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Network Theory

Networks of Power, Degrees of Freedom

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The article offers a conceptual framework for describing freedom and power in terms of human behavior in multiple overlapping systems. Power and freedom describe relations of influence and susceptibility over the principles, policies, perceptions and preferences; outcomes; and configurations available to human beings, in each case as characterized by the affordances and constraints of an agent in context of multiple overlapping systems. Networks characterize systems while keeping classes of discrete entities and relations between them explicit. Freedom and power are affected by the degree of (a) openness, the extent to which individuals can bob and weave between networks to achieve their desired behaviors, perceptions, or outcomes, and (b) completeness, the degree to which they can maneuver within a network to achieve those results; and (c) configuration, pathways for the flow of influence or its avoidance. The paper uses examples from Web-based music, video, and news reporting to explain these concepts.

On July 12, 2007, two Apache attack helicopters fired on a group of individuals in Iraq, killing about 12. Among the dead were a Reuters photographer and his driver. Reuters tried to get access to the video footage from the helicopter gun camera to investigate what had happened and whether, indeed, there was a threat to the helicopters that would have explained the shooting. The U.S. government successfully resisted information requests for recordings of the events. On April 5, 2010, a Web site, WikiLeaks, made available what is considered an authentic version of the video. In it, and on its soundtrack, the helicopter pilots exhibit trigger-happy, aggressive behavior and they seem to take pleasure in hunting down their targets, some of whom appear to be unarmed civilians. After the video and its contents became front page news in all the major papers, WikiLeaks and its founder-leader, Julian Assange, were considered journalistic heroes and romantic rebels. The site itself is an international operation with a handful of full-time volunteers, several hundred occasional volunteer technical experts, and an operating budget of a few hundred thousand dollars a year raised from donations from around the world. It runs on servers that are themselves located around the world in more or less congenial jurisdictions and is dedicated to providing a censorship-resistant platform for disseminating information about governments and companies. In late May 2010, an Army intelligence analyst, Bradley Manning, was

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Date submitted: 2011–02–08

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arrested for having leaked the video to WikiLeaks. His identity was discovered because a hacker, Adrian Lamo, had approached the Army with information about Manning, after, apparently, the intelligence analyst had told Lamo that he had leaked the video as part of asking the hacker's advice on what to do with large caches of classified materials that he had in his possession and wanted to leak. Lamo felt that Manning presented a security threat to the United States and needed to be stopped. As of this writing, there is no public record of any person associated with the July 2007 attack having been investigated, nor is there any indication of a review of the rules of engagement or a similar substantive response oriented toward changing the practices observed in the video (BBC, 2010; McGreal, 2010a, 2010b; Poulsen & Zetter, 2010).

This bare-bones version of the story helps to highlight the way in which the Internet has created new kinds of freedom and power—here, I use what I take to be colloquial meanings of the terms, but later I will define them more precisely—and how it has done so at the intersection of several dimensions of power in several systems. Twenty years ago, such a video could only have been disseminated or leaked in a medium with the potential to exert public-political force through a mainstream media outlet, primarily one with a video delivery platform, such as a television station or cable news channel. While video cassettes were available, copying of one of the originals would have been cumbersome. Making many successive copies of a hard-to-interpret original and disseminating them would have been extremely difficult. A decade before that, it would have simply been impossible. Effective distribution, then, would have depended on access to one of a relatively small number of outlets. These, in turn, were constructed in organizational forms, with editorial control that would have placed a very limited number of individuals in the position to decide whether to distribute the report of the video. These individuals, in turn, were located in a social and institutional system that would have given them certain capabilities and constraints. In the United States, for example, access to a court system that was organizationally and institutionally independent enough to provide internal limits on state power through application of an extensive first amendment doctrine would have afforded the media outlets freedom to publish, if they chose to do so. The decision would also have been influenced by the internal dynamics of the professional press, and what counts as good and respectable behavior, as well as on the interpersonal ties and long-term source dependence on people who occupy positions of power, and who may (or may not) have successfully persuaded the editors with the power to decide to avoid distribution of the video. The courses of action open to the soldier who came into possession of the video were limited to operating through the set of systems that could effectively disseminate the video; these systems, in turn, had certain affordances and constraints that were different from those that characterize the Net and WikiLeaks. In the new context, WikiLeaks provided the soldier—as it did the broader set of people seeking to critique the U.S. military intervention in Iraq—with new forms and pathways for discovering and disseminating information about the military, and new ways of mobilizing public opinion to critique the military rules of engagement, both of which provided dimensions of power to these people that were not previously available to them.

That power is hardly perfect or absolute. Most important, there is no evidence that the rules of engagement, in fact, changed as a result of the exposure of the video and the subsequent criticism, or that the pilots were disciplined in a manner that would have led others to alter their behavior. Indeed, the new power may turn out to be rather weak. But again, the story does identify new avenues to try to exercise power over a matter of public concern through the discovery and dissemination of information

over forms and pathways that are different from, and susceptible to, different forms of control than those that would have been available in previous eras.

When we speak, then, of networked society or networked economy, we are speaking primarily about an understanding of a particular historical moment when computer-mediated networks of information and communications have come (a) to play a particularly large role, and (b) to realign in fairly substantial ways the organization of production, power, and meaning making in contemporary society, relative to how similar aspects of social life were organized in the preceding century or earlier (Benkler, 2006; Castells, 1996, 2000). As with other moments experienced as major transformations, this moment too has generated its own utopias and dystopias, but more important, it has also produced plausible hopes and fears. The latter range from the creation of a much more thoroughly instantiated surveillance society, where everything we do is visible to the state and/or to one or more major corporate behemoths; to a cyber-terrorism Armageddon; to a loss of community and identity; and to a fragmentation of the public sphere. The “hopes” include an unleashing of new, higher-velocity innovation and increased growth, shared across a wide spectrum of political-theoretical traditions: first, a liberal-social democratic cluster of hopes loosely termed *democratization*—of the polity, or cultural production, or economic opportunity, or of government transparency and accountability; and second, a libertarian-anarchist cluster of radical individual freedom—in the case of the former, from the state, and in the case of the latter, from both the state and corporate power.

This article’s intent is to offer a framework for describing human behavior in systems that allow us to make concrete claims about how we believe a given effect will happen, in ways that can then be observed and considered empirically. I use the terms “freedom” and “power” to do so. So, for example, democratization needs to be detailed in terms of who has the freedom to do what, and who has the power to do what within the system or set of systems claimed to be democratized by a given change or attribute of interest, relative to previous circumstances. In analyzing a case like the WikiLeaks exposure of the Apache helicopter video, democratization entails analyzing the effect of layering a censorship-resistant online platform on to the traditional media environment. This analysis could facilitate explaining precisely what is meant by democratization in this context. Here, it would mean that (a) government transparency and the watchdog function can be performed by many more people with more diverse interests and opportunities for observation, so that many more people have the opportunity to exert power over the behavior of the military, mediated through their power to shape the agenda of public debate; and that (b) more people have the capacity to construct their own systems for collecting and disseminating their insights and views, so that they can create more power over the agenda, and thus are more free from the power of others, both government and media actors, to define the political agenda to which they, and others around them, can and must respond. Once so defined, it becomes possible to develop an empirical program to observe the presence or absence of agenda-setting power and the relative weight of networked-based systems and actors in setting the public agenda. We can observe the actual public agenda as it develops and then track an appropriately defined sample of agenda items to see who moved them there. We can use text analysis tools and link analysis to identify the sources and pathways of intervention. Then we can measure whether the networked public sphere does, or does not, as a practical, measurable matter, distribute power to new entities, how those entities exercise that power, and the extent to which there are aspects of the behavior of those new sources of power that can define new dimensions of freedom available to those actors.

We live our lives in systems. Each of us as agents, and the organizational and social entities we are part of, function within multiple overlapping systems of constraint and affordance. These systems foster some behaviors that we more or less want to perform (due to perceptions, preferences, policies, or principles [Ps] we hold to be our own, individually or collectively, as when we perceive ourselves to be part of some higher-order entity, like a family, firm, community, nation, etc.); they make some behaviors those we can and do perform, or not; and they make some outcomes more or less feasible and likely, given the range of possible and desired behaviors. The configuration of each of these systems and of the overlapping systems relevant to a situation has a large influence on what we want, do, and attain within these systems. Power and freedom in this approach are terms that describe relations of influence or its absence, as characterized by the affordances and constraints of a given set of overlapping systems. We have systems that define the structure of organizational power (Piore & Sabel, 1984; Powell, 1990). We have networks of arguments and sources and forms of evidence that can be mobilized to influence beliefs about the state of the world, relations of cause and effect, and the range of possible behaviors and outcomes (Latour, 1987, 2005). We have marketing studies focused on whose preferences in a network influence the preferences of others in the network most effectively. Power in any of these systems is an effect one entity can have on another within a system that will influence that other entity's Ps, actions, outcomes, or configurations. Freedom is the absence of susceptibility of an entity to some other entity's power in a given configuration. The dimensions along which we can describe freedom and power are those of Ps (perceptions or beliefs, preferences, policies, and principles), actions, outcomes, and configurations. If we can be precise enough in our definitions of which set of systems is hypothesized to have a significant impact on a studied interaction, and if we can specify what the sources of power are and how they flow in each of the overlapping effective systems, we may be able to use new approaches to multidimensional network mapping (Contractor, 2009; Contractor, Monge, & Leonardi, 2011) to begin to state precisely how different configurations of systems lead to different distributions of power and freedom.

Moving forward, I try to offer a sufficiently precise set of definitions of the systems described as networks, power, and freedom, so that we can more clearly identify ways in which we could observe, refute, or validate some of the claims that we read, and so that we can also write about the effects of networked society on freedom and power in society and do so in a way that translates among the various political-theoretical frameworks that we use to address similar sociohistorical patterns. Much will overlap with Castells' proposals for four network powers (Castells, 2011). However, Castells' powers combine social criticism with observational method; here, I at least try to focus on method. For example, Castells' first two powers incorporate an observation about the existence of a global social elite that dominates outsiders, and then he defines the two powers in terms of the power of those inside the global network over those outside it and of the power to define standards of inclusion. As I believe the subsequent analysis demonstrates, these two characterizations of social criticism—identifying the power of some over others as definitional—are subsumed in the latter two forms of power, which are concerned with method. If we are to describe how those inside the global network society exercise power over those outside it, we will likely be able to describe a different network, say, a local network of mutual recognition and validation, or an organizational chart in a sweatshop, whereby those who occupy a position at the intersection of the global and local networks use their membership in the former to exert power in the latter or vice versa. At that point, we can probably describe the relationship in terms of power in the network, what Castells calls networked power, and what he calls the power to program networks (*ibid.*). This article attempts to use these two forms of power to provide an abstract theoretical framework for defining power, freedom, and their flows in any given network that can be applied to the global networked

information society and economy, but is not specifically tailored to it. In particular, I will try to be precise enough to identify claims of power and measures of its presence or absence, so that we can combine the insights of social theory with the capabilities of computer science in the context in which—for many of the most interesting contemporary social phenomena—the computer-mediated transcript is the interaction, and computer-processed observation and analysis can make a real contribution to social theory.

Definitions

Networks as Systems; Completeness and Openness

When we use the term *networks*, we are choosing a particular way to describe systems of human interaction that emphasizes both individual action and structural patterns. When we do so, we can think of individuals as discrete entities in multiple intersecting networks, but also of organizations, or even techno-organizational forms, like WikiLeaks, as opposed to Julian Assange as the operative entity. (This follows Latour's *actant*—rather than actor—as a capacious name for a given entity of interest that need not be a human agent.) Networks of power, in this framework, describe the extent to which one entity in a network can affect the behavior, configurations, or outcomes of another entity, as well as the modality through which it can do so. To be “in” a network or system (here, interchangeable terms, although network is one form of expression of systems that emphasizes the discrete member entities and their relations), an entity's behavior (*behavior* being shorthand for both Ps and actions, except where it is important to separate them), outcomes, and configurations must be affected by the system. The point is that whether one is (or is not) in a network or system is a measure of effect, not a formal categorization. An entity is in or “out of” a system to the extent that its behaviors, outcomes, or configurations are affected by the dynamics of that system. One can be in a network in this sense of effect, even though the rules of the network define one as an outsider to the network; consider an all-male club affecting the women who function within the sphere of influence of decisions made in the club. Freedom for any given individual in a network is the extent to which that person can behave or attain a preferred or wanted outcome, given the sources of power that can effectively be brought to bear on that person's behaviors (including influencing what he or she believes or prefers), outcomes, or configurations in that network.

Networks differ from each other in their completeness and openness. A network is complete or tightly coupled if, considering only the effects of that system (such as where the effects of that system on the context dominate the effects of other systems also nominally or weakly operative in context), the fact that an entity and a behavior are properly characterized as in a system determines the behaviors, outcomes, or configurations for that entity. By *context*, I mean a temporally bound characterization of all systems that can influence the behavior or outcomes of the entity or entities analyzed. I use the term *network* as a particular approach to describing systems, which focuses on keeping classes of discrete entities and relations between them explicit and which emphasizes those classes of relations described as operative in influencing the behaviors, processes, and outcomes for the described entities. *Completeness* and *openness* are properties of systems generally, not only when described as networks. A network is incomplete or loosely coupled to the extent that, even where a certain set of behaviors is properly characterized as dominated by the dynamics of that particular network, the behaviors, outcomes, or configurations are not determined. A network is closed to the extent that an entity inside or outside the network cannot leave or join (reduce or increase the effect of) the network on its behavior, outcomes, and configurations. A network is open to the extent that entities can shift their behavior, outcomes, and

configurations into or out of the system, so that another network's affordances and constraints can influence the behavior, outcomes, and so forth, and vice versa. We can think of completeness and openness as within-network and between network measures of freedom and power, respectively, to the degree to which an entity of interest in a given system or network predicts the behaviors, outcomes, or configurations of that entity of interest, while measuring the degree of influence (or probability of the behavior or outcome conditional on being in the system) in terms of either (a) the internal determinism or nondeterminism of the network itself (if only in the network N, then probability of behavior or outcome B or O); or (b) the possibility that the behavior, configurations, or outcomes of the entity of interest will not be completely influenced by the network examined (if behavior in network N, probability that network N will dominate the vector sum effect of the operative systems in context).

Power and Freedom

We can describe and measure the degree of power of a given individual or other actor (a node) in a network as the extent to which that node can influence the probability that another (or second) node will behave, obtain outcomes, or inhabit configurations that are consistent with the perceptions, preferences, principles, or policies of the power-exercising node. We can describe freedom in a network as the extent to which individuals or other entities in a given network can influence their own behaviors, configurations, or outcomes (exercise freedom) and be immune to the efforts of others in the network to constrain them (be subject to their power). Both freedom and power are affected by whether it is feasible for either actor to shift from one set of networks to another. Characterizing these factors should allow us to determine whether the fact that a network has changed, or that different kinds of people or entities inhabit different types of networks, will increase or decrease freedom, as well as increase, decrease, or reallocate power in a social system characterized by a given new set of networks.

By the term *power*, I mean the capacity of one entity to alter the behaviors, outcomes, or configurations of others. Power should be measured in terms of probabilities and deviations from a baseline in the absence of the action in which it consists. For behaviors, Actor A1 can be said to exercise power over A2 to an extent reflected by the probability that A2 will behave B1 (A1's preferred behavior for A2), inhabit configuration C1, or obtain outcome O1, rather than B2, C2, or O2 (A2's preferred behavior, configuration, or outcome), conditional upon A1 exercising power over A2 in whatever way the network instantiates and transmits power from A1 to A2. (This is a generalization of the way economists think about bargaining power, as a deviation for A2 from the preferred distribution, which, due to the simple assumption in economics about incentives and rationality, means A2's maximum payoff.) To measure power, therefore, we have to characterize A2's preferred behavior, configuration, or outcome; A1's preferred behavior or configuration for A2, as well as A1's preferred outcome for A1 and A2; A2's postinteraction state, that is, A2's observed behavior, configuration, or outcome after A1 exerts power; and finally, A1's outcome. Then we measure the difference between the observed behavior, configuration, or outcomes and the two preferred states, net of other factors that are likely to have contributed to the existence of the state for which power has been measured.

The use of the term *preferred* in this formulation is a complicating factor, because one of the main modalities of power is preference shaping (really, P-shaping), whether through explicit persuasion or

through less explicit and transparent forms.¹ In seeking to measure power as a difference between preferred behaviors, configurations, or outcomes at time t_1 and actual behaviors and so forth at t_2 , we have to be able to anchor A2's perceptions, preferences, principles, and policies (Ps) at t_1 . To do so, we can say that A2 prefers a behavior, when an empathetic observation of the interaction from the perspective of A2 at t_1 prior to the interaction, would indicate that A2, as he or she was prior to the interaction, would have wanted to behave, or inhabit a configuration, or obtain an outcome after the interaction, independent of the P-shaping characteristics of the interaction (we might say that we are trying to determine A2's preferences at t_1 over A2's preferences at t_2). Persuasion that reflects a genuine shift in preferences from that empathetic-observer perspective would be legitimate power, where *legitimate* refers to a form of power whose subject accepts it as appropriate for the setting. It does not make it not power; it merely makes it power applied in a way that, in a given normative framework—one that privileges the decision, perceptions, preferences, policies, and principles of individual agents, but that also recognizes their susceptibility to influence and manipulation—we (whoever is analyzing the interaction) consider to be normatively acceptable from that internal perspective. Simply put, this is power that the individual has chosen to submit to, and hence it is not a power that is criticizable from within a normative framework that gives an individual's choice about his or her own fate a privileged position.

Given this definition of power, *domination*, then, would refer to a regularity of practice and predictability of the ability of one actor or type of actor vis-à-vis another actor or type of actor that makes the presence of power in that relationship a working assumption of the possibility set of those who

1 That consciousness and its construction are a major dimension of power has long been a core component of Left social theory since Marx. The role of false consciousness and hegemony are central to cultural Marxism. But the phenomenology of the sense of choice and authentic self-creation, on the one hand, and the discomfort with too stark a view of false consciousness, on the other, make working with these concepts in diagnosing actual interactions cumbersome, and in particular, make the explanation of choice, after all, all but impossible. The recognition that preferences are not stable, but are themselves the object of intervention in relations between systems has also long been problematic for liberal theory, because it interferes dramatically with being able to define autonomy or choice. Whether the basic recognition—at least since Veblen—that market preferences are endogenous, or whether it is the recognition that what citizens or voters want or choose is the subject of major propaganda and marketing campaigns, both market liberalism and political liberalism for the most part simply swallow the incongruity and move on in the pursuit of protecting choice, with greater or less degrees of emphasis on the imperfection of markets and distribution, and of political access or literacy, depending on whether these are left or right versions of liberal theory. For all the discomforts of the theory, life is stronger than theory. If economists—and even more so, market liberals who gloss over the economics beyond the introductory level—assume preferences as exogenous, business people certainly do not, and the massive investments that businesses make in clearly noninformational advertising, on the “Just Do It” model, are evidence of the bankruptcy of a theory—economic or social—that does not incorporate preference shaping into the model. When we speak of the networked society, this is starkly so as we increasingly see advertising, or preference shaping, becoming one of the core economic underpinnings of the entire system. Google exists from advertising revenue. It has become synonymous with search. We are now seeing even network science itself turning to the use of the insights of influence in networks to marketing. See, for example, Kiss and Bichler (2008). An instance of a broad research program aimed at measuring belief change and cultural behavior that exemplifies the kind of analysis I am describing as important is the Whitman Richards' project on Belief Dynamics and Cultural Shifts at the MIT (CSAIL).

possess the power. The critical points here are (a) the emphasis on an observable set of behaviors and outcomes that are coupled with an observable repeated practice of same over time, and (b) an empirically determinable question of whether the expectation of being able to exercise power in the next similar interaction becomes a (subjectively believed) working assumption of those with the power as part of the affordances made available by the network in which they are asserted to exercise domination. That working assumption must also be a reasonable interpretation of the objective probabilities that the power they exercise will be effective in that network, as measured by influence over those who are being dominated.

Castells (2007) has characterized the term “counter-power” in the context of networks. I propose limiting the use of the term to a subset of instances of power: the set of actions available to those who are subject to domination, which allow them to act on those who are dominant in ways that disrupt the domination. I do so to distinguish counter-power from the more common experiences of *freedom* (defined subsequently) and *power* exercised by those who, in some contexts, are dominated, but outside of that context. The operative delimitations here are (a) that the subset of actors plausibly exercising counter-power are only those whom we can define as being putative subjects of domination; and (b) that the function of the exercise of counter-power is to disrupt the domination. For a person normally subject to domination to act in a way that is consistent with his or her own preferred behaviors, for example, is an exercise of freedom, not of counter-power. If such action is common and systematic, its existence may negate the presence of the alleged domination. For that same person to gain that freedom by acting in a way that systematically disrupts the ways in which power was earlier exercised as domination is counter-power. WikiLeaks can be said to be an exercise in counter-power, because it disrupts the organizational-technical form in which governments and large companies habitually control the flow of information about their behavior in ways that constrain the capacity of others to criticize them—that is, affect the behavior of those others so that it is different than what those others would have preferred—and because it increases the probability that the outcomes of their behaviors will be closer to those they prefer.

Freedom in this context means the capacity to behave, alter one’s own configurations, and change the probabilities of one’s own outcomes. Freedom can be coupled with power, both intentionally and unintentionally. That is, I act in a way that is aimed at my own configurations or outcomes, but do so in a way that exerts power over your behaviors, configurations, or outcomes, and I do so either knowingly and with the intention of affecting your outcomes, or knowingly and without intention with regard to you, or without knowledge of the effects on you. Freedom is distinct from both power and counter-power in that it describes a possibility set for self-oriented action, rather than a possibility set and actual effects of action oriented toward the behaviors, configurations, or outcomes of others. I use the term *degrees of freedom* because, across disciplinary usages, it connotes dimensions along which an entity is nondetermined and contributed to the determination of some combined outcome—whether it is mechanically in the range of displacements a body can undergo, or statistically, with the set of parameters free to vary and contribute to a determined estimate. This usage tries to capture the idea of freedom within systems as specifiable in terms of discrete dimensions of possible action and effect within those systems.

Freedom and power do not take binary values but rather continuous values reflecting the extent to which actual behavior, configuration, and outcomes deviate from preferred behaviors, configurations, or outcomes of the relevant actors in an interaction whose freedom or power we are trying to characterize.

From Hohfeld's Jural Relations to Defining Power and Freedom in Networks

Almost a century ago, a legal scholar named Wesley Hohfeld (1913) published an analytic critique of one of the most prevalent forms of legal sleight of hand used by courts at the time. For example, a court involved in a dispute, say, over whether efforts to enforce a union shop at a factory were legal or whether they violated some law, would run the following analysis: Everyone has a right to freely enter into contract; that right being inviolable, the court must protect it, and so it issues a ruling that prohibits the union from enforcing a union shop in this plant. The economic/social interests underlying this kind of reasoning were those reflected in the story; as workers began to organize, and populists began to win elections and pass labor-protective laws, conservative judges used these approaches to reverse political and organizing gains (Horwitz, 1994).

Hohfeld attacked this analysis by explaining that "everyone has a right freely to enter into contract" does not, in fact, analytically entail that "the court must issue an injunction," and that there is significant confusion in language. Instead, he explained that what "everyone has a right freely to enter into contract" means is that "everyone has a privilege to enter into a contract," that is to say, no one else has a right to prevent them from doing so, and this is very different from saying that they have a right against others. He defined eight "jural relations," based on how they described the affordances and constraints of the system we have in place, to make calls upon the coercive powers of the state through invoking judicial decisions. Each of the four primary jural relations are in two pairs: The first pairing of right-duty says you have a right (when the law is such) to go to court and have it order another party to do or not do something under the threat of state coercion for failure to comply, while that other party has a duty to you, which simply says that it is susceptible to such a court order in your favor; the second pairing is privilege-no right, that is to say, no one else has a right (as previously defined) against you in this matter—to say you are privileged to do X is simply a correlate of saying that no one else has a right to call on a court to send the sheriff to make you not do X. The remaining two pairs of jural relations pertain to the configuration of the judicial system: power-liability, and immunity-disability, which describe exactly the same pairing as the four primary jural relations, but also refer to the ability of one person to alter the configuration of his or her, or someone else's, primary jural relations—their rights, privileges, duties, or no-rights. You can have the power to change the jural relations that describe your relationships with someone else, and then the condition of that person vis-à-vis you is called a liability. Or that someone else can be immune to your ability to change her primary jural relations vis-à-vis you, in which case you are under a disability vis-à-vis her on this matter—you cannot change the relevant primary jural relations between you. For instance, you have a privilege to give away your stuff, so if Alice gives Bob a widget as a gift, she is exercising a power over Bob's jural relations, because before the gift changed hands Bob had a duty not to take the widget—and no-right as against anyone with regard to the disposition of the widget. Whereas after the gift changes hands, Bob has a right against anyone else to determine who can (or cannot) use the widget, and so forth. So, to say that Bob is under a liability for the widget does not mean he owes something, but rather that his jural relations vis-à-vis the widget are susceptible to being changed by Alice. The actual law, however, requires that Bob accept the gift, so in reality Bob is immune to Alice's gifting power, a legal immunity that seems counterintuitive until you imagine that the widget might be a Superfund toxic waste dump.

Hohfeld's template is useful for developing a more general approach to power and freedom in multidimensional systems and networks because his objective was precisely the one with which we are

concerned here: defining the kinds of affordances and constraints a given system provides one or another entity, vis-à-vis other entities in that system, through calls on the pathways through which that system instantiates and transmits power. He focused specifically on law as the system, but already we see here a sophistication about needing discrete terms to define power to exercise (a) a system's affordances on the behavior or outcomes of the other (rights, duties), or on the configuration of the system (powers, immunities); and (b) to distinguish power to make someone else do/receive and the freedom not to have someone else influence your behaviors and outcomes. It is fairly simple to abstract from the particular system of law to a more general statement about systems that describe flows of power and freedom.

First, recall that to say that A1 has power over A2 in system S is to say that the system is designed with such affordances and constraints so that, acting through this system, A1 can increase the probability that A2 will behave B1, obtain O1, or inhabit C1, which are, respectively, A1's preferred behavior, outcome, or configuration for A2. We can also say that A1 has power, and A2 has a corresponding susceptibility. To say that A2 has freedom in S is to say that A1 has no power over A2 in S. The corresponding term for freedom is no-power.

Now, this basic set of pairs—power-susceptibility and freedom-no-power—also has to have at least two types: those that relate to behavior or outcomes and those that relate to the configuration of the system or network itself. One dimension of power is direct action/coercion, but another is persuasion (for which we use various names, depending on our normative orientation toward it, from propaganda and manipulation to reasoned argument). Configuration can be both within-network and between-network: that is to say, it can involve defining the behavior of the system, its completeness, and its closure. In summary, the term *configuration* means (a) the definition of within-network pathways for the exercise of power; (b) the degree of completeness, or the tight- or loose-coupling defining the degree to which, if an action occurs within a system, the resultant behavior and outcomes are determined by the power of those with power in that system, as opposed to more loosely-coupled systems that permit less deterministic behavior and outcomes, even within a system; and (c) the between-system openness or closure that defines the extent to which a behavior or outcome can be influenced by more than one system, assuming it is touched by a system of interest (the one whose closure or openness we are characterizing), and the extent to which entities can shift into and out of systems, or networks, defined as increasing or decreasing the relative influence of one or another of potentially pertinent networks on the behaviors or outcomes of interest.

Table 1 provides an overview of the various dimensions of power and degrees of freedom. It outlines a structure of analysis in which for each relationship (power, susceptibility, freedom, no-power), we can map an event or studied relationship in terms of which aspects of the system affect power, susceptibility, freedom, and no-power, and along which dimension (behavior, outcomes, or configuration). Behavior, in turn, is divided into Ps and actions, while configuration is segmented into its three core components (within-system coupling, between systems openness, and within-system pathways). Tables 2–7 take this overall schema and fill in the boxes with short examples that will make the analysis more intuitive. These tables break down each column into its own table. Each table then provides an example of how that column would be filled for each of the four relations described. Examples are taken from advertising supported media and the shift from TV to Web-based distribution, networked music distribution, and Internet protocol and Internet neutrality.

Table 1. Overall Schema for Analyzing Freedom and Power in a System.

	Behavior		Outcomes	Configuration		
	Ps (perceptions, preferences, policies, principles)	Actions		Pathways of power within the system	Completeness/tight- or loose-coupling within system	Closure/openess of between-system transitions
Power						
Susceptibility						
Freedom						
No-power						

The way to use such a table to describe any given relationship between an A1 of interest and an A2 of interest is to fill in the table with statements of the form: A1 is hypothesized to have power over A2's behavior (actions, Ps) through these given pathways, over A2's outcomes over those, and over A2's configurations, and so forth. A2 has power over A1 (symmetrically described). Then, we repeat with the entities' respective susceptibility, freedom, and no-powers. We could, for example, say the following:

1. WikiLeaks has power over the U.S. military along the dimension of between-system open configuration; the U.S. military has susceptibility to between-system openness.
2. The U.S. military has powers over WikiLeaks that include, for one, power over actions, brought to bear by the legal system. However, this turns out to be a weak power, with weak susceptibility associated with it for WikiLeaks.
3. WikiLeaks has freedom from the U.S. military's legal power because of what we could describe as between-system openness of discrete national legal systems, or within-system loose-coupling, if we were to consider the global legal system as a single system parallel to the global communications network.
4. The U.S. military might also have power within the technical system, say, to launch a denial of service attack on WikiLeaks servers, which would be a power over outcomes.
5. WikiLeaks may be susceptible to this power, but may also be able to exercise counter-power through both replication of the data on multiple servers and sites, as well as through mirroring, all of which would be hard to bring down without the Internet coming to a grinding halt.

Table 2. Behaviors Operating on Perceptions, Preferences, Policies, and Principles

	<i>Behavior Ps (perceptions, preferences, policies, principles)</i>
<i>Power</i>	<p>Advertising campaigns are designed to shape the target Ps to lead to behavior desired by the entity buying the advertising.</p> <p>If we know the baseline practices that are the subject of advertising for behavioral change, and if we can measure the pre- and post-campaign behavior, we can assign a value, measured in dollars spent, or in hours of the desired practice, and so forth, of the power exerted by the campaign.</p>
<i>Susceptibility</i>	<p>Consumers apparently respond to advertising with behavioral changes in the direction desired by the advertiser—at least enough so as to sustain continued investment in advertising. Apple's advertising campaign made the iPod and then iTunes cool, creating a desire for its particular branded system.</p>
<i>Freedom</i>	<p>A facility that allows a user to get at desired content without being exposed to advertising provides a degree of freedom and affordance to be free of this particular modality of power.</p>
<i>No-power</i>	<p>Where users can get at content without passing through a system that requires that advertising be paired with content—say, a Web browser with an ad-blocking plug-in rather than a TV or print newspaper—the party buying ads as no-power, corresponding to the users' freedom from influence.</p>

Table 3. Behavior: Actions.

	<i>Behavior: Actions</i>
<i>Power</i>	Digital rights management, or encryption of copyrighted materials, forces users to enter a code that they must purchase if they want to get music. Once a user adopts iTunes, for example, that system enforces a payment requirement, heavily influencing—though, because it can be cracked, not deterministically so—the probability that users will pay for music to which they listen.
<i>Susceptibility</i>	Consumers adopt a system, and when they do they become susceptible to the power affordances of that system. This is different from susceptibility to power over Ps in the sense that as long as users adopt the system, they must pay for the music whether or not they believe that they ought to or want to pay.
<i>Freedom</i>	A system of unencrypted music gives users technical freedom to use music files as they please. Note: They may still not be “free” of all restraints, due to, say, the legal system’s constraints, but they do have freedom in the technical distribution system from the particular kind of technical power.
<i>No-power</i>	The pervasive cracking of the Secure Digital Music Initiative (SDMI) in the late 1990s and early 2000s put the music industry in a state of no-power in the technical system. This led the industry to shift its emphasis to efforts to shut down the P2P networks (like Napster) through the legal system, as well as to suits against fans. The condition of no-power was partly reversed in the late 2000s in the United States through the adoption of iTunes and to educational campaigns to shape Ps of music fans.

Table 4. Outcomes.

	<i>Outcomes</i>
<i>Power</i>	A system designed to track users' downloading activity and then bill them through their ISP would affect the outcome of "payment for music" rather than impact the behavior of the fan.
<i>Susceptibility</i>	Users who want to use any kind of Internet connectivity are susceptible to the power to affect outcomes on any given dimension, where these are implemented through their basic service billing system.
<i>Freedom</i>	Critiques of systems designed to bundle payment for cultural materials with basic ISP service have so far succeeded in preventing this pathway of exerting power over outcomes from being established. Users may still be susceptible to power over behavior in the form of digital rights management (DRM), but not to power over outcomes in this form.
<i>No-power</i>	As above. The present system, with regard to music distribution, gives record labels no power over outcomes.

Table 5. Configuration: Pathways.

	Configuration: Pathways of Power Within the System
Power	An advertising system might have clearly delineated advertising pathways—say, the adjacencies in a TV program (product placement or subliminal messages)—that can be ignored in certain ways. Each may be more or less direct in its power, easier or harder to resist, and so forth, creating various pathways with diverse probabilities of success, that is, diverse amounts of power they bring to bear. Digital watermarking can simply enable the legal system, whereas access controls can enable power over behavior, and so forth.
Susceptibility	Depending on the pathway chosen, users can have more or less readily available ways to avoid or limit the impact of the particular form of power.
Freedom	A system that allows users to turn off ads gives them an affordance to avoid influence, while a system that automatically decrypts DRM provides users freedom from that system.
No-power	Some preferred pathways for exerting power may be unavailable, given the actual system elements in place. A legal ruling that refuses to impose liability for personal copying, as in many European countries, leaves record labels with no-power in those legal systems, whereas they do have such power in the U.S. legal system. An ad-blocking plug-in leaves advertisers with no-power; a DRM circumvention device does so for music labels distributing DRM-encrypted music.

Table 6. Configuration: Completeness.

	<i>Configuration: Completeness / Tight- or Loose-coupling Within System</i>
<i>Power</i>	The traditional telephone infrastructure gave the phone company control over the services that can be offered over the system. Once a service needed telecom's capacity, it had to use that system. Once it had, it defined the parameters of the service and gave the telecom company a high degree of power to define the parameters of the service. Apple built its iPhone and App Store model to preserve substantial control over Apps, much less so than the traditional phone company—its system is more loosely coupled than that of the phone system—and more so than the PC platform running Windows or Linux, and even more so with browser-based applications. Apple's decision not to support Flash, for example, is an instance of exercising its power over a tightly coupled system's configuration to exclude a class of actors from using the platforms, or from determining how they must act to be part of the network.
<i>Susceptibility</i>	At the extreme, adoption of a tightly coupled system renders the adopter completely susceptible to the entity controlling that system.
<i>Freedom</i>	The Internet, with TCP/IP and the slash between them, is the epitome of a loosely coupled system. Deciding to use the Internet to implement a service imposes few limitations on how to do so, and no particular entity has the power to prevent anyone else from doing as they please on it. Ideal, well-functioning markets are loosely coupled systems, as opposed to monopoly markets or regulated markets, where there is only a prescribed set of ways to perform certain behaviors. (Although various forms of market regulation can improve markets. by diffusing market power, for example, a market regulation somewhat decreases flexibility in a market for some firms, but overall makes the system less tightly bound by reducing market power.)
<i>No-power</i>	A major driver of the debates over net neutrality in the past decade has revolved around the efforts of Internet providers to extricate themselves from a position of no power over behaviors and configurations of Internet-based services. They seek to use those aspects of their networks that are telecom-like in their architecture to change the configuration of the Internet protocol to which they adhere, and shift from a position of no-power over behaviors, outcomes, and configurations for Internet-based practices to a position of power.

Table 7. Configuration: Closure/Openness.

	Configuration: Closure/Openness of Between-System Transitions
Power	In the era of the three-network, one-newspaper town, it would have been difficult to try to gain access to news or sports without exposure to ads. Media owners and advertisers had more power vis-à-vis consumers than they did after Web-based pathways were introduced and ad blocking plug-ins enabled users to shift from the advertiser-supported networks that had no blocking options to those that did. P2P music distribution networks limited the power of record labels by enabling fans to shift their acquisition of music from formal, copyright-based distribution networks to informal and illegal copyright-defeating networks. The battles over the liability of firms like Grokster or Napster is a battle over the possibility of between-system shifting as a degree of freedom for fans and as a limitation of power for labels.
Susceptibility	Fans able to skip ads automatically using DVRs, users able to install ad blocking, and so forth are forms of reduced susceptibility to advertising. The fan perspective on P2P networks is that P2P networks reduce their susceptibility to the power of the labels to bundle songs into albums, or to control formats or use platforms.
Freedom	Being able to shift out of the traditional music distribution networks provided a degree of freedom. This example emphasizes that the conception of freedom identified here is relative and contextual, and that it reflects a degree of freedom—a particular dimension along which a given entity is not susceptible to the power of another. Here, P2P networks released fans from the power of the owners of the prior distribution chain along the dimension of access to the works. However, the activity itself is still susceptible to suit, and the overall level of freedom from the power of the labels depends on the legal rules and enforcement approaches in the different countries. Users in the Netherlands or Spain are freer to listen to music without being subject to the power of the labels than are users in the U.S.
No-power	Correlative to the aspect of freedom, no-power, or the absence of power in a given system, is similarly a description of the affordances of one of several intersecting systems or networks that influence the behaviors and outcomes of entities in a relationship. Labels have no-power in the technical system of P2P, but do have more power over U.S. users than over some European users, and they have more power over users who use iTunes than over those who use P2P networks. Power describes a relationship within and between one or more specific systems through which a relationship of interest is instantiated.

Not every analysis of freedom and power necessitates a full mapping of all possible dimensions of power or degrees of freedom. We can imagine that, in a particular relationship, we are seeking to isolate a particular subset of forms of power, or moves intended to exercise freedom in a given context. The basic point is that to understand the power relations and the measure of freedom for a given system of relations, one needs to identify the dimensions and pathways of power flowing among the entities of interest, as well as the available pathways for dodging or evading the power of another, or exercising one's own power over others to obtain a desired outcome, state, or dynamic. Power and freedom are also not coextensive with affordances and constraints or capabilities. That digital versions of videos make it technically feasible for A1 to manipulate images and re-create his own mash-up of a popular video is not what one would describe as "A1 has the power to make his own video mash-ups" or as "A1 is free to make mash-ups." Digitization of cultural objects certainly makes certain affordances feasible, and by doing so sets potential conflicts of will or interest between different social entities, such that their relationships can be described in terms of new dimensions of power and freedom. The new affordance of digital video sets up a potential conflict between the creative fan and the copyright owners of the videos, and that relationship can be described, based on power and freedom in the various multidimensional networks, or overlapping systems that the fan and the copyrights holder occupy. Freedom and power describe the relationships among entities in context vis-à-vis a range of behaviors, outcomes, and configurations, not the simple fact that A can, or cannot, act in certain ways. If, however, a copyright owner refuses to digitize to maintain better control, and someone rips and posts a digital version, those actions can properly be identified as efforts to exert power between the two sides. The movie studio is exercising power to prevent the video from entering a technical network that enables unauthorized creative manipulation, while the person ripping and posting seeks to inject the video into such a technical system. The movie studio would try to maintain the video on a system characterized by power to control the flow of physically embodied cultural goods, coupled with legal power to bring to bear the coercive powers of the state onto a behavior inconsistent with the will of the owner. The person ripping would be seeking to place the video in a technical system in which users can rip and remake their own versions, embedded in a system of mutual recognition and validation that provides those who make the mash-ups with moral/normative and psychological support for doing so, even in the teeth of a legal system that prohibits the behavior, but whose practical enforcement powers in the network are relatively weak.

Using the Framework to Evaluate Claims About the Internet's "Democratizing" Effects, or its Enabling Greater Freedom

To provide a clearer grasp of how to construct a description of power and freedom in a given interaction, mediated through multiple systems, consider the single discrete relationship that closes the prior section: between the creator of a movie or video and a creative fan who wants to create her own version or meaning, or what John Fiske describes as "semiotic democracy" of TV (Fisher, 2004; Fiske, 1987; Madow, 1993). This article presents it in a series of figures, each providing a simplified description of the relevant systems in place, the relevant actors, and the relevant directions and dimensions of power and freedom. Power is depicted as a directed, solid-line arrow going from the entity with the power to the susceptible entity. Freedom is a dotted-and-dashed arrow leading from the entity with the freedom to the entity that seeks to exercise power over that entity, but which turns out to have no-power over a given behavior or outcome. The provision of affordances that is not an exertion of power or an assertion of freedom is a fine-dotted line from the provider of an affordance to its user. Several systems are described, each with its own color. The systems represented in the four panels are:

- (a) technology (blue);
- (b) law (light red);
- (c) communications of cultural expressions (dark red/brown);
- (d) expressions of recognition, validation, support, and association (yellow);
- (e) expressions of moral condemnation (black);
- (f) marketing (light green);
- (g) competition (dark green);
- (h) political lobbying (orange);
- (i) corporate acquisition (light magenta); and
- (j) standards-setting processes (dark magenta).

An arrow depicting power or freedom is given thickness intended to qualitatively represent the weight of that relationship in affecting the overall outcome or behavior of interest—in this case, whether a fan can (or cannot) make a creative mash-up or fan video as a form of self-expression in response to the movie or video. This is, of course, a highly stylized and simplified version, but it is intended to provide an initial example of how this kind of analysis of the flow of power and freedom in multidimensional networks or overlapping systems can crystallize the phenomena and make them amenable to observation and testing. I avoid using the social system as itself one dimension of power or freedom, but instead characterize specific modes of association or connection, experimenting with whether a description that might fit Latour's "sociology of associations" would be useful. Specifically here, communications of cultural expressions and expressions of validation, recognition, and expressions of moral condemnation are discrete components of what might be called "social" ties; the latter two mediated by social psychology and the former a means of constructing what we might describe as social meaning.

The four figures that follow describe stylized snapshots of power around fan video from 1970 to the present. They portray a picture of increasing complexity, that is, of an increasing number of entities and subsystems coming to bear on the basic dynamic: Can a fan make a video takeoff of a favorite movie or TV show? The figures do suggest that power becomes more diffuse and less effective generally, while freedom increases, and they portray a series of systems, where within- and between-system loose coupling, enabled largely by technological change, appears to increase freedom of fans and decrease power of movie studios over them on the question of whether fans can make fan videos.

Figure 1 presents the systems as they stood on the eve of change—before video recorders, cable channels, and most important, before digitization and the Internet. Technologically, film is a highly controllable medium, embedded in a legal-organizational framework of studios, broadcasters, and theaters that are well structured by contracts and copyright law defining the power between the relevant entities. Movie studios and broadcasters create and disseminate cultural artifacts and perceptions, then send them

Fan video circa 1970

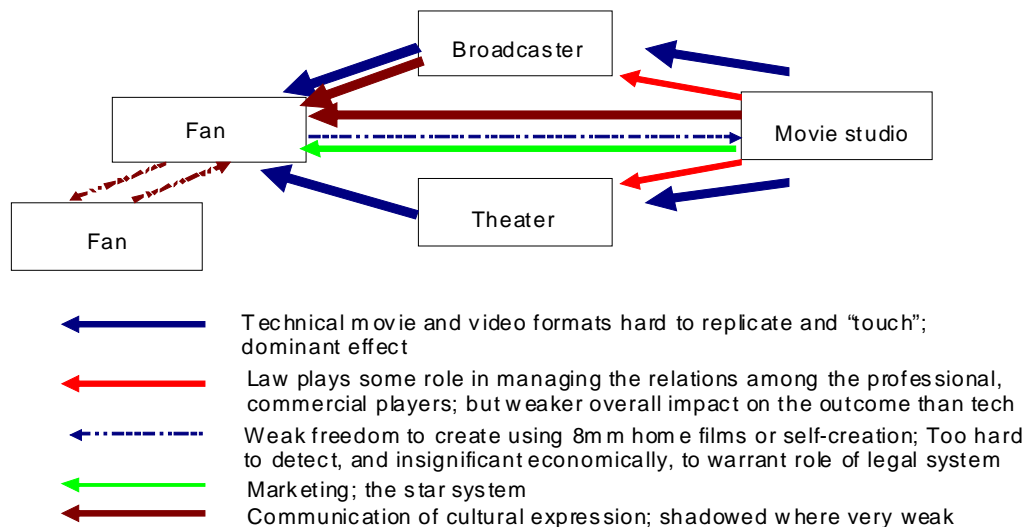


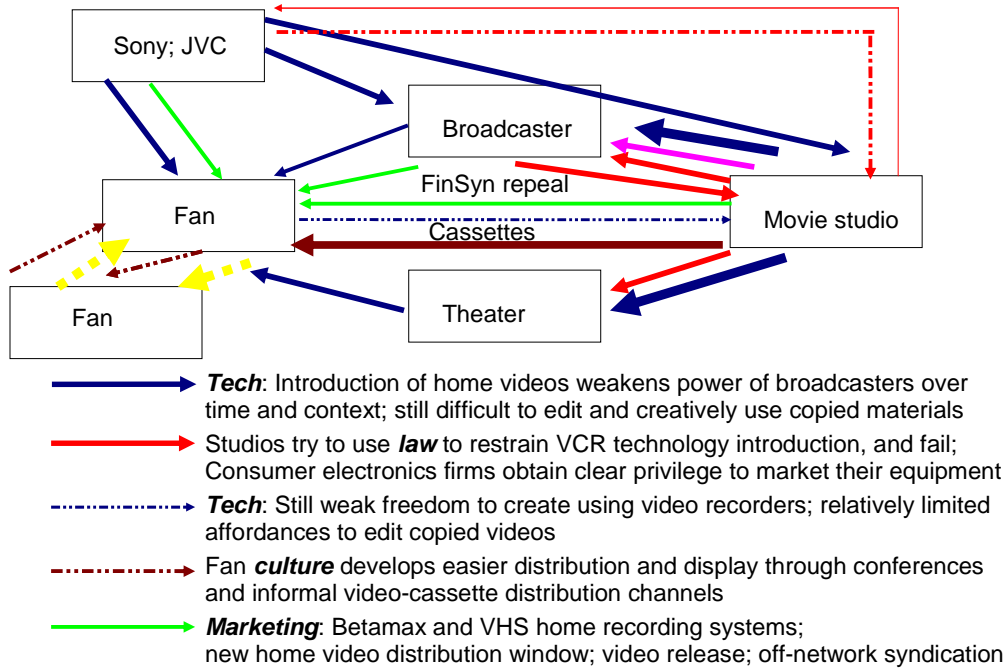
Figure 1. Power Flow Chart, Fan Video Circa 1970.

to viewers. Fans have minimal technical affordances, using 8mm film and live performances to exercise the freedom to make their own interpretations of their favorite movies. While fans can and do perform for and with each other, these ties are relatively sparse, made difficult by the media of communication and given a dispersed population of fans.

Figure 2 looks at the introduction of video recording in the mid 1970s, which alters the technical conditions for fan video, adding outlets such as cable channels and additional studio-owned broadcasters, both of which make off-network syndication much more widely available, with many more reruns of many more cult shows (*Star Trek* being the most obvious). Consumer electronics manufacturers that make and market home video recording equipment become one set of major new players. Sony's Betamax and JVC's VHS become a medium through which fans can record, watch, and perform their favorite videos. The movie studios try to exercise power through the legal system with copyright suits, but ultimately get rebuffed by the Supreme Court, leaving the consumer electronics manufacturers relatively free of legal constraint (represented by the red power arrow, which has a low weight, and the broken counter-arrow representing the legal privilege that Sony and JVC win) (Sony, 1984). At the same time, the introduction of cable increases the number of channels looking for content and improves the feasibility of over-the-air UHF TV channels, leading first to the creation of Fox, then to WB and UPN channels. All three of these channels are owned by movie studios with large libraries of back content that can be rerun on them. They

are created, in part, as a response to judicial decisions that overturn the FCC's FinSyn rules that movie studios have used to restrict the power of the broadcast network over TV series rerun revenue. Fox, Warner Bros., and Paramount all pursue their own networks so as not to be shut out of TV channels for distributing their libraries. As a result, there is a glut of reruns of movies and TV programs, which, in turn, is now technically susceptible to capture by fans as basic material. Home video recorders make fan movies easier to make and VCR tapes vastly easier to distribute and copy than 8mm film, thus increasing the practical capability of fans to improve their own internal networks of distribution and shared creativity. These videocassette distribution channels also permit freedom, as their medium is hard to detect and thus free of enforcement channels available to the copyright owners. These networks also provide validation and recognition of association among the fans, creating fan communities. But the medium still makes remixing and cutting of original materials, as opposed to reenactment, difficult.

Fan video 1975-1990



Key

- > Power from the entity with power to the susceptible entity
- > Freedom from the entity with freedom to the entity with no power
- - - - -> Affordance provision: from the entity providing the affordance to the entity using it

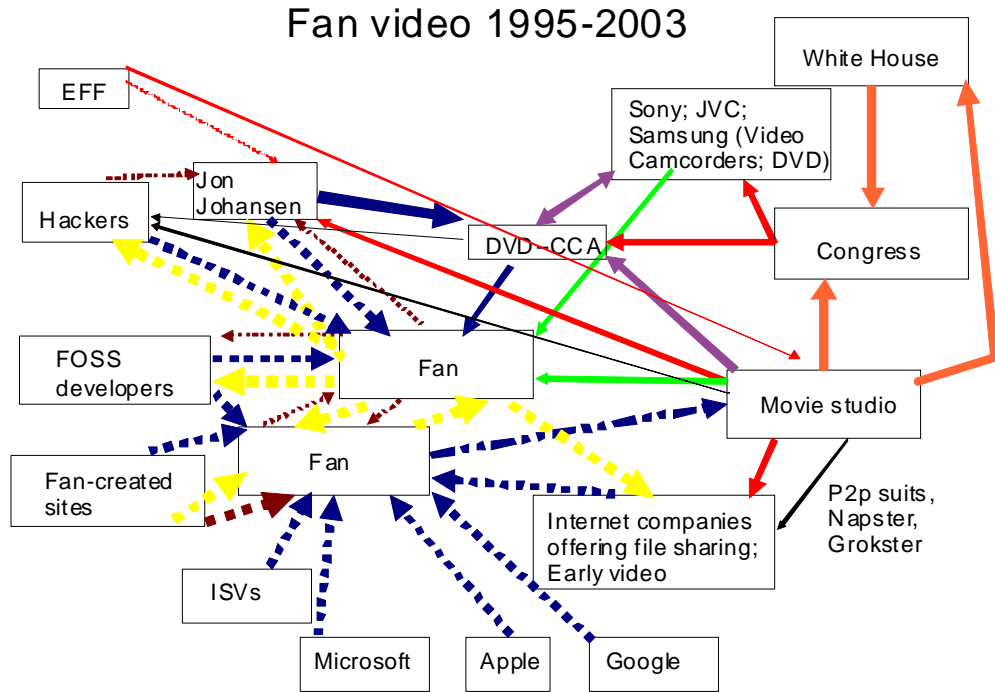
<ul style="list-style-type: none"> Technology Law Communication of cultural expression Expression of recognition validation, support, association Expression of moral condemnation 	<ul style="list-style-type: none"> Marketing Competition Political lobbying Corporate acquisition Standard-setting processes
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Figure 2. Power Flow Chart, Fan Video 1975–1990.

Figure 3 represents the period of digitization and very early Internet distribution before the rise of contemporary video sharing sites like YouTube. Digitization makes original materials vastly more malleable and open for remixing and self-creation using found materials. It also increases the potential production value of self-created videos using fan themes. The Internet, even prebroadband (and increasingly so after 2000 as speeds increase), becomes a major pathway for distribution of the materials among fans, also serving as a platform for fans to share creations, discuss techniques, and offer each other a social background on which to create. A whole new set of players, both commercial and noncommercial, begin to have an effect on fans' affordances and freedom.

Figure 3 introduces a third type of arrow or relationship, where the actions of one entity increase the affordances of another entity. The arrow runs from the acting entity to the entity receiving increased affordances, some of which increase freedom vis-à-vis some other actor from that action. The movie studios use extensive lobbying to exert power over both the White House (under all administrations) and Congress to pass legislation and enforce against copyright violations. They demonize or exert moral condemnation of hackers, and in part, through this move, seek to affect law. Congress passes a slew of laws in 1998, most prominently the Digital Millennium Copyright Act (DMCA), which calls on the powers of the legal system available to the studios to support other studio efforts to exercise technical power through the definition of standards for digital rights management systems. These two pathways come together in a case called *Universal City Studios, Inc. v. Reimerdes* (2001) in which the studios sue a Norwegian teenager, Jon Johansen, and several Web sites that distribute code he has written to defeat a technical protection measure embedded in DVDs through the DVD Copyright Control Association, an industry standards-setting process for defining and implementing encryption measures to protect DVD copyrighted materials. Whereas the power of moral condemnation appears very clearly in the tenor and substance of the legal decision supporting the movie studios, the decision also crystallizes the enormous power of a countermove, as well as the increasing recognition and validation offered by Internet users, and in this case, fans who look on hackers as freedom fighters. The DVD-DeCSS descrambling code becomes, for a short period, a cultural icon of resistance.² This is illustrated in Figure 3 by the proliferation of yellow arrows conveying privilege of action to the hackers, shielding them from both the moral criticism, and to some extent, from the legal modalities of power by denying law its most powerful enforcement vector—the psychological experience of legitimacy and its associated behavior of voluntary compliance (Benkler, 2010).

2 The best collection of these expressions is computer scientist David Touretzky's gallery: <http://www.cs.cmu.edu/~dst/DeCSS/Gallery/>. My favorites are the haiku form of the source code by Seth Schoen, <http://www.cs.cmu.edu/~dst/DeCSS/Gallery/decss-haiku.txt>, and the square-dance performance of the source code: http://www.cs.cmu.edu/~dst/DeCSS/Gallery/the_computer_code_hoedown.mp3



Key

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<ul style="list-style-type: none"> Technology Law Communication of cultural expression Expression of recognition validation, support, association Expression of moral condemnation 	<ul style="list-style-type: none"> Marketing Competition Political lobbying Corporate acquisition Standard-setting processes
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Figure 3. Power Flow Chart, Fan Video 1995–2003.

Parallel to and reinforcing the expressions of validation and recognition, the increasingly political culture of the Internet freedom movement begins to provide affordances to some of the actors. A nonprofit, the Electronic Frontier Foundation (EFF), steps in to defend the *Reimerdes* case, as do academics writing amicus briefs. These are depicted in Figure 3 as arrows providing freedom from these entities to the fans and exercising (weak) legal power on the studios—all to no avail, as the courts side with the studios. But the actual software that gives fans the ability to rip videos and circumvent the copy protection mechanism in DVDs is offered by a network of online volunteers: hackers doing so for political or commercial reasons (or just for fun), all with the support of the network of expressions of mutual recognition and validation from the fan and online user community at large—Robin Hoods of the contemporary age. In other words, a distributed network of technical affordances developers intersects with a distributed network of social norms development and a culture of recognition and respect to form a system of counter-power that defeats the power given the movie studios by the legal system, by their own internal, proprietary technical developments, and by their power over the standards-setting processes of DVD technology. The term *counter-power* is consistent with the definition already given: that is, a class of actors, traditionally dominated by studios in their ability to make movies, now harnessing a set of systems to disrupt precisely the pathways through which the studios traditionally exert power: law and the definition (institutional through standards and technical through production) of the technological affordances of the copies.

Free software developers, in the meantime, develop more applications for users to create their own videos and mash-ups, as do commercial, proprietary software developers. All these together form a web of mutual increased freedom—from the developers of technical affordances to the fans, and from the fans to the technical developers through relations of respect and social recognition to adoption of commercial software and the making of those firms attractive to investors. Some of these commercial firms primarily arise in the context of P2P file-sharing networks (more so in music than in video) and are used primarily at that stage for listening to music downloaded without payment rather than for distribution of fan video. These companies, in turn, are sued for contributory copyright infringement and placed under significant pressure to cease and change their affordances from the movie studios and law. This is partly successful, although P2P programs and practices continue extensively. Underlying much of this is continued work from the mainline consumer-side software companies—Microsoft and Apple—to build video capabilities into their basic systems, all the time making it easier for fans to create their own videos.

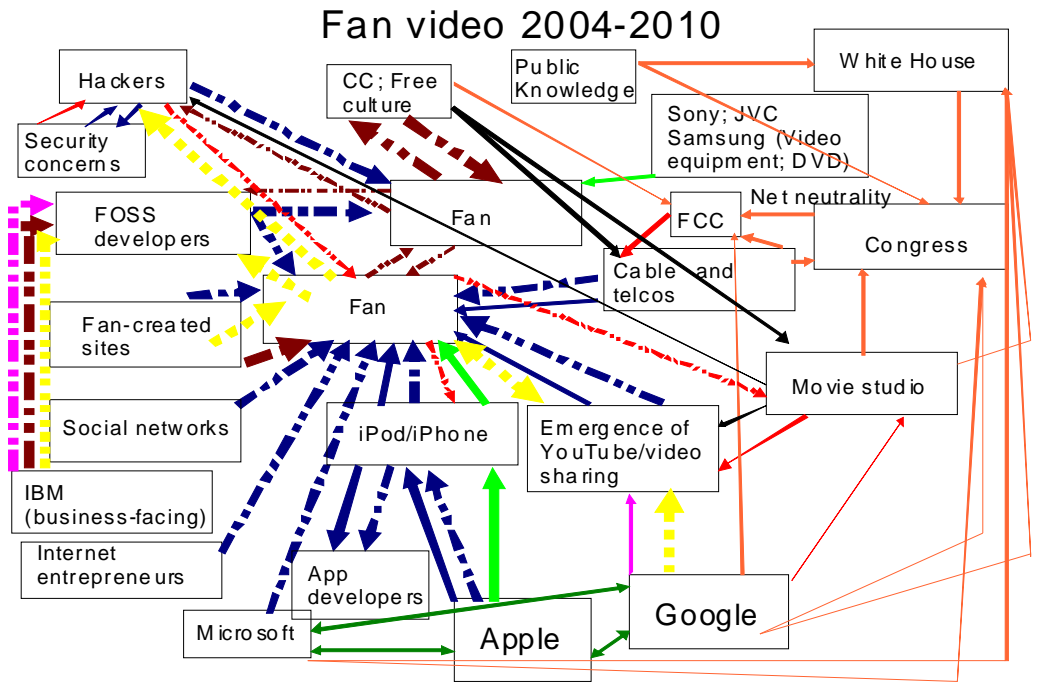
Figure 4 portrays the dynamics of the six years from 2004 to 2010. The legal-political side of the figure, on the right side, becomes weakened overall as the newly established players, mostly Microsoft and Google, establish lobbying offices in Washington, DC, for the first time, and together with a coalition of NGOs like Public Knowledge, begin to push back significantly in Congress. The result, in the American system with its many veto points, is relative inaction on the legislative front and a general decline in the effective role of law in controlling the relationship. Indeed, in 2010, the Librarian of Congress (2010) explicitly declares that noncommercial video mash-up is exempted from the prohibition on breaking encryption that protects copyright under the DMCA. In other words, these activities that have played an important role illegally are now legally privileged. Note, however, that this legal right to hack for certain purposes is a removal of the power of the movie studios; it is a privilege, not a right, in Hohfeld's legal terms. Fans still require the backup of a system, which creates technical affordances that lets them defeat the technical controls. The difference is that, for these purposes, that network of affordance construction is legal. At the same time, Apple introduces first the iPod, then the iPhone, experiencing a renaissance in

its power in the market. Using a fantastic advertising campaign and high-quality design, Apple persuades users to buy its devices, which do indeed increase the affordances available to users to capture and manipulate video. But technically, they are also more proprietary and provide Apple more power to control uses and applications than did the PC platform for companies that sold PCs.

As a result, the lower third of Figure 4, portraying the marketing and technical relations with established firms, begins to show new pathways for the exercise of power over fans. In this case, it is a combination of marketing that leads to adoption of devices and of technical power being exercised through control over devices that users choose to adopt, and then those same devices also increasing their affordances along some dimensions, resulting in a dual effect of both enhancing freedom (from the movie studios) and increasing the power of the device maker (Apple). Note that the same Librarian of Congress decision (2010) also privileged iPhone “jailbreaking,” that is, circumventing the digital rights management encryption in the iPhone to enable applications not approved by Apple to run on it. The librarian has effectively limited the role that law plays as a dimension of power over iPhone use, leaving it up to marketing—for adoption—and technical hacking to determine how controlled or free uses in the new environment of ubiquitous, hand-held Internet access will be. The range of actors that provides fans with technical freedom through the development of affordances continues to exist and is enhanced by increased availability of free software, now supported by mainline firms like IBM that have come to partly adopt free software as part of their business strategy. Were one to zoom in on the free software development “entity” in this figure, one would find interesting contributions of power from IBM in terms of political and legal support, as well as interesting new dimensions of power for IBM employees—against their employer, within the organization, and at the intersection of that firm and free software development communities. From the internal dynamics of a free software development community, participation requires freedom from organizational control. Once a firm decides to rely on free software for some aspect of its strategy, it must—to interface with that system—change its internal organizational processes to provide those individuals who form the interface between the two systems a greater degree of freedom from the internal organizational hierarchy in all matters pertaining to the free software entity. Moreover, the adoption by IBM and many other firms, including Google, of full or partial free software strategies provided a vector of recognition and validation for developers, further strengthening the first-generation, more romantic expressions of validation previously discussed in regard to Figure 3. Similarly, the use of the idea of entrepreneurship and innovation, as well as the lawsuits against Internet entrepreneurs that defined them as anti-innovation, anti-growth, and anti-freedom all rolled into one, provided some moral validation to push back against the campaign for moral condemnation of some of these innovators as pirates. One major example of this effort to harness new normative arguments and evidence is the release, in 2007 and 2010, of reports from the Computer & Communications Industry Association (2007, 2010) titled *Economic Contribution of Industries Relying on Fair Use*, which claimed that industries relying on fair use accounted for over one-sixth of the U.S. economy and employed over 17 million people. Beyond these dimensions, we also see firms like Google, Microsoft, and Apple exerting power over each other through competition and marketing, one consequence of which is improved freedom for fans.

The introduction of user-generated video distribution sites, from Revver and Google Video and ultimately to YouTube, increases the ease with which users make their own videos and by which fan communities can circulate their materials. They increase the salience, acceptability, and recognition of fan-created videos, again providing greater freedom from potential pressures on illegality. Social networks—the online platforms, not the analytic category—contribute, alongside the fan sites, to

alternative distribution channels and mechanisms for creating social meaning. Throughout all of these developments, it is critical to emphasize the enhanced degree to which fan communities, using these platforms and others developed by fans for fans, offer each other technical, social, cultural, and artistic support networks. Though these networks did exist prior to this period, they were greatly facilitated, on one hand, and had their coverage extended to many new fans, on the other, by networked communications (Ito, 2008; Ito et al., 2009; Jenkins, 2006a, 2006b). Finally, in the United States, broadband providers, in particular cable companies, provide higher capacity transmission to increase the fans' capabilities, but they also begin to experiment with control over flows of video over their wires, resulting in political/legal battles over Net neutrality, which are still being contested and remain the subject of intensive lobbying and political power. The network of NGOs, users, and Internet-based companies also begin to put moral pressure on the incumbent firms, using terms of monopoly, suppression of innovation, and similar tropes that weakly limit the effectiveness of the movie studio and telecommunications carriers in the political sphere and that provide a complement to the validation of some of the activities that those actors themselves are trying to dampen through moral condemnation.



Key

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|---|---|

Figure 4. Power Flow Chart, Fan Video 2004–2010.

In all, the four figures tell a simplified and stylized story of one particular dimension of freedom: the expressive and cultural freedom of fans to make their own meaning of (and with) the professionally and commercially produced cultural materials that surround them. They incorporate technical, communications/cultural, moral, social valence and recognition, market, political, legal, and standards-setting systems that contribute to the ultimate result. They map where it would be possible to dig deeper into the dynamics of subsystems, like the fan sites and their relationships with various communities of software developers, or the internal dynamic of the Washington, DC lobbying subsystem, or the way in which judicial opinions come about to influence behavior, and so forth. The figures are simply intended as an outline of what, in principle, a much more sophisticated and data-driven set of maps would need to look like. These maps would chart multiple dimensions of power sources and flows, multiple systems through which entities can act for themselves and on others, and multiple pathways for entities to bob and weave among these systems and to try to shift which system dominates or at least has the greatest influence over the behaviors and outcomes of interest. One particular point of interest is that these figures suggest, if not technological determinism (which I have long denied as an appropriate explanatory approach), certainly a very large, possibly dominant role for technology and technological affordances in determining the actual pattern of behaviors we observe. Efforts in the other systems to suppress and control fan creativity have faltered, even though they were successful in, most prominently, the political and legal systems of power. How much weight one should give to sheer technology and how much to the mutually supportive relationship between technological development and cultural practice is still very much an open question. Certainly, technology has played an enormous role in enhancing “semiotic democracy” in this particular domain. It has also been central in redefining the set of entities that have some dimensions of power over whether freedom is (and to what degree) available to fans to express their own meaning in video and to transform video culture from its industrial model in the 20th century to a more open, loosely coupled system of video cultural expression a mere 10 years later.

It bears repeating that the effort here is to provide only an example of the approach, not a claim that these four figures exhaust this phenomenon, much less anything else. If one were to zoom in on the free and open source software developers in Figures 3 or 4 and map their networks of power, we would discover the rewiring of the organizational power network. There, a major dimension of power is organizational authority over the day-to-day work life of employees. The emergence of free software has provided a distinct system that allows software developers to not only work on projects, but to do so with people not in their organization. This system also allows them to develop skills and form associations that, in turn, give them greater power to assert freedom from internal organizational power to the extent that they can shift their own employers to engage in free software projects and use them as the contact point between the internal organizational process and the networked free software development project (O’Mahoney & Ferraro, 2004). Independent musicians have similarly found new pathways and networks to free themselves of the power of the labels over the market in music and to connect directly with fans. Some of them are using moral and relational flows to elicit payment from fans, while exercising power over their fans to produce what might be termed as voluntary compliance with a system of providing the public good—that is, associated with maintaining professional musicians—rather than relying on technical and legal systems (Belsky et al., in press). Politically engaged individuals have done so to counter the power of what they see as mainstream media and deride as MSM, but it appears that there are real differences between how the left and the right design their systems—differences that go precisely to the power to control the agenda of those online systems within the left and right sphere of the blogosphere itself (Benkler & Shaw, 2010). The efforts and instances of leveraging the affordances of the digitally

networked environment are many and have occupied the work of many. Figures 1–4 use one particular example as a way of making more concrete why it would be productive to map these various arguments as multidimensional networks that describe the flows of power and the degrees of freedom that characterize these relationships.

Conclusion

When it was time to conclude this article, I learned that WikiLeaks had struck again. This time, it released thousands of classified documents portraying internal U.S. military intelligence reports. The site obtained them from a leaker, possibly the same Bradley Manning who provided the helicopter videos. But the story is not one of a new networked system replacing an old one. Rather, it reflects a fascinating change in both systems that leverages the power of both the traditional system and the networked system to increase the power of the volunteers who run WikiLeaks. Assange and WikiLeaks do not simply dump the documents online; they release the data to *The New York Times*, the *Guardian*, and *Der Spiegel* simultaneously. By doing so, they use the affordances of networked communications to obtain the materials and exclude the possibility that the three organizations might suppress the materials. Doing so counters not only the power of the U.S. Department of Defense over the materials but also neutralizes those aspects of the system of professional responsibility that could have influenced the newspapers into deciding not to publish these sensitive materials. WikiLeaks leverages the international system of distinct markets to create incentives (or drive) for three publishers, in three countries—each with troops in Afghanistan and internal opposition to the war—giving them enough market advantage in their respective markets through exclusivity to publish, but also enough lack of exclusivity in a globally networked information system to remove the possibility of suppression and nonpublication from the set of available outcomes. The U.S. Department of Defense issues a fairly feeble denunciation, as the international system of distribution and jurisdictional unaccountability apparently gives it no power to prevent the distribution. The following days, filled with public reconsideration of the war in Afghanistan in all three polities, is a powerful indication of just how much power WikiLeaks was able to bring to bear with this combination of distributed networked and mainstream-traditional publication models.

The story offers us a discrete, vivid instance of the ways in which the networked society has disrupted traditional pathways for the exercise of power and created new dimensions of power and new degrees of freedom. We live our lives as individuals in systems. Our preferences, policies, and principles; our perception of the situations we inhabit and the options available to us; and our actions are all shaped and influenced by the systems we inhabit. In particular, these systems structure the ways in which we can exercise power over others and how others can exercise power over us, and the ways in which we are free of the power of others and they are free of ours, along all the dimensions of behavior, including the Ps and beliefs that underlie it, as well as along dimensions of outcomes and the configuration of the very systems we inhabit.

The term *networks* and network analysis perform two critical functions in our understanding of the human and social condition. The first is analytic: Networks allow us to express well both the individual entities that make up the system and the interrelationships between them. They present a form of analysis that can reflect both structure and choice, both system and self. The second function is historical: The particular set of perturbations that underlies many of the present changes in the organization of

economic, social, and political life are driven heavily by the introduction of networked information technology into an increasing range of aspects of life.

This article seeks to define power as the flow of influence in a network: that is, the extent to which entities can influence the probabilities that other entities will hold certain Ps, behave in certain ways, obtain certain outcomes, and inhabit (be influenced by) certain systems with certain configurations. Freedom is defined here as the condition of not being susceptible to power in a given set of dimensions and to being a matter of degree: That is, entities can have more or less power and/or more or less freedom, all defined through the set of relationships and systems they inhabit. Power can operate on behavior, in both its Ps and action dimensions, in its outcomes, or in its configurations. Configurations include (a) the definition of within-network pathways for the exercise of power; (b) the degree of completeness, or the tight or loose coupling defining the degree to which, if an action occurs within a system, the behavior and outcomes are determined by the power of those with power in that system, as opposed to more loosely coupled systems that permit less deterministic behavior and outcomes, even within a system; and (c) between-system openness or closure, which defines the extent to which a behavior or outcome can be influenced by more than one system, assuming it is touched by a system of interest (the one whose closure or openness we are characterizing), and the extent to which entities can shift into and out of systems or networks, defined as increasing or decreasing the relative influence of one or another of potentially pertinent networks on the behaviors or outcomes of interest. Table 1 and Figures 1–4 offer an example of how one might systematize evidence about a relationship that will help to crystallize who is claimed to have power over (freedom from) whom, through what system, and how the claimed power (freedom) interacts with other dimensions of power and degrees of freedom provided by other systems that also influence the behavior, outcome, or interaction of interest.

The effort to understand the flow of power and its dimensions, and the level of freedom and its sources, is important as a matter of observation and understanding the moment. But it is also a critical input into policy, politics, and social action. Too often, we see political struggles or policy debates focused on issues that reflect the commitments and power flows of an earlier period, reified into the flags of today's battles. For the American Civil Liberties Union to file an amicus curia brief in the *Citizen's United v. Federal Election Commission* case in the Supreme Court, which urged the Court toward its ultimate decision to protect unfettered corporate political speech under the First Amendment, is a supreme instance of self-injury born not of self-hate but of a poor conceptualization of the multidimensionality of power and freedom. We need a better understanding of the dynamics of power and freedom so that we can develop more effective interventions into the configurations of those systems to pursue whatever set of goals we seek.

To understand that freedom and power are multidimensional social facts and practices, created by the intersection of multiple overlapping systems, is to reveal the potentially destructive myopia of any single-minded pursuit of any one dimension of freedom: be it constitutional-legal liberal freedom, like the First Amendment or privacy; libertarian market freedom embodied in a laissez-faire doctrine; communist freedom from hunger through state provisioning; or traditional progressive freedoms from want through well-regulated government programs. No single perfect system exists. We seek to advance multiple competing goals, from welfare and growth to individual well-being, from individual freedom to justice and community, and we cannot find a perfect stable equilibrium because there is none. Like a bicycle rider, we lean on one pedal and then another, stable only dynamically as we oversteer to one direction or another in

rapid succession, one slight or large error following another, and one partial success leading to its own instabilities and then to the next partial success that replaces it. We bob and weave between systems; we exercise power, alone and in cooperation with others, and are subject to it; and we exercise a wide array of freedoms along many dimensions—none of them perfect, none dominant—as we navigate the pathways to our various and competing goals.

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