

Constructing Commons in the Cultural Environment

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Abstract

This paper considers the problem of understanding intellectual sharing/pooling arrangements and the construction of cultural commons arrangements. We argue that an adaptation of the approach pioneered by Elinor Ostrom and collaborators to commons arrangements in the natural environment may provide a template for the examination of constructed commons in the cultural environment. Such an approach promises to lead to a better understanding of how participants in commons and pooling arrangements structure their interactions in relation to the environment(s) within which they are embedded and with which they share interdependent relationships. We propose a framework for evaluating and comparing the contours of different pooling arrangements with an eye toward developing an understanding of the institutional and structural differences across arrangements and industries as well as the underlying contextual reasons for such differences. The proposed approach would draw upon case studies from a wide range of disciplines. Among other things, we argue that a theoretical approach to cultural constructed commons should consider rules pertaining to membership criteria, contribution and use of pooled resources, internal licensing conditions, management of external relationships, and institutional form along with the degree of collaboration among members, sharing of human capital, degrees of integration among participants, and whether there is a specified purpose to the arrangement.

Keywords: *Constructed commons, pooling, intellectual property, information, culture*

1. Introduction

This paper explores the theoretical challenge of understanding the construction and governance of what we refer to as constructed commons in the cultural environment. “Constructed commons,” as we use that term, refers to open environments for developing and distributing cultural and scientific knowledge through pooling arrangements and related institutions and structures. The paper argues for a case-study-based theoretical framework for research exploring the construction of the cultural commons analogous to that used by Elinor Ostrom and her colleagues to understand commons approaches to natural resources.

In the past, intellectual property law scholarship has viewed innovation and creativity as stemming for the most part from the efforts either of individuals or firms – as encouraged and structured by the patent and copyright systems – or from government efforts – particularly as reflected in university research and scholarship.

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Consistent with this view of innovation as arising out of either individual or public efforts, the cultural landscape was viewed as divided between the private property of copyright holders and patent holders and “the “public domain,” or “the commons,” open and available to all, comprised of those intellectual works that were never protected by intellectual property and those which had fallen out of protection. Increasingly, it is evident that this paradigm is inadequate to describe what we will refer to here, following on the work of James Boyle (1997), as the cultural environment. Cultural production comprises not just individual economic activity or government production of public goods, but an inherently social phenomenon taking place over a wide range of scales and within a complex and overlapping variety of formal and informal institutional structures. Thus, there is not just “the public domain” or “the commons,” but a variety of differently comprised and governed “constructed commons” arising in a wide variety of cultural contexts.

In some respects there is nothing new or surprising about this observation. Cultural works and information goods have always been socially constructed in many senses. What is changing is both the recognition that the traditional economically-inspired realm of production around which intellectual property protection is designed cannot be treated as independent of the larger cultural environment and the fact that social production of cultural goods has become more salient and more economically important as a result of globalization and of the communications revolution symbolized by the Internet. We are thus beginning to grapple with the realization that legal facilitation of innovation and creative production is not and cannot be confined to a simple set of property rules to incentivize individual innovative and creative efforts, but is a matter of governance of a highly social cultural environment. The question becomes how best to use legal and other tools to encourage a creative, sustainable, and equitable cultural environment.

We use the term “cultural environment” advisedly. We believe that the environmental metaphor is a natural and appropriate way to approach the problem of cultural production, and we want to argue more specifically that an approach to understanding the regulation and governance of the natural environment pioneered by Elinor Ostrom and her collaborators is likely to be fruitful in helping us to navigate the more complex system in which we now acknowledge our intellectual property system is based. Modern approaches to regulating the natural environment have followed a trajectory that should resonate with intellectual property scholars. The need for environmental regulation arises out of “the tragedy of the commons,” famously explicated by Garrett Hardin (1968). Hardin argued that the commons is tragic because each individual seeking to extract value from a given resource (such as a grazing ground for sheep) has an incentive for over-use such that in the long run the resource is depleted. Avoiding this tragedy seems at first to require either privatization or top-down government control. One key insight of Ostrom’s approach to the natural environment was recognition of the important role for institutions intermediate between private property and the state in solving problems of collective action and provision of public goods (Ostrom 1990). These intermediate institutions are sometimes called “common property” or “limited commons” and generally denote collective, but not necessarily

governmental or even formal, means for sharing and making productive and sustainable use of resources such as fisheries, water, forests, and so forth. The research of Ostrom and other scholars demonstrates that solutions to these resource-sharing problems are various and highly contextual. Simple models, such as the Prisoner's Dilemma, and generalized theories, such as the "tragedy of the commons," can therefore be only the beginning of a much more complex analysis. The temptation to seek out regulatory panaceas, whether through private property, state action, or even notions of community, must be resisted in favor of a more nuanced approach (Ostrom et al. 2007).

The analogy between the natural environment and the domain of ideas, between the public goods problems addressed by private property and intellectual property, has been exploited fruitfully by a number of intellectual property law scholars. Much of the scholarly debate in intellectual property law has pitted proponents of privatization as a means of incentivizing production of intellectual goods against proponents of a widely available public domain upon which culture goods can build. The discussion has often devolved into a disagreement over the relative importance of incentives and access for production of ideas and creative expression. However, as technology has evolved to facilitate an increasingly extensive and various landscape of social and cooperative creative and innovative projects, a third perspective has emerged. Books, articles, and scholarly discussion of such projects, of which open source software has become the poster child, increasingly extol community production as a solution to the free rider problems of cultural production. There is a danger that the amorphous idea of "community production" will become the new one-size-fits-all panacea approach in rivalry with privatization, public subsidy, and the public domain. We argue that now is the time to recognize that lessons learned by those concerned with the natural environment caution against an overly simplistic view of community cultural production. The primary lesson of the work of scholars of commons regimes such as Ostrom is that the devil is in the details – complex environments demand a more contextual empirical and theoretical approach.

Once one acknowledges the complexity of an environment, whether natural or cultural, and the futility of applying one-size-fits-all theories or legal approaches, one is confronted with the difficult question of how to develop both appropriate conceptual understanding and policy prescriptions. Here is where we think the Ostrom approach may be particularly helpful for intellectual property scholarship. In response to the inadequacy of one-size-fits-all approaches, Ostrom and her collaborators developed a two-pronged attack: First, they engaged in a broad range of case studies of resource commons to form a basis for a bottom-up practice-based taxonomy of successful and unsuccessful approaches to resource management. Second, based on the initial case studies they developed a framework for identifying the variables that are significant in determining the success or failure of a commons enterprise and what kinds of institutions are viable in particular contexts. This approach recognizes the crucial importance to the success or failure of common pool management of the interplay between the characteristics of the common pool resource itself and the social and institutional arrangements for its governance. It also attempts to walk the difficult line between overly simplistic theoretical models which paper over important complexity and

an entirely fragmented list of diverse situations. The approach is a work in progress even in the natural resource domain, but we think it has proven sufficiently fruitful to make it worth adapting for our purposes.

In this article, we make an attempt to sketch out how an Ostrom-like approach to the cultural environment might work. We identify both similarities and differences between the cultural environment and the natural environment which will be important in adapting the approach to the cultural context. We discuss the special problem of defining the “natural” or default environment in the cultural context that arises because of the constructed nature of cultural and intellectual resources. We suggest a preliminary framework for organizing the analysis of constructed commons in the cultural environment.

As a foundation for our proposed approach we draw an explicit connection between two approaches to intellectual property and other information policy problems that are sometimes thought to conflict. First, we draw on linguistic and metaphorical approaches to legal and sociological questions, drawing specifically on the metaphorical dimensions of the idea of the information “environment” and the knowledge “commons.” Second, we align ourselves with the economic approach to common pool resource production, consumption, and distribution by adopting significant portions of the functional approach to investigating commons resources in the natural environment that was pioneered and still exemplified by Ostrom and her colleagues. In proper proportion, a humanistic and metaphorical inquiry into information policy, on the one hand, and a functional approach grounded in social science models, on the other hand, are complementary and can be effectively unified in research questions that yield accurate descriptive summaries of commons phenomena as well as policy prescriptions.

1.1 The Environmental Metaphor

Scholars of many stripes have focused increased attention over the last decade on the role of language and metaphor in structuring analysis of legal and policy problems, both in connection with intellectual property law and otherwise. Some of this work has coalesced in the so-called Law and Literature movement. (Nussbaum 1995; White 1994). Other scholars have emphasized connections between language and metaphor, on the one hand, and cognitive processes that drive behavior and experience, on the other hand (Lakoff & Johnson 1980). Boyle (1997) focuses on the rhetoric of authorship and invention metaphors in order to expose the political character of property law. Rose (1994) focuses on narratives of property law in order to demonstrate the essentially social character of the law. A number of intellectual property scholars draw on environmental and spatial metaphors in their discussions of information law and policy (Frischmann 2007; Samuelson 2006; Madison 1998).

The environmental metaphor for information law and policy – focusing on cultural and knowledge resources, rather than physical or natural resources – offers an especially illuminating and useful starting point for our project. We define the cultural

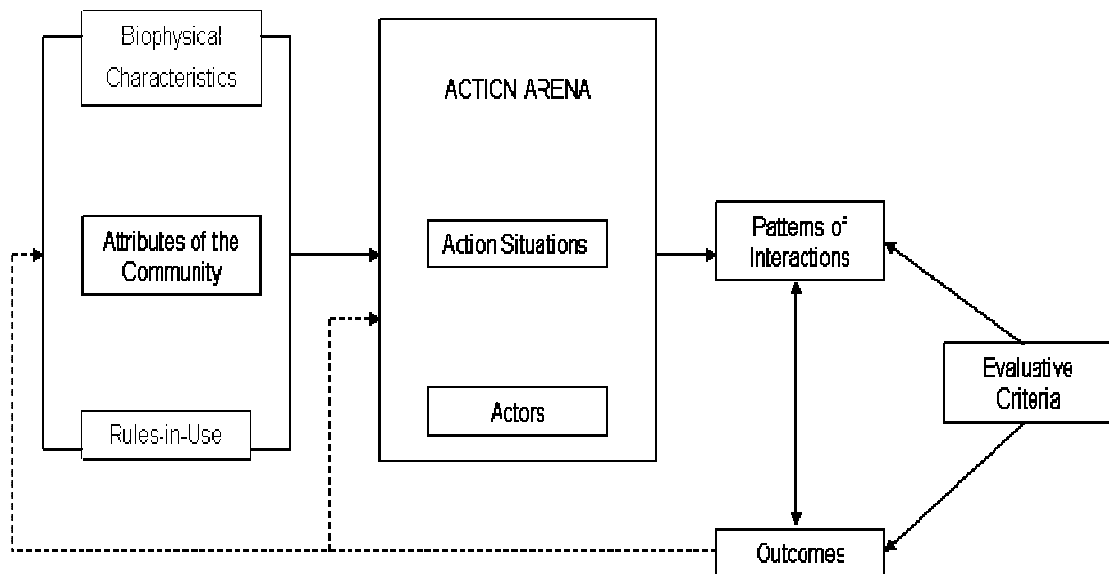
environment as a system of interconnected and interdependent resources that includes both natural and built resource systems (Frischmann 2007). Relying on this metaphor offers the ability to explore connections within and between those systems, to differentiate growth and progress from stewardship, conservation, and sustainability; to describe the differences between natural and constructed environments and differences between open and closed or “gated” or “managed” environments; to describe different versions of concepts based on adjacent metaphors, such as the public domain and the commons; to identify and describe important patterned behaviors that correspond to different kinds of environments; and to draw lessons from a variety of regulatory and governance structures in other environmental contexts: public, private; legislative, administrative; oriented toward individual entitlements or collectivist, and so on.

As to function, adopting the cultural environmentalism metaphor also offers the ability to borrow a structure for functionalist analysis from studies of the natural commons, and specifically the approach of Ostrom, which we introduce in the next subsection.

1.2 The Common Pool Framework

Ostrom’s extensive case-study-based investigation of the commons and governance structures in the natural resource context is, in nearly all respects, a model for the current project. Via studies and reviews of numerous case studies addressed to the social, political, and physical dimensions of natural resource environments, Ostrom has shown the inadequacy of methods that investigate the commons according to a small or limited number of attributes identified *ex ante*. Such simple models fail to account for what Ostrom characterizes as the nested, multi-tier character of the natural resource commons (Ostrom 2007). Accordingly, they likely fail to capture the range and complexity of social, political, and economic aspects of the governance mechanisms in which the commons is embedded.

Instead of simple models, Ostrom offers what she characterizes as a “framework” for systematizing the investigation of commons regimes. Her Institutional Analysis and Development framework is used to structure a common set of research questions to be applied in diverse contexts with the eventual goal of coming to some conclusions about the significance and interactions of various factors in facilitating effective management of common resources. The IAD framework is illustrated in Figure 1 (modeled on Figure 3.1 of Ostrom and Hess 2007). It divides the investigation of a commons regime into the underlying factors, including biophysical characteristics, community attributes, and what Ostrom and her collaborators denote “rules-in-use;” the action arenas, leading to patterns of interactions; and the outcome of the commons management approach.



[Figure 1]

We argue that this perspective on the complexity of commons resources and of the governance regimes that manage them can and should be applied to resources in the cultural environment. Ostrom and her colleagues themselves have taken preliminary steps to understand how these methods might be relevant to investigating the cultural commons (Hess and Ostrom 2007), including digital collections of knowledge resources that fall within intellectual property regimes. We argue that the approach should be extended to encompass a broader view of cultural commons – in particular to investigate commons arrangements for the simultaneous production and sharing of intellectual goods. The nested, multi-tiered character of sustainable cultural environments, and the diversity of attributes that contribute to successful governance regimes, are keys to understanding the commons both as a mechanism for knowledge production, collection, and distribution, and in the context of modern information and intellectual property legal regimes.

Our particular interest (though by no means does it exhaust the scope of the inquiry) is the intersection between copyright and patent law and the construction of cultural commons. Copyright and patent pools, through which IP rights holders agree to contribute patents or copyrights to a “pool” that those same holders may exploit on standardized terms specified as part of the construction of the pool, are examples of such constructed cultural environments. With considerable variance across contexts and specific arrangements, pooling arrangements create socially constructed commons environments within which creators, inventors and innovators may engage in a variety of productive and interactive activities. These environments are not hermetically sealed. They are nested within larger, still more complex systems of natural and socially constructed environments.² In other words, patent and copyright laws construct

² In future work, we will examine both the “interior” space and the boundaries with the “exterior” that pooling arrangements create. The “interior” is open in the sense that members can borrow and share

particular environments with default boundaries governing access to and use of certain forms of knowledge. Pooling arrangements grounded in those laws represent contextually-driven deviations from the IP default. These constructed cultural commons may lead to innovation and improvement that would not be attainable either in the “natural” state without intellectual property protection to deter free riding or in the context of the default IP rules, without the aid of the constructed commons.

This article begins to explore how this nesting process can and should be examined in the cultural context, and how understanding that process suggests a preliminary set of attributes that guide further examination of the cultural commons on a cross-disciplinary, case-by-case basis. While we develop certain examples by grounding the analysis in IP law, it should be understood that the framework developed below is expressly intended for application to the cultural commons in environments that are structured by not only by intellectual property law but also by other legal rules, such as the rules of contract and license, and by informal cultural institutions and social practices.

2. The Information Environment and Constructed Cultural Commons

Scholars from many fields have examined the human phenomena of sharing and exclusion, or more broadly, cooperation and competition. In his well-known summary of cooperation problems in the natural resource environment, Hardin described the challenge of simultaneously enabling productive use of a common resource, on the one hand, and avoiding overconsumption and underproduction of that common resource, on the other hand. Hardin described this problem as the “tragedy of the commons.” His argument is often coupled with an argument, associated with Harold Demsetz (1967), that such “tragic” situations give rise to solutions grounded in regimes of exclusionary property rights.

In the field of intellectual property, the sharing/exclusion and cooperation/competition dichotomies evident in the tragedy of the commons present especially interesting and challenging puzzles. This is so for three reasons: First, those who create, invent, innovate, and participate in similar intellectually driven, productive activities necessarily borrow from or share with others. It is impossible to divest oneself from that to which one has been exposed, and, inevitably, the intellectual products of past and contemporary “producers” (which we will use as a shorthand to refer to creators, inventors, innovators, thinkers, and so on) serve as inputs into each of our own productive activities. We necessarily borrow and share. Second, the resources that shape the cultural environment are by their nature naturally nonrivalrous – meaning that consumption of the resource does not deplete the supply available to other users – and nonexcludable – meaning that knowledge resources are not naturally defined by boundaries that permit exclusion of users (Frischmann 2005). Third, unlike resources in the natural world, resources of information and expression must be created before they

resources, but what does the interior/exterior boundary “look” like? It varies by context, and it is interesting to examine the variations and causes for structural differences.

can be shared. These three characteristics define information resources as public goods. Because of the public goods character of these resources, solving the tragedy of the commons in the cultural environment is especially fraught. To be successful, a cultural commons must be managed so as to manage both use and production of cultural resources. Intellectual resources in the cultural environment not only *are shared in practice*, but they are *naturally shareable*. This means that in assessing any particular constructed cultural commons arrangement, we must expand the framework used in studying natural resources to include consideration not only of how resources are managed and shared within the community but also how and if resources are *created within* and *transferred outside* of the community.

What might be called the classical approach to studying the implications of this conclusion for law and policy divides the information environment into two domains. First, there is the domain of exclusion, in which producers of creative and innovative things employ proprietary rights sanctioned by law to control their development, distribution, and exploitation. Via private rights and private market exchange, in short, the natural shareability of knowledge and innovation is limited. At the core of intellectual property law as traditionally conceived is the right to exclude, without which some producers would abandon their efforts for fear of free riding (unlicensed sharing) by competitors. Without exclusion, (sharing-driven) competition would undermine incentives to invest in the production, development and/or dissemination of some resources in the first place. Intellectual property law constructs and assigns these exclusive rights and encourages their exploitation through market exchange. Second, there is the domain of government or public subsidy, by which the overconsumption and underinvestment problems associated with shareability are solved by provision of cultural goods by direct or indirect provisioning by the public sector, by a combination of grants to researchers, tax credits or subsidies to researchers and enterprises that employ them, prizes, and production and distribution of knowledge and innovation by the government itself, either by organizing research enterprises or by purchasing and distributing private research.

Over the last decade, however, scholars have recognized increasingly that many of the most interesting and important aspects of the information environment exist in the area between these private and public extremes, precisely because of what Frischmann and Lemley (2007) characterize as “spillovers”: uses and reuses of information resources that sustain the dynamic character of the information environment. Because of these spillovers, the information environment is sometimes characterized as what Smith (2000) and others define as a semicommons, a combination of private rights of exclusion, management by public authority, and a domain of resources that are open for reuse. Smith gives the example of a highway, which is a commons in that its most significant aspect is its openness to all users—yet the individual driver has private rights with respect to the moving portion occupied by his vehicle. As applied to patent and copyright regimes, semicommons refers to the allocation of exclusive rights and exceptions by the statutes themselves. The idea of the semicommons more broadly conceived in metaphoric terms, that is, in analogy to the natural resource environment, includes a broad swath of industry-specific and market-specific structural innovations,

collective enterprises, thickets, pools, portfolios, and legal forms that also exhibit blended private and public attributes. These “constructed commons” are, like intellectual property regimes themselves, socially constructed institutions that allocate rights to control access to and use of *some* intellectual and cultural resources, including what we sometimes refer to as *intellectual works*. The design, allocation, and circumscription of these rights reflect social choices about how to manage or delegate management of intellectual works, and how to structure relationships among resource owners and potential resource users.

In other words, we conceive of a blurry line that divides what belongs in the market, and therefore presumptively subject to legal rights of exclusion, and what is more or less clearly outside the market, socially, culturally, and/or institutionally. We then conceive of an important and sizable set of intermediate constructions that draw on elements of exclusion claims, government management, and openness claims, that is, which blend the conventional categories. These are constructed environments for information exchange and sharing, or the constructed commons in the cultural environment. Benkler’s revisiting the theory of the firm in light of distributed and networked information resources (2006) is, in our framing, an example of analysis of constructed commons. In this light, intellectual property laws are seen not merely or even primarily as sources of exclusion and production, and concomitant construction of the public domain, but instead as social institutions constructed to allocate rights to control, i.e., to govern access to and use of *some* intellectual resources. Those resources are also governed by related institutions, such as the firm and social norms. That is, intellectual property laws enclose some intellectual resources, making what would be naturally open less open or more restricted. Yet intellectual property laws also circumscribe the very rights allocated, limiting the restrictivity and preserving some degree of openness.

Intellectual property pools are one example of constructed commons. A patent pool, specifically, is an agreement by two or more patent holders to aggregate their patents. The patents in question typically relate to complementary technology, or the exercise of patent rights by one holder “blocks” the exercise of related rights by a different holder, or both; the pool therefore facilitates exploitation all of the pooled patents that relate to a given technological domain. The pooled patents are typically available to all members of the pool, and are available on standard licensing terms to non-members (Shapiro 2001). A well-known example of a patent pool in the United States is the Manufacturer’s Aircraft Association, which was formed in 1917 and encompassed nearly all American aircraft manufacturers, who needed access to patents held by the Wright Company and the Curtiss Company (Dykman 1964). To illustrate the potential breadth of our concept of the constructed cultural commons, we note that additional phenomena that may be analyzed under this rubric include examples such as medieval guilds, which provided a structured environment for sharing expert trade knowledge among members; the modern research university and the departmental and disciplinary structures that lie within it and above it; and the series of Requests For Comment (RFCs) that define the technical protocols of the Internet.

The remainder of this Section seeks to flesh out the way in which we believe that the Ostrom framework might be extended to study these constructed environments and to highlight some challenges in adapting the Ostrom approach to constructed cultural commons.

2.1 Defining the Cultural Environment

When seeking to apply the Ostrom approach to constructed cultural commons, we immediately confront a conceptual challenge: how should we define the environmental backdrop against which a commons is constructed? There are at least two approaches one might take to this question, which corresponds in Ostrom's framework to interrogating the "biophysical characteristics" of the common pool resource. We argue that, as is generally true for understanding constructed cultural commons, there may be no one right answer to this question. Indeed, there is no clean way to separate a particular constructed commons from the "natural" cultural background, since cultural activity is always grounded in human social interaction. The key is simply to ask the question as a starting point for investigation in a particular case. Asking the question ensures the salience of the choice of the background against which further description is made. We discuss here two reasonable points of "natural environment" reference for the investigation of constructed cultural commons: a "natural" cultural environment without intellectual property and a "default" intellectual property-based cultural environment. These two starting points correspond to the public domain and to a propertized environment respectively. Which is most appropriate to use for a particular inquiry will depend upon the particular context. In a context such as a patent pool, for example, it may be most useful to describe a constructed cultural commons according to how it deviates from the default intellectual property regime. In other contexts, it may be most useful to describe a constructed commons according to its differences from a completely open public domain.

2.1.1 The "Natural" Cultural Environment

From an abstract and relatively broad perspective, intellectual property laws can be seen as a targeted intervention that is aimed at a sector of activities and practices and particular subsets of intellectual resources. Participants in debates about intellectual property laws argue about how well targeted the interventions really are, their impacts across sectors, the relative "sizes" of the subsets, and the existence and desirability of expanding intellectual property laws. Nonetheless, a significant range of activities, practices and intellectual resources remain outside the intended scope of intellectual property regimes. We characterize the cultural environment unmediated by rights of exclusion or other regulation as the "natural" cultural environment.

Why this environment might exist as it does is less important to us than the fact that it is the subject of lively debate. Not all cultural resources can or should be the subject of intellectual property rights. It is important to note, however, that our conception of the natural environment does not depend solely on identifying legal principles that govern exceptions from enclosure by intellectual property rights. The

major intellectual property regimes exclude many different types of intellectual resources based on many different criteria and doctrines. Our purpose is not to catalogue them or fully describe what cultural resources are not enclosed within the systems. Some would describe the complete set of non-enclosed resources as the public domain, including not only matter excluded on subject matter grounds, but also matter subject to rights of fair use or fair dealing, or as to which intellectual property rights have expired. The public domain – the “natural” environment – then can be seen as a vast pool of resources openly accessible and openly usable without seeking the permission of anyone else.

Cohen (2006a), however, has argued that a purely natural resources conception of the public domain, and one that relies on the distinction between permitted and lawful, unsanctioned use, may lead to a misleading follow-on analysis too closely tied to geographic place—that is, to a conception of the public domain as a separate place. She argues persuasively for a more contextual understanding of the “common in culture,” a cultural landscape that is informed and shaped by cultural practices.

Our conception of the “natural” environment relates to Cohen’s cultural landscape model as it similarly integrates a more dynamic and contextual understanding of intellectual resources. We might say that the “natural” cultural environment encompasses all that we *inherit* and *experience*. We *inherit* the natural physical environment; live within, use, interact with, and change it; and pass it on to future generations. Similarly, we inherit, live within, use, interact with, change, and pass on an intellectual and cultural environment, which is itself comprised of many overlapping (sub)environments of science and art, among other things. *Experience* constitutes an important intellectual resource that simultaneously relates human beings to their inherited and evolving environment(s) and constitutes a resource that may shape the intellectual environment. Experience (or perception or observation) is not enclosed within intellectual property regimes, except when expressed and embodied in a particular qualifying form.

The backdrop from which intellectual property regimes emerge and build is complex and rich. It should suffice to say that the natural intellectual environment consists of a vast pool of open intellectual resources within which and with which we experience life and engage in a wide variety of activities and practices.

2.1.2 The Default Proprietary Environments

The two principal regimes of intellectual property law – patent and copyright law – represent the most salient departures from the open environmental baseline described above.

2.1.2.1 The Default Patent Law Environment

Patent statutes are justified generally as departures from the norm of the “natural” environment for technological innovation, on the ground that the natural

shareability of this material undermines incentives to produce and distribute more and better material forms of innovation. Patent rules vary somewhat from country to country, but generally time-limited patent rights are granted to the developers of an “invention” after examination of an application by an appropriate government agency. The applicant must demonstrate to the satisfaction of the patent examiner that the innovation represented by the invention is new (or “novel,” in the language of patent law), in that no one has invented this device before; useful; nonobvious (in the language of American patent law) or possessing an “inventive step” (in most European systems), such that the invention represents a technical advance over the existing art; and adequately described in the application for the benefit of future adopters and adapters of the technology. The holder of a valid patent possesses a statutory right to exclude all others from producing or selling the invention, subject to extremely limited exceptions for experimentation and research on the subject matter of the patent. Notably, however, patent rights expire after a relatively short term, typically 20 years. The material covered by the patent passes at that point into the public domain.

2.1.2.2 The Default Copyright Law Environment

Copyright law departs from the “natural environment” norm for the cultural environment in ways that resemble patent law, and for the same reasons, but with respect to material forms of artistic and creative cultural expression rather than technological and technical innovation. As with patent law, copyright statutes vary in their details from country to country. As with patent law, however, copyright statutes generally embody a set of core principles: The author of an “original” or creative work is granted a statutory entitlement to exclude others from reproducing, adapting, performing or distributing copies of that work to the public. Unlike patent law, copyright generally embeds a broad range of exceptions and exclusions, including exclusions of subject matter that is functional rather than expressive (and therefore the subject of patent law) or that is too broad or abstract to be identified clearly as the specific product of a specific author. In the United States the copyright holder is subject to a user’s power to engage in “fair use” of copyrighted material. In the Commonwealth countries, a copyright typically is subject to a somewhat more limited “fair dealing” exception. Other countries specify a range of exceptions, exclusions, and compulsory licenses for a variety of specific purposes. Finally, as with patents, expiration of the copyright delivers the covered material to the public domain. In general the term of copyright lasts far longer than the term of patent – life of the author plus 50 years, in most countries, and life of the author plus 70 years in the United States and European Union countries.

3. Understanding Constructed Cultural Commons

As we have suggested in earlier sections, the rights of exclusion that comprise the default regimes of patent and copyright law are not absolute. Because knowledge and other forms of culture are inherently cumulative and combinatorial, intellectual property regimes moderate their exclusionary principles with limitations and exceptions. In part those limitations and exceptions are designed to construct a public domain of resources that are freely available to all. In part they are designed to construct a

commons of cultural resources that are partly open and partly closed, usable by others but not always on a purely “free” basis. Default rules of intellectual property may be combined with licenses and contracts, with social norms, and with cultural and other institutional forms to construct these commons, which depend on but are built alongside and on top of the basic forms of knowledge and culture, on the one hand, and intellectual property rules, on the other hand.

Why are these constructed commons arrangements significant and worth investigating in the cultural environment? As a departure from default regimes of intellectual property rights, and as an alternative to government-supplied solutions to tragedy of the commons problems, constructed commons offer distinct means for promoting creativity, innovation, and reuse of cultural resources, particularly with respect to creating “spillovers” that benefit those who are not directly involved in the initial production and consumption of those resources. Frischmann and Lemley (2007) explain how (1) the private rights components of intellectual property laws are designed to internalize some externalities; improve supply side incentives to invest in the production, development, and dissemination of intellectual works; and thus improve markets for intellectual works; and (2) the commons components are designed to promote spillovers, or positive externalities generated by the “leakiness” built into the IP rights systems (via fair use and fair dealing in copyright, for example, and via disclosure requirements in patent law, for example) and by temporal limitations on the rights themselves. Intellectual property pools, which are constructed by cross-licensing of IP rights by IP holders, illustrate the relatively simple construction of a semicommons using these default regimes. Madison (2005) shows how this constructed character of intellectual works, and the balance between their private and public character, can be investigated at the level of the individual object or item that embeds knowledge or culture. Strandburg (2005) does likewise at the level of the institution, showing how university practices regarding transfer of research to the private sector mediate between public and private conceptions of science itself. In sum, the cultural environment displays multiple tiers of construction both in regard to the absence and presence of different forms of legal regulation, and also in regard to the relevant objects of analysis within that environment. A structured inquiry is needed in order to make progress in understanding the complex and diverse commons arrangements that may be constructed in the cultural environment.

In her studies of natural resource pools, Ostrom has focused in part on the character of the resource units and of the pool itself: What sorts of boundaries define the pool; what is the source of supply and sustainability of the resource units; under what conditions may resource units be appropriated from the pool? She has also focused in part on governance characteristics of the population of contributors and users that exists symbiotically with the pool: How does the population monitor and enforce rules regarding contribution and appropriation? What sorts of sanctions are available, and what sanctions are actually used? What conflict resolution mechanisms are in place? If the community relies on other populations in some respects, or if the population delegates some functions to subsidiary populations, what is the character of these relationships? In all instances, to what extent are these attributes inscribed in

formal institutions of the state; to what extent are they inscribed in other formal, legal institutions, and to what extent are they inscribed in social norms or other social or cultural structures?

With respect to pools of information or knowledge resources, a closely related set of questions arises. Each of these inquiries is prompted by preliminary observations of constructed cultural commons. None of them, however, should be understood at this point as defining the entirety of the range of relevant attributes of a successful commons. Within each of these clusters of issues, additional research at finer grains of analysis will reveal specific attributes that are relevant to commons structures.

The next step after choosing an appropriate characterization of the “natural” environment in which a particular constructed commons resides is to identify characteristics relevant to the success of that construction in producing, managing, and disseminating intellectual goods. Here we suggest, as a starting point, a series of nested inquiries that we hope, over time and over a series of reviews and case studies, can assist researchers to identify the attributes that define successful and sustainable cultural commons regimes, and distinguish them from unsuccessful regimes.

By analogy to Ostrom’s “biophysical characteristics,” we propose and discuss in this Section the following initial inquiries:

- Particular subject matter, resources pooled, types of cultural activity, and so forth
- Particular activities undertaken and the actors who perform them
- Goals and objectives of the constructed commons
- Degree of “openness” of the constructed commons

In Section 4 we discuss some other types of characteristics that we believe will be important variables in understanding constructed cultural commons.

3.1 Resources and Community

The starting point for investigating a constructed cultural commons is to identify the set of resources being pooled and the relevant community of actors. We have struggled to some degree in delineating the types of resources and communities that reasonably fit within the scope of this research project. One possibility is to focus on the pooling of intellectual works subject to intellectual property rights in the form of copyright or patent pools. This is a useful subset to work with because the set of pooled resources is easily identified as is the relevant community of actors. Specifically, the set of resources is comprised of rather discrete intellectual works, e.g., patented inventions, and the community is comprised of those who own those works.

But, as noted earlier, we envision a much broader project. There are many examples of constructed cultural commons that involve the pooling of intellectual, cultural, and related resources that are not subject to intellectual property protection or for which intellectual property is tangential. For example, the sharing and development

of ideas, skills, tacit knowledge, and even the intellectual/cultural components of social capital within a university research community constitutes a constructed commons within the scope of our project. (Frischmann 2005b). We note that this example itself invites significant variation among case studies based on the resources and community targeted for study; the relevant community may be defined broadly in terms a particular university or academic discipline or more narrowly in terms such as the civil engineering department of a particular university. At this stage, we believe the defining characteristic of a constructed cultural commons is the pooling of intellectual, cultural, and related resources within a community.

3.2 Identifying Goals and Objectives

In describing the goals and objectives of a constructed cultural commons, it is important to identify the particular problem that a given commons is constructed to address. In the natural resource context, this question does not arise because common-pool resources are defined by the problem of subtractibility or rivalrousness and the possibility that a common pool resource will be exhausted by uncoordinated self-interested activity. Intellectual commons address different problems, such as the production of intellectual goods to be shared, the overcoming of transaction costs leading to bargaining breakdown, the production of commonly useful platforms for further creativity, and so forth.

It may be useful to distinguish among different types of cultural commons or pools based on their core purposes. Some of these arrangements arise as solutions to collective action, coordination, or transaction cost problems that exist apart from intellectual property rights (and perhaps would not be solvable without intellectual property rights). These might involve instances of cooperative behavior where members construct an open environment to pool resources and use those resources themselves for some specific purpose. The General Public License and related licenses for open source computer software are likely examples of this type. Standard-setting enterprises also likely fit into this category, as do joint ventures for research and development. These constructed commons depend on each member's possessing certain intellectual property interests as a facilitator of participation.

A second type of commons or pooling arrangement arises as a solution to collective action, coordination, or transaction cost problems that exist only because of the intellectual property rights themselves (Heller 1998). Examples of such arrangements might include constructed commons for basic biological building blocks such as the SNP consortium or the publicly available databases of the Human Genome Project. In some such cases, the commons is constructed as a defense against potential privatization of commonly useful resources which becomes possible only with the expansion of the domain of intellectual property rights.

A third type of constructed commons may be designed to mediate between communities with different default norms. Technology transfer institutions, which enable universities and other non-profit research enterprises to deliver information resources

(such as patents) to the private market, are examples of this type (Strandburg and Jones, work in progress). The cultural environment inside the university is typically characterized by information sharing not governed by intellectual property rights (even if IP rights are present as matters of form). The environment outside the university is governed largely by IP rights. Technology transfer institutions may constitute an institutional pool or commons that mediates these two regimes (Auerswald and Branscomb 2003). Similarly, open source projects have developed “boundary organizations” to mediate their relations with commercial firms (O’Mahoney and Ferraro, forthcoming).

By specifying these distinct types of cultural commons, we may be setting up a more sharply delineated field of institutions than really obtains in practice. In any given commons, it may be the case – and may even likely be the case – that the motivation for the pool arises from a variety of considerations, that is, some that do not arise from the character of intellectual property interests themselves, and some that do.

We also note that while some pools may be characterized in formal or technical terms according to licensing or contractual arrangements, others may be less formal and more conceptual or metaphoric in character, as they depend on intersecting institutional arrangements or social norms. At this point in our investigation, we choose not to be too restrictive in identifying what is, and what is not, a constructed cultural commons. As Ostrom points out, restricting the inquiry too narrowly, too soon, creates the risk that salient attributes of the production of commons may be overlooked

We are obviously aware that pooling arrangements may exist for less socially salutary reasons. Most obvious is the case of members colluding to restrict competition. By requiring that an intellectual commons operate via sharing of intellectual resources themselves, we distinguish this project from similar investigations of cartels, which operate via sharing price and output information and which therefore pose significant risks of anticompetitive behavior without offsetting welfare benefits. The functional purpose of cartels is different from the arrangements noted above; that is, cartels are not designed to create an open environment within which resources may be shared and productively used by members or to sustain individual members. But just as the line between different types of intellectual commons may be difficult to draw consistently, the line between commons and cartels similarly may be difficult to draw; antitrust regulators have long been faced with the challenge of identifying illegitimate cartels disguised as legitimate pools.

3.3 Degrees of Openness and the Character of Control

As part of describing the subject matter of a constructed cultural commons, including the activities involved in producing, managing, and extracting information works and the actors who undertake those activities, it is important to describe the degree of openness associated with a particular constructed cultural commons. Because natural resources are finite and rivalrous, it is natural to limit access to a common pool resource to a defined community. Thus, the boundaries of the community

sharing a resource tend to be coextensive with the boundaries of commons self-governance. Because intellectual goods are naturally shareable, it is entirely possible and desirable for a community to produce and/or manage a cluster of cultural goods that is accessible to others. Indeed, one of the measures of success of a constructed cultural commons may be the degree to which it disseminates the intellectual goods it produces to a wider audience. It is thus important to inquire into the degree of openness of a particular constructed commons.

Commons regimes, and all structured intellectual property regimes and other resource management regimes, are guided by both the *degree of openness and control* that they exhibit, with respect to contributors, users, and resources, and by the *assignment of control, or custody of the power to administer access*. These features should be assessed both with respect to the commons itself and with respect to the intellectual resources that constitute the commons. As noted above, the natural shareability of those resources makes the design of openness and control especially pertinent to constructing cultural commons.

3.3.1 Openness as Applied to Resources

What do we mean by openness? There is little ambiguity in most everyday contexts (i.e., an open door), but openness can be a confusing concept when used to describe a particular attribute of a resource.

When we say that *something is open*, we are generally referring to a *thing*, a *resource* that can be described, possessed, and used. Openness describes our capacity to relate to a resource by accessing and using it. Thus, openness describes the extent to which there are barriers to possession or use. At one extreme, there are no barriers at all to possession or use, and at the other extreme, there is an insurmountable barrier to access and/or use. In between the extremes, openness (restrictiveness) varies according to the barrier costs (in terms of money, conditions, or other restrictions). As West (2007) observes, openness in this sense may encompass joint or shared access to and use of the resource.

Barriers to possession or use of a resource may be natural or constructed. A resource may be open naturally because its characteristics prevent it from being possessed, owned or controlled by anyone. For most of the earth's history, the oceans and the atmosphere were natural commons. Among other reasons, exercising dominion over such resources was beyond the ability of human beings and was unnecessary because there was no indication of scarcity. A resource also may be open as the result of social construction. Laws or rules may prohibit ownership or ensure a certain degree of openness. For example, copyright law grants protection over creative expression but excludes protection for ideas, in order to maintain open access and use of ideas. Patent law likewise excludes abstract ideas from patentability. Openness may arise through norms and customs among owners and users, and through institutional design.

Openness and the vesting of control over openness are related. In part both

concepts may simply reflect choices regarding how best to manage resources. In the context of intellectual property pools, for example, management of the pooled resources may be vested in a central institution created specifically for that purpose, or may be decentralized and vested in the hands of individual IP rights holders.

Openness and the sources of control also reflect power and its distribution among potential possessors and users. Openness may be measured by the degree of control over the terms of access and use of a specific resource. Such control is exercised by human beings on human beings; it is relational, and it relies on social institutions.

In sum, openness is a functional variable that describes the degree to which possession and use of a resource is controlled, and it is a relational variable that describes the structure of relationships among potential resource users.

3.3.2 Openness as Applied to an Environment

As a resource may have an open character, so may an environment. As is openness applied to resources, openness in an environment is defined partly in functional terms, by natural and constructed attributes that define management of the environment, and partly in terms of power and other bases for relations between participants in the environment. Above, we defined the cultural environment as a set of interdependent and interconnected systems and resources. As with openness applied to resources, openness with regard to an environment describes our capacity to relate to that environment, by accessing the environment as a contributor or user of resources that describe that environment (in part). Thus, openness describes the extent to which there are criteria for or barriers to membership or participation in the creative or innovative processes that the constructed commons is intended to support. It also describes the extent to which a particular environment is accessible to and interconnected with related context, institutions, and social practices.

Openness with respect to an environment has an internal dimension as well as an external one, as it reflects the degree to which participants in the constructed commons collaborate with one another or otherwise share human capital as well as (or rather than) resources. For example, the participants in an intellectual property pool may specify rules regarding how resources are contributed to and withdrawn from the pool. The General Public License for open source computer programs specifies that membership in the community defined by users of the program is open to anyone. Anyone may add to, use, or re-distribute the licensed program. Re-distributors, however, are required to abide by the license term that they make the full source code of the program accessible to further users of the program. Moreover, in most open source software projects only certain contributions are accepted into "official" versions of the code. Thus, while use and modification of the code for personal use are open to anyone, the ability to contribute to the shared resource is regulated.

In describing and assessing the degrees of openness and control that

characterize a constructed commons or pool, it is significant to bear in mind not only the conventional producer perspective by which information and knowledge shareability problems are analyzed. Hardin's "tragedy of the commons" is typically understood as challenging markets and governments to come up with ways to supply resources in the face of cooperation and competition problems. In analyzing openness with respect to resources and environments, accordingly, it is tempting to limit the analysis to openness with respect to actual and potential resource producers.

In information and knowledge environments, however, those resources are "naturally" given only in part. As described above, the cumulative and aggregative character of knowledge is fundamental to human culture. Producers of knowledge and culture resources are therefore simultaneously users and consumers. In analyzing openness, therefore, it is important to consider the degree to which openness expresses the interests of users, as matters of both function and relation. In particular, a constructed commons in the cultural environment may function as what Frischmann (2005) has described as infrastructure. In the cultural environment, the tragedy of the commons which Hardin described may refer not to an undersupply of a resource prompted by overconsumption, but instead to an undersupply prompted by the failure of the private market to aggregate user or consumer preferences for certain fundamental or "infrastructural" resources. To the extent that the Internet itself constitutes a commons, it is likely better characterized as an infrastructural resource that solves certain problems of consumption, rather than problems of production.

4. Other Important Variables for Describing Constructed Cultural Commons

Having identified a cultural commons or pool, and assessed by analogy to Ostrom's biophysical characteristics the degree and character of openness and control associated with that commons and its associated resources and populations, the next task is to investigate more specifically other characteristics of the constructed commons. Here we identify several clusters or "buckets" of variables that will be important to explore. Analogous to Ostrom's inquiries into the descriptive characteristics of a commons regime, we identify the following important inquiries:

- History and narrative
- Entitlement structures and resource provisions
- Institutional setting (including markets and related firm and collective structures, and social structures, and boundary organizations or mechanisms mediating internal governance with external markets, public domain, and so forth)
- Legal structures (including intellectual property rules, subsidies, contract and licensing law, antitrust provisions)
- Governance mechanisms of the commons (membership rules, resource contribution or extraction standards and requirements, conflict resolution mechanisms, sanctions for rule violation)

Finally, as when analyzing natural resource commons, there should be an inquiry into outcomes, including:

- Solutions and benefits to the underlying collective action problem delivered by the commons
- Innovations, creative output, produced, shared, and disseminated to a broader audience
- Costs and risks associated with the commons (any negative externalities)

This list is preliminary and thus unavoidably vague. The proposal is to use empirical studies to flesh out these categories and perhaps uncover others. In the next few sections we attempt to give more content to some of these inquiries.

4.1 History and Narrative

Above, we noted the importance of language and metaphor in understanding the information environment. Any given knowledge pool likewise depends in an important sense on its creation narrative. That narrative depends in turn on a variety of linguistic and metaphor resources: The vocabulary and syntax that participants and observers use in describing the construct are keys to unlocking its origins, its operation, and even its future. Rose (1994) has written of property as a story. Madison (2003) and Silbey (2008) have both described the creation myths that accompany default regimes of intellectual property, some but not all of which are grounded in individual inspiration. The very phrase “patent pool,” for example, itself has come to signify a specific set of legal expectations and criticisms. One says “patent pool” and an informed commentator thinks immediately of (i) a self-governing arrangement and (ii) antitrust considerations, rather than intellectual property problems and solutions. (In part, we aim to realign that point of view.) Calling something a “knowledge commons,” or recharacterizing certain patent pools as solutions to “anticommons” problems, triggers a different set of expectations. The rhetorical frame shifts primarily to dynamic problems in information and information property, rather than to largely static output concerns. A commons is a rhetorically open place. A “pool” emphasizes the resources themselves, and how those resources are bounded. Explicitly giving attention to creation narratives also encourages attention to evolutionary processes. How does the pool change and adapt over time, in light of changes in firm structure, market structure, and resource changes – such as emergent legal structures and changes to background legal entitlements?

4.2 Entitlement Structures and Resource Provisions

In any resource pool, the resources that are part of the commons have to come from somewhere. The “natural” information environment contains an abundance of raw information resources, including inherited and experienced knowledge, but those things only become information “works” and therefore resources in the pool via some cultural construct, such as the default copyright or patent law systems, for example, or some other institution, such as a publishing industry producing books, or films, or songs, or some combination of these and other things. Understanding the construction of cultural commons therefore requires understanding the mechanisms by which resources are provisioned to the commons, whether via legal entitlements or otherwise, and the nature of entitlements to use and consume those resources while they are part of that

commons. A patent pool offers an obvious example. The patents themselves are resources constructed via rights of exclusion offered by patent law. As pool members develop follow-on inventions based on the pooled resources, the agreement by which the pool is constituted may obligate members to contribute patents covering those inventions to the pool.

As with some natural resource pools that (when suitably managed) supply their own resources, in the cultural context the commons itself may be a source of the resources as well as a mechanism for managing them. The follow-on invention is but one example. In addition, resources that are excluded from the commons because social choices limit the scope of intellectual property entitlements – as with “facts” or “ideas” in copyright law, for example, which are excluded from legal protection – may be the sources of resources that are protected by law and later contributed to the commons. An essential attribute of a cultural commons, therefore, is the degree to which it is a dynamic construct, rather than a static one.

Boundaries in an information environment are likewise more obviously culturally constructed than their counterparts in the field of natural resources. Oceans, lakes, and rivers have beds and shores; forests yield to fields. Boundary maintenance is an important part of commons management in natural resources, but the maintenance question often has a reference point in naturally occurring boundaries. In the information environment, all boundaries ultimately depend on cultural constructs.

4.3 Institutional Setting

Pools and commons in the cultural environment are functional entities; they serve markets and industries and firms. It is important to understand the identities and roles of those institutions and how their own functions relate to the pool and its members. What are those markets and how do they relate to the pool? The Manufacturers' Aircraft Association, identified above as an example of an early, well-known patent pool, was organized in large part to facilitate the production of aircraft for military use during World War I.

The institutional and social setting of a cultural commons may include related collectivist enterprises. Members of a pool may be part of a network structure that extends to related collectives, firms, individuals, groups, and social structures, including disciplines and social norms (Strandburg et al. 2007). Research scientists may be organized formally into pools or commons structures within firms and other formal institutions, such as universities. Their functional network will include both members of their own technical art and related arts and other researchers in different arts who share a related but distinct set of social norms related to sharing of information and knowledge. Networks in not-for-profit or educational research settings will overlap to a degree with related networks in commercial environments; researchers in university science departments will be interested in sharing information resources with researchers in corporate research and development groups. Pools may bridge gaps created by the edges of formal institutional structures.

4.4 Legal Structures That Affect the Pool Itself

While industry and market structures are essential reference points for a knowledge commons, positive law and direct government involvement with a particular cultural commons are likewise keys to understanding it. We distinguish between law that creates and enforces the entitlements that cause information works to come into being and that sustain them, on the one hand, and law that is specifically addressed to cultural commons themselves, on the other hand. Here, it is often the case that legislators and judges find that law can reinforce and itself sustain a pool that is determined to be welfare-enhancing. An exemption from antitrust enforcement for parties engaged in a form of concerted activity, or intended to engage in concerted activity, may be adopted. Market conditions or technologies may develop to the point where observers recognize that some kind of information collective would be useful, but fear of prosecution under antitrust law or relevant intellectual property law may be a barrier to the emergence of the pool. A safe harbor of a sort may emerge, either via legislation or via judicial decision. The 1984 judgment of the United States Supreme Court in *Sony Corp. of America v. Universal City Studios*,³ upholding the legality of distributing videotape recorders over the objection that they facilitated copyright infringement, may be characterized as creating a form of judicial safe harbor for innovation oriented to technologies for reproducing and distributing copyrighted works.

Legal rules may create subsidies or safe harbors in ways other than relieving parties at risk from potential liability. For example, income tax regimes may permit (or limit) the deductibility of research expenses by firms, non-profit enterprises, and/or research collectives. In the United States patent statute, the section that bars patenting inventions that are “nonobvious” in light of prior art in the relevant technical field includes a subsection that suspends the rule if the inventor and the producer of the relevant prior art are part of a common “joint research agreement.”⁴ It should be noted that that laws designed for one thing may contribute, differently, to promoting collaborations or collectives in ways not intended by the drafters of the law. Such a rule becomes part of the constitution of a commons, even if it was not designed to do so in the first place. Litman (2002) uses this proposition to analyze the persistence of a legal regime subsidizing jukeboxes in American copyright law. A compulsory license permitting owners of coin-operated record players to use copyrighted American music was incorporated into the copyright statute initially in order to prevent holders of those copyrights from monopolizing an adjacent market for performances. Over time, the rationale for the subsidy became less significant, but the statute was retained because a new collective emerged to support its continued existence -- companies that manufactured and distributed jukeboxes.

4.5 Governance Mechanisms

As a constructed commons is an alternative to proprietary exclusion and to direct

³ 464 U.S. 417 (1984).

⁴ 35 U.S.C. § 103(c) (2006).

government intervention as a means of addressing a tragedy of the commons, yet relies in part on both of those things, understanding the commons as a form of governance, rather than government, is at the heart of the analysis. In Ostrom's work, the degree of *self-governance* is an important characteristic of a resource pool. Members have rights not only to contribute to and extract from the pool, but to govern themselves by adopting and modifying the relevant rules of participation.

The attributes to be considered here overlap to some extent with those addressed in the context of determining the scope of the openness of the pool. Who is a member, and who decides who may be a member; how is resource contribution and extraction monitored and, if necessary, limited; what sanctions and dispute resolution mechanisms are provided for misconduct; to what extent do these self-governance mechanisms rely on or incorporate formal legal mechanisms, and to what extent do they rely on or incorporate other, non-legal institutions or social structures?

For example, in the context of the General Public License for open source computer programs, membership in the commons defined by the license is defined by use of the program itself, which according to the terms of the license that accompanies the programs, constitutes assent to its terms. Violation of those terms, such as onward distribution of a copy of a program without including a copy of the program's source code, constitutes a license violation and automatically terminates that membership. Actual enforcement of that regime, however, typically is not pursued by individual contributors to the open source commons, but instead by an independent entity, the Free Software Foundation, which operates as a free-standing non-profit organization dedicated to advocacy on behalf of "free" software, and accompanying open source license terms, in its own right.

Research on natural resource pools emphasizes that effective self-governance typically requires formal access to public sanctioning and/or enforcement mechanisms. Without the threat of seizure or attachment or injunction, community-based or purely norm-based mechanisms may lack sufficient bite to sustain the pool. In the context of the cultural commons, effective connections between self-governing collectives and formal sanctioning authorities have not yet been identified. In the open source computer software area, no violations of the license have been litigated to judgment. Conflict-resolution mechanisms within a pool depend on monitoring mechanisms. Before the emergence of the Internet, research on self-governing communities emphasized size and distance as key variables in a monitoring system. As Benkler (2006) and Cohen (2006b) each argue, networking technology offers not only the potential for community development and resource aggregation, but also potential for monitoring and enforcement. Examination of a pool should include assessment of whether and how it is embedded in network technologies that perform some or all of the pool's governance functions.

4.6 Outcomes

Not only should a constructed commons be assessed in light of its ostensible

purposes, but it should also be viewed in light of its consequences.

4.6.1 Solutions and Benefits

Above, we defined constructed commons in the cultural environment as solutions to collective action or other transactions costs problems not arising from the character of intellectual property entitlements themselves, as solutions to problems that do arise from those entitlements, as solutions to boundary spanning dilemmas, and as reactions to an “infrastructure”-type problem that is the inverse of the standard tragedy of the commons diagnosis. In all cases, we argue that commons can enable what Frischmann and Lemley label “spillovers,” the dynamic benefits that an information environment should be designed to enable, whether in its “natural” state, via the “default” variations on that state as described earlier, or via some pool or other constructed environment.

For any specific cultural commons, therefore, the questions involve not only the type of problem that it appears to be designed to solve and precisely how the combination of legal rules and other “openness” constructions propose to solve it, but also the success of the commons in sustaining and generating spillovers and a dynamic cultural environment. Quantifying or otherwise documenting that success is particularly difficult in the cultural environment precisely because the desired spillovers benefit populations other than those in direct producer/consumer relationships. Under some circumstances, the very persistence of an institution may be evidence of the success of a commons regime.

4.6.2 Costs and Risks Associated with a Cultural Commons.

Any cultural commons may engender a tradeoff between the benefits anticipated from the commons in terms of dynamic welfare enhancements, and costs and risks associated with the commons. In conventional law-and-economics terms, these costs and risks are fairly well-understood (and, importantly, they are generally better understood and easier to describe and quantify in many instances than the downstream benefits that pools may supply). Enabling collaboration and cooperation among firms in terms of sharing access to pooled information resources facilitates cooperation along lines that are generally regarded as socially harmful: agreements to raise and fix costs, and agreements to reduce output. Pools, like any collective arrangements, also involve administrative costs associated with constructing, monitoring, and enforcing compliance with the rules of the pool. From a welfare standpoint, the level of those costs must be compared to the level of administrative costs associated with a system that provisions information resources in the absence of the pool.

5. Conclusion

Applying the environmental metaphor increasingly common in studies of information and intellectual property policy, we analogize information and knowledge resources in the cultural environment to physical resources in the natural environment. We identify a set of constructed commons, or pools of information resources, that serve

functions in the cultural environment similar to the functions provided by common pool resources in the natural environment. Those functions consist largely of serving as alternatives to private rights of exclusion and to government intervention in solving underproduction and overconsumption problems associated with an unmanaged or “natural” resource. Although constructed commons in the cultural environment exist for a variety of purposes, in general we hypothesize that they are often welfare-enhancing in regard to promoting valuable spillovers of information and knowledge – benefits to third-parties associated with two-party information production and distribution.

Borrowing from Ostrom, we argue that understanding the origins and operation of these beneficial constructed commons requires detailed assessments that recognize that they operate simultaneously at several levels, each nested in a level above, and that each level entails a variety of possible attributes that cannot, at this stage of the inquiry, be specified in detail in advance. We suggest a set of buckets or clusters of issues that should guide further inquiry, including the ways in which information resources and resource pools are structured by default rules of exclusion, and the ways in which members of these pools manage participation in the collective and production and extraction of information resources. Case studies across disciplines and reviews of existing literature that addresses cultural commons will help specify relevant attributes within each cluster. These variables will help scholars and eventually policymakers assess the level of openness associated with a given pool and determine the extent to which “openness” is, as we hypothesize, associated with pools that are welfare-enhancing.

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