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Should Pain-and-Suffering Damages be Abolished from Tort Law? More Experimental Evidence

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Ronen Avraham*   SHOULD PAIN-AND-SUFFERING DAMAGES
                                    BE ABOLISHED FROM TORT LAW?
                                    MORE EXPERIMENTAL EVIDENCE[†]

                                                            I *Introduction*

Pain-and-suffering damages can account for up to half of the total tort
damages paid in product liability and medical malpractice cases. They are
a contentious issue in all of the various tort reform attempts made in
recent years.[1] Many commentators consider them to be a source of the
maladies in tort law.

   Legal economists often debate the efficiency rationale of providing
pain-and-suffering damages to injured parties. From an efficiency per-
spective, awarding pain-and-suffering damages should help achieve two
objectives: that potential tortfeasors be given appropriate incentives to
exercise care (the 'deterrence' rationale); and that the victims' losses will
be efficiently transferred to a larger pool of risk bearers (the 'insurance'
rationale). Most scholars rationalize the damages on grounds of efficient

1 See Eleanor D. Kinney, 'Malpractice Reform in the 1990s: Past Disappointments, Future
   Success?' (1995) 20 J. Health Pol. 99, which summarizes recent federal efforts to reform
   pain-and-suffering damages. President Bush has urged Congress at least six times to
   impose substantial nationwide restrictions on medical malpractice cases, including a cap
   on pain-and-suffering damages of over $250 000. See Mike Allen & Amy Goldstein,
   'Bush Urges Malpractice Damage Limits; Plan Includes Goals Sought by Business' *The
   Washington Post* (26 July 2002) A4. Bush's plan would override laws in states that have
   set higher limits. See U.S., Bill H.R. 1091, *Health Care Liability Reform Act,* 105th Cong.,
   2000; Bill H.R. 2242, *Medical Malpractice Rx Act,* 106th Cong., 2001; Bill H.R. 4600 / S.
   2793, *HEALTH Act of 2002,* 107th Cong., 2002; Bill H.R. 5 / S. 607, *HEALTH Act of 2003,*
   108th Cong., 2003; Bill S. 11, *Patient First Act of 2003,* 108th Cong., 2003; Bill H.R. 4280,
   HEALTH Act, of 2004, 108th Cong., 2004. Most recently, on 28 July 2005, the U.S. House
   of Representatives passed (by a vote of 230–194) H.R. 5, the Help Efficient, Accessible,
   Low-cost, Timely Healthcare (HEALTH) Act of 2005. H.R. 5 includes a $250,000 limit
   on noneconomic damages. Efforts at federal reform are expected to continue.

caretaking (deterrence rationale), arguing that defendants should bear the full social cost of their conduct, which includes non-monetary pain-and-suffering costs.[2] However, the desirability of pain-and-suffering damages is more questionable with respect to efficient risk-bearing grounds (insurance rationale), the other major efficiency goal of tort law. The latter question is the focus of this article.

Following Guido Calabresi, most legal economists accept the notion that tort law (which is essentially a system of third-party insurance) and first-party insurance markets act as alternative solutions to the problem of allocating accident costs.[3] Using this perspective, the optimal level of tort compensation should equal the amount of first-party insurance coverage purchased by an independent, rational, and fully informed consumer ('sovereign consumer') in a world without tort laws.[4]

But only empirical or experimental data can indicate whether sovereign consumers would buy pain-and-suffering coverage in a world without tort law.[5] Scholars who support pain-and-suffering damages justify their beliefs with *indirect* evidence that sovereign consumers *would*

2 William Landes & Richard Posner, *The Economic Structure of Tort Law* (Cambridge, MA: Harvard University Press, 1987) at 186–7 [Landes & Posner, *Economic Structure*]. Steven Shavell, *Economic Analysis of Accident Law* (Cambridge, MA: Harvard University Press, 1987) at 133–4 [Shavell, *Economic Analysis*]; Samuel A. Rea, Jr., 'Non-Pecuniary Loss and Breach of Contract' (1982) 11 J.Legal Stud. 35 at 39. Paul Rubin, in contrast, argues that since there are other forces for deterrence in the economy, such as direct regulation and reputational effects, tort law must not carry the entire deterrence burden alone. Accordingly, deterrence is not diluted even if pain-and-suffering awards are not awarded. Paul Rubin, *Tort Reform by Contract* (Washington, DC: AEI Press, 1993) at 82–4 [Rubin, *Tort Reform*].

3 Guido Calabresi, *The Cost of Accidents: A Legal and Economic Analysis* (New Haven, CT: Yale University Press, 1970).

4 If an analysis on optimal insurance grounds reveals that pain-and-suffering damages are indeed desirable, then it seems that the debate is settled, because then, on *both* grounds (optimal insurance and optimal deterrence), pain-and-suffering damages are warranted. Whether tort law should be tuned only towards achieving optimal deterrence or, alternatively, towards achieving optimal insurance, or whether it should try to achieve both simultaneously, is beyond the scope of this article. Rubin, for example, argues that regulatory regimes and reputational effects weaken the need to focus on optimal deterrence. See Rubin, *Tort Reform*, supra note 2. Posner and Landes, on the other hand, believe that the major function of tort law is deterrence. See Landes & Posner, *Economic Structure,* supra note 2. As an example of an intermediate approach, consider Kip Viscusi's claim that '[t]he competing objectives of deterrence and compensation in tort liability consequently result in pain and suffering damages that will typically range from zero [the optimal insurance amount for pain and suffering, according to Viscusi] to deterrence values associated with the injury.' W. Kip Viscusi, *Reforming Product Liability* (Cambridge, MA: Harvard University Press, 1991) at 114–5.

5 Shavell, *Economic Analysis,* supra note 2 at 228–31, building on Cook and Graham's seminal paper arguing that whether an individual would demand pain-and-suffering damages depends on her post-accident marginal utility, which may vary across different types of injuries: P.J. Cook & D.A. Graham, 'The Demand for Insurance and Protection: The Case of Irreplaceable Commodities' (1977) 91 Q.J.Econ. 143.

demand and pay for some coverage for their pain-and-suffering losses in a hypothetical (first-party) insurance contract.[6] Other scholars provide *indirect* evidence that sovereign consumers would prefer *not* to pay for any coverage at all.[7]

This article accepts the sovereign consumer paradigm as the relevant way to explore the desirability of pain-and-suffering damages in tort law. It provides, for the first time, *direct* experimental evidence on consumers' demand for pain-and-suffering coverage relative to their demand for monetary coverage. It shows that people demand not only monetary coverage but pain-and-suffering insurance as well. The article then argues that pain-and-suffering damages may play a vital role in achieving not only the deterrence rationale but also the insurance rationale of tort law.

Part II below presents the methodology and results of two experimental studies I performed to study the demand for pain-and-suffering coverage. The experiments were designed to see whether participants perceived any difference between insurance coverage for monetary damages and coverage for non-monetary damages.[8] Each participant faced several insurance decisions for different products: padding for roller skates ($40), a portable saw ($100), a facial cream ($100), a computer monitor ($250), a trampoline ($600) and tires for a car ($800). Each product was associated with different types of injuries, ranging from a migraine, to brain damage resulting in a comatose state. Participants stated the price they were willing to pay, above the price of each product, for insurance to cover monetary damages and pain-and-suffering

6 See Patricia M. Danzon, 'Tort Reform and the Role of Government in Private Insurance Markets' (1984) 13 J.Legal Stud. 517 at 533 (arguing, based on her observations of the market, that serious pain-and-suffering injuries should be awarded); Steven P. Croley & Jon D. Hanson, 'The Non-Pecuniary Costs of Accidents: Pain-and-Suffering Damages in Tort Law' (1995) 108 Harv.L.Rev. 1785 [Croley & Hanson, 'Non-Pecuniary'] (providing anecdotal evidence to support their conclusion that consumers are likely to demand some level of pain-and-suffering insurance and that, therefore, tort law should provide some level of pain-and-suffering damages). W. Kip Viscusi & William N. Evans, 'Utility Functions That Depend on Health Status: Estimates and Economic Implications' (1990) 80 Am.Econ.Rev. 353 [Viscusi & Evans, 'Utility Functions']; William Evans & W. Kip Viscusi, 'Estimation of State-Dependent Functions Using Survey Data' (1991) 73 Rev.Econ.& Stat. 94 at 101 [Evans & Viscusi, 'Estimation'].

7 George L. Priest, 'The Current Insurance Crisis and Modern Tort Law' (1987) 96 Yale L.J. 1521 at 1546–47, 1553 [Priest, 'Insurance Crisis']; Robert Cooter, 'Towards Market in Unmatured Tort Claims' (1989) 75 Va.L.Rev. 383 at 392 [Cooter, 'Unmatured Torts'] (arguing that 'a rational person would insure only against that pain-and-suffering that curtailed earnings'); John E. Calfee & Paul Rubin, 'Some Implications of Damages Payments for Non Pecuniary Losses' (1992) 21 J.Legal Stud. 371 [Calfee & Rubin, 'Implications']. See also Alan Schwartz, 'Proposals for Product Liability Reform: A Theoretical Synthesis' (1988) 97 Yale L.J. 353 at 362–7 [Schwartz, 'Proposals for Reform'].

8 I use the terms 'non-monetary' and 'pain-and-suffering' interchangeably.

damages. I then compared the demand for monetary coverage with the demand for pain-and-suffering coverage.

My results in both studies show that the vast majority of the participants (89 per cent in both studies) treated both types of insurance the same – either they bought them both or they bought neither. Moreover, on average, in both studies the majority of participants treated both types of insurance *exactly* the same – that is, they paid *exactly* the same amount of money for both types of insurance. Of those who did not treat both types the same, the majority preferred monetary to pain-and-suffering insurance.

II *Exploring the demand for pain-and-suffering coverage:*
The theoretical framework

A INTRODUCTION

How can we know whether to provide pain-and-suffering damages in tort law on insurance grounds? The origins of the theoretical framework suggested here are based on (although not identical to) the literature on mandated benefits.[9] The basic idea is that there are rules that directly benefit some or all of the manufacturer's customers while, at the same time, increasing the manufacturer's expected costs; these costs are passed on, partially or completely, to all customers through higher prices.[10]

Pain-and-suffering damages in tort law cause the expected marginal costs of manufacturing products to increase by the amount of the actuarial cost of providing such insurance. These costs, however, may be passed back to consumers through higher product prices.[11] Thus,

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9 See Lawrence H. Summers, 'Some Simple Economics of Mandated Benefits' (1989) 79 Am.Econ.Rev. Papers & Proceedings 177; Richard Craswell, 'Passing on the Costs of Legal Rules: Efficiency and Distribution in Buyer–Seller Relationships' (1990) 43 Stan.L.Rev. 361 [Craswell, 'Passing On']; Christine Jolls, 'Accommodation Mandates' (2000) 53 Stan.L.Rev. 223.

10 Product warranties are a classic example. The same analysis would apply, however, to any rules directly regulating the safety or quality of a product (*e.g.*, residential housing codes or laws requiring crashworthy automobile bumpers). Craswell, 'Passing On,' supra note 9 at 362–3. In competitive markets, only the costs of the cheapest manufacturer will be passed on to consumers. See Richard Craswell & Alan Schwartz, *Foundations of Contract Law* (New York: Oxford University Press, 1994) at 39. The assumption of competitive markets is made for simplicity and to match previous literature. Nothing material is changed in the analysis if this assumption is withdrawn. Like Craswell, I assume that there is no price discrimination in the market. Craswell, 'Passing On,' ibid. at 373 n. 19.

11 Employees' salaries and shareholders' dividends may also go down. The basic idea is that there is no free lunch. Someone must pay for the mandated pain-and-suffering damages. Interestingly, as Craswell shows, generally the more consumers value the insurance, the more the manufacturers will be able to pass on the cost of the insurance.

consumers are essentially purchasing pain-and-suffering coverage in the form of higher product prices.[12] To measure the efficiency of this 'purchase,' policy makers can compare the value that consumers place on this legislative measure with the costs of this measure.[13] Is providing pain-and-suffering damages efficient?

B LITERATURE REVIEW

1 Theoretical work evaluating the demand for pain-and-suffering coverage
As mentioned earlier, most legal economists believe that the optimal level of damages should equal the level of coverage (monetary *and* pain-and-suffering coverage) that a sovereign consumer would have bought in a world with no tort law at all. Therefore, the argument goes, society should compel the purchase of non-pecuniary coverage in the form of pain-and-suffering tort damages only if consumers demand it but the market cannot provide it.

Alan Schwartz, Robert Cooter, and George Priest all claim that in the real-world insurance market, individual consumers do not in fact 'demand' insurance for non-pecuniary losses.[14] The lack of demand for insurance on children's lives is perhaps the most prevalently cited example that Schwartz, Priest, and Cooter, as well as other supporters of the elimination of pain-and-suffering damages, discuss in this context.[15]

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12 The paradigm that this article adopts, which asks whether consumers prefer more expensive products that include the extra costs associated with pain-and-suffering insurance, is most intuitively understood in connection with product liability law and medical malpractice cases, both of which involve implicit or explicit contractual relationships between victims and injurers. Traditional tort law between 'strangers' seems intuitively less relevant. Yet, upon reflection, it is straightforward to extend the paradigm to parties that are not in contractual relationship by asking whether consumers would be willing to bear the extra first-party insurance premium associated with providing pain-and-suffering damages in tort law, if such insurance were available. The idea is the same – there is no free lunch; pain-and-suffering awards do not fall from the sky but, rather, are purchased, in one form or another, by the class of potential victims.

13 The reader may wonder whether the relevant criterion should be 'whether the value that consumers place on this legislative measure outweighs the costs *passed on to them.*' The argument for this criterion would be that satisfying consumers' preferences means providing the insurance whenever they value it for more than it costs them, and not more than it costs manufacturers. One possible response, as Craswell shows, would be that when consumers are homogeneous and there is no price discrimination in the market, the two criteria converge. Craswell & Schwartz, *Foundations of Contract Law,* supra note 10 at 39. I will not elaborate on this point.

14 See, *e.g.,* Priest, 'Insurance Crisis,' supra note 7 at 1546–7, 1553; Schwartz, 'Proposals for Reform,' supra note 7 at 362–7; Robert Cooter, 'Unmatured Torts,' supra note 7; Calfee & Rubin, 'Implications,' supra note 7.

15 See, *e.g.,* Shavell, *Economic Analysis,* supra note 2 at 134 and, more recently, Louis Kaplow & Steve Shavell, *Economic Analysis of Law* (N.B.E.R. working paper 6960, online:

There is a lot to be said about these scholars' arguments.[16] Here, it is enough to note that other scholars have shown that, in fact, there are numerous examples of real-world insurance for non-pecuniary losses, suggesting that there is indeed some 'consumer demand' for such insurance.[17] Not less importantly, Steve Croley and Jon Hanson argue that in areas where we do not see a demand for pain-and-suffering insurance, it is because there are market impediments to consumers' demand. One such impediment is consumers' imperfect information and lack of mental ability to perceive the post-injury state of the world and make correct (especially non-pecuniary) insurance decisions,[18] especially because 'there are an infinite variety of accidents that might occur, and each could lead to an infinite variety of non-pecuniary losses requiring an infinite variety of compensation levels.'[19]

Another impediment mentioned in the literature is the existence of asymmetric information, which can cause both *ex ante* and *ex post* moral hazard problems. That pain and suffering is difficult to observe and verify, of course, is exactly what makes it also non-contractible in the market. Yet tort law might have some comparative advantage over the market in dealing with these problems and therefore overcome the impediments that the market cannot.

Moreover, in the case of life insurance for children – the example most often cited by opponent of pain-and-suffering insurance – social norms create yet another impediment to consumers' demand. Specifi-

National Bureau of Economic Research <http://www.nber.org/papers/w6960>) at 8. Calfee and Winston use this example to demonstrate the deadweight loss associated with pain-and-suffering damages. See John E. Calfee & Clifford Winston, 'The Consumer Welfare Effects of Liability for Pain and Suffering: An Exploratory Analysis' in N.N. Baily, P.C. Reiss, and C. Winston, eds., *Brookings Papers on Economic Activity* (Washington, DC: Brookings Institution, 1993) 133 at 134 [Calfee & Winston, 'Consumer Welfare'].

16 For a more detailed critique of the problems in the work of Cooter, Priest, and Schwartz, see Ronen Avraham, *Pain-and-Suffering Damages in Tort Law: Revisiting the Theoretical Framework and the Empirical Data* (Michigan Law and Economics Research Paper No. 03-001; Northwestern Law & Econ Research Paper No. 03-03, online: Social Science Research Network <http://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID382120_code030221570.pdf?abstractid=382120>) at 14–8 [Avraham, *Pain-and-Suffering*].

17 For example, Croley and Hanson argue that accident insurance (which provides coverage for death, dismemberment, and various other injuries) constitutes a form of pure pain-and-suffering insurance, given that all of the pecuniary elements of those losses tend already to be covered under other types of policies, such as life insurance and health insurance. Croley & Hanson, 'Non-Pecuniary,' supra note 6 at 1885–92. See also Jennifer Arlen, 'Tort Damages' in Boudewijn Bouckaert & Gerrit De Geest, eds., *Encyclopedia of Law and Economics* (London: Edward Elgar, 2000) at 705–6.

18 Ellen S. Pryor, 'The Tort Law Debate, Efficiency and the Kingdom of the Ill: A Critique of the Insurance Theory of Compensation' (1993) 79 Va.L.Rev 91 at 111–6.

19 Croley & Hanson, 'Non-Pecuniary,' supra note 6 at 1846.

cally, there is a strong social norm against being in a position to benefit from the death of a child, regardless of whether the death results in a monetary or non-monetary loss.[20] Indeed, there are economic monetary reasons that can justify life insurance for children,[21] yet such insurance is uncommon. It should be noted, however, that despite all the impediments, it *is* possible to find a demand for this type of insurance.[22]

In short, absent harder empirical or experimental data, the nicest thing that can be said about scholars' arguments against pain-and-suffering damages in tort law is 'not proven.'

2 Empirical and experimental work evaluating the demand for pain-and-suffering coverage

As I have explained above, collecting evidence from the market is problematic because of the market's numerous imperfections. However, a few scholars have nevertheless undertaken systematic empirical or experimental studies to evaluate the demand for pain-and-suffering coverage.

Patricia Danzon searched for real market-based empirical evidence concerning the demand for first-party insurance.[23] She concludes that the 'tort norm of full coverage of all pecuniary loss plus pain and suffering far exceeds the coverage people are prepared to pay for, given the choice.'[24] Yet, interestingly, a close look at Danzon's findings reveals that, despite all impediments, there *is* a demand for pain-and-suffering coverage.

Danzon found that only about 20 per cent of the US labour force has private long-term disability income protection and that this coverage is

20 Consider a question that a neighbour might ask you: 'So now, when your kid has died and you got a million dollars, are you *really* sad?' History teaches us that life insurance engendered similar problems when it was first introduced.

21 One such reason would be to preserve a child's insurability. Because the underwriting process is fairly minimal for children, parents can purchase a series of policies as the child grows up that would afford the insured's family (parents, spouse, or kids) much more insurance protection. There could also be tax-related benefits that would justify life insurance on children.

22 Children's life, or accident, insurance is especially prevalent where social norms allow it and there is no fear of moral hazard, as in schools' field-trip accident insurance. Croley and Hanson, 'Non-Pecuniary,' supra note 6 at 1880, argue that 14 per cent of all ordinary life insurance policies are for the lives of children under the age of fifteen, and the average benefit from those policies is $22,000. At note 302 they provide two examples: Student Accident Insurance (1989–1990) (underwritten by the Equitable Life Assurance Society) and the Athletic Accident Insurance Program (1989) (underwritten by the All American Life Insurance Company).

23 Patricia M. Danzon, 'Tort Reform and the Role of Government in Private Insurance Markets' (1984) 13 J.Legal Stud. 517 [Danzon, 'Tort Reform'].

24 Ibid. at 524.

for only about 60 to 70 per cent of the pre-disability salary. Danzon concludes that demand for first-party insurance, which does not include insurance for losses beyond their wage loss, reveals that there is no demand for pain-and-suffering coverage. But, are these figures really low?[25] Starting with the amount of coverage bought, it is not surprising that people may demand coverage only up to 70 per cent of their pre-disability income because these insurance awards are tax exempt and therefore anything above that would be considered excess insurance.[26] What about the fact that only 20 per cent of the labour force demands such insurance? Danzon admits that consumers determine their demand for disability insurance in light of existing pension plans, Social Security Disability, and Workers Compensation. As she herself admits, 45 per cent of the labour force has private pension coverage that provides benefits in the event of early disability. Social Security Disability provides coverage amounting to about 40 per cent for those who earn above the minimum taxable income and up to 86 per cent for those earning the minimum wage.[27] Indeed, it is estimated that annual disability benefits paid by Social Security and Workers Compensation are much larger than those paid by private insurers.[28] Thus, Danzon's figures may indicate that people rationally adjust the amount of coverage they purchase to the existing state and federal plans. Moreover, one should add tort law as a means for providing coverage, including pain-and-suffering coverage, for accidental injuries.[29] Thus, to the extent that there is any reduced demand in Danzon's findings about the private markets, it simply reflects an adjustment to the existing law. If parties understand that they are insured through these other means, their incentives to purchase insurance through the private market are reduced.[30]

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25 Ibid. at 522–3.
26 Moreover, providing less than full coverage (via deductibles or co-insurance/copayment provisions) is a well-known method of giving people incentives to recover from their disability and return to work, that is, to combat *ex post* moral hazard. So these data, even if correct, do not prove there is no demand for such coverage.
27 Danzon, 'Tort Reform,' supra note 23 at 523.
28 US Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, s. 3, online: US Census <http://www.census.gov/prod/www/statistical-abstract-us.html>.
29 In most states, the jury is prohibited from receiving evidence of compensation or coverage from other sources (the 'collateral source rule').
30 A similar point is made in Randall Bovbjerg, Frank Sloan, & James Blumstein, 'Valuing Life and Limb in Tort: Scheduling "Pain-and-Suffering"' (1989) 83 N.W.U.L.Rev. 908 at 935 [Bovbjerg *et al.*, 'Life and Limb']. 'Informed consumers know that pain-and-suffering is compensable in tort cases; they are already covered when someone else is to blame for their injury. Given that they thus have a limited need for such coverage, its absence is not proof of its lack of value.' Ibid. at 933.

Interestingly, Danzon reports that 57 per cent of the labour force has accident insurance, which is the only private insurance that 'bears some resemblance to compensation for pain and suffering,' since these policies do not compensate for specific expenses but, rather, pay a pre-specified sum in the event of an injury. Danzon is correct, given that all of the pecuniary elements of those losses tend already to be covered under other types of policies, such as life insurance and health insurance policies.[31]

Taken together, Danzon's findings seem to imply that the best explanation for the demand she found is that people feel that tort law does not sufficiently compensate them for pain-and-suffering losses. Danzon's findings do not reveal a lack of demand for pain-and-suffering coverage; in fact, they may indicate exactly the opposite.[32] This conclusion is reinforced by the fact that, somewhat surprisingly, Danzon herself eventually recommends including pain-and-suffering damages in tort law.[33]

Kip Viscusi is another prominent economist who has attempted a systematic investigation of pain-and-suffering damages in tort law. Viscusi accepts the paradigm that, as a general rule, whether sovereign consumers would demand pain-and-suffering coverage in a world without tort law is an empirical or experimental question that is dependent upon whether the victim's post-accident marginal utility of income increases or decreases as a result of the loss.[34] His logic is as follows: if the marginal utility of income increases, this indicates that people will derive a relatively large amount of utility from the income they will receive as insurance after they are injured (because of their increased needs) and,

31 Danzon, 'Tort Reform,' supra note 23 at 524; see also Croley & Hanson, 'Non-Pecuniary,' supra note 6 at 1885–92, for the same point. Yet Danzon argues that the total contribution of less than 1 per cent of health benefits indicates a relatively low demand for such insurance.

32 It is interesting to note that, in her policy recommendations, Danzon adopts a view that does not reflect her own conclusions. In her conclusions, Danzon recommends providing individualized 'compensation for wage loss up to 70 percent of pre-disability, pre-tax earnings (full replacement of after-tax earnings)' and 'a schedule of compensation for pain-and-suffering for serious injuries only.' Ibid. at 533.

33 The only constraint she puts on pain-and-suffering damages is that they should be paid solely for *serious* injuries. For a detailed critique of Danzon's study see Avraham, *Pain-and-Suffering*, supra note 16 at 50–3.

34 'Marginal utility' is the additional utility (benefit or satisfaction) one gets from consuming an additional unit of a commodity or service. Consumer theory assumes that consumers consider marginal utility when deciding how much of different commodities to consume. Thus, a rational consumer will prefer to consume the commodity that provides her with higher benefit: the commodity with higher marginal utility. In the context of insurance, a rational consumer will purchase insurance coverage so long as its marginal utility is higher than that of other consumption goods.

accordingly, *will* be willing to pay for insurance coverage that goes beyond their direct monetary loss. In other words, when their post-accident marginal utility of income increases, it is rational for people to demand pain-and-suffering coverage.[35] If, in contrast, the post-accident marginal utility of income decreases, it is irrational for people to demand pain-and-suffering coverage, because the benefit (the utility) they can derive from money after their injury has been materialized is relatively small. At the extreme, if someone is comatose, so that her ability to derive utility from money is almost zero (her marginal utility is zero), she would not demand pain-and-suffering coverage at all, because she has no practical way to derive benefit from that coverage.

Viscusi has published several studies on people's demand for pain-and-suffering coverage. The two most influential studies are those he published with William Evans in 1990 and 1991.[36] These studies are the source for Viscusi's famous empirical finding that major injuries decrease individuals' marginal utility of income and minor injuries increase it. Based on this finding, Viscusi concludes that there should not be pain-and-suffering damages (on insurance grounds) in tort law. Viscusi's studies also serve as major sources of evidence in the law and economics literature to demonstrate that, as Louis Kaplow and Steve Shavell have recently argued, 'victims would often not elect to insure against non-pecuniary losses because these losses would not create a need for money, that is, raise their marginal utility of wealth.'[37]

Viscusi's work, however, raises several concerns. First, Viscusi derives his conclusions based on the *quantitative* responses of lay (uninformed) people and how they perceive low-probability risks in different contexts.[38]

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35 Shavell, *Economic Analysis,* supra note 2.

36 Viscusi & Evans, 'Utility Functions,' supra note 6; Evans & Viscusi, 'Estimation,' supra note 6 at 101.

37 See Kaplow & Shavell, *Economic Analysis of Law,* supra note 15 at 8. As already mentioned, in a survey forthcoming in the *Handbook of Public Economics,* Kaplow and Shavell refer to Viscusi & Evans, 'Utility Functions,' supra note 6, and to this study only, as their empirical evidence for the claim cited in the text. Calfee & Winston, 'Consumer Welfare,' supra note 15 at 137, refer to this study as a proof that losses reduce marginal utility of income in most important kinds of injury.

38 In the study reported in Evans & Viscusi, 'Estimation,' supra note 6, the authors asked consumers how much they would pay to obtain a specified reduction in the risk of injury from a risk of 15 injuries per 10,000 bottles of toilet bowl cleaner and of insecticide. From the responses the researchers attempted to elicit people's utility functions. Note, however, that not all of Viscusi's studies rely on lay people's demand for insurance. In Viscusi & Evans, 'Utility Functions,' supra note 6, the authors asked chemical workers to reveal the wage increase required to compensate them for working with certain hazardous chemicals. From their responses, the authors elicited their post-injury marginal utility of income. In later publications, Viscusi admits that a potential approach of building upon responses to questions involving low probabilities is that 'the valuations will be distorted by the perceptual biases, thus affecting the estimate of the

Second, and more importantly, it is hard to find in the data any basis for the conclusion that major injuries decrease individuals' marginal utility of income and minor injuries increase it. The distinction the authors made between minor and major injuries seems artificial.[39] Taken together (and it is a question whether these studies, which are so different in their methodology, can be analysed together), the results of the studies cannot be reconciled. One study shows that some injuries decrease individuals' marginal utility of income, while the other shows that other injuries may increase it, there being no reasonable distinction between the severities of the injuries in each of the studies.[40]

implicit value of the health outcome.' Wesley A. Magat, W. Kip Viscusi, & Joel Huber, 'A Reference Lottery Metric for Valuing Health' (1996) 42 Manage.Sci. 1118 at 1119 [Magat et al., 'Valuing Health']. Indeed, in later and less influential papers, Viscusi designed different studies in order to correct exactly this research error after getting what he called 'implausible' results. Frank A. Sloan *et al.*, 'Alternative Approaches to Valuing Intangible Health Losses: The Evidence for Multiple Sclerosis' (1998) J.Health Econ. 475 at 489–90[Sloan *et al.,* 'Alternative Approaches']. It is important to note that these *early* studies of Viscusi are the ones most often cited in the legal literature.

39 Specifically, it is not clear why in Viscusi & Evans, 'Utility Functions,' supra note 6, the authors chose to describe alpha-chloroacetophenone as 'just an eye irritant' that causes only minor injuries. As official data from the US Department of Labor reveals, it is not only an eye irritant but also a respiratory and skin irritant. Moreover, it can in fact cause severe injuries and even death. (According to the US Department of Labor, Occupational Safety and Health Administration (OSHA), it is 'an eye and respiratory tract irritant' and can cause 'burning and irritation of the skin ..., especially if the skin is moist.' Its use as a riot-control agent 'has caused several deaths.' Moreover, 'overexposure can cause permanent partial [corneal] opacity. ... Severe inhalation exposure causes pulmonary edema, which may have delayed onset.' See OSHA, US Department of Labor, *Occupational Safety and Health Guideline for Alpha-Chloroacetophenone,* online: OSHA <http://www.osha-slc.gov/SLTC/healthguidelines/a-chloroacetophenone/recognition.html#healthhazard>.

For the purposes of these studies, the more important factor is the participants' *perception* of the injuries. Given that the participants were chemical workers, it can reasonably be assumed that they were aware of alpha-chloroacetophenone's potential for devastating consequences. TNT, on the other hand, seems to be less dangerous than one might initially think. Chemical manufactures use TNT as an intermediate in the production of dyestuffs and photographic chemicals. At high concentrations in the air (above the levels permitted in the workplace today), workers involved in the production of TNT experienced anaemia and abnormal liver tests. After long-term exposure to skin and eyes, some people developed skin irritation and cataracts, respectively. There is no information that TNT causes birth defects. See Massachusetts Military Reservation, 'Fact Sheet – TNT' (Fact Sheet 2001-05), online: Groundwater Program <http://groundwaterprogram.army.mil/community/facts/tnt.html>.

40 A deeper look at Evans & Viscusi, 'Estimation,' supra note 6, can further teach us how the formulation of the model influences the results. One of the issues the authors were interested in was whether the data support a move on the non-state-dependent utility function or a change of the function itself. Recall that in Viscusi & Evans, 'Utility Functions,' supra note 6,, the authors investigated whether individuals' perception of their post-accident marginal utility is increased or decreased relative to their pre-

Viscusi's other studies – those less frequently cited by law and economics scholars – must lead, if anywhere at all, to the conclusion that pain-and-suffering damages *are* desired. These studies by Viscusi *et al.*, as well as other empirical studies that measure individuals' valuation of life and limb (the 'value of life' work), show unequivocally that individuals value the loss of life and limb more than the compensation they receive through various private and public coverage plans. Viscusi himself has published studies in which he found that the value people placed on their lives was $4.3 million, much more than courts are likely to award in damages.[41] Probably the best explanation for this phenomenon, under the consumer sovereignty paradigm, is that people do, in fact, value life and limb above monetary gain.[42] And if people value life and limb more than its 'market value,' so to speak, when they face death (a state of being where money does not buy you much), one might cautiously conclude that they do so even more when they face injury.

The work of John Calfee and Clifford Winston looks somewhat closer (in its methodology) to the studies presented here. Their main goal was to 'assess the disparity (if any) between consumers' willingness to pay for

accident state. Interestingly, Viscusi claims here that an increase of post-accident marginal utility supports the monetary-equivalent approach, at which the loss is tantamount to a shift left along the (non-state-dependent) utility curve, whereas a decrease of the post-accident marginal utility supports the state-dependent approach, at which the loss is tantamount to a shift down to a flatter state-dependent utility function. But this is incoherent. Viscusi could have viewed the increase in the post-accident marginal utility as supporting a state-dependent utility function, in which the loss is tantamount to a shift to a *steeper* post-accident state-dependent utility function. Evans & Viscusi, 'Estimation,' supra note 6 at 94. It is Viscusi's own formulation, and not his findings, that fail to allow for the alternative explanation. A similar problem exists in Viscusi & Evans, 'Utility Functions,' ibid.

41 For example, a study by Viscusi and Michael Moore found that workers receive $43.40 in additional annual wages (in 1981 dollars) for each additional death per 100 000 workers and thus estimated at $4.34 million the cost that this group associated with the loss of one life. Michael J. Moore & W. Kip Viscusi, 'Doubling the Estimated Value of Life: Results Using New Occupational Fatality Data' (1988) 7 J.Pol'y Analysis & Mgmt. 476. This reasoning assumes that the price a group places on the statistical death of one of its members is equal to the price an individual places on her own life when confronted by a fatal risk. This, in turn, requires the assumption that people are linear in their probability preferences, an assumption known to be empirically false. Whether it is a change from 0.99999 to 1.0000 or a change from 0.00001 to 0.00002 matters. The 'assumption of linearity is clearly false; individual valuations of changes in risk will vary with the background risk that is modified.' Lewis A. Kornhauser, 'The Value of Life' (1990) 38 Clev.St.L. Rev. 209 at 215; see also Graham Loomes, 'Probability vs. Money: A Test of Some Fundamental Assumptions of Rational Decision Making' (1998) 108 Econ.J. 477.

42 This assumes that the methodology of these studies is valid. For a more detailed critique of the problems in Viscusi's studies see Avraham, *Pain-and-Suffering*, supra note 16 at 54–63.

insurance versus their willingness to pay for prevention.'[43] Their underlying theory is similar to Viscusi's: if the post-accident marginal utility of income decreases, people's willingness to pay for insurance coverage decreases as well, because the benefit (the utility) they can derive from money after their injury has been materialized is relatively small. Calfee and Winston further argue that people's willingness to pay for *prevention* of such injuries remains constant, no matter whether the post-accident marginal utility of income increases, decreases or stays the same. Accordingly, in accidents that decrease people's post-accident marginal utility of income, people's willingness to pay for prevention will be higher than their willingness to pay for insurance. Indeed, Calfee and Winston found in their study that people were usually willing to pay more for prevention than for insurance. From this they conclude that setting damages in tort law to equal the willingness to pay for prevention (as in a regime of strict liability) will generate more than the desired amount of insurance. There is thus no justification for pain-and-suffering damages in tort law because such damages serve as an unwarranted insurance coverage – a deadweight loss.

Calfee and Winston's theoretical framework is problematic. When people need to allocate their money between prevention and insurance, their first priority is always to pay for prevention and then to purchase insurance. Insurance coverage becomes relevant only after all cost-justified prevention is provided. The fact that people prefer to efficiently prevent losses rather than to insure against them holds true for most types of post-accident utility functions not only in the case of non-monetary loss but for monetary loss as well. Thus, if one were to adopt Calfee and Winston's results and logic, one would have to recommend eliminating not only insurance for non-monetary losses but also insurance for monetary loss.

Moreover, Calfee and Winston's methodology also seems problematic. Their study employed the contingent valuation method to elicit preferences for pain-and-suffering insurance and prevention in situations involving possible injury, or loss of life, to participants, or their children, from a product, or service. There were ten such 'situations' in total, each involving two scenarios (a and b) that 'were essentially identical except that one offered prevention and the other offered insurance.'[44] Calfee

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43 Calfee & Winston, 'Consumer Welfare,' supra note 15 at 192.

44 For example, in Scenario 3a (the prevention scenario of Situation 3), participants were asked to imagine that they needed to a buy a car and to decide on certain features. These included engine size, whether to have an air conditioner, and whether to have a safety package (which halves the chance of a child sustaining crippling injuries that would make it impossible for her to walk). The price of the car varied depending on the features chosen. In Scenario 3b (the insurance scenario of situation 3), there was no safety package; instead, participants were offered the opportunity to purchase an

and Winston then compared participants' willingness to pay for the accessory packages offered in both scenarios.

Unfortunately Calfee and Winston seem sometimes to have compared apples with oranges. For example, in Scenario 3a, rather than comparing the willingness to pay for prevention and the willingness to pay for insurance *of a non-monetary loss*, they compare the willingness to pay for prevention of a mixed (monetary and non-monetary) loss with the willingness to pay for insurance against a non-monetary loss. However, the mixed loss is always larger than the purely non-monetary loss. All else being equal, participants are almost always expected to pay more to prevent a large loss than to indemnify against a much smaller one.

Another problem with their design is, as Viscusi recognizes, that their survey 'places such severe demands on respondents that they may be unable to give meaningful answers to the survey questions.'[45] Indeed, their participants were required to rank thirteen accessory packages, each with four different features (engine size, whether there is an air conditioner, whether there is a safety package [or insurance policy], and the total price). This task is a difficult one for professional economists, let alone lay people.[46] Based on their results, Calfee and Winston estimate the consumer burden from over-insurance to be in the range of billions of dollars.[47] The flaws presented here, as well as others that are not, significantly alter the authors' estimation.[48]

C THE SUGGESTED APPROACH

Like Calfee and Winston, I investigate an individual's direct preferences. More specifically, I compare the demand for monetary insurance mandates with the demand for non-monetary insurance mandates. A finding of a similar demand for both types of insurance will suggest a strong case for pain-and-suffering damages in tort law.

Here is why. Economists conventionally assume that people are risk averse with respect to (non-negligible) monetary losses. The von-

insurance policy that would pay benefits if a child had a crippling accident and was permanently unable to walk. This coverage would be in addition to payments for medical expenses. Again, the price of the car varied depending on the features chosen. Ibid. at 158–9.

45 W. Kip Viscusi, 'A Comment on Calfee and Winston' (1993) 1 Brookings Papers on Economic Activity: Microeconomics 175 at 191. For a list of other methodological flaws, see ibid. at 182–91. For the authors' response, see ibid. at 192.

46 Ibid. at 184.

47 See, *e.g.*, Calfee & Winston, 'Consumer Welfare,' supra note 15 at 152, where the authors use the $440 actuarial value of the policy in Scenario 1b to estimate the annual burden from automobile accidents at $4.7 billion. As was discussed above, the result is process driven.

48 For a more detailed critique of the problems in Calfee and Winston's study see Avraham, *Pain-and-Suffering*, supra note 16 at 64–72.

Newmann-Morgenstern expected utility theory implies that given the assumption of risk aversion, rational people should buy full insurance against monetary losses.[49] Thus, if we find in the experimental research that people do indeed demand coverage against monetary losses and, in addition, that they treat both monetary and non-monetary insurance identically (*e.g.*, that they are willing to pay roughly the same premium for the same scope of coverage), then we can make inferences from the demand for monetary insurance to the demand for non-monetary insurance.[50]

Before I show what my findings are, it is worth pausing to explain what I do *not* show in these studies. It is important to note that I do not estimate people's overall demand for pain-and-suffering coverage. It is a well-documented fact that lay people lack the necessary skills, knowledge, and training to make complex calculations (such as calculating the actuarial cost of the mandate). Therefore, one should be very cautious in making *quantitative* inferences from lay people's responses. Unfortunately, this is exactly what Viscusi *et al.*, as well as Calfee and Winston, have done in their studies. In contrast, my study explored whether there is a *relative* difference between people's demand for monetary insurance mandates and their demand for non-monetary insurance mandates. If I find a similar demand for both types of insurance, then in spite of the fact that, from a quantitative point of view, the magnitude of the overall demand can teach us nothing, from a qualitative point of view the relative demand can teach us a great deal.[51]

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49 Assuming that no administrative costs or problems of moral hazard or adverse selection exist.

50 The logical chain of reasoning is as follows. The von Newmann–Morgenstern expected utility theory implies that rational and risk-averse individuals demand fair insurance for non-negligible monetary losses. According to the mandated benefits framework, the value people place on monetary insurance is more than the actuarial costs they pay for it. If empirical studies reveal that people treat both types of insurance identically (in the sense described above), then we can conclude that people also place a higher value on non-monetary insurance than what they would have to pay for it (holding the scope of coverage constant). This implies that people would be better off with pain-and-suffering insurance than they would be without it, just as they are better off with monetary insurance than they are without it.

51 This objection is just one of many possible objections to experimental studies, of which four major ones are discussed below. The first objection is that the behaviour of human subjects is variable and therefore less predictable than the 'behaviour' of physical objects, which is consistent across repeated trials; this is known as the lack of internal validity critique. See, *e.g.*, Chris Stramar, 'Experiments in Economics: Should We Trust the Dismal Scientists in White Coats?' (1999) 6 J.Econ. Methodology 1 at 7. This objection is overcome by the design of the study. As long as any auxiliary hypotheses, such as whether subjects understand the tasks, and the main hypothesis can be distinguished, then statistical tests can be used to determine whether the theory's main predictions are valid despite inconsistencies of human behaviour.

Below I report the results of two empirical studies I conducted in order to investigate whether the demand for pain-and-suffering coverage is significantly different than the demand for monetary coverage.

The second objection is that the experimental setting induces different behaviour from that which would be produced in the natural setting; this is known as the lack of external validity critique. Experimental designs, so goes the critique, do not mirror natural environments closely enough because, among other things, real-world experience is based on lifelong learning whereas laboratory work is based on a short-term learning process. This critique may be true in certain circumstances; in the studies presented below, however, the *relative* differences or similarities between demand for monetary insurance and demand for non-monetary insurance are explored, and, even if lack of learning experience plays a role in the decision-making process, there is nothing that would prevent that factor from playing an equal role in the demand for both types of insurance and, therefore, allowing the relative results to be relevant and valid nonetheless.

The third objection is that participants may not understand their tasks and may, in any event, act to either satisfy or outwit the experimenter. This problem was solved in several ways. First, there was no interviewer to satisfy; instead, in my studies, there was an instruction booklet. This booklet also served another goal: it was pre-written so as to maintain coherence among sessions and preclude passing the experimenter's expectations on to the study participants. Different comprehension questions were planted in the questionnaires to signal whether participants understood their tasks; those who did not understand the tasks were excluded from the database. My research assistant, who ran the experiment, was blind to the research hypothesis. Lastly, I ran three pre-tests in which a small group of participants (not knowing they were not participating in the 'real' study) were asked to do the tasks and were then debriefed to see whether everything was clear, whether they could guess the research goal or hypothesis, and so forth.

The fourth objection is that participants have no motivation to act as maximizers; rather, their only concern is to finish their tasks as quickly as possible. A solution to this objection is that participants can be compensated for their performance, creating incentives for them to complete their tasks accurately. For a list of conditions that make the laboratory micro-economy fit into economic theoretical models, see L. Wilde, 'On the Use of Laboratory Experiments in Economics' in Joseph C. Pitt, ed., *Philosophy in Economics* (Boston: Reidel, 1981). But even then there is the question of judgement as to what constitutes adequate compensation. In a recent study that reviewed seventy-four experimental papers in which the level of financial performance-based incentive given to participants was varied, the authors concluded that 'in ... risky choices the most typical result is that incentives do not affect the mean performance.' Colin F. Camerer & Robin M. Hogarth, 'The Effects of Financial Incentives in Experiments: A Review and Capital–Labor–Production Framework' (1999) 19 J.Risk & Uncertainty 7 at 34. In my studies this critique is less powerful, however, as I was interested in the *relative* demand for monetary and non-monetary insurance and therefore any lack of incentives would presumably be the same for both types of demand. In any case, my only claim is that the results produced in my studies should be taken as *prima facie* evidence to be further investigated. I, myself, am sceptical regarding how much can be learned from any single experiment, but I do believe, as many others do, that much can be learned from a *series* of independent studies. See, *e.g.*, Chris Stramar, 'Experimental Economics: Hard Science or Wasteful Tinkering?' (1999) 109 Econ.J. F5 at F5–F6.

III *Exploring the demand for pain-and-suffering coverage:*
The empirical framework

I designed two experiments to examine whether the demand for pain-and-suffering insurance and differs from the demand for monetary insurance.

A STUDY 1 EXPERIMENTAL DESIGN

1 Participants
The participants were 120 undergraduate students from the University of Michigan. Participants were recruited through ads posted around campus and by sending e-mails to members of the 'Greek System' (i.e., student fraternities and sororities) as well as to a list maintained by the Economics Department of students interested in participating in research studies. Participant were promised $10 for a forty-minutes session.

2 Design[52]
Participants faced four insurance decisions involving the purchase of four different types of products: padding for roller skates ($40), a computer monitor ($250), a saw ($100), and tires for a car ($800). Each product was associated with different types of injuries.[53] For each product, participants had to state the price they were willing to pay, above the price of the product, for monetary insurance and for pain-and-suffering insurance. Some participants were first asked to state their willingness to pay for the monetary coverage, while others were asked to state their willingness to pay for the pain-and-suffering coverage first.[54]

   Before answering the questions, participants were presented with a cover page explaining to them that they had no other rights whatsoever to a remedy for any loss as result of an accident besides the insurance coverage that they were about to buy. They were then presented with

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52 In this study participants were asked to immerse their arms in ice water for ten seconds to let them experience some pain. The full text of the questionnaires is available from the author.

53 The rollerblade pads, if defective, might not protect against a fall, which might result in serious injury to the affected joints; this injury could possibly lead to permanent damage in the form of reduced mobility and function. The computer monitor, if defective, might cause migraines, which are very painful and are usually accompanied by nausea and spotty vision. The saw, if defective, might cause amputation, usually of a finger or the whole hand. The tires, if defective, might cause the driver to be left paralysed. Full text of the study instruments is available from the author.

54 The order of the questions was not found to be significant.

explanations of the nature of pain-and-suffering versus monetary insurance.[55]

3 Information

Participants were informed of the probability of an accident occurring and of the magnitude of the expected damages so that they had enough information to calculate the expected loss to help them decide on the amount they were willing to pay for the insurance. To make it as easy as possible on students, I held the expected loss of the insurance coverage constant across products.

4 Study 1 experimental results

a Cleaning the data set

I first eliminated participants' responses indicating that the total amount of money they were willing to pay for the product was not equal to the sum of the amounts of money they were willing to pay for the different

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55 The explanations read as follows: '**Insurance for non-monetary harm:** This provides compensation for pain and suffering resulting from an injury. This could include physical or emotional pain, or any suffering involving the hassle of changing your lifestyle to adjust to living with a loss of mobility, a loss of function, or a disability. It *does not* include any compensation for any monetary expenses like medical costs or lost wages. **Insurance for monetary expenses:** This includes full compensation for medical expenses and rehabilitation following an injury, and for lost wages due to time away from work. It *does not* include any compensation for any non-monetary harm like pain and suffering.'

One could argue that my design makes the pain-and-suffering insurance look very much like monetary insurance in an artificial way because I quantified the pain and suffering amount rather than describing it. First, let me observe that the questionnaire includes descriptions of the consequences of each of the injuries as well as a general description of what pain-and-suffering losses are. Second, my design follows standard practice among experimental economics in the field; see, *e.g.*, Calfee & Winston, 'Consumer Welfare,' supra note 15. Third, my design builds on the consumer sovereignty paradigm, which assumes that pain-and-suffering damages *can* be monetized. See Schwartz, 'Proposals for Reform,' supra note 7; Shavell, *Economic Analysis*, supra note 2; Priest, 'Insurance Crisis,' supra note 7; Cooter, 'Unmatured Torts,' supra note 7; Calfee & Rubin, 'Implications,' supra note 7. Fourth, my design allows me to test whether, in such *synthetic conditions*, where the notoriously difficult task of quantifying pain and suffering is eliminated, people's demand for non-monetary insurance is significantly different from their demand for monetary insurance. If people's demand in such synthetic conditions were significantly different, one would have a hard time making a case to economists that pain-and-suffering is desired. Lastly, there is an additional methodological reason for quantifying, rather than merely describing, the pain and suffering in the scenarios I tested. People's subjective monetary estimations of any given description of pain-and-suffering losses are notoriously variable, perhaps because of different imaginations or personal experiences. This introduces sampling error, which, in turn, requires a much larger sample size.

types of insurance they chose plus the cost of the product itself. Eight such insurance *decisions* were ignored.[56] In addition, I faced the problem that some participants were willing to pay extremely high premiums for different types of insurance. I therefore decided to ignore any total payment reported by participants that was more than five times larger than the product price. Specifically, I eliminated payments above $4 000, $1 500, $700, and $250 for the tires, monitor, saw, and padding respectively. Six *participants* were erased from my database because *all* of their responses were eliminated in this way, leaving me with 114 participants.[57]

b The general demand for both types of insurance
I compared the overall numbers of participants who were willing to buy the different types of insurance. Chart 1 presents the percentage of participants who were willing to pay (weakly) above the expected loss for each type of insurance.[58]

Chart 1 reveals that most people demanded pain-and-suffering insurance for all four products. Chart 1 also shows that, across all products, the demand for pain-and-suffering insurance was up to seven percentage-points lower than the demand for monetary insurance, yet for most products this difference was not found to be significant.[59]

56 The last question for any product was used to control for errors. For example, for the saw, the question read as follows: 'In total I will pay for *this product* _____ dollars. (Please make sure that the amount you write is equal to the price of the product, $100 in this case, plus the amounts you wrote in questions 1 and 2).'

   In questions 1 and 2 participants identified their willingness to pay for monetary and pain-and-suffering coverage respectively. This last question served to signal whether or not subjects understood their tasks. Those who did not were excluded from the database. As I specifically asked participants to avoid this error, there were only a few instances like this.

57 Such extreme willingness to pay for insurance made me suspicious of these participants' understanding of their task. In any case, as these participants expressed extreme demand for *both* types of coverage, the results of the study do not change when these 'outliers' are included.

58 The reason I included only those who were willing to spend the expected value or above was that, clearly, even participants whose demand for insurance is low, such as risk-liking people, will sometimes be happy to pay a very small amount of money for insurance. Notice that I also included here those who paid exactly the expected value. The justification for this is that if the budget is balanced (as is the case when the premiums equal the expected value), then there is no reason not to respond to people's preferences and provide them with insurance. For the rest of this article, when I use the words 'buy' or 'purchase,' I mean 'paid the expected value or more.'

59 I ran a McNemar test and found that the difference between the demands for both types of insurance was significant only for the monitor ($p = 0.0455$). It is worth mentioning that the demand for each type of insurance is either together with the other type of insurance or alone.

Chart 1
Demand for monetary and pain-and-suffering insurance (Study 1)
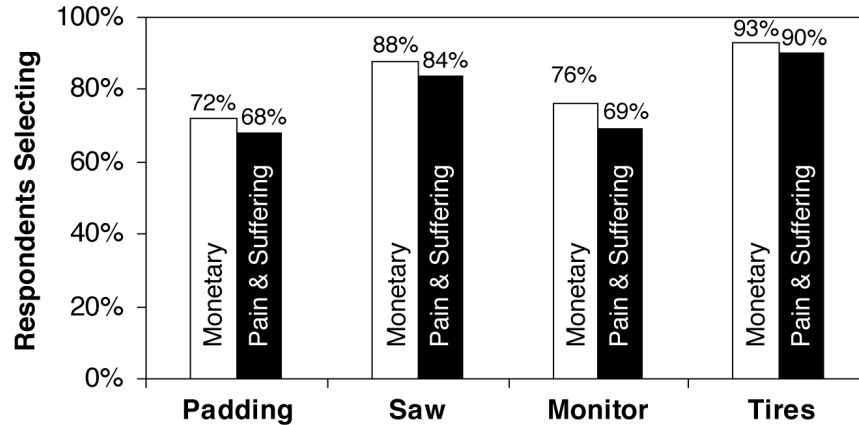
c The dollar value of the demand for monetary versus pain-and-suffering insurance

I examined the group demand for monetary and pain-and-suffering insurance. Chart 2 presents the results for the four products.

Chart 2 reveals that there is, across all products, a demand for *both* types of insurance. Demand for pain-and-suffering insurance exists, but it is smaller than demand for monetary insurance in two respects. Across all products, the average amount of money spent on pain-and-suffering insurance was lower than the average amount of money spent on monetary insurance. But these differences were, in general, not significant at the $p = 0.05$ level.[60] This is further reinforced by the fact that the median prices paid for both types of coverage for the padding and the monitor were the same.[61]

Chart 2 also shows that participants, as a group, were willing to spend far above the $1 expected loss.[62] This may mean that participants were extremely risk averse or, more probably, that what drives their decision to

60 The padding was the exception. The same holds when we included *all* participants (rather than only those who paid weakly above the expected value) in checking whether the difference between the average amount spent on the two types of insurance was significant.

61 As the distributions are skewed and not well defined, the medians are better predictors of the distributions than the means.

62 The chart presents the mean and median for those who were willing to pay above the expected value for the coverage; it excludes those who did not pay anything for it or who paid less than the expected value. The fact that the mean is higher than the median may mean that, of those who paid above the expected value, a minority were willing to spend extremely high sums of money.

Chart 2
Price paid for monetary and pain-and-suffering insurance relative to base product price
(Study 1)
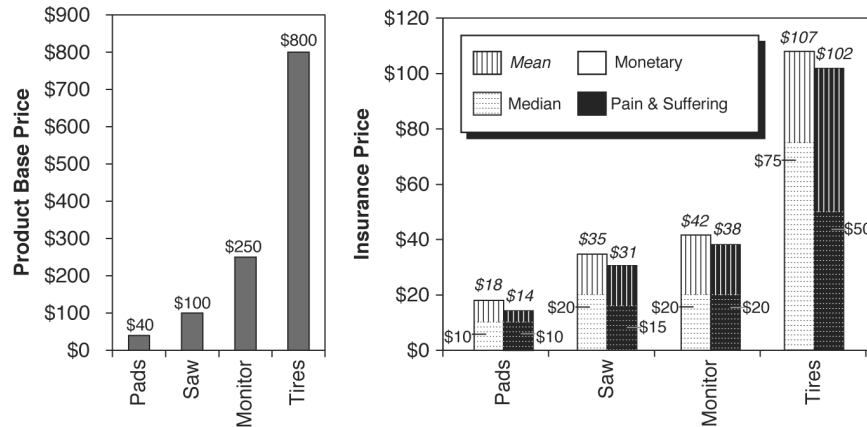
buy insurance is not their expected loss but something else. Indeed, the graphs in Chart 2 highlight the relationship between the base price and the price participants were willing to pay for the insurance. The similarity of the shapes of the graphs reflects a possible cognitive bias that the base price played on their willingness to buy insurance. For now, it is enough to observe that both types of insurance were treated the same. Specifically, focusing on the medians reveals that for both types of insurance participants were willing to pay premiums of about 6 to 8 per cent of the monitor and tire prices and 15 to 25 per cent of the padding and saw prices.[63]

I next turn to an analysis on the individual level. I compared the *differences* between the amount of money that *each* participant spent on both types of insurance.

d The individual demand for both types of insurance

I explored the difference between the demands by *each individual* for the two types of insurance. A McNemar test revealed that the vast majority of the participants treated monetary insurance and pain-and-suffering insurance in the same manner, either buying them both (by paying weakly above the $1 expected loss) or buying neither. Specifically, 82 per cent of the participants treated monetary and pain-and-suffering insurance for padding in the same manner, 86 per cent treated monetary

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63 Doing the same analysis as above for the means reveals that the qualitative analysis does not change: participants were willing to pay premiums of about 10 to 15 per cent of the monitor and tire prices for both types of insurance, and about 30 to 35 per cent of the padding and saw prices, again for both types of insurance.

and pain-and-suffering insurance for the monitor in the same manner, 93 per cent treated monetary and pain-and-suffering insurance for the saw in the same manner, and 96 per cent treated monetary and pain-and-suffering insurance for the tires in the same manner. Of those participants who did not treat these two types of insurance the same, most preferred monetary insurance to pain-and-suffering insurance.

I then checked the percentage of people who treated both types of insurance *exactly* the same, that is, who were willing to spend *exactly* the same dollar amount for both types of insurance. Chart 3 present the results. Chart 3 reveals that 60 to 70 per cent of the participants were willing to spend *exactly* the same amount of money for pain-and-suffering insurance and for monetary insurance across the four products (see row 2).[64] However, among the 30 to 40 per cent who treated these two types of insurance differently, about two-thirds paid more for monetary coverage.

5 Study 1 discussion

The results show that the majority of the participants (about 80 per cent on average) expressed a demand for pain-and-suffering insurance. This demand was product dependent, however, which means that the scope of the demand for pain-and-suffering coverage cannot be universally answered; rather, there is a need to further investigate the nature of the product and the pain and suffering it causes.[65] This is also true, however, for monetary insurance.

More importantly, the results also show that, in general, the vast majority (on average, about 90 per cent) of the participants treated the two types of insurance the same, either buying them both or buying neither. Moreover, as Chart 3 shows, on average, 60 to 70 per cent of the participants treated both types of insurance *exactly* the same: they paid *exactly* the same amount of money for each type of insurance.

Of those who did not treat the two types the same, the vast majority preferred monetary to pain-and-suffering insurance. As a result, the overall demand for monetary insurance was higher than the demand for pain-and-suffering insurance, yet the differences were small and were not, in general, found to be significant.[66]

64 Specifically, 60 per cent of the participants were willing to spend exactly the same amount of money for the monetary and pain-and-suffering insurance for the padding, 62 per cent for the saw, 65 per cent for the monitor, and 70 per cent for the tires.

65 Specifically, 90 per cent of participants expressed a demand for pain-and-suffering insurance for the tires, 69 per cent for the monitor, 84 per cent for the saw, and 68 per cent for the padding.

66 The demand for monetary coverage was larger in two respects: more participants demanded monetary insurance (on average, more than 80 per cent of the participants versus more than 75 per cent who demanded pain-and-suffering insurance), and participants were willing, in general, to pay higher premiums for monetary than for

Chart 3
Relative spending for the two types of insurance
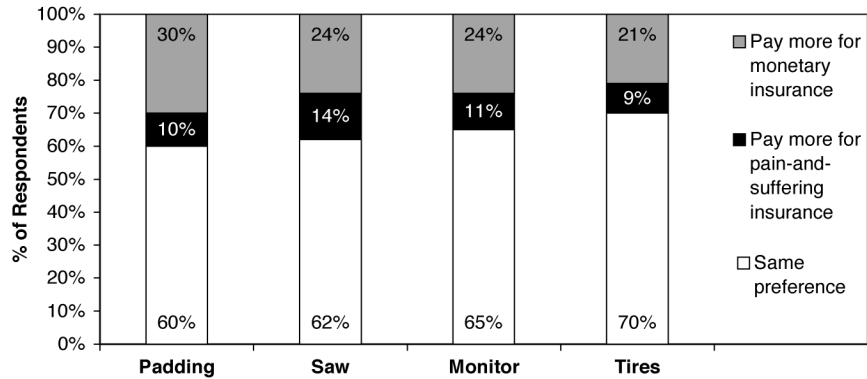
Interestingly, the results show that individuals' insurance purchase decisions are based on some rough percentage of the product price and not on the probabilities and values.

B STUDY 2 EXPERIMENTAL DESIGN

Study 1 raises several concerns.[67] First, participants' willingness to pay for pain-and-suffering coverage may reflect their willingness to send adequate deterrence signals to sellers. Consumers, so goes the critique, demand pain-and-suffering not for its insurance value but for its deterrence value.[68] Study 2 dealt with this concern by explaining to the participants that the extra money they pay for insurance will go to an independent insurance company and not to the vendor from which they are buying the product.

Second, one could argue that while it manipulated the types of products, Study 1 did not sufficiently manipulate the types of injuries. In fact, so goes the critique, one can explain Study 1's results in light of Viscusi's studies where people expressed a demand for pain-and-suffering coverage for non-severe injuries.[69] For Study 2 the types of products and

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pain-and-suffering insurance. As mentioned in the text, however, the differences were not significant.

67 I am grateful to Jennifer Arlen for raising these objections.

68 Mark Geistfeld has shown analytically that once deterrence considerations are taken into account, and when the assumption of perfect information by consumers is relaxed, rational individuals will *always* demand some pain-and-suffering coverage. Mark Geistfeld, 'Placing a Price on Pain and Suffering: A Method for Helping Juries Determine Tort Damages for Nonmonetary Injuries' (1995) 83 Cal.L.Rev. 775 at 797–800 [Geistfeld, 'Placing a Price'].

69 It is not clear how strong this critique is, however. Recall from note 53 supra that the rollerblades' pads, if defective, might fail to protect against a fall, possibly resulting in serious injury to the affected joints, which could lead to permanent damage in the form

associated injuries were changed to include a trampoline that, if defective might cause a fall resulting in serious injuries including brain damage; a facial cream that can cause burns that are very painful, especially at night, yet do not prevent the injured from participating in daily life; and tires that, if defective, can cause severe injuries to the driver including coma. In addition to these products, Study 2 explores again the demand for pain-and-suffering coverage for the purchase of a saw to check whether the results from Study 1 can be replicated.

Third, one could argue that because the explanations of the nature of pain-and-suffering versus monetary insurance do not explicitly specify the role of rehabilitation costs, participants may interpret the instructions to mean that rehabilitation costs are part of the pain-and-suffering coverage. According to this objection, the demand for pain-and-suffering coverage is really a demand for rehabilitation costs. Study 2 responded to this objection by randomizing the location of rehabilitation damages between monetary and non-monetary coverage.

A fourth concern is that the participants might think they need more than the mean monetary coverage offered to them, and therefore the demand for pain-and-suffering coverage in fact reflects a higher demand for monetary coverage. Study 2 dealt with this concern by eliciting participants' subjective estimations of the monetary coverage they would need once injured.

1 Participants

The participants were 121 first-year law students from Northwestern University School of Law. Questionnaires were distributed one half-hour before the end of a tort class in the Fall 2003 term.

2 Design[70]

Participants faced four insurance decisions involving the purchase of four different types of products: a trampoline ($600), a facial cream ($100), a saw ($100), and tires for a car ($600). For each product, participants had to state the price they were willing to pay, above the price of the product, for monetary and for pain-and-suffering insurance. The design of Study 2 is similar to that of Study 1; the description will therefore not be repeated. One difference between the designs was that the explanations about the nature of pain-and-suffering versus monetary insurance preceding the questionnaire were presented differently.[71]

of reduced mobility and function. The computer monitor, if defective, might cause migraines, which are very painful and are usually accompanied by nausea and spotty vision. The saw, if defective, might cause amputation of a finger or the whole hand. The tires, if defective, might cause the driver to be left paralysed.

70 The full text of the questionnaires is available from the author.

71 I scrambled the order of the explanations about the nature of the monetary versus the pain-and-suffering insurance. Fifty-nine per cent of the participants saw the explanation

Specifically, for 41 per cent of the participants the explanation specified that the expenses for adjusting to new life are part of monetary coverage, whereas for 59 per cent it specified that these expenses are part of pain-and-suffering coverage. Thus the first group received the following explanation for monetary insurance:

Insurance for monetary expenses:
This provides compensation for medical expenses and rehabilitation costs (including psychotherapy) following an injury, and for lost wages due to time away from work. This could include your medical bills, salary you might lose, *and expenses you might have in order to adjust to living with your injury, like a special car, a care provider, etc.* [emphasis added] It *does not* include any compensation for any pain & suffering like physical or emotional pain.

The second group received the following explanation of pain-and-suffering insurance:

Insurance for pain & suffering:
This provides compensation for pain and suffering resulting from an injury and for rehabilitation costs (including psychotherapy). This could include expenses for physical or emotional pain and suffering, *and expenses you might have in order to adjust to living with your injury, like a special car, a care provider, etc.* [emphasis added] It *does not* include any compensation for any monetary expenses like medical expenses or lost wages.

For the first group (for which the rehabilitation costs were part of the monetary coverage), the explanation for the pain-and-suffering coverage was similar to the one above but without the text in italics. For the second group (for which the rehabilitation costs were part of the pain-and-suffering coverage) the explanation for the monetary coverage was similar to the one above but without the text in italics.

3 Information
As in Study 1, all 121 participants were informed of the probability of an accident occurring and of the magnitude of the expected damages so that they had enough information to calculate the expected loss and help them decide on the amount they were willing to pay for both types of insurance. To make it as easy as possible on students, I held the expected loss of the insurance coverage constant across products.

4 Study 2 experimental results

a Cleaning the data set
As in Study 1, I eliminated responses that were extremely high or in which the amount of money paid in total for the product was not equal

for the monetary insurance first and 41 percent saw the explanation for the pain-and-suffering insurance first. The order of the explanations was not found to be significant.

to the cost of the product plus the sum of the amounts of money participants were willing to pay for the different types of insurance.[72] I was left with 110 participants.

b Order effect

I investigated whether the order in which the two types of insurance were offered to participants was a factor. Specifically, are participants willing to pay more for the type of insurance they see first? The reason for this concern is that, according to conventional economic theory, participants' demand for the next type of insurance would be reduced. I ran a Wilcoxon rank sums test and found that in all cases participants expressed no significant difference in their willingness to pay for the monetary insurance or pain-and-suffering insurance across different orders of presentation. In any event, since I had randomized over any possible order effect (by scrambling the order in which participants read about the products), I decided to ignore this issue altogether.[73]

c The general demand for both types of insurance

I begin by reporting the results of the overall number of participants who were willing to buy the different types of insurance. Chart 4 presents the percentage of participants who were willing to pay (slightly) above the $10 expected loss for each type of insurance.

Chart 4 reveals that most people demanded pain-and-suffering insurance for all products; demand was relatively high for the trampoline and the tires and relatively low for the cream. Specifically, 79 per cent demanded pain-and-suffering insurance for the trampoline, 69 per cent for the tires, 55 per cent for the saw, and 52 per cent for the cream.

Chart 4 also shows that, across all products, the demand for pain-and-suffering insurance is somewhat lower than the demand for monetary insurance. I ran a McNemar test and found that the difference was significant for the trampoline ($p = 0.014$) and tires ($p = 0.0002$), not significant for the cream ($p = 0.365$), and weakly significant for the saw ($p = 0.095$).

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72 Participants' decisions stating a total price that was not equal to the sum of the amounts of money they were willing to pay for the different types of insurance they chose plus the cost of the product itself were ignored. For every product there was one such 'control' question. Five participants who got all control questions wrong were deleted. As before, I ignored any total payment reported by participants that was too high. In this case I ignored payments above $2 400 for the trampoline or the tires and above $600 for the facial cream or the saw. For example, one participant was willing to pay $1 000 for monetary insurance and $1 000 for pain-and-suffering insurance for the $600 trampoline. Six more participants who got all control questions wrong were deleted.
73 Forty per cent of participants encountered the monetary insurance first and 60 per cent encountered the pain-and-suffering insurance first.

Chart 4
Demand for monetary and pain-and-suffering insurance (Study 2)
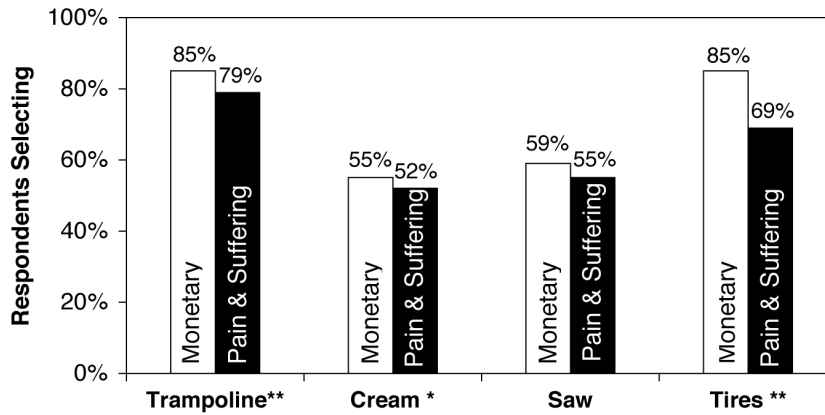
* – Difference between types of demand is significant at p=0.1

** – Difference between types of demand is significant at p=0.05

d The dollar value of the demand for monetary versus pain-and-suffering insurance

As before, I first examined the group demand for both monetary and pain-and-suffering insurance. Chart 5 presents our results for the four products.

Chart 5 reveals that across all products, there exists a demand for *both* types of insurance. Specifically, the demand for pain-and-suffering insurance exists, although it is slightly smaller than the demand for monetary insurance. For some products, the average amount of money spent on pain-and-suffering insurance was slightly lower than the average amount spent on monetary insurance. The differences in the means were significant for the trampoline and the saw but not significant for the cream or the tires. Analysis of the medians shows the same pattern.

As before, participants, as a group, were willing to spend far above the $10 expected loss. Specifically, focusing on the medians reveals that participants were willing to pay more, for both types of insurance, for the trampoline and the tires.[74]

I next turn to analysis on the individual level. I compared the *differences* between the amounts of money that *each* participant spent on the two types of insurance.

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74 The qualitative analysis is not changed when we focus on the means: participants were willing to pay larger premiums, for both types of insurance, for the trampoline and tires.

Chart 5
Price paid for monetary and pain-and-suffering insurance relative to base product price
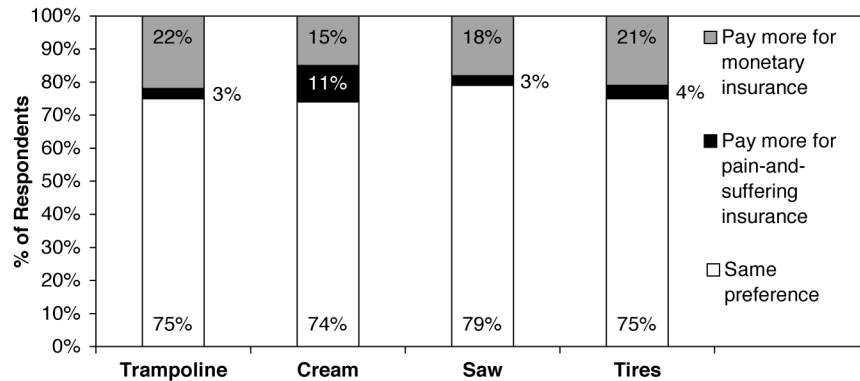(Study 2)
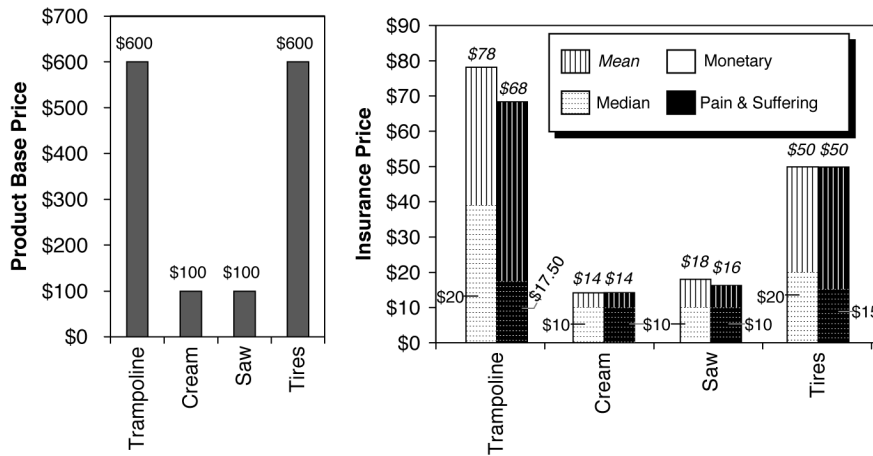
e The individual demand for both types of insurance
I ran a McNemar test to explore the difference between the individual's demand for the two types of insurance. The test revealed that the vast majority of the participants treated monetary insurance and pain-and-suffering insurance in the same manner – either buying them both (by paying slightly above the $10 expected loss) or buying neither. Specifically, 95 per cent of the participants treated monetary and pain-and-suffering insurance for the trampoline in the same manner, 90 per cent treated them the same for the facial cream, 92 per cent for the saw, and 81 per cent for the tires. Of those participants who did not treat these two types of insurance the same, most preferred monetary insurance.

I then checked the percentage of people who treated both types of insurance *exactly* the same, that is, who were willing to spend *exactly* the same dollar amount for the two types of insurance. Chart 6 presents the results.

Chart 6 reveals that between 74 and 79 per cent of the participants were willing to spend *exactly* the same amount of money for pain-and-suffering and monetary insurance across the four products (see row 2). However, among those who treated these two types of insurance differently, the majority paid, on average, $41 more for monetary insurance for the trampoline and $11 more for monetary insurance for the saw. For the cream and the tires, the average amount paid for the monetary insurance was not significantly larger than the average amount paid for pain-and-suffering coverage.

Chart 6
Relative spending for the two types of insurance

Before turning to the question of the influence of rehabilitation costs, it is worth mentioning that, in general, despite some quantitative differences, the results of Study 2, as reported so far, are qualitatively consistent with the results of Study 1. I will discuss the differences in more detail below.

f The influence of rehabilitation costs
As mentioned above, a critique raised against the results of Study 1 is that the demand for pain-and-suffering coverage is, in fact, a demand for rehabilitation costs.[75]

This section explores the difference in demand for the two types of insurance while controlling for rehabilitation costs. Recall that for the first group, rehabilitation costs were part of the monetary coverage they

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75 Indeed, there is some confusion between what legal scholars call pain-and-suffering damages and what economists call pain-and-suffering damages, which often leads the two groups to talk past each other. The main difference boils down to the role of rehabilitation costs. For economists, reasonable expenses that the victim might incur in order to adjust to living with her injury, such as a special car or care provider, are monetary components, similar to medical costs. Such costs are those that rational and risk-averse people should insure against. For economists, only what is beyond rehabilitation costs is pure pain-and-suffering and unnecessary to insure against. Kip Viscusi, 'Pain and Suffering: Damages in Search of a Sounder Rationale' (1996) 1 Mich.L.& Pol.Rev. 141 at 151. For lawyers, in contrast, pain-and-suffering damages, also known as general damages, are anything beyond medical bills and loss of income. For lawyers, or at least for many of them, rehabilitation costs are therefore part of the general damages component. Croley & Hanson, 'Non-Pecuniary,' supra note 6 at 1799. Observe that this reduces the tension between economist and lawyer: *both* groups support damages for rehabilitation expenses. 'Thus, much of the difference between optimal insurance concepts for pain-and-suffering and the views of strong advocates of pain-and-suffering insurance such as Croley and Hanson, may stem in part form semantics and the nature of the designation of the awards components': Viscusi, ibid. at 152.

purchased, whereas for the second group these were part of their pain-and-suffering coverage. If the critique is correct, then the demand for pain-and-suffering coverage should be significantly lower than the demand for monetary coverage – perhaps even non-existent – for the first group, but not for the second.

I compared the number of participants from each group who were willing to purchase the different types of insurance. I also compared the amount of money that participants, as a group, were willing to spend on the different types of insurance across products. Chart 7 begins to present the results.

Chart 7 is similar to Chart 4 above but breaks the results of Chart 4 to two groups: those for whom rehabilitation costs were part of the monetary coverage and those for whom these costs were part of the pain-and-suffering coverage.

Chart 7 shows, again, that in almost all cases most people demanded pain-and-suffering insurance for all products, with relatively high demand for the trampoline and the tires and relatively low demand for the cream and the saw.[76] Interestingly, the percentage of people who demanded both types of insurance was lower for the second group, for whom rehabilitation costs were part of pain-and-suffering coverage. For the saw and the facial

Chart 7
Demand for monetary and pain-and-suffering insurance (by classification of rehab costs)

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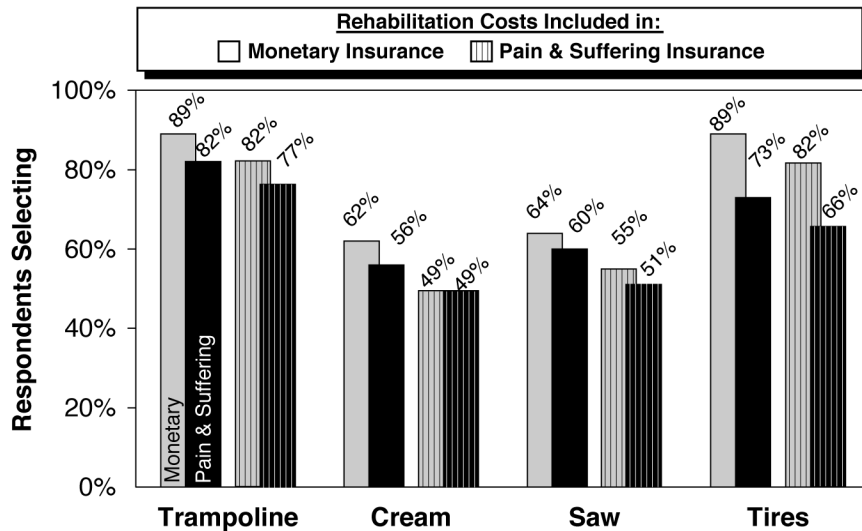
76 Indeed, only 49 per cent of the group for whom rehabilitation costs were part of pain-and-suffering coverage bought pain-and-suffering coverage for the facial cream.

cream, the demand for pain-and-suffering coverage in that group was only about 50 per cent. Lower demand for pain-and-suffering coverage among this group is exactly the opposite of what we would expect if the critique is correct.

Is there any difference in the demand for the two types of insurance? Focusing first on the percentage of participants who demanded coverage, Chart 7 shows that in both groups about the same percentage of people demanded each type of insurance. For example, 89 per cent of the participants in the first group, for whom rehabilitation costs were part of the monetary coverage, bought monetary coverage, whereas 82 per cent of that group bought pain-and-suffering coverage. The difference was not found to be significant. A significant difference ($p = 0.05$) between the demands for the two types of insurance was found, for both groups, only for the tires. Of the group for whom rehabilitation costs were part of monetary insurance, 89 per cent bought monetary coverage but only 73 per cent bought pain-and-suffering coverage. Similarly, in the other group, 82 per cent bought monetary coverage but only 66 per cent bought pain-and-suffering coverage.

I then examined the group demand for monetary and pain-and-suffering insurance. Importantly, a comparison of the mean and median amounts of money that participants in each group were willing to spend reveals that, in general, both groups were willing to spend more on monetary coverage than on pain-and-suffering coverage. However, neither of these differences was found to be significant, even at the $p = 0.1$ level.[77] This means that the finding of Study 1 that participants, as a group, treat both types of insurance in the same manner is not affected.[78]

I next turn to an analysis on the individual level. I checked *differences* between the amounts of money *each* participant spent on the two types of insurance. Chart 8 presents the results.

Chart 8 reveals that the percentage of participants who treated both types of insurance *exactly* the same is large and is roughly the same across products and across groups. Specifically, between 71 and 80 per cent of

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77 This result was calculated by a non-parametric rank-sums test for independent observations (Wilcoxon two-sample test).

78 Across all products, participants for whom rehabilitation costs were part of monetary coverage were willing to pay significantly more (for both types of insurance) than participants for whom rehabilitation costs were part of pain-and-suffering coverage. For example, the former group paid $111 and $96 for monetary and pain-and-suffering coverage respectively, whereas the latter paid only $55 and $47. It is not clear why the demand for *both types* of coverage was reduced for that group. This is not the case when the medians, rather than the means, are compared. In any case, this finding has no bearing on the major questions I am considering in this study.

Chart 8
Relative spending for the two types of insurance (by classification of rehab costs)
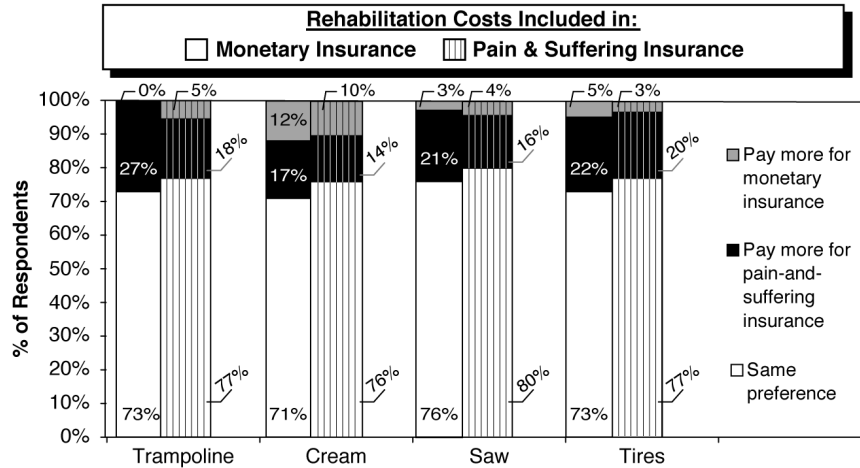
the participants paid *exactly* same amount of money for the two types of insurance.

Importantly, a comparison between the two groups reveals that in the group for which rehabilitation costs were part of the pain-and-suffering coverage, 4 per cent more participants paid exactly the same amount for the two types of insurance.[79] This result sheds light on the magnitude of the critique that the demand for pain-and-suffering coverage is a demand for rehabilitation costs. Indeed, making rehabilitation costs part of pain-and-suffering coverage makes the two types of coverage look more similar to each other. More participants therefore treat both types of coverage in the same manner, but this effect is small and accounts for only a 4-per-cent increase in the number of participants who treated both types of coverage the same.

g The influence of excessive demand for monetary coverage
As mentioned above, there may be some concern that the demand for pain-and-suffering coverage reflects a higher-than-average *subjective* demand for monetary coverage. Thus, if participants think they may need more monetary coverage than the amount suggested, then they may demand pain-and-suffering coverage simply in order to cover their excess *monetary* coverage needs.[80]

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79 In this group a smaller percentage of participants paid more for pain-and-suffering coverage.
80 Another concern is that if participants estimate their own subjective probability of being injured as higher than the probability stated in the questionnaire, their demand for

It should be noted at the outset that, on average, only 8.5 per cent of participants expressed a demand for excess monetary coverage (compared to 13 per cent who expressed demand for lower-than-average monetary coverage).[81] Chart 9 presents the mean and median premiums paid for pain-and-suffering coverage by two groups: the group that expressed demand for excessive monetary coverage and the rest of the participant pool, which did not.

As we can see from Chart 9 below, the small group of participants who expressed demand for excess monetary coverage had a mixed effect on the demand for pain-and-suffering coverage. On the one hand, for accidents due to trampoline failure, they were willing to pay, on average, a premium more than twice as high as the other group for the pain-and-suffering coverage; this effect is reflected in both the mean and the median amounts they were willing to pay. With respect to tires, this group's mean premium is much larger than the other group's mean premium, yet their median is not different. On the other hand, with respect to both the facial cream and the saw, those participants who expressed demand for excess monetary coverage were willing to spend, on average, only half as much as the rest of the pool on pain-and-suffering coverage, *despite* their excess demand for monetary coverage.

Despite the mix effect, I checked in several other ways whether the demand for pain-and-suffering can be explained by demand for excess monetary coverage. First, I created a dummy variable for excess demand for monetary coverage. I then ran several regressions in which the dependent variable was the amount of money participants were willing to pay for the pain-and-suffering coverage. Across all products, the excess amount was not a significant factor. I also checked for a combined effect of demand for excess monetary coverage and whether rehabilitation costs are part of the monetary or the non-monetary coverage; I found no effect.

coverage may increase. But this critique does not seem to be strong. Recall that my focus is on the relative difference between people's demand for monetary coverage and their demand for non-monetary coverage. Given that their subjective estimation of the probability of being injured is independent of the type of coverage they intend to purchase, it seems to me immaterial whether they misperceive their real probability of being injured at all. Indeed, on average, 72 per cent of participants perceived their subjective probability as equal to the average probability of being injured, 10 per cent were optimistic, and 18 per cent were pessimistic about their probability of being injured.

81 Seven per cent expressed excess (13 per cent expressed lower) demand for monetary coverage when buying the trampoline; 18 per cent expressed excess (7 per cent expressed lower) demand for monetary coverage when buying the facial cream; 10 per cent expressed excess (12 per cent expressed lower) demand for monetary coverage when buying the saw; and 11 per cent expressed excess (8 per cent expressed lower) demand for monetary coverage when buying the tires.

Chart 9
Participants' demand for pain-and-suffering insurance
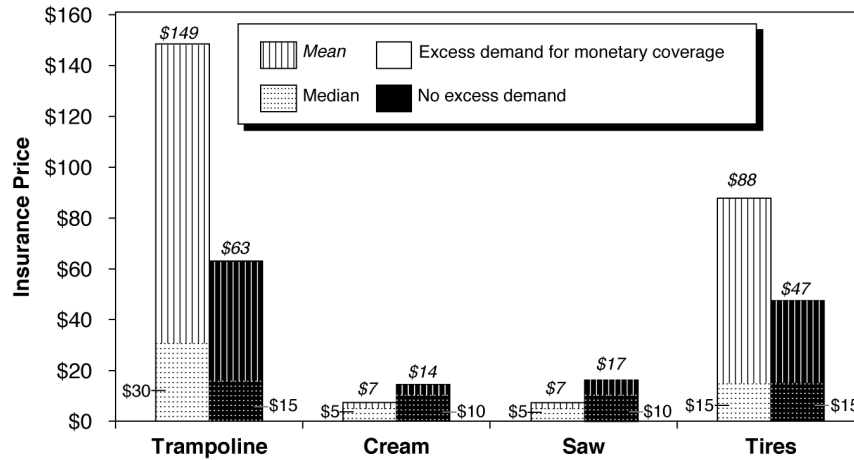
Second, I excluded from my pool those whose demand for monetary coverage was excessive and reran the above analysis on the remaining participants. There were no significant differences in the price that participants in the two pools were willing to pay. I also checked whether there was any difference between the pools at the individual level. The vast majority of the participants were willing to pay *exactly the same* amount for the two types of insurance.[82]

In sum, there is no evidence that excess demand for monetary damages is what drives the demand for non-monetary coverage.

5 Study 2 discussion
Study 2 replicates the results of Study 1 in that it shows that the majority of the participants expressed a product-dependent demand for pain-and-suffering insurance.[83] More importantly, Study 2 also replicated the finding that the vast majority (between 74 and 79 per cent) of the participants treated both types of insurance *exactly* the same: they paid *exactly* the same price for the two types of insurance. As in Study 1, of those who did not treat it the same, the majority preferred monetary to pain-and-suffering insurance; and, also as in Study 1, participants paid higher premiums for both types of insurance when the product itself (trampoline, facial cream, saw, or tires) was more expensive.

82 The only significant difference is with respect to the saw; in this case, more people treated both types of insurance exactly the same in the new pool.
83 Seventy-nine per cent demanded pain-and-suffering insurance for the trampoline, 69 per cent for the tires, 55 per cent for the saw, and 52 per cent for the facial cream.

Study 2 further rules out two alternative hypotheses: first, that what drives the demand for pain-and-suffering coverage is the demand for rehabilitation costs; and, second, that the demand for pain-and-suffering coverage is driven by excess demand for monetary coverage. Positing rehabilitation costs as part of pain-and-suffering coverage and the existence of demand for excessive monetary coverage caused a small reduction in the percentage of people who demanded *both* types of coverage.

More importantly, the results show that both participants who were offered rehabilitation costs part of monetary coverage and those who were offered rehabilitation costs as part of pain-and-suffering coverage expressed similar demand for the two types of insurance: about the same percentage of participants in both groups were willing to pay weakly above the expected loss for each types of insurance. Similarly, participants in both groups paid roughly the same amount of money for the two types of insurance. More importantly, about three-quarters of participants in both groups paid the *exact same* dollar amount for the two types.

Even when participants who expressed excessive demand for monetary coverage are excluded from the pool, the characteristics of the demand for pain-and-suffering coverage do not change.

IV *General summary*

My results in both studies show that the vast majority of the participants (89 per cent in both studies) treated the two types of insurance the same: either they bought them both or they bought neither. Moreover, on average, in both studies the majority (64 per cent in Study 1; 76 per cent in Study 2) of participants treated the two types of insurance *exactly* the same, paying *exactly* the same amount for each type of insurance. Of those who did not treat it the same, the majority preferred monetary to pain-and-suffering insurance.

Study 2 further rules out the possibility that demand for rehabilitation costs and demand for excessive monetary costs are alternative explanations for demand for pain-and-suffering coverage.

These results may cast doubt on the notion supported by scholars that people are risk averse and therefore will always buy an actuarially fair monetary insurance but not non-monetary insurance. The results clearly show that people do not always demand either monetary insurance or pain-and-suffering insurance. Importantly, people are much more likely to treat the two types of insurance equally than scholars have traditionally thought.

It should be noted that the demand for both types of insurance is not fixed across level of coverage but, rather, depends on the product in question (and the injuries it implies). Importantly, neither study's results show any support for Viscusi's finding that people will demand pain-and-

suffering coverage for minor injuries but not for severe injuries. In fact, participants demanded pain-and-suffering coverage even when the injury involved was brain damage or a coma.[84] The fact that, across products and in all studies, people were willing to pay considerably more than the expected loss may tell us that people tend to add some perceived-as-reasonable premium to the price of the product, thus neglecting the expected loss altogether.[85] Indeed, this pattern fits well into the literature on cognitive biases and anchoring.[86]

The results of this investigation are unlikely to be an artefact of the questionnaire design. The design of the questionnaires is similar to those routinely used by profit-maximizing firms to assess demand for products not yet on the market, but is substantially superior to those used by market research firms. Indeed, one of the novelties in this study is methodological. By comparing the *relative* demand for monetary versus pain-and-suffering coverage, the study overcomes the traditional critique of experiments. Specifically, the study is immune to whatever cognitive biases, lack of incentives, computational deficiencies, and so on participants may have had, as all such problems affect the demand for *both* types of insurance equally. By comparing relative differences between the

84 The fact that participants demanded both types of coverage in all cases may be an artefact of the study design. Recall that I compared the *relative* demand for monetary versus pain-and-suffering coverage in order to overcome the traditional criticism of experiments (i.e., that participants suffer from cognitive biases, lack of incentives, computational deficiencies, etc.). See supra note 51. As such problems affect the demand for *both* types of insurance equally, by comparing relative differences between the demand for monetary insurance and the demand for pain-and-suffering coverage, this study controls for these factors. Yet this design, by lumping together both types of insurance, may have created a cognitive bias to treat both types of insurance the same. To rule this out one would need to run another study in which a specific injury creates pain and suffering but no monetary loss. This new design, however, would be subject to the same criticism my study was originally intended to avoid.

85 Indeed, most participants in a state of risk were willing to pay an estimated 15 to 35 per cent of the product price, regardless of the expected loss, for the coverage. In conversations with participants in the pre-test stages, I discovered that many participants, when deciding how much insurance coverage to purchase, do not take into account the expected loss. This result is corroborated by the fact that information about the expected loss was not significantly correlated with a change in the premiums but only with the likelihood of buying insurance.

86 This pattern of decision making may attract entrepreneurs to extract surplus from non-expert consumers, especially in non-competitive markets. For example, a local monopoly that sells a specific audio system may well extract surplus (which would be far above the 'regular' monopoly rent) because consumers determine the premium they are willing to pay for a service contract (a warranty) by applying a rule of thumb and paying some fixed percentage of the product price. In competitive markets, in contrast, there is a higher probability that the price charged to consumers will be closer to the supplier's marginal cost, which is virtually the expected loss for the insurance coverage is intended to compensate.

demand for monetary coverage and the demand for pain-and-suffering coverage, this study controls for these factors.

What are the policy implications of these studies? Ideally, because of consumer heterogeneity, one would want to let consumers sort themselves into pools in which they either buy or do not buy pain-and-suffering coverage. Despite being more efficient and potentially distributively more fair (because the poorest consumers are not driven out of the market by high overall product prices), this solution may be administratively impossible.[87] Therefore, between the two possible default rules – either to have or not to have pain-and-suffering coverage bundled with the sale of the product – the evidence presented here suggests that even on pure insurance grounds, the preferable default rule is to provide for *some* pain-and-suffering damages.[88] Thus, these results should be read as providing evidence to refute the proposition that pain-and-suffering damages should be eliminated from tort law altogether because people do not demand such coverage. They do not, however, support the proposition that pain-and-suffering damages in current tort law should be left untouched. Indeed, between these two points there is a spectrum of possibilities for improvement.

Thus, if one is willing to assume that, because of supply-side problems, insurance markets are inferior to the legal system in providing pain-and-suffering coverage – not a trivial assumption[89] – the question to be addressed is how the legal system can best provide pain-and-suffering coverage in practice. Should pain-and-suffering coverage be determined by applying some structured means, such as schedules? Or should it perhaps be left to a jury's full discretion on a case-by-case basis? In either

87 It is not necessarily true that a separation equilibrium is more efficient and fair. Even if it were administratively possible to separate consumers into two different pools, pooling them together could nonetheless be preferable. First, in a separating equilibrium, low-risk consumers will purchase lower coverage than otherwise desired to differentiate themselves from high-risk consumers. Thus, if there are relatively few high-risk consumers, the benefit of differentiation could be lower than the benefit of getting the desired coverage. Second, if being a high-risk consumer is correlated with low income (perhaps because the quality of parental education – which *is* correlated with income – is what teaches people to be more careful), then the pooling equilibrium where the high-income (low-risk) individual subsidizes the low-income (high-risk) individual may be superior. Janus Ordover, 'Products Liability in Markets with Heterogeneous Consumers' (1979) 8 J.Legal Stud. 505.

88 That is, even if deterrence is fully provided via regulations, reputational effects, or any other means.

89 Whether insurance markets are indeed inferior to the legal system in providing pain-and-suffering damages is not a trivial question. One should compare the relative advantages of each system in combating moral hazard, adverse selection, and other market failures. For an extensive discussion of this point see Croley & Hanson, 'Non-Pecuniary,' supra note 6.

case, how exactly should the decision maker *calculate* the appropriate coverage?

Randall Bovbjerg, Frank Sloan, and James Blumstein offer three different models for structuring the calculations of pain-and-suffering damages:[90] first, a system of standardized awards set according to a matrix or schedule of dollar values based on the plaintiff's age and the severity of the injury;[91] second, a system that uses scenarios of hypothetical injuries and their corresponding non-economic awards, which are presented to juries as suggested and non-binding guides to valuation;[92] and, third, a system of flexible ranges of monetary awards that would reflect the various categories of injury severity and victim age.[93] Mark Geistfeld, in contrast, suggests that in the event of a prior contractual relationship between the parties, a jury would assess damages from an *ex-ante* perspective, asking how much a reasonable person would have paid to eliminate the risk that caused the pain-and-suffering loss. This measure, Geistfeld argues, reflects the consumer's *ex-ante* assessment of the cost of the pain-and-suffering loss.[94]

In a forthcoming paper I criticize these different approaches. Caps, damages schedules, and other proposed solutions take us away from the free market and yet solve nothing. I therefore suggest a yardstick to determine pain-and-suffering awards by using medical costs and the plaintiff's age as the basis for calculating pain-and-suffering losses. Under my approach, a system of multipliers will be associated with the health costs and the age of the plaintiff to calculate the pain-and-suffering component. My aim is to establish a simple, administratively cheap system of dealing with the problem of pain-and-suffering damages. I hypothesize that victims' medical costs and age can be statistically significant proxies for people's pain-and-suffering losses. This system solves the unpredictability problem inherent in pain and suffering in tort law at negligible administrative costs. It preserves the advantages of efficiency and fairness

90 Bovbjerg *et al.*, 'Life and Limb,' supra note 30.

91 Ibid. at 941. The severity of the injury would be categorized according to whether it is permanent or temporary and whether it is minor or major. With respect to age, the authors argue that whereas with bodily injuries young people are expected to recover faster from temporary pain-and-suffering loss, they suffer more from permanent loss because of their longer lifespan.

92 Ibid. at 953–6. The authors suggest constructing nine scenarios that would describe the physical severity of the injury, including the victim's age, the pain endured, and so on.

93 Ibid. at 956–60. Recognizing that some injuries are much more severe than others, the authors object to applying a single flat cap. They also question the wisdom of assuming that some awards, because of sympathetic juries, will be disproportionate to the damages sustained. It is worth mentioning that the authors see this alternative as inferior to the matrices and scenarios, for in most cases, they give the juries no guidance but only deal with the problem of outliers. Ibid. at 959.

94 Geistfeld, 'Placing a Price,' supra note 68 at 805–7.

associated with having a jury decide on a case-by-case basis, without the high complexity of assessing pain-and-suffering losses required by other proposals or the current system.[95]

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95 Ronen Avraham, 'Putting a Price on Pain-and-Suffering Damages: A Critique of the Current Approaches and a Proposal for a Change' N.W.U.L.Rev. [forthcoming in 2005].