaintiffs’ argument that the genetic information contained within their bodies was their property, but suggested that it became the property of the researchers once it had been commodified.”).

<sup>312</sup> *Id.* at 977.

<sup>313</sup> *Id.* at 966.

<sup>314</sup> *See id.*

<sup>315</sup> Radin, *supra* note 16, at 978.

personal and can speak to a person's individuality or identity. Authors have referred to DNA and genetic information as "our biological identity"<sup>316</sup> or "the thing that makes individuals special and perhaps unique."<sup>317</sup> Contributors of genetic material might therefore assert that their genetic information is personal property because it forms an essential part of either their individual or collective identities. Thus, it would seem that contributors of genetic material have a strong basis for asserting that they own their genetic information.<sup>318</sup> This degree of connectedness to genetic information might explain why people feel so violated even when biotech companies follow the proper protocols. In other words, the sources of genetic information could be expressing ownership claims consistent with a personhood theory of property.

Diving deeper into a personhood theory of property in genetic information for the sources of genetic material reveals serious complexities. Recall from Part I that Radin's personhood dichotomy distinguishes between fungible and personal property, giving individuals the kinds of heightened moral claims directly described above only when the object of ownership is irreplaceable. Radin herself notes that some derivatives of the body—especially depending on who owns them at the time—are in fact fungible.<sup>319</sup> Examples of fungible bodily parts include blood for transfusion, human hair for a wig, and organs for transplant.<sup>320</sup> By contrast, Radin asserts that some components of the body "may be too 'personal' to be property at all."<sup>321</sup> She proposes that this intuition means it may only make sense to call a bodily derivative property when it exists outside of the owner's body.<sup>322</sup> Genetic information tests the boundaries of these distinctions, raising unique questions when applying Radin's theory.

Genetic information, unlike other forms of even bodily property, can simultaneously be fungible and personal depending upon the owner. This paradox occurs because of the non-rivalrous nature of genetic information. Unlike wedding rings and houses, or even blood and hair, two different parties can have complete possession of the exact same genetic information at the exact same time in such a way that does not inhibit the other party's use of that

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<sup>316</sup> Weeden, *supra* note 11, at 627.

<sup>317</sup> Allen, *supra* note 205, at 49.

<sup>318</sup> Weeden, *supra* note 11, at 617.

<sup>319</sup> Radin, *supra* note 16, at 966.

<sup>320</sup> *Id.*

<sup>321</sup> *Id.*

<sup>322</sup> *Id.*

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information. As Pilar Ossorio quips, “[i]f a researcher creates an immortalized cell line from my cells and licenses that cell line to a biotechnology company for a million dollars, that will not prevent me from traveling on my vacation, writing a play, or getting a pet.”<sup>323</sup> However, while a researcher’s or genetic testing companies’ ownership of a person’s genetic information will not interfere with her physical body’s “use” of that information, members of the biotech industry could nonetheless produce serious dignitary and identity-related harms—that is harms to personhood—through even non-rivalrous ownership. Again these harms include engaging in research that undermines the contributor of DNA’s dignity or privacy, perhaps through creating stigma or revealing information she would prefer to have left unknown, or by violating her moral, philosophical, or spiritual beliefs, whether individual or collective.<sup>324</sup> Genetic information can therefore remain immensely personal and central to personhood for the sources of genetic material, despite its non-rivalrous qualities.

By contrast, members of the biotech industry arguably experience identical information as fungible. Remember from Part I that being fungible does not mean the property is valueless or easily substitutable, just that the owner holds it for instrumental reasons and it can be replaced with an equally valuable good. Although some scholars have implied that under certain, albeit rare, circumstances researchers might have weak personhood claims,<sup>325</sup> their predominantly economic and commercial approaches to the ownership of genetic information tip heavily in favor of its construction as fungible property. Because genetic information typically functions as

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<sup>323</sup> Ossorio, *supra* note 11, at 232.

<sup>324</sup> *Id.*

<sup>325</sup> See Holman & Munzer, *supra* note 17, at 836 (“Whatever the intellectual merits of personality theories of intellectual property, such theories have scant import for property rights in [express sequence tags]. When DNA sequencing was done by hand, one might have located a basis for self-actualization of the individual by acts of will and intellect. But now that virtually all ESTs are isolated by automated DNA sequencing machines, little room remains for personality theories in this highly specialized context. True, such theories could be relevant to inventing such machines, assembling DNA databases, and developing search engines. Yet that relevance bears on property rights in the machines, databases, and search engines—not in ESTs themselves. As with the labor-desert principle, it would be incorrect to say that personality theories offer no justification at all for property rights in [express sequence tags]. But these theories yield only a very weak justification.”).

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a means to an end, whether that end is personal recognition, downstream profits, or future funding, the thing that gives genetic information value for the biotech industry is not its inherently unique attributes but what it represents. Taking Radin's theory at face value then, it would seem that the contributors of genetic material—for whom the property is deeply personal—would have a greater moral claim to ownership than members of the biotech industry—for whom that genetic information is largely fungible.

This analysis further distinguishes the ownership of genetic information from the ownership of genetic material. Going back to Radin's analysis, unlike genetic information, which maintains its connections to personhood and identity perpetually, genetic material can move along the spectrum from personal to fungible. In the hands of the biotech industry, genetic material, such as blood spots, tissue samples, and cheek squabs, (like genetic information) has value because of the research and monetization that the genetic material represents. And while these things are deeply personal when contained within someone's body, much genetic material is clearly replaceable. As long as we live, our bodies will produce more blood, tissue, and saliva. Yet putting aside the occasional mutation, our bodies will not produce new genetic information. Thus, the personhood theory provides a stronger claim for the ownership of genetic information *ad infinitum* than it does for genetic material.<sup>326</sup>

However, there are reasons to remain skeptical of looking to property for personhood to justify an individual's ownership of her genetic information. For example, it may not make sense to assert that our genetic information is constitutive of our identities because we have control over its content. As Allen explains, a person's genetic information "is not a self-selected, self-initiated narrative."<sup>327</sup> Additionally, justifying the ownership of genetic information for the sources of DNA runs the risk of overvaluing the importance of genetic information to a person's sense of self, effectively engaging in genetic essentialism. Equating genetic information with personhood or identity could lead to low self-esteem and stigma.<sup>328</sup> Social psychology

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<sup>326</sup> Yet it is worth noting that other authors have arrived at juxtapositionally opposite conclusion when apply personhood theory to the ownership of genetic material and genetic information. See Harlan, *supra* 18, at 201 (arguing that personhood theory exclusively support's an individual's property interests in her extracted genetic material and not in her genetic information).

<sup>327</sup> Allen, *supra* note 205, at 50.

<sup>328</sup> Allen, *supra* note 205, at 49.

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confirms this concern with individuals that receive undesirable genetic test results describing themselves as “flawed” and “dirty.”<sup>329</sup>

But regardless of its downsides, personhood theory represents a valuable lens to assess claims of genetic ownership. In particular, it demonstrates how reasoning from an alternative theory of property can lead to different conclusions. While the courts in *Moore* and *Greenberg* rejected the ownership claims of the sources of genetic material in the resulting innovations by adopting a labor theory of property, a personhood theory would yield another outcome. Under property for personhood, the California Supreme Court would have had a basis for taking Moore’s persona claim more seriously. The court could have recognized that even though the researchers’ labor generated the cell line, the uniqueness of Moore’s genetic information made that labor possible. More importantly, even though his spleen had been removed from his body, essential elements of John Moore remained within the genetic code of those cells. Thus, regardless of the physical location of his genetic material, Moore’s genetic information remained uniquely and perpetually his own. Furthermore, Moore might have a stronger moral claim to the cell line because its genetic information constitutes an element of his identity, when to researchers the cell line was merely a highly useful and highly profitable commercial product. Personhood theory therefore seems to favor the rights of DNA contributors over the rights of the biotech industry under most circumstances.

Thus, unlike the labor theory (or economic utilitarianism) the personhood theory of property supports recognizing ownership rights in genetic information for the contributors of genetic material, perhaps even to the detriment of the rights of researchers and genetic testing companies. Consequently, both the biotech industry and sources of DNA have legitimate ownership claims with respect to genetic information, depending on this property theory one adopts. In the face of two sets of conflicting yet potentially valid ownership claims, it makes sense to adopt a theory that attempts to balance those competing interests.

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<sup>329</sup> ROBERT L. KLITZMAN, AM I MY GENES? CONFRONTING FATE & FAMILY SECRETS IN THE AGE OF GENETIC TESTING 177 (2012) (discussing the incorporation of genetic information into an individual’s self-concept and the formation of genetic identity); see also Jessica L. Roberts, *Rethinking Employment Discrimination Harms*, 91 IND. L.J. --- (forthcoming 2016) (discussing possible stigmatization and identity harms associated with genetic information).

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Part II reveals that the biotech industry and sources of genetic information are reasoning from different theories of property when they assert their ownership interests. Researchers and genetic testing companies claim ownership over genetic information for primarily financial reasons. For them, owning genetic information represents an economic reward for their work and the opportunity either to commercial the resulting data (in the case of genetic testing companies) or to use it in other studies and for securing funding for additional research (in the case of researchers). Therefore, their ownership claims align most directly with the labor theory of property. By contrast, people who provide genetic material tend to view the resulting genetic information in identity-related terms, constitutive of their personhood and individuality. Their concerns are primarily dignitary. Hence, the ownership claims of contributors of DNA most directly align with the personhood theory. Framing competing claims of genetic ownership in property theory terms reveals that the conflict arises from two differing theories of ownership, thereby opening the door to alleviate this tension.

### III. RECONCILING COMPETING GENETIC OWNERSHIP CLAIMS

Conflicts surrounding the ownership of genetic information threaten to jeopardize the promise of genetic and genomic science, as well as the future of biological research. Contributors of genetic material may feel exploited, even when the researchers have followed the proper protocols. These perceptions of exploitation, particularly when experienced by groups or individuals who have dealt with social subjugation, can lead to distrust and, as a result, chill their willingness to buy potentially beneficial genetic tests or to participate in genetic or genomic research. The preceding Part established that these potentially damaging ownership conflicts stem from divergent intuitions about ownership. Drawing from this insight, Part III attempts to reconcile these competing ownership claims using a third property theory: welfare-maximization.

#### *A. Welfare-Maximization*

As described at length in Part II, the labor theory seems to disproportionately favor the interests of researchers and genetic testing companies, whereas the personhood theory seems to

disproportionately favors the contributors of genetic material. Read side by side, this analysis reveals two sets of legitimate competing ownership claims to the same genetic information. However, despite potentially valid claims by both members of the biotech industry and providers of DNA, the courts in at least two of genetic ownership's watershed cases have only recognized the property interests of researchers and institutions. Reasoning from the labor perspective, the courts in *Moore* and *Greenberg* both express the concern that recognizing ownership interests for the contributors of genetic material could undermine the property rights that researchers earned from their labor. But as the controversies related to 23andMe, the Havasupai, and the Lacks family demonstrate, individuals who provide genetic material are also in need of protection.<sup>330</sup> Despite their legality, perceived breaches of trust can harm research relations, making people hesitant to participate in future research.<sup>331</sup> Additionally, others have gone a step farther and argued that when a profitable innovation, like a cell line, comes exclusively from one person's cells, the source of the genetic material should be able to share in the proceeds of that innovation "as a matter of fairness."<sup>332</sup> Hence, we must find some middle ground for genetic ownership claims.

I propose that welfare maximization provides just such territory for compromise. Yet to be meaningful as a theory, as well as to be preferable to labor or personhood, a welfare-maximizing approach to genetic ownership must address the issues confronted by all utilitarian theories: (1) defining welfare and (2) aggregating welfare.

[I would ideally like to arrive a clear(er) notion of how to apply welfare maximization and/or human flourishing to the ownership of genetic information. My first step is to reject an economic view of welfare.]

A definition of welfare that favors commercial use and market value might not have the desired effects of adequately balancing the ownership claims of sources of genetic material and the biotech industry because it would favor recognizing an individual's property interests in her genetic information only if that information had value in the marketplace.<sup>333</sup> Although genetic information can be financially

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<sup>330</sup> Sweeney, *supra* note 18, at 1166.

<sup>331</sup> Suter, *supra* note 11, at 788-89.

<sup>332</sup> Spinello, *supra* note 18, at 40.

<sup>333</sup> Barrad, *supra* note 15, at 1081.

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valuable—both in the abstract and to specific stakeholders,<sup>334</sup> a purely economic approach would ignore the reality that for at least some people their genetic information is not fungible. Thus a meaningful definition of welfare must go beyond simple material wealth. From this perspective, both traditional utilitarianism, which focuses on happiness, and human flourishing, which focuses on virtue and community, would provide potentially appropriate frameworks. Yet any definition of welfare brings with it its own biases.<sup>335</sup>

[Here I plan to expand my discussion. What is the best, most workable definition of welfare? I am leaning toward a human flourishing pluralist approach, which attempts to avoid the quantification and aggregation issues. In the respect, human flourishing may be more properly understood as a *welfarist* not a *welfare-maximizing* theory, which I would need to establish more clearly in Part I. Is this account compelling? Are there better ones?]

With respect to aggregation, a welfare-maximizing theory faces the same challenges as all non-economic utilitarian theories of property. Even if we settle on something like happiness as the appropriate currency of welfare, how do we measure happiness? In moment to moment pleasure? Life satisfaction? Or some combination of the two? And even having a definition of happiness does not make what constitutes a quantum of that happiness apparent, nor does it imply that my happiness is equivalent to your happiness as a simple additive matter. Perhaps then with its pluralist approach, human flourishing provides the best framework because it dodges the aggregation bullet. Yet even then practical applications can become frustratingly elusive.

[Do I need to say more about the pitfalls here or can I rely on the discussion in Part I? Are there additional pitfalls?]

[Below I outline some general balancing concerns.]

To that end, it is useful to address some of the kinds of balancing inquiries that might occur in the context of a non-economic welfare-maximizing approach to genetic ownership. One point of

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<sup>334</sup> *Id.*

<sup>335</sup> Boyle, *supra* note 245, at 115 (asserting that “[t]here is no neutral account of innovation or efficiency.”).

inquiry in assessing how to allocate genetic ownership rights is the relationship between the provider of the genetic material and researcher or company interested in its acquisition. Having to bargain with one's personal physician might skew the willingness to participate in research and the potential of profitable future research might skew the recommendations of the physician.<sup>336</sup> It may therefore be beneficial in such cases to offer the source of the DNA heightened rights in her genetic information to address the possible disparity in bargaining power.

However, critics of property rights for the providers of genetic material argue that their recognition could present a variety of externalities, including higher financial and administrative transaction costs for research that could be passed down as heightened prices for consumers in need of care.<sup>337</sup> Thus, the scientific community's objections to legally recognized ownership interests for the contributors of DNA can be framed in utilitarian terms.<sup>338</sup> Importantly, these arguments matter, even when welfare is defined in non-economic terms. For example, if I am sick but I cannot afford to purchase a much needed treatment because the recognition of genetic ownership rights by the sources of genetic material has inflated prices, that lack of access will inevitably affect my happiness and my ability to flourish. Thus, such concerns have a place in even a non-economic welfare calculus.

Yet even in light of those potential drawbacks, recognizing ownership claims for individuals who provide genetic material might still create a net social benefit if more people participate in research than otherwise would have, leading to more expansive, more frequent advances in the science.<sup>339</sup> While this exploration of the potential factors that might be weighed in a welfare-maximizing approach to genetic ownership, it has hopefully identified some of the sorts of concerns that would be in need of balancing.

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<sup>336</sup> Suter, *supra* note 11, at 805.

<sup>337</sup> Spinello, *supra* note 18, at 35; *see also id.* at at 38 (asserting that the author "made a tenable case on utilitarian grounds that property rights in genetic material are unsound since the social costs are disproportionate to the benefits received").

<sup>338</sup> Suter, *supra* note 11, at 761-62.

<sup>339</sup> Suter makes this very point: "Society might be better off overall if more people participated in research, even if they demanded compensation, than if fewer participated for free. This issue raises empirical questions about the consequences of property rights in genetic information and samples on research participation." *Id.* at 761.

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[Is this general discussion useful? Does it need to be expanded? Are there additional balancing concerns I should address?]

*B. Unbundling Genetic Property Interests*

As a theory of property, welfare maximization tends to adopt a bundle of sticks approach to ownership.<sup>340</sup> Going back to Part I, part of the appeal of this definition of property is in the ability to unbundle the property interests at stake and allocate each of them in the way that would generate the most good. In this final Sub-Part, I attempt to outline how welfare maximization might function as a theory of genetic ownership within practical reality.

Of course, determinations of genetic ownership would ideally be made on a case-by-case basis and would require justification for the allocation of the individual ownership rights at stake, yet a few hypotheticals are nonetheless useful.

[Here I seek to provide some concrete examples of how we can unbundle property interests and distribute them between the different parties in a way that would maximize social good. Are these examples useful? Are others better? I might also want to emphasize how welfare maximization would arrive at different and ultimately better outcomes than a labor or personhood approach.]

Just as a general matter, individuals donate DNA, which indicates that a right to sell their genetic information is not of great importance. By contrast, a right to sell is clearly important to the biotech industry, which could benefit from licensing agreements. Thus, in many situations rights related to commercialization may not be of central interest to the contributors of genetic information, thereby weighing in favor of allocating those rights to the biotech industry in those circumstances.

But take a more complicated scenario, like the case of the Havasupai. Imagine a biotech company would like to conduct research on the genetic information of a tribe with a particularly high occurrence of diabetes. As per usual, the company cares most about being able to commercialize the findings, both as potential profits or future funding opportunities. Members of the tribe, however, care most about avoiding stigma and exploitation, as well as adhering to their core cultural and spiritual beliefs. In light of these differing

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<sup>340</sup> *Supra* notes 133 & 140 and accompanying text.

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types of interests, how should the law allocate the property interests in the tribe's genetic information? Assuming the tribe is not participating in research to seek remuneration, the commercial interests, such as the right to income, the right to capital, and the right to transmissibility, could go primarily to the company. To ensure that the tribe's dignitary and identity-related interests are protected, the tribe and the company could share certain rights, such as the right to possess, the right to use, and the right to manage. Moreover, drawing from Radin's personhood dichotomy, the tribe could have a stronger moral claim over the genetic information if a situation arises, as did with the Havasupai, in which the company plans to use the tribe's genetic information in harmful ways.

Yet imagine the tribe shares the perspective of the *Greenberg* plaintiffs and will only participate in research if the results enter the public domain. Those circumstances might require the company to forgo at least some commercialization rights to facilitate research that would otherwise not occur. This hypothetical leads to a potentially surprising conclusion: A welfare-maximizing framework leaves the door open for the possibility that affording *no* ownership interests might generate the most good. Gesturing toward the fear of an anticommons, some scholars have cautioned against recognizing ownership rights for researchers too far upstream.<sup>341</sup> The United States Supreme Court seems to have responded to this concern by invalidating patents in isolated genes in *Association for Molecular Pathology v. Myriad Genetics*.<sup>342</sup> Simply allocating no ownership interests in genetic information could certainly address some of the equity concerns outlined in this Essay. Thus, a welfare maximization theory of property could ironically weigh against the recognition of ownership interests in certain contexts.

[Include additional hypotheticals. Should I apply labor theory and personhood theory to demonstrate that they would lead to different, less desirable conclusions or is it clear how they would apply?]

While a welfare-maximizing approach that allocates the various rights in the property bundle in the way that would extract the most social good might be ideal, it could prove challenging on a practical level. Specifically, it might require an inordinate amount of time and resources—beyond what any society might have—to conduct

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<sup>341</sup> Spinello, *supra* note 18, at 37.

<sup>342</sup> *Ass'n for Molecular Pathology v. Myriad Genetics*, 569 U.S. \_\_\_\_ (2013).

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a cost-benefit analysis of the allocation of every component genetic ownership right in the bundle to every possible stakeholder under every possible circumstance. Yet perhaps it is worthwhile to have something to aspire to, even if the practical implementation itself is challenging. At a minimum, we could use a generalized utilitarian approach (opposed to analyzing every individual case) to balance competing interests and create better clarity regarding the presence or absence of legally recognized ownership claims when individuals provide their genetic information.

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Viewing competing claims to genetic ownership through the lens of property theory not only reveals the source of the conflict but also an opportunity for resolution. Adopting a welfare-maximization theory of ownership—opposed to the labor theory favored by the biotech industry or the personhood theory favored by providers of genetic material—could better balance the concerns of these two groups. A welfare-maximizing theory of genetic ownership would allocate rights in the way that would generate the most social benefit. In an ideal world, this inquiry would occur on a case-by-case and a right-by-right basis. We would ask which party in a given circumstance would generate the most welfare from being given—or being denied—a particular property right. However, such a specific and complicated regime might be difficult both to implement and to enforce. Alternatively, we could make these determinations on a more general level and assure that all parties involved are aware of the ownership rights they do and do not enjoy in a particular context.

#### CONCLUSION

Over the past year, direct-to-consumer genetic testing companies have been open and unapologetic about their desire to sell their customers' genetic data to medical researchers. Despite the lawfulness of this conduct, the public has expressed surprise and distaste at the practice. But the recent activities of Ancestry and 23andMe are just the latest in a series of conflicts about the rights of genetic ownership. Feelings of exploitation have dulled the sheen of the genetic and genomic revolution since it began, with providers of genetic material feeling as though they have been used, commodified, and even dehumanized by the biotech industry. But with that said, the biotech industry also enjoys legitimate ownership claims over

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genetic information. Like an oilfield without a drill, the value of genetic data requires scientific intervention to be realized. Without researchers, a cancerous cell is just medical abnormality, not an opportunity for future knowledge and treatment. Without genetic testing companies to compile large-scale databases, an individual's genetic profile only reveals information about that person. Both the contributors of DNA and the biotech industry appear to be asserting legitimate—yet conflicting—ownership claims to genetic information.

Yet how is it possible to have two competing yet legitimate claims to owning the same genetic information? The answer is that these two different groups are reasoning from different theories of property. In the past, several legal scholars have been wary of wholly embracing the property law model out of fear that it was inferior to other means of legally safeguarding genetic information. However, applying property theory to genetic information generates several important insights. First, it explains how the biotech industry and contributors of genetic information could both have valid ownership claims to genetic information. Second, it reveals a pathway to resolve that conflict. Because one group adopts a labor theory and the other a personhood theory, a third theory—welfare maximization—provides both an alternate framework and a means of better balancing competing interests.

Yet this Essay does not purport to offer a silver bullet. A true welfare-maximizing approach to genetic ownership could be self-defeatingly complex both to calculate and to implement. This Essay therefore advocates a more generalized allocation of ownership interests in genetic information. In other words, rights should be allocated in a way that tends to generate the most welfare across the most circumstances. Moreover, to avoid possible feelings of exploitation, everyone involved should be adequately informed of the rights they have and the ones they do not. Of course, to accomplish this goal, further research will be needed regarding how relevant parties value their potential rights and the biotech industry must reconsider how it structures its consent.