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Asymmetric market failure and prisoner's dilemma in intellectual property: presentation by Professor Wendy J. Gordon

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PRESENTATION BY PROFESSOR WENDY J. GORDON

PROFESSOR GORDON:

As you know from the paper I submitted, I am going to explicate two models that I think underlie a good deal of intellectual property discussion. From my experience, the more clear you are about underlying models the easier it is to pull them apart, show their inadequacies, or show ways in which they are useful but need to be supplemented. Of the two I want to identify, the first is something I have called "asymmetric market failure," which I think would be uncontroversial once understood, but I think is not often understood. The second is something called the prisoner's dilemma game, which I think you will recognize yourselves as having used for years, as it provides the underlying structure of a traditional argument for copyright, even though you may never have heard of the game theory literature out of which it evolves. This latter comment is addressed to some extent to the practitioners; I am sure my academic colleagues are aware of the prisoner's dilemma game, though perhaps not in this context.

Let me begin by explaining asymmetric market failure. An asymmetric market failure is present when two events or conditions converge. The first condition is that authors and inventors would not be able to obtain much payment for their work in the absence of a rule that restrained strangers from copying. In other words, the first condition is that *creators would face a market failure* in the absence of a legal rule that requires copyists to seek permission and pay license fees.

The second condition for asymmetric market failure is that once a no-copy rule is put in place, licensing will evolve. In other words, this second condition is met if, in the presence of a copyright or some other rule restraining strangers from copying, markets will *succeed*, not fail.

The first condition, that authors face market failure in a world without copyright, is important because of incentives. If, in the absence of a no-copy rule, a potential creator would expect competitors to copy her work and undersell her, she may refrain from creation in the first instance, so that the public gets less creative work than it really would be willing to pay for.

It is this kind of market failure that copyright and patent are intended to cure. When it is asked why have copyright or any other intellectual property rules in the first place, the usual answer given is the public goods problem; that is, that it is hard to exclude free riders. And the law provides, as Jerry [Reichman] says, little bitty fences around

each bit of intangible property: It gives you an ability to exclude free riders from using your work.

The first condition in asymmetric market failure addresses this difficulty the creator has in excluding nonpayors. Copyright economic policy assumes that if you are in a world that doesn't have rules against copying, you are going to have insufficient fences. That logic implies, in turn, that if you are going to try to get a court or legislature to make new rulings against copying, it should be because your current fences are insufficient. In other words, to make a good case for intellectual property in an area, the facts should suggest that a potential creator, who has some claim to be paid, based on morality or economics or anything else, *needs* the courts to act on her behalf, and could not get paid otherwise. If the money could be forthcoming even without an intellectual property rule in place, why get courts and legislatures involved with all that expensive process?

Thus, the first condition of asymmetric market failure addresses the question of whether an intellectual property system is needed in the first place. The second condition for asymmetric market failure addresses whether the intellectual property system will be practicable, and really provide the incentives desired.

As you will recall, this second condition was that under copyright markets would evolve—that users under copyright wouldn't face market failure. This consideration is also clearly relevant to incentives, for monetary payments will not come to creators unless potential users are able to bargain around the law's restrictions and pay for licenses or copies. No matter how otherwise desirable it may be to have a copyright system, a lot of the arguments in favor of that system from an economic perspective fall flat on their face if you are not going to have markets, because then the people who have the copyright aren't going to have customers and they are probably not going to have incentives, and the rest of the world isn't going to get the use of the intellectual product. So as I suggested in an article on copyright's fair use doctrine, if a defendant faces market failure in the face of copyright, that is a good argument (if not a complete one) for not enforcing the copyright against him.

If markets do not evolve for a particular creative work or use—say for example that bargaining is impeded by problems such as externalities, high transaction costs, or the impossibility of identifying the copyright proprietor—then if the copyright laws prohibited copying in that area it would simply be preventing copying without yielding creators any monetary advantage. That would be undesirable. Not only would copyright then fail to perform its primary function, but if users can't reach market deals with creators, copyright would impose *more costs*

and generate *less benefit* than would a regime without copyright. For in a world without copyright, incentives may be low, but at least copyists and other users would have access to whatever works happened to be created; by contrast, in a world where there is copyright but no markets, incentives are low *and* the public has no access. Therefore the ability of users to form markets is crucial to copyright's economic mission of encouraging the production of new work to serve the public weal.

The ability of users to form markets under copyright is also important for another reason: administrative costs. Let us say that after having supposedly cured the first market failure—the public goods problem—by setting up a system of intellectual property rights, Congress decides to cure any secondary market failures that arise that could block licensing of the copyrighted works. So perhaps transaction costs block licensing in a particular industry, and the legislators cure the market failure by setting up a scheme like compulsory licensing, or by explicitly authorizing courts to give continuing damage remedies; in cases like that the law is “making a market” of sorts. For example, the compulsory licensing scheme may eliminate bargaining difficulties by imposing a mandatory license fee, and the fee becomes the “price.” Similarly, a court that allowed an infringing use to continue while awarding a damage remedy or a reasonable royalty would basically be setting up a compelled license. But these schemes are much more expensive and cumbersome than ordinary markets are.

Also, because their administrative costs are high, there will be gaps in coverage: such devices will not be set up wherever their administrative costs outweigh the benefits of a given license. These devices are also likely to be imperfect market mimics, for nothing calls forth accurate revelation of preferences and costs like a real bargaining situation does. Therefore, for example, even as to a class of uses covered by a compulsory license scheme, some sort of particular uses that would occur in a perfect market will not happen.

Considering the administrative costs of these market substitutes, it may be that an intellectual property regime that faces significant market barriers won't generate enough economic incentives to be worth pursuing even if the lawmakers are committed to surmounting these barriers. Not only might the administrative costs cancel out much of the incentive gains, but incentives themselves may be low because some potential uses will remain unexploited.

So where does this leave us? I argue that it shows us that intellectual property rights are most easily justified when the two conditions of asymmetric market failure converge: Where intellectual property is necessary to cure a market failure faced by authors, and where, after

the law adopts an intellectual property system, users do not face market failure in their search for licenses. Under such conditions, the allocative gains for an intellectual property system are likely to be high, and the administrative costs of the system are likely to be low.

When the two conditions of asymmetric market failure obtain, authors face a market barrier that copyists do not. In a world where lack of copying restrictions leads to market failure, authors cannot easily get paid—for example, they may not even know who the potential copyists might be and, therefore, could not negotiate with them. Yet, if in a world that *has* copying restrictions, copyists can form markets, they are not stymied. For example, if copyists know who owns the work they wish to reproduce, they may be able to bargain for the right to do so. Licensing can evolve.

I'd now like to move to the second half of my presentation: the prisoner's dilemma model. That model is related to what I just covered, and I would like to spend a moment making the connections explicit.

As you will recall, the first prong of my asymmetric market failure test addressed the question of whether intellectual property is really necessary to provide adequate incentives. Commentators like Stephen Breyer and Tom Palmer have suggested there are situations in which authors *can* obtain payment even without a copyright system in place, and much debate centers on the extent to which intellectual property protection is really necessary in various industries. The second part of my presentation addresses the issue of when authors without copyright are most likely to face significant market failure. As I'll suggest, situations in which the prisoner's dilemma is present are situations in which the economic need for legal intervention is likely to be strong.

Thus, to tie the two parts of the discussion together: A copyright proponent will want to show that without intellectual property, creators would face market failure that would erode their incentives to create. The prisoner's dilemma, when present, presents a set of powerful incentives *not* to create. Where it is present, a *prima facie* case of author market failure is made out.

Prisoner's dilemma comes from game theory. Game theory essentially investigates how rational actors would behave under a variety of specific constraints, usually consisting of a pattern of payoffs that each player will receive from a particular configuration of player choices. The closer the constraints of a given game conform to real-world conditions, the more helpful the game will be in predicting real-world behavior, and the more useful experiments in changing the payoffs of that game will likely be in yielding information about how to change that real-world behavior. The game which has probably had the greatest influence on legal scholars is the prisoner's dilemma. In fact a multi-

person prisoner's dilemma is taught to virtually every first-year student today in his or her property class under the title 'tragic commons.'

Prisoner's dilemma is a game where each of the two participant players is likely to be better off if she is empowered to join with the other to constrain their mutual choices by some means, by, for example, law. Thus, though it may not always happen that way, each is likely to be better off if they can constrain their choices than each is likely to be if both are at liberty to respond to the initial payoff pattern as unconstrained individuals. The prisoner's dilemma pattern accordingly is used both to explain and to justify certain legal constraints.

The justificatory argument goes basically as follows; note it has one aggregative and one individualistic strand. If unconstrained incentives in a particular context would lead to mutually destructive behavior, the introduction of legal constraints into that context can be understood as a rational way to increase aggregate productivity. Second, on the individualistic side, if the constraints serve the parties' individual long-run interests, then it may be fair to treat each party as having given implied consent to the constraints, even if in the short run one of the parties finds it irksome.

Admittedly, prisoner's dilemma may be more harmful to the group than to individuals—some players are able to save themselves, albeit at the expense of the player opposite them. Therefore, the first strand (aggregative) tends to be stronger. Nevertheless, the game suggests why people may give consent to being constrained. The literature is full of variations of implied consent, from Locke to Rawls and beyond. But all of those implied consent locutions have a concern with looking to the welfare or interest or preferences of the people affected rather than some outside third party, like a king; therefore, something that helps individuals be better off in the long run is susceptible to justification under a wide range of legal theory and political theory.

The prisoner's dilemma game gets its name from the heuristic commonly used to illustrate it. Imagine two prisoners who had joined together to pull a heist and have gotten arrested. The prosecutor has some evidence against each, but not enough to be conclusive on the severest charge that the acts of the two would warrant. Say, for example, that if both stay silent, cooperating with each other and denying the prosecutor any additional information, each can expect a short jail term of eighteen months. That's the basic starting point.

Now assume that each prisoner is in a separate cell and they can not communicate with each other. Each is approached by the prosecutor and told the following: If she rats on her pal and the pal stays silent, the prosecutor will dismiss the charges against the informant and use the proffered information to convict the pal for the maximum

term, nine years. Conversely, the prosecutor also tells her that if she refuses to rat and her pal rats, then she will go to jail for the maximum and her pal who confessed will go free. If both rat, the prosecutor says, he will use the information against each, but in return for their forthcomingness will send them to jail for only a moderate term, say five years.

What often happens in plays of this game is that both players rat on each other. Now, if both players rat, both are worse off than if they had cooperated with each other and stayed silent because they are both in jail for five years instead of the eighteen months they would have each received if they stayed mum. To avoid this result it is necessary to change the payoff structure. One reason we might not allow binding keep-silent contracts between two criminals in jail is because we would not want to change their payoff structure. But the game can be generalized well beyond that context to places where you do want people to be able to constrain their choices—as by binding contracts or by rules of property or tort—so they will do things that yield maximum benefit for themselves.

Just to formalize for a moment, imagine a blackboard which I don't have. Take out your pens if you don't mind; this will make it easier to follow what I am about to say. It will be a matrix showing the payoffs that constitute the classic prisoner's dilemma, and here I am following Charles Goetz's version.

Across the first horizontal line would be the payoff you get if you cooperate; across the second horizontal line would be the payoff you get if you defect. By defect I mean you rat to the cops.

PROFESSOR LITMAN: The second is what?

PROFESSOR GORDON: You're cooperating, first horizontal line; you are defecting, second horizontal line; each line is under each other.

Your reward for cooperating or defecting will be affected by what the other prisoner does. So you also make two vertical columns. The first shows what happens to you if the other player cooperates, that is, he keeps silent, and the second vertical column shows what happens if the other player defects, that is, if he rats.

By the way, for intellectual property purposes, what I mean by "cooperation" is making your own independent work rather than copying; a "defection" will be copying. We will get there in a minute. We should first finish the generalized model.

By now you have four boxes formed by the intersection of the horizontal and vertical lines. In the upper left hand corner, for example, you'll put the payoff you will get if you and the other player both cooperate.

In the cooperate/cooperate box put A, if you don't mind. That's just a symbol. In the heuristic I gave you a minute ago, cooperate/cooperate means you are both silent and both go to jail for eighteen months. So A equals minus a year and a half in that version of the game. In the box under it, where you are defecting and the other player is keeping mum, he is cooperating, put B. What is your yield in that box? In the prisoner's context, you go free, which is a fairly high reward. So B equals freedom or zero years in jail. Now, in the box where you are cooperating but the other is defecting, which is in the upper right hand corner, put C, and your payoff for C in the prisoner context is that you are going to jail for nine years. Beneath that, in the fourth box put D. That's defect/defect, the payoff to you when you both rat. Since you would both then go to jail for five years, D is a payoff of minus five.

Formally speaking, the constraints of prisoner's dilemma are that B is greater than A; D is greater than C; A is greater than C; B is greater than D; and A plus A is bigger than the sum of any alternative pair of payoffs the two players could achieve. Basically what that means is this: Defecting is the dominant strategy; both parties may be led to defect in a context where mutual defection makes them both worse off than mutual cooperation; and had they both cooperated, the aggregate welfare of the pair would have been higher than it is under the other options.

Getting back to an example in intellectual property terms, cooperation means creating your own individual work. Defecting means copying the other person's work. A prisoner's dilemma situation results when there are two parties, each a potential creator or a potential copyist, who face the following set of circumstances. First, creation of a new work is expensive, but it is cheap to copy the work and make it into a new product. Second, investing in the creation of a new work will more than pay off its investment, so long as no copying occurs. (By the way, we all realize this doesn't always happen, and a prisoner's dilemma is present only where these various circumstances are fulfilled, where they match the real world.) Third, if copying occurs the creator will lose all his investment. This is plausible because the copyist, being free of creation costs, may be able to charge less for the product than the person whose efforts first produced it. If the creator's and the copyist's products are identical, consumers will presumably purchase the cheaper one.

Now, if these circumstances are present, they in turn might provide the following specific payoff structure. If both parties cooperate, that is, they opt to create their own works independently, then both parties reach their own audience, and both prosper. That's A: like the

robbers going to jail for only a year and a half. Their payoff on the prosperous path is, let us say, to choose an arbitrary number, a hundred dollars profit each.

If both parties opt to be copyists, that is, if they both defect, there will be nothing to copy. The payoff of each is, therefore, zero. That is the box we labeled D, and in the other example it was equal to going to jail for five years.

If one party creates and the other copies, that is, one cooperates and one defects, the cooperative creator loses his investment, which is like going to jail for nine years in the other example. This is box C, and it gives the cooperator a payoff of *minus* 450, assuming that's how much it costs him to create the thing initially. (Ignore marketing costs for this example.) At the same time, the copyist makes a very large profit.

Let's say the original work cost 450 dollars to make and a creator without competition would have earned a gross revenue of 550 dollars, giving him a profit of a hundred dollars. Along comes the copyist, and since he is free of the 450 dollar creation cost, assume he sells at a lower price and takes the entire market—making, let us say, a total of 530 dollars. So had the party we are looking at chosen to be a copyist, and had the other party chosen to be a creator, the payoff in box B would be 530 dollars in profit. That's like being released from prison in the prior scenario.

In the circumstances set out above, choosing not to be a creator becomes the dominant strategy. The reason is clear: there is a huge potential loss associated with creating, you have lost your 450 dollar investment in the creation cost; and there is a huge potential gain of 530 dollars associated with copying. Now, if this is true, both parties looking rationally to the future may opt to be copyists. After all, even if they both position themselves to copy and achieve zero payoff, that is a lot better than losing their shirts, which is what happens if someone creates and then is a victim of somebody else's piracy. Yet had both been cooperating creators, they would be better off, as would society which contains their potential customers.

To cure this situation, the law creates various anti-copying rules in the form of doctrines such as copyright and patent. These legal regimes alter the relevant payoffs, and in so doing discourage copying and encourage investment in creative activity.

In the original form of copyright, 1790, American copyright tracked the prisoner's dilemma model quite closely. Authors were protected only against copyists whose sales would be most likely to be competitive and undermine the author's incentives—there was no right to control performances of one's work, public displays of that work, or,

most important for our purposes, the making of derivative versions of one's work. For example, abridgements were not infringing back then so long as they were bona fide abridgements addressing a different market from one's own. In fact, one of the early abridgement cases, *Folsom v. Marsh*, helped give rise to the doctrine we now know as fair use, and this is fitting, for fair use is practically the only copyright doctrine where current law shows special solicitude for the creative defendant, that is, the defendant who is not competing and has high costs of his own. Today the creative copyist is most likely to be treated as an ordinary infringer.

The most obvious illustration of this change is that copyright today grants authors extensive rights to control the making of derivative works. As a result, it protects creators in situations where no prisoner's dilemma is present. For example, where a copyist is making a creative use of a creator's book in an unexpected and noncompeting field, as where a producer uses the plot of a novel as the basis for an exercise in a new art form, the costs of making that novel into the new product are very high. That is, costs of copying are not cheap, so that even without copyright protection, the payoff for copying in box B is not extraordinarily high. Also, the original author is likely to face no resulting decrease in the sales of her book, quite the contrary, in fact. Her books sales are likely to rise from the publicity. Therefore the payoff in box C isn't as negative as it would be in a prisoner's dilemma. Nevertheless, the producer today must bargain for the adaptation rights or face the author's wrath in court.

The reasons for Congress granting this expansive set of rights may be tied to the same notions of personality as arguably underlay the Court's preference for creativity in *Feist*. That was Jerry's [Professor Reichman's] speculation. On that I offer no opinion. I think it may be part of the reason but not all of it. But the divergence between pure prisoner's dilemma and copyright's coverage does at least suggest that there may be some merit to the Court's holding that something other than piracy of valued labor need be shown before one can invoke the copyright act's extensive grant of rights and remedies. That is, if copyright rights and remedies give coverage in situations where the need for incentives is less acute than it is under prisoner's dilemma, it doesn't seem right to use a claimed need for incentives, standing by itself, to invoke the act's protection.

Dennis Karjala argues that copyright should make all acts of piracy infringements, regardless of the creativity of the work that is pirated. By piracy, I think Dennis has in mind something like the classic prisoner's dilemma. You will see various pieces of his paper all converging on that point. That is, in his examples where he sees piracy and

favors liability, the following circumstances tend to conjoin: there are two competitors; usually, one is a creator whose investments in creativity are high; one is a copyist who copies at low cost and undersells the creator; the creator is ruined; and the prospect of such events deters creation *ab ante*. This looks remarkably like the prisoner's dilemma pattern outlined. But however consistent with copyright's 1790 structure Dennis' proposal might be, the proposal does not sit easily within the current copyright law. Clearly that is something he already recognizes, but I find it troubling to mix the two kinds of arguments as freely as his suggestion might lead us to do.

What is the importance of prisoner's dilemma? Does it really illustrate anything? One thing it does, is to suggest why so many scholars have insisted on keeping competition between the parties a prerequisite for suit under misappropriation law, because when you do not have competition between the parties you do not have a prisoner's dilemma payoff structure which is so destructive to incentives. Also the prisoner's dilemma suggests explanations for several other areas in the law. For example, it suggests rights are only needed where the costs of copying are low. That's one explanation for why trade secret law permits reverse engineering. It is an instance where costs of copying are quite high so you're not going to have the same kind of temptation that can lead to a destructive prisoner's dilemma spiral where people are being tempted to copy, or other persons are afraid to be creative, because copying looks so easy.

The bottom line question might be: Do I believe prisoner's dilemma is a necessary and sufficient basis for copyright protection? Clearly not. For example, free speech concerns could counsel against granting rights over copying even where a prisoner's dilemma is present. Conversely, there may be noneconomic policies favoring copyright that policymakers find persuasive independent of prisoner's dilemma and other incentive arguments. But I must leave the discussion of the other issues of concern to other fora rather than go into them here. The point about prisoner's dilemma is a fairly narrow one. If a policymaker is concerned about allocative efficiency, and wants to encourage people who are creative to use their resources to produce things of value, the arguments for protection tend to be high from that one particular policy perspective when the facts show prisoner's dilemma. When the facts do not show a prisoner's dilemma, then that particular kind of argument—about incentives being so threatened that society needs legal protection—just does not fly as well. In the absence of a prisoner's dilemma situation, something else—whether it is another form of economic argument, or arguments based on personality theories, reward theories, corrective justice, or yet other policies—must be looked to to

for an explanation of why the courts might be giving protection. In short, the absence of a prisoner's dilemma situation means one must be more suspicious about claims that market failure justifies judicial or legislative interpretation. Thank you.

