Not Just Being There: An Economic Analysis of Fact Witness Payment

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ABSTRACT

In this paper we discuss the disparate treatment of perceptual ("fact") witnesses and expert witnesses in the legal system. We highlight the distinction between the perceptual act of witnessing and the act of testifying, and argue that although there might be good reasons to regulate payments to fact witnesses, the customary prohibition on paying them for their services is not justified by reference to economic theory. We propose considering a court mediated system for compensating fact witnesses so as to encourage witnessing of legally important events. We construct a simple model of witness incentives, and simulate the effects of several possible payment mechanisms. Although it is possible that any system that offers a financial incentive will induce some unreliable witness testimony, we argue that the current system also provides incentives for biased testimony, so it is not clear that a payment system would lower the quality of witness testimony.

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1. INTRODUCTION

Two different legal regimes govern the market for expert witnesses and perceptual ("fact") witnesses. Litigants secure the services of expert witnesses through the payment of a negotiated rate. Fact witnesses, by contrast, receive zero compensation for their services. Unlike experts, whose testimony is voluntary, fact witnesses can be compelled through subpoena. Thus experts' labor is protected by the property rule typical in contractual settings, while perceptual witnesses fall under a liability rule with compensation set at zero. This two-fold distinction – compensation and consent - between the market for expert and fact witnesses spans Western legal systems.

This paper takes these differences as the point of departure for examining the economics of fact witnesses. We show how the differences between fact and expert witness justify the use of a liability rule for the former, but do not explain the rule of zero payment. Indeed, non-payment of fact witnesses results in suboptimal levels of witnessing. The paper explains that witnessing – perceiving phenomenon that will be relevant to litigation – is an activity distinct from testifying. Whether someone witnesses litigation-relevant facts depends in part on their voluntary actions. Thus the level of fact witnessing is sensitive to incentives. The current non-payment regime discourages investments in witnessing and results in a socially suboptimal amount of information being generated. Moreover, inadequate compensation for the costs of testifying what one has witnessed acts as a tax on witnessing and encourages people to avoid witnessing and to conceal the fact that they have witnessed.

There is, however, a strong reason for treating fact and expert witnesses differently, one that has been thus far neglected. Fact witnesses possess a strong natural monopoly. Thus market-rate payment for fact-witnesses could be even more problematic

than non-payment, as it would allow for holdout and rent extraction by the witness. This paper explores the effects of an intermediate regime -- a regulated-rate payment system for fact witnesses– a model that has not been previously considered. We conclude that a system with properly set payments for fact witnesses would be superior to both the status quo and the mostly unregulated property rule applicable to experts.

To the extent the law and economics literature on evidence has dealt with witness issues, it has focused on the payment and performance of expert witnesses or party witnesses (Posner 1999; Shapira 1998). Yet the much larger phenomenon of the supply of third party fact witnesses has never been examined (Sanchirico 2007). Indeed, the literature generally assumes that all evidence is within the control of the litigants or other interested parties, and their incentives determine the amount of evidence production (Sanchirico 2001, 2007; Acconcia, Immordino, and Rey 2009). This paper broadens the analysis to include disinterested third-parties with relevant information. It also contributes to the literature by showing how existing legal rules affect evidence production independent of litigant conduct.

Section 2 examines the differences in the markets for fact and expert witnesses. It shows how fact witnessing is a distinct activity from testifying, and shows how compensation can affect the level of witnessing. Section 3 examines the difficulties a compensation system would have to overcome, including incentives for perjury, overproduction and other issues. The Appendix develops a simple model of witness behavior and simulates the response to several proposed mechanisms for rewarding witnesses.

2. EXPERT VS. FACT WITNESSES

The American Bar Association's Model Rules of Professional Conduct, adopted by many states, reflects the basic division between expert and fact witness fees: "The common law rule in most jurisdictions is that it is improper to pay an occurrence witness *any fee* for testifying and that it is improper to pay an expert witness a contingent fee."[2]

> *A lawyer should not pay or agree to pay a non-expert witness an amount in excess of reimbursement for expenses and financial loss incident to his being a witness; however, a lawyer may pay or agree to pay an expert witness a reasonable fee for his services as an expert.*

These rules have been interpreted in most jurisdictions as allowing for the payment of actual expenses incurred in coming to court to testify, including, in some places, lost wages or other measures of opportunity costs. (This issue will be discussed below.) But no jurisdiction provides compensation for the service of having witnessed or for any activities of the witness before being summoned (Villa 2001; Maskin and Cailteux 1999).

There is no comprehensive theoretical account of the different rules for payment of fact and expert witnesses. Payments for fact and expert witnesses are generally discussed separately in the legal practice literature and thus little light is shed on their comparative treatment. The reasons generally offered for nonpayment of fact witnesses are concerns about encouraging witnesses to color or even fabricate their testimony; increasing the costs of litigation and putting it beyond the reach of many (Kinsler and Colton 1999); and more abstract notions of a civic duty to reveal legally relevant

[2] . Similarly, the ABA Model Code of Professional Responsibility, the predecessor to the Model Rules, allows the expert witness to be paid for her "services," but other witnesses can only be paid for actual "expenses reasonably incurred . . . in attending or testifying.") Rule 7-109(C). The distinction with expert witnesses is made explicit: "A lawyer should not pay or agree to pay a non-expert witness an amount in excess of reimbursement for expenses and financial loss incident to his being a witness; however, a lawyer may pay or agree to pay an expert witness a reasonable fee for his services as an expert."

information.[3] Of course, none of these policies explains the differential treatment between fact and expert witnesses: slanted testimony and costly litigation are vices often attributed to the use of experts.

The conventional understanding of why expert witnesses *do* get paid is that they had to invest time and money to obtain the expertise that makes their testimony valuable. The possibility of earning expert fees raises the potential earnings in various fields and thus makes them more attractive to potential entrants (Thornton and Ward 1999). If not compensated sufficiently, people would under-invest in developing the relevant expertise. The implicit assumption behind treating fact witnesses differently is that because they did not make particular investments to secure their information, their actions are insensitive to incentives, so there is no need to compensate them.

2.1. Market Power

As will be shown below, the differences between expert and fact witnesses do not justify the rule of nonpayment for the latter. The differences do justify the other variation in their treatment - property rule protection of experts' testimony versus the compelled access to fact witnesses' testimony. There is a competitive market in most areas of expertise. Many are able to obtain the education necessary to qualify as an expert. One can expect that expert witness compensation would be competitive. Not so with fact witnesses. Having perceived something that has already transpired, fact witnesses possess one of the purest natural monopolies imaginable. A past event will not be produced or discovered in greater quantities. Given that fact witnesses have market power, in the crucible of litigation they would demand monopolist rates, extracting the social surplus of

[3] Golden Door Jewelry Creations, Inc. v. Lloyds Underwriters Non-Marine Ass'n, 865 F. Supp. 1516 (S.D. Fla. 1994).

the litigation. Strategic behavior by such witnesses could lead to bargaining breakdown, keeping their testimony out of court and reducing the accuracy of litigation.

This difference between fact and expert witnesses justifies compulsory process but does not satisfactorily explain nonpayment. The standard response to a problem of natural monopoly is compelled access and rate regulation. Private market power in the face of a social need is the familiar problem of takings, which is governed by a liability rule. But with takings, payment is made at a governmental estimate of fair market value. Even if one assumes that witnessing is a windfall -- benefits obtained without any prior investment – the standard response is taxation not confiscation.

2.2. Witnessing and Incentives

The standard justification for nonpayment of perceptual witnesses assumes that witnessing is entirely a windfall, and thus its incidence is insensitive to incentives. Yet the level of witnessing depends in part on effort and choice. It is important to distinguish between witnessing and testifying. The former refers to the actual perception of an occurrence. The latter refers to recounting in court what one previously witnessed. One can witness and not testify (if one does not come forward and is not subpoenaed); and testify without witnessing (perjury). Many jurisdictions allow some payment for *testimony* – meaning the time and expense of going to court. Even if this were fully compensatory, it would not compensate for the separate and prior activity of *witnessing.*

Fact witnessing may involve investment and effort. If perceptual witnesses were paid for their information, one would expect an increase in perceptual witnessing. Going further, people may draw on their private information to position themselves in settings

where they might witness the most legally valuable phenomena. The extent to which this happens would of course depend on the prospects of compensation.

While it may not be obvious today that fact witnessing is responsive to incentives, one hundred years ago it was not understood with respect to expert witnesses either. John Henry Wigmore explained that the then-current rule against paying *expert* witnesses by observing that "it is only by accident and not by premeditation or deliberate resolve with reference to the litigation that either [a fact or expert witness] has become desirable as a source of evidence; neither the expert in blood-stains nor the bystander at a murder has expressly put himself in the way of qualifying as a witness so that no claim based on a special dedication of services for the case can be predicated of one rather than the other (Wigmore 1905, § 2203 at p. 2986)." Today, the notion that the forensic expert did not invest in his human capital at least partially with an eye to litigation can be dismissed as naive. Yet in Wigmore's time, it may have been true in the simple sense precisely because payments to expert witnesses were not generally permitted. Just as it is circular to argue for nonpayment of experts because they had thus far not been paid and yet acquired their expertise anyway, one cannot say paying fact witnesses is unnecessary because they obtained their socially valuable information "only by accident." While in a static perspective, payment of both kinds of witnesses will not retroactively change the supply of witnesses in the current period, in a dynamic setting, the availability of payment will affect the supply of both kinds of witnesses.

Consider some illustrations of how compensation can affect witnessing. Under the current regime, a passerby might not stop to observe the condition of victims of a car crash. Even though such immediate observation could be very valuable in subsequent litigation, under a no-compensation regime passers-by have no incentive to witness. In

another situation, one might walk out of the room when a colleague notorious for sexual harassment enters. A retiree who has a choice between watching television for an hour and keeping an eye on a corner famous for its automobile collisions may, in a witness payment regime, choose the latter option. People who live in violent neighborhoods may be encouraged to put cameras outside their houses to witness events on the street.

The situation is analogous to the problem of salvaging buried treasure. As with witnessing, the largely fortuitous nature of treasure-finding does not make it insensitive to marginal inputs of effort. A person walking along the beach might receive a hint of the possibility of treasure (a gleaming thing in the sand, perhaps) and decide whether to incur some cost of investigation (such as dirtying her clothes) depending upon what she would be likely to keep should she find something. Confiscatory policies will also prevent treasure finders from revealing their discovery, as well as discouraging professional treasure-hunting. An optimal policy would compensate finders to promote disclosure and some level of search, but would not give them the full social value of the discovery so as not to induce excessive and duplicative treasure hunting (Landes and Posner 1978). As will be seen, the problem of duplication is less severe with fact witnesses, as there can be social value from multiple witnesses observing the same thing, while there is not social value to two people finding the same buried treasure.

Subpoenaed fact witness testimony amounts to a levy of personal services. Forced, uncompensated labor is anomalous: the major other examples are jury service and the (discontinued) military draft. The draft is in effect a tax on young able-bodied men. The "draft tax" may be thought to have relatively little incentive effects, since it is difficult to substitute away from being a healthy young man (though not impossible, as evidenced by self-inflicted wounds and flight to Canada). One might think the same

applies to witnessing, since once cannot "unwitness" without committing perjury (Posner 1998). However, variable individual levels of effort have a much greater effect on the probability of becoming a witness than they do on becoming an 18 year old man. One makes choices about how often one goes out, where one goes, how attentive one is, etc. Furthermore, although an individual witness can be compelled to testify once they are identified, it is far more difficult to compel someone to identify oneself as a witness.

Turning to the mandatory service contextually closer to testimony, jury duty is widely evaded, but it is unlikely to have significant *ex-ante* behavioral effects. Jurors are not expected to bring anything of value to the judicial process except themselves, and they cannot underproduce themselves. Fact witnesses, on the other hand are expected to bring valuable information that improves the accuracy of litigation, and the possession of this information varies with effort.

2.3. Paying Perceptual Witnesses in Current Practice

While the expert/fact witness disparity is a formal feature of the justice system, paying perceptual witnesses for more than just testimony is already an explicit or implicit feature of several public and private arrangements. The Internal Revenue Service pays informants a "reward in proportion to the value of the information" they provide on tax evasion by others -- a percentage of the government's recovery in a subsequent suit or investigation (U.S. Internal Revenue Service 2004). Police departments provide cash bounties for informants or leniency at trial for incriminating plea bargains and jailhouse snitches. (In some cases, the leniency or other considerations for criminal informants serve partially as payment for the risk of testifying, rather than for witnessing.) However, payments to everyone from jailhouse snitches to *qui tam* plaintiffs do not depend on their

testifying in court. Rather, they are payments designed to encourage actual witnessing – obtaining of legally valuable information (Scott 2006).

Private parties also implicitly pay for the activity of witnessing. An associate who is brought along by a an executive to sit in during an employee termination or other meeting that could result in litigation so that he can subsequently testify about anything that transpired can be seen as a professional witness. More blatantly, in Great Britain, tabloids pay for information even from sources that are witnesses to crimes. Anecdotal evidence suggests people insinuate themselves with likely defendants so they can might later be paid to divulge information to a newspaper - an illustration of how witness payment can have *ex ante* effects on investments in the production of information.

3. COMPLICATIONS

3.1. Perjury

Paying fact witnesses would have potential drawbacks that have to be balanced against the benefits. Chief among these is the increased incentives for perjury. Increasing the accuracy of litigation is a public good. In the simplest witness payment scheme, all witnesses would be paid by the government. (In criminal cases, fact witnesses' travel and other expenses are already paid by the court, so some of the administrative machinery is already in place.) This would eliminate the incentive to lie about *what* one saw for the benefit of one side or another, since there would only be one payer. However, one might still be tempted to lie about *whether* one saw anything, since it is the act of witnessing and not the content of the testimony that would determine eligibility for payment.

Perjury by fact witnesses could be discouraged through existing punishments, and perhaps less drastic but more easily administrable means such as withholding witness

payments or barring witnesses whom a judge concludes are not testifying truthfully from receiving future payments for witnessing. However, there are limits to how strong these incentives can be. If the incentives to avoid being found untruthful are too severe, or the standard for proving perjury are set too low, witnesses will be very reluctant to provide truthful testimony which might appear to be perjured or incredible. Rather than providing testimony that is actually true, the witnesses would choose to provide testimony that is 'safe' but is at best redundant and at worse misleading.

Incentives for fabricating a story increase with the level of compensation. The smaller the witness payment rate, the smaller the incentive to claim one has seen something when one has not, but at the same time the smaller the increase in witnessing. However, perjury problems are inherent in all witness testimony, and it is not clear whether a witness payment system would have more such problems than the current regime. Currently, the only parties who have any ex ante incentive to witness and testify are those with a stake in the case. Thus the primary producers of testimonial evidence are interested parties -- often the litigants themselves. Given that the stakes of the case are always greater than what a payment to witness would be, the incentives to perjury may already be higher than those created by witness payment. Even if witness payment led to some fabricated testimony, it could reduce the *proportion* of perjured testimony introduced into evidence.

The problem of tainted testimony arises with expert witnesses, who are selected and paid directly by the parties and consult with them prior to giving testimony. Yet experts have some private disincentives to perjure themselves. They are repeat players, and a bad reputation will hurt their livelihood. Furthermore, perjury by expert witnesses can generally be detected, or at least contradicted by other experts, who have access to

the same facts. This constraint will be less salient for perceptual witnesses, who might claim to have a unique vantage point, and for whom witness payment is more fortuitous and irregular. Yet concerns for reputation can cut both ways. Experts do not want a reputation for perjured or discredited testimony. But they do want a reputation for being useful to their client, which provides an incentive for biased testimony. Perceptual witnesses, precisely because of their market power, do not need to curry client favor. Thus it would be hard to say a priori that perceptual witnesses would be more likely to distort their testimony than experts.[4]

Finally, paying witnesses would also have an opposite effect on perjury. Because payment will increase the number of people actually witnessing an event, it will increase the expected cost of perjury by increasing the likelihood of detection. It will be hard to maintain that one saw something if multiple other witnesses say one was not at the scene. Thus payment has both positive and negative effects on perjury.[5]

3.2. Adverse Selection and Crowding Out

Closely related to the perjury problem are concerns about adverse selection and crowding out. We have argued that the quantity of available testimony will increase as compensation increases. However, if instituting payments significantly decreases the quality of available testimony, it may not be beneficial. The reliability of testimony from people who are only testifying for pecuniary benefits may be lower than from those who are testifying or witnessing out of a sense of civic duty.

[4] We leave to one side the epistemological question of whether lying means something different when it comes to facts one has perceived versus opinions one has formed.

[5] Prosecution for perjury is rare, in part because of the cost of what is essentially secondary litigation, and the difficulty of proving a statement false. However, the increased likelihood of impeaching a fact witness s valuable even if it only results in the rejection of the testimony. One could also imagine the use of small, judicially-imposed fines for rejected testimony, akin to contempt sanctions.

If the propensity to commit perjury is positively correlated with an individual's sensitivity to rewards for witnessing, concerns for adverse selection might be an argument for low or no rewards for witnessing. On the other hand, in many cases, the lack of a general mechanism to compensate witnesses enhances the adverse selection problem. Under current conditions, the people most likely to be tangibly rewarded for testimony are suspected or convicted criminals, hardly the most trustworthy segment of the population. One worries that even modest rewards to jailhouse informants might induce them to perjure themselves. .[6] Finally, we note that the impact of the adverse selection effect need not be monotonic. A small increase in payments (from zero) might decrease the quality of witnesses, by picking up the most opportunistic, but further increases in the payment might go in the other direction.

The Appendix considers a model where courts can adjust their payment of a witness based on how credible they find the testimony. Our results are that as long as payments can be conditioned on the court's beliefs about the prevalence of false testimony and the degree to which testimony is consistent with the testimony of other agents, increasing the rewards for testimony is unlikely to substantially decrease the reliability of testimony, even if unreliable witnesses are substantially more sensitive to monetary rewards than reliable witnesses. As long as some reliable witnesses are sensitive to incentives, increasing the payment attracts at least some reliable witnesses. As the number of witnesses increases, it becomes easier to distinguish between reliable witnesses and unreliable witnesses, and the difference between the expected payment for true witnesses as opposed to false witnesses increases. Thus, although the unreliable

[6] This explains the broad criticism of the use of jailhouse informants. Jailhouse snitches are criticized as generating a great deal of false information because they have few other opportunities to improve their position (Pew Trusts 2007).

witness are more sensitive to the increased payment, their expected payment increases less relative to true witnesses because the former are more likely to be found unreliable when there are more other witnesses.

There is some evidence that providing payment for what had previously been perceived to be voluntary or eleemosynary activity reduces the level of the activity by depriving people of the (higher) non-pecuniary compensation. A classic article by Gneezy and Rustichini (2000) describes studies where the imposition of a fine led more parents to pick up their children late at an Israeli day care. The authors hypothesize that the imposition of the fine reduced the parents' feelings of civic duty to pick up their children on time. The traditional argument against paying witnesses seems to invoke such considerations. "The testimonial duty, like other civic duties, is to be performed without pay, the sacrifice being an inherent burden of citizenship," as Wigmore put it.

However, it does not seem to us that fact witnessing is the kind of voluntary activity - like blood donation - that is subject to crowding out effects. For one, any civic duty felt by people today is likely to be one of testifying. People may feel obliged to testify if they have important factual information, but few feel any civic duty to *acquire* factual information that would qualify one to testify. Secondly, even now testimony is not a voluntary activity, but rather one that can be mandated by subpoena.

3.3. Overwitnessing

Witnessing produces diminishing marginal returns in terms of social welfare. If excessive payment is guaranteed to all witnesses, there may be too much witnessing. This is analogous to the overfishing problem: in an unregulated market, too much effort is expended catching fish because each additional fisherman gets the average production of

all fishermen rather than his own marginal product. However, unlike with fisheries, witnessing and testimony is already part of an existing regulatory process, the judicial system. Given judicial supervision of witness payments, the expected payment to a witness need not be set at a witness's average social value. Since the regulator is setting the price, the regulator can always set a reward low enough so there will not be overwitnessing. In any case, the optimal number of witnesses is not just a function of the needs of proof at trial, but also of deterring false or perjured witnesses. *Thus additional witnesses can add value by increasing the credibility of the other witnesses, even if they did not themselves witness anything unique* (see section 3.1).

To see why overwitnessing is unlikely to be an unavoidable consequence of such an incentive scheme we start with an examination of the original overfishing problem. Imagine that total fish production is given by a function ($f(x)$) of the number of fishermen (denoted x). Increasing the number of fishermen increases total fish production, so $f'(x)>0$, but we might assume that each additional fisherman increases total catch by less, so $f''(x) < 0$.

This could occur because some of the fish caught by the additional fisherman would have been caught anyway by one of the previous fishermen. If we assume that each fisherman actually catches the same number of fish, and the price of each fish is a constant p each fisherman's share of the total catch will be $p\,\frac{f(x)}{x}$. Note that because $f'(x)$ is decreasing, $p\,\frac{f(x)}{x}$ will be decreasing in x. Let us arrange the potential fishermen in increasing order of opportunity costs, and let $C(x)$ be the total opportunity cost of fishing

when there are x fishers, and let $c(x)$ be the opportunity cost of the x^{th} fisherman. (So $c(x) = \frac{dC(x)}{dx}$)

Fishermen will keep entering until $p\frac{f(x)}{x} = c(x)$. Call the value at which this happens $\hat{x}$.

The social welfare is the total value of the fish caught, minus the opportunity costs of the fishers. So it is simply: $p\,f(x) - C(x)$. Note that this will be maximized when $p\,f'(x) = c(x)$. Let us call that value x^*. Note also that if $f''(x) < 0$, $\frac{f(x)}{x} > f'(x)$ for all x. So if $p\,f'(x^*) = c(x^*)$ then $\frac{p\,f(x^*)}{x^*} > c(x^*)$, and $\hat{x} > x^*$. Thus even when there are a socially optimal number of fishermen, more will still want to enter, so in the unregulated fishery there will be more fishing then socially optimal.

Note that the overfishing problem arises partially from the lack of property rights in the fishery, which would have limited entry. Similarly, there are no property rights or markets for "witnessable" phenomenon, and thus there are similar problems with controlling entry.

Just as open access to a fishery leads to overfishing we might worry that open access to witnessing would lead to over-witnessing. With fact witnesses, it is certainly true that the marginal contribution of each additional witness is likely to be decreasing, as in the fishing problem. Much of the testimony of the additional witness could have been garnered from the original witnesses. Indeed if the total payments available to all witnesses were set to be equal to the total social value of witnessing, we would expect to see too much witnessing. However it is neither necessary, nor even likely that the total payments be set at the social value.

3.4. Amount of Compensation

Any fact-witness payment regime would face the problem of setting compensation correctly. If rates are not regulated, the monopoly power of many perceptual witnesses could lead them to extract surplus from litigants. Ideally, the rate would be set so that the expected payment for a witness is equal to the expected marginal social value of her witnessing. Because the value of an additional witness depends in part on how many other witnesses there are, determining the witness payment should depend on the supply of witnesses. A payment that is too low will not do much to solve the under-witnessing problem, while, an overly high rate could lead to potentially wasteful rent seeking activity, as too many people would seek to witness the same thing.

As will be shown in the model, if potential witnesses have no private information about the costs and the social benefit of witnessing a particular incident, it is possible to induce efficient incentives for witnessing with a fixed payment to all witnesses. If potential witnesses do have private information about the value of witnessing, perhaps because they can predict how many others are likely to witness the same incident, it might be possible to achieve efficiency with a payment that depends on the number of other witnesses who are available. However, if the potential witnesses have private information about the benefits of witnessing that are not easily verifiable (for example the quality of other witnesses), it may not be able to achieve first best efficient investment in witnessing. Nonetheless if witnessing has any social value, the current policy of no payment at all is never likely to be optimal.

A frequent cause of skepticism regarding price regulation is that it is unlikely that the government or regulatory agency will get the price "right", while it is likely that the price in a free market will more closely reflect the social value. As explained by Shavell

(1997), unlike the market-mediated rewards for fishing or treasure hunting, there are few market forces that tend to make the rewards for any use of the legal system equal to their social value, regardless of whether there are explicit subsidies or taxes. Thus there is no reason to believe that allowing a free market for fact witnesses is any more likely to result in the "right" price, strengthening the argument for a regulated price. Since we discuss a system of regulated payments, concerns about overwitnessing can be alleviated by offering lower rewards.

Returning to the fishing example, one way to achieve efficiency is to make sure that when there are x^* fishermen, each one expects to receive $p\, f'(x^*)$, rather than $p\, \frac{f(x^*)}{x^*}$. One way to do this is to impose a tax of $t = p\, (\frac{f(x^*) - x^* f'(x^*)}{f(x^*)})$ on each fish sold, or to sell licenses at $p(\frac{f(x^*)}{x^*} - f'(x^*))$.

In the fishing example, we start with the overfishing which would occur in the free market, and impose some form of tax to correct it. We take the opposite approach with witnessing. We start with the under-witnessing which occurs in the absence of payments and offer a subsidy to correct it. Constructing an expression for the value of an additional witness from first principles would involve looking at the social impact of the underlying behaviors the legal system is trying to regulate, along with assigning values to the abstract concept of dispensing justice, and is far beyond the scope of this paper, Instead we will assume a reduced form expression for the value of witnesses. Let us use the function $V(x)$ to represent the social value of witnessing where x is the number of witnesses. We assume that $V'(x) \geq 0$ for all x, and that there exists some $\underline{x}$, such that if $x > \underline{x}$, $V''(x)<0$. That is to say that having more witnesses is never harmful, but that at

some point ($\underline{x}$), the marginal value of each additional witness decreases.[7] We could imagine that having too many people testify could be undesirable because it could lead to long trials and high costs, but it seems unlikely that having too many people witness can be detrimental to adjudication.

We also assume that there is a cost to witnessing, and that this cost varies among people. Thus if there are J potential witnesses, each witness has a cost of witnessing c_j. Importantly, we would assume that there is some possibility that $c_j \leq 0$ for some j. In other words, there is a possibility that there will be some witnessing, even if there are no rewards. Let γ be a ranking of costs so that γ_n is the cost for the n^{th} lowest cost witness. And let $N(\gamma)$ be an inverse cost function defined so that $N(\gamma)$ is the number of potential witness with cost less than γ. Let K be the set of actual witnesses, let k be the size of K. So k is the number of witnesses and $N(\gamma_k)=k$. The optimal allocation maximizes $V(k)-\sum_{j\in K} c_j$. Let k^* be such that $V'(k^*)= \gamma_{k*}$. If the social planner sets the reward at $r = \gamma_{k*}$, then we will have efficiency.

It may be difficult to know what the optimal level of witnessing is in any particular case. For one the distribution of costs $N(\gamma)$ will tend to vary from case to case, leading to variation in k^* and hence γ_{k*}. Since the costs differ, a fixed reward will result in wide variation in the number of witnesses. For example, there might be many more witnesses to an event on a busy intersection than in a dark alley on a winter night. A fixed payment would over-incentivize witnessing of easy-to- see events, and not give enough incentives for events that are difficult to witness. It would most likely be far too

[7] We do not assume that $V''(x) < 0$ for any $x > 0$ because there might be cases where for credibility reasons, two or three witnesses might be much more valuable than only one.

cumbersome for the courts to independently estimate a cost function for each witnessed event.

However, the number of actual witnesses is probably a pretty good indicator of the cost, when there are few witnesses, it is reasonable to conclude that costs of witnessing were high, and when there are many witnesses the cost of witnessing was most likely low. Thus the courts could adopt a reward schedule that decreases in the number of witness. If the social planner does not know $N(\gamma)$, it is not possible to directly identify k^*. However if we assume that the court still knows *V(k), and* it is feasible to construct a reward system with a variable reward *r(k)* such that $r(k)=V'(k)$, then each potential witness's expected returns from witnessing would be equal to the marginal social returns. Thus we would achieve the information-constrained first best result.

If potential witnesses have private information about the value of their testimony, so that *V(k)* is not known by the court, then it is not possible to provide optimal incentives unless the payment can vary with the quality of witnessing. Any incentive scheme that provides the same reward for witnessing regardless of the quality of witnessing might attract too much low quality witnessing and not enough high quality witnessing.

Of course, the difficulty of determining social value and optimal payment is not confined to fact witnesses. This is just an instance of a problem that cuts across the legal system. While it is difficult to assess the marginal social value of any input into the legal system, society implicitly values many of the inputs when it chooses how much to spend on them. For one, society makes implicit judgments about how important it is to have accurate criminal trials when it decides how many police, prosecutors, judges and public defenders to employ. Few argue that the fact that we are not confident of the exact value

of any of these inputs implies that we should not pay for them. Similarly, difficulties in valuing additional witness do not mean that they should not be rewarded.

3.5. Testimony Fees

As discussed above, testimony is a distinct activity from witnessing and has separate costs. The economic costs of testifying include travel and the opportunity cost of time in court. Because testifying can be compelled when one has witnessed a relevant event, undercompensated costs of testifying effectively serve as a tax on witnessing. Jurisdictions are divided on extent to which witnesses can be reimbursed by lawyers in civil suits for the cost of testifying. In criminal suits, almost all jurisdictions provide some compensation for testimony expenses, but there generally are vastly under compensatory (well below minimum wage).[8] The analysis here strongly supports full reimbursement of all expenses including opportunity costs and preparation time in both criminal and civil cases. Of course, if fees for fact witnesses were available, undercompensatory reimbursement for testimony would lower the effective payment.

While paying for witnessing increases the amount of witnessing but may also cause some problems, an effective negative payment reduces witnessing but has no socially desirable consequences. Indeed, if witnesses are not compensated for the opportunity costs of their time and testifying -- above and beyond any fee for their having obtained valuable information -- it could have an adverse selection affect. The greater someone's opportunity cost of time, the greater their incentive to avoid or not disclose having witnessed. If one believes low opportunity costs are associated with unreliability, the current system selects for the worst witnesses. A concern with payment for witnessing

[8] For example, the New Hampshire Department of Justice Witness Payment Program provides a maximum $24 a day for expenses.

is overproduction for easy-to-witness events, things many people see. Undercompensation for testimony has the opposite effect, discouraging the production of the most valuable kinds if witnessing. For example, for events with only a single witness, his testimony is relatively valuable. However, it is easier for him to not disclose having witnessed, as others cannot put him at the scene, and thus undercompensation may disproportionately select against witnesses.

CONCLUSION

This paper has examined the economics of fact witnessing, and the differences in the market for fact and expert witnesses. It concludes that the principal economic difference between fact and expert witnesses is the market power of the former, which justifies compulsory process. Not paying perceptual witnesses a market rate is certainly justifiable. Yet the current regime of zero payment produces socially suboptimum levels of witnessing relative to a properly calibrated payment regime. Very small payments (above all actual expenses and opportunity costs of testifying) might have some (small) social benefit compared to regime of nonpayment.

APPENDIX:

The formal analysis in the body of the paper assumes that all witnesses are equal, and more problematically, that the quality of the witness does not depend on the reward structure being given. Even though we believe there are good reasons why people who are encouraged to be witnesses by payment will not generally be less credible than witnesses who come forward without payment, we think that a well designed system would provide safeguards and disincentives for false testimony. Below, we model a

system of incentives where payment for testimony depends on the extent to which the court believes that the purported witness actually witnessed the event.

MODEL

Imagine that there are N members of the population, split into two kinds of people, honest, and dishonest. The likelihood that any member of the population is honest is λ, In addition to any cash reward, honest people receive a warm fuzzy feeling, worth b, from testifying truthfully about an event they have witnessed. Honest people are also unwilling to falsely claim they have witnessed an event. We assume there is a cost of actually witnessing, which is distributed according to $F(\gamma)$. Thus when the expected payoff from truthfully witnessing an event is u_T, the expected number of honest witnesses is $N\lambda F(u_T+b)$. The remaining fraction of the population is dishonest, and willing to make a false claim to be a witness, and their cost of doing so is $G(\gamma)$. For simplicity, we assume that these people never actually witness the event. Thus the expected number of false witnesses is $N(1-\lambda)F(u_F)$

If one could impose an arbitrarily high penalty for perjury, we could discourage perjury even by those who have a low likelihood of being caught. This would naturally make offering rewards for witnessing more attractive, but as we noted in the body of the paper, extremely large penalties for perjury might discourage truthful witnesses from testifying, and thus we might assume that the penalty for being found guilty of perjury is fixed at some practical maximum, but that the courts have available a less stringent penalty of withholding payment to witnesses if it is convinced the witness's testimony was not truthful.[9] To be conservative, in our model we assume no penalties other than the withholding of payment are available.

Because of the lower standard for denying a reward on the basis that a witness is not valuable, we will assume that it is possible to deny or decrease payment based on circumstantial evidence. This implies that an increase or decrease in the quality of circumstantial evidence can be self-reinforcing, leading to a possibility of multiple equilibria. When evidence is generally scant and of poor quality, it is difficult to know whether any particular witness is trustworthy and there is less difference in the expected

[9] Perhaps the court could use a preponderance of the evidence standard, or a clear and convincing evidence standard to justify refusal to pay the witness payments.

compensation between false and true witnessing, leading to lower quality. On the other hand, when evidence is expected to be of good quality, it is easier to identify false witnessing, so there will be fewer false witnesses and testimony will generally be more credible. With the same legal rules regarding payments, it is possible that there could be one equilibrium where the general expectation that witnesses will generally be high quality discourages false witnesses, and another one where all witnesses expect that there will be lots of false testimony, and thus false witnessing may avoid detection.

Formally, we assume that there are J potential facts relating to the event that can be witnessed, and there is some likelihood ρ that one fact is salient. A salient fact is one that is particularly likely to be noticed for reasons that are particular to the incident witnessed. If there is a salient fact, the likelihood that any particular true witness notices is it is μ. An example of a fact would be "The perpetrator is wearing a blue jacket".

However, when a false witness fabricates a statement, since he didn't actually witness the incident, and thus has no knowledge that any one of the facts is salient, he must guess whether or not any fact was salient. Furthermore, even when the false witness correctly guesses that there is a salient fact, he must guess correctly what that salient fact is. Thus when two or more witnesses report, but disagree on either whether there was a salient fact, or what the fact was, this is a signal that at least one of them may be fabricating a statement. On the other hand, when there are consistent reports about a particular fact, this is a strong signal that the witnesses both actually saw the incident.

Consider the expected payoffs of a true witness when there is one other witness. If the other witness is true, it is quite likely that they give consistent reports about the incident. On the other hand, if the witness is false, they are more likely to report on disjoint sets of facets, creating some suspicion of falsehood, and if they do report on the same fact, there reports are likely to be inconsistent. Thus a true witness is much less likely to be found credible if the other witness is false.

In equilibrium, a false witness will sometimes bluff, claiming to have witnessed a salient fact. We can see this by noting that if only true witnesses claimed to have noticed a salient fact, a false witness will always thought to be a true witness when she claims to have noticed a salient fact. On the other hand, a false witness has less incentive to report having witnessed a salient fact than a true witness. Since the false witness doesn't know which facet was actually salient, he is guessing, and no other witness is likely to have

reported the same facet as salient. Even if the other witness did by chance report the fact as salient, it is likely that their reports about the content of the fact do not agree, regardless of whether the other witness is true or false.

Naturally, the desirability of offering rewards to witnesses in this model will depend on the values of the parameters. If there are many truthful witnesses who will enter purely out of civic duty, and the majority of those who respond to incentives are dishonest fabricators, offering any reward will naturally degrade the quality of evidence. However there is a mitigating factor; even if the false senders are very sensitive to expected payments, increasing the rewards may not draw in too many false witnesses. Because it is very difficult for the false witnesses to prove that they were actual witnesses, the payment of the false witnesses is very dependent on the court's prior beliefs regarding the likely truthfulness of witnesses. When more false witnesses are expected to enter, they expect to be paid less, because the court is more likely to assume any witness is false unless her statement is consistent with that of another witness.

Figures 1-3 shows the results of simulations under three payment mechanisms.[10] For each of the mechanisms the payment to the witness would be dependent on the posterior belief the court placed on the witness being a true witness. For the proportional mechanism, the payment for a witness was simply the likelihood the witness was true multiplied by the payoff factor. For the preponderance standard, the payment was equal to the payment factor if the posterior the witness was true was greater than 52%. If the posterior that the witness was true was less than 48%, the witness was not paid, and the payoff went linearly from 0 to full between 48% and 52%[11] For the 'clear and convincing standard' the witness received full payment only if the posterior on truth was above 77% and the witness received no payment if the posterior was below 73%. For all payment mechanisms, it was assumed the courts would accept at most three witnesses. If more than three witnesses came forward, the court would randomly choose three. Aside from this, it was assumed that the payment to a witness who did testify would not directly depend on the number of witnesses, however, the number of other witnesses and their

[10] The assumptions for simulations in all Figures are as follows: $\lambda = 0.3$, $\mu = 0.99$, $\rho = .6$, $N=20$, $b=.1$, $F(\gamma)=G(\gamma)=\gamma$.

[11] It was necessary to limit the steepness of the relationship between belief and payment in order to ensure that the simulations converged. However, such an assumption could be justified by noting that if a witness testified in a way such that it was very nearly equally likely that she was true or false, it would be very difficult to predict whether a judge would approve a payment or not.

testimony would affect the posterior the court places on any one witness being true. Unsurprisingly, the simulations showed that true witnesses generally preferred there to be more witnesses, and false witnesses often preferred there to be fewer other witnesses.

The horizontal axis on all of the figures represents the payment (in arbitrary units) that a witness who testifies, and whom the judge is certain is telling the truth would receive. For the plots of the proportion of witnesses who tell the truth , the vertical axis simply represents that proportion. For the plots of expected payoffs for the true witness or the false witness, the vertical axis is in the same units as the payment on the horizontal axis. There are two reasons why a witness doesn't expect to receive the full payment: First, there may be enough witnesses that she is not chosen to testify. Second, even if she is chosen to testify she may not convince the judge that her testimony is credible. One can see that in all simulations, the expected payoff for a true witness is greater than that for a false witness, because witnesses who actually saw the incident are more likely to have their testimony corroborated. Furthermore, the ratio between the expected payment for a true witness and that for a false witness tends to increase as the payments increase; when there are more witnesses, it is more likely that the testimony of a true witness is corroborated, and more likely that the false witness's testimony is cast into doubt.

As can be seen from the simulations, for the linear payment mechanism and the preponderance standard increasing the payments to witnessing did increase the number of both true and false witnesses. Initially increasing the payment substantially decreased the average quality of witnesses, which was to be expected, given our assumption that only true witnesses were motivated by civic duty. However, further increases in payments did not significantly decrease the quality of witnesses, and did increase the quantity. As the payments for credible testimony increased, the incentive to falsely claim to have witnessed the event is dampened by the increasing number of true witnesses, and the increasing likelihood of being contradicted and not receiving payment.

The clear and convincing standard was more effective at encouraging truthful witnesses without attracting false witnesses. Requiring a higher standard of credibility for testimony makes it much less likely that false witnesses will reap any reward, but does not affect true witnesses as much. Interestingly, increasing the payment on the clear and convincing standard at times increased both the quality and quantity of payment. This can be explained as some sort of virtuous circle. The increased payment draws more true

witnesses in which makes it more likely that any true witness's story will be corroborated making truthful witnessing even more attractive without significantly increasing the attractiveness of false witnessing. It should be noted that the finding that using the 'clear and convincing' standard is more effective is not surprising given the general result in contract theory that high-powered incentives tend to be more effective.

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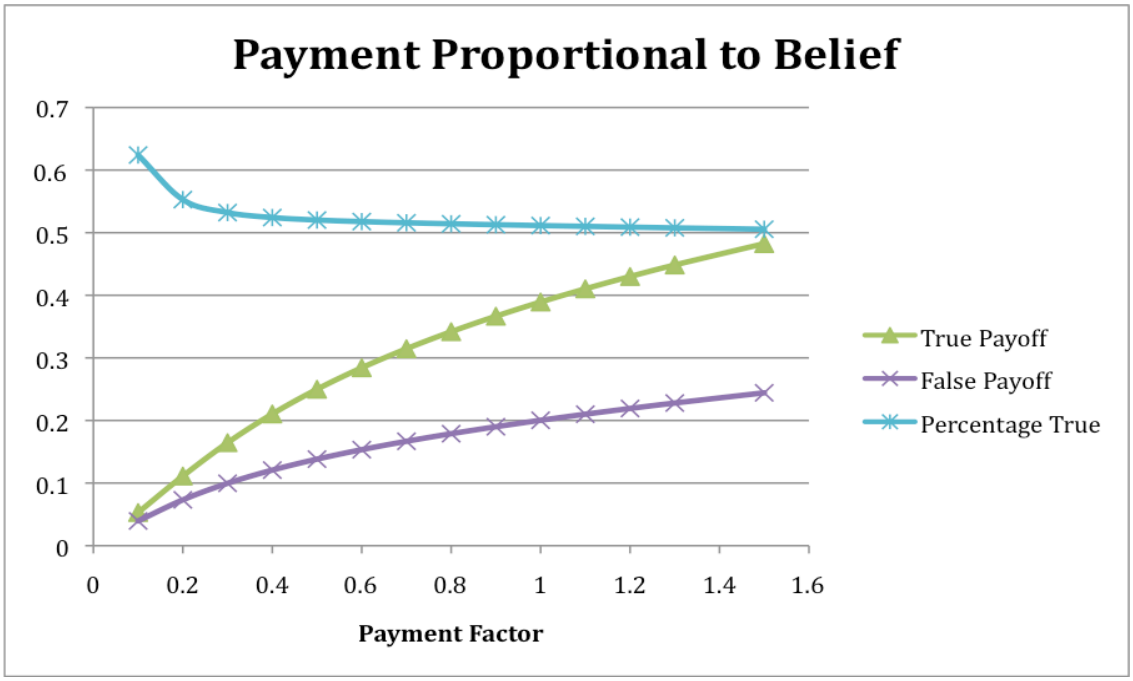

Figure 1a

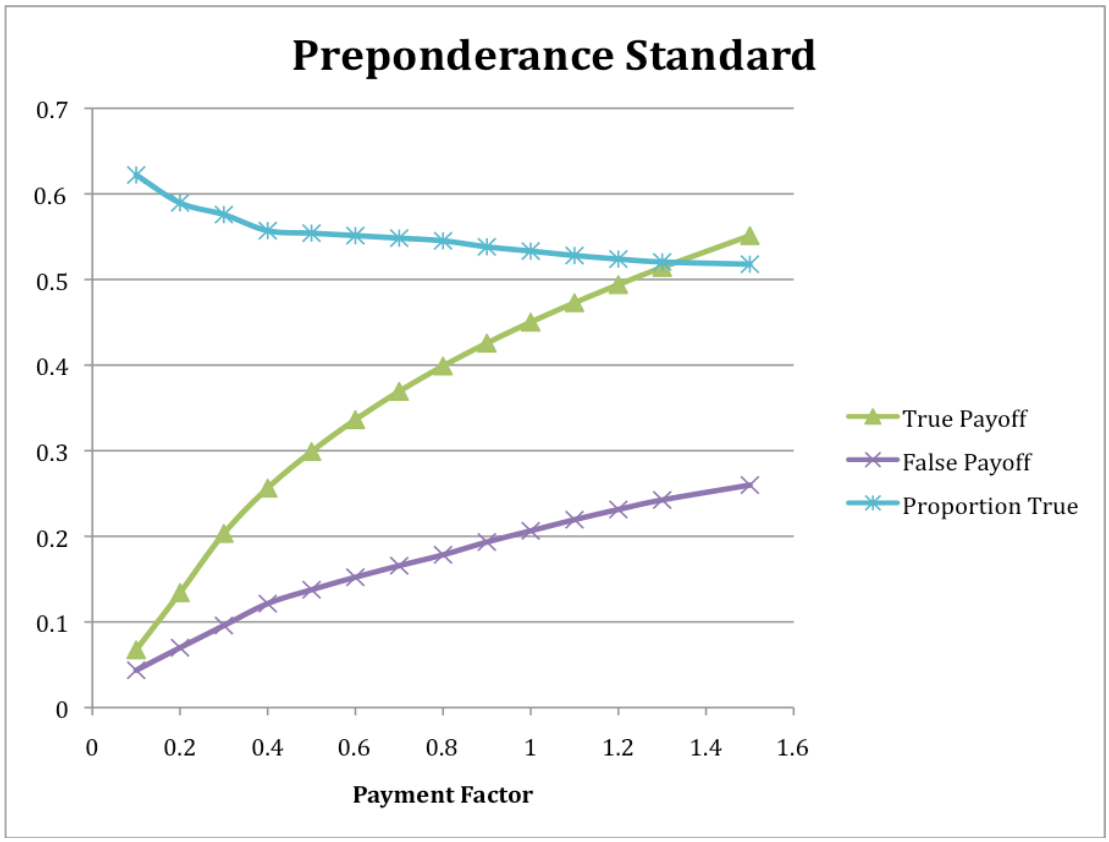

Figure 1b

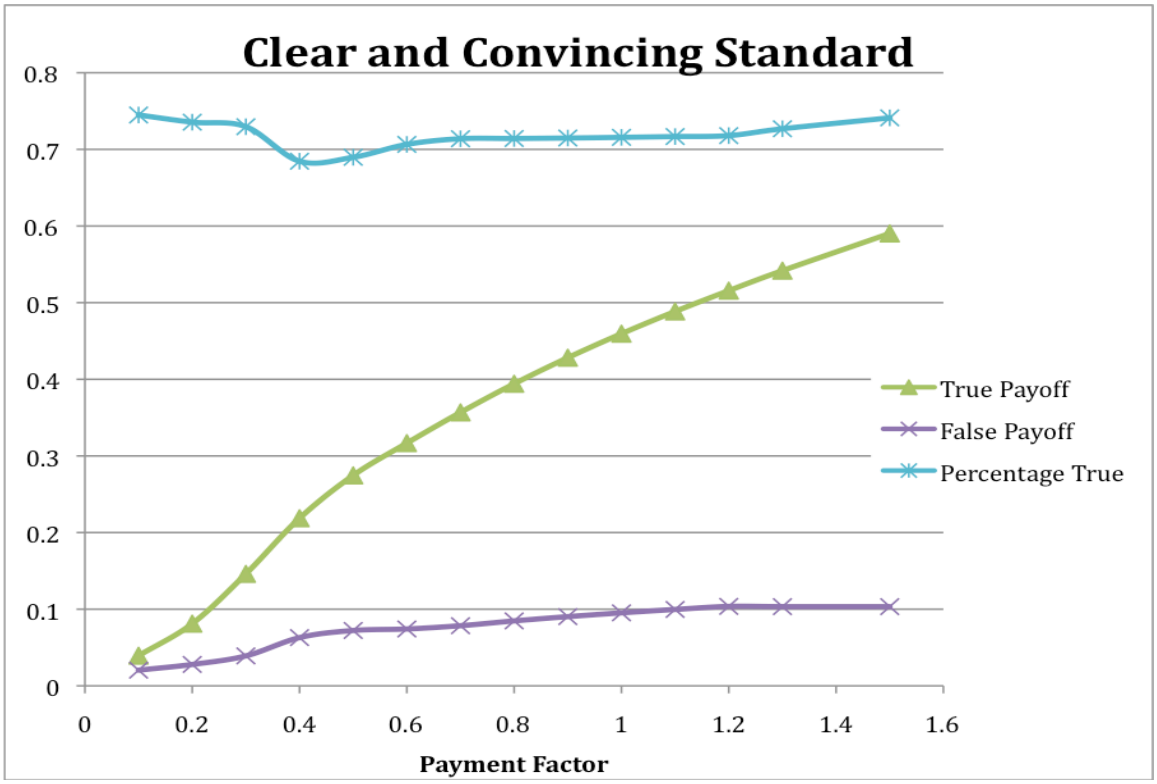
Clear and Convincing Standard
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
Payment Factor
True Payoff
False Payoff
Percentage True

Figure 1c