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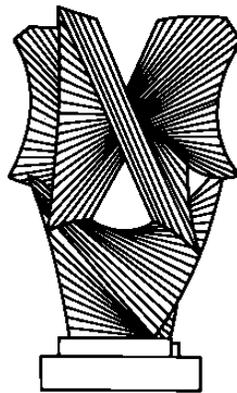
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Liability for Lapses: First or Second Order Negligence?

by

Robert Cooter
and
Ariel Porat

October 1, 2008

Abstract

"First order precaution" directly affects the probability of an accident, such as judging the speed of a car and stepping on the brakes. Intentions are not always realized, so first order precaution is a draw from a probability distribution. Drawing an uncharacteristically low value is a "lapse." "Second order precaution" reduces the probability of a lapse. Examples include concentration when driving and preparation before performing a medical operation. The prevailing tort rule holds the injurer liable for harm caused by unreasonable first order precaution, regardless of second order precaution. Unlike the standard model, our model allows injurers to make second order precaution observable at a cost. Modifying the prevailing tort rule to allow a defense of second order reasonableness will cause injurers to satisfy the legal standard and make this fact observable. Three distinct advantages follow. First, the courts can set the legal standard to induce socially efficient second order behavior. Second, this defense reduces the burden of liability on the underlying activity, which is especially desirable to encourage activities that benefit others, such as practicing medicine. Third, this defense reduces the attraction of actors to activities and forms of precaution that decrease the probability of a lapse and increase the overall risk of an accident.

Liability for Lapses: First or Second Order Negligence?

Robert Cooter and Ariel Porat*

Introduction

When making a decision and executing it, harm can result from misjudged distances, under-estimated probabilities, unforeseen consequences, quavering hands, slips of the tongue, clumsy feet, or an eye's blink. Given the possibility of lapses, actors cannot simply choose a specific level of precaution. Instead, they draw their precaution from a probability distribution. Here is an example.

Example 1: Driver's Lapse. A motorist sets out on the long, straight drive from San Francisco to Los Angeles on Route 5. The speed limit is 70 miles per hour which is also the reasonable speed. The car lacks a mechanical device to maintain constant speed ("cruise control"). The driver aims for 65 miles per hour. Not being a machine, the driver cannot possibly go 65 all the time. The driver makes reasonable effort to maintain constant speed, but occasional lapses in attention cause the driver to exceed or fall short of 65. Near the end of the trip, the driver has an accident while going 73. He would have avoided the accident if he had been going 70 or less.

In statistical terms, the driver in Example 1 draws his speed from a probability distribution with high density around 65 and low density above 70. The driver lapses when he unintentionally draws an uncharacteristically high speed from the probability distribution.

We use the term "first order precaution" to refer to acts that directly affect the

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probability of an accident, such as driving speed. First order precaution that falls short of a community standard of care constitutes negligence in common law. The possibility of a lapse makes negligence and liability probabilistic. Under the prevailing tort rule, the driver in Example 1 was negligent at the time of the accident, and his negligence caused the accident, so he is liable for the resulting harm.

While the driver in the example cannot choose an exact speed, he can affect the probability of lapsing. After beginning his journey, the probability of lapsing depends on how often the driver checks the speedometer, glances in the rear-view mirror, observes the gap between his car and the car in front of him, and makes a rest stop or drinks coffee. Even before the journey begins, the driver can take driving lessons, practice going a constant speed, and get a good sleep the night before the journey. The driver can also choose his target speed, which affects the consequences of a lapse. Thus lapsing has less serious consequences when the target is 65 than when it is 70. We refer to such acts that affect the probability distribution over first order precaution or the seriousness of its consequences as “second order precaution.” In liability law, second order precaution often takes the form of intentions, preparations, and concentration. In our terminology “second order negligence” is a failure to take reasonable second order precaution.

Under prevailing law, the injurer is liable for the harm caused by negligence of any order.¹ The prevailing tort rule holds the injurer liable for harm caused by unreasonable first order precaution, regardless of second order precaution. Prevailing tort law does not allow a defense of higher order reasonableness.

Example 1 concerns a lapse while executing a decision. Another kind of lapse occurs while making a decision. Deciding what to do requires weighing the alternatives. Failing to consider alternatives, or giving the wrong weight to them, can cause an uncharacteristically bad decision. Tort law sometimes treats such a lapse in judgment

¹ Under prevailing law, the plaintiff who cannot prove first order negligence may be able to recover by proving that second order negligence caused his harm. For example, assume that a driver swerves into the opposing lane and hits another car. If the driver swerved to avoid hitting a child, swerving may not have been negligent. First order behavior is reasonable. However, the plaintiff may be able to prove that the driver failed to stop because he did not maintain his brakes in good order. Second order behavior is unreasonable.

differently from a lapse in execution. A lapse in execution often triggers liability, as in Example 1. In contrast, a lapse in judgment often does *not* trigger liability, as this example illustrates:

Example 2: Doctor's Lapse in Judgment. A doctor has performed a given operation successfully many times. Before a particular operation, the doctor carefully examines the patient and prepares the operating room. During the operation, the patient's condition unexpectedly deteriorates and the doctor must immediately make a critical decision. The doctor makes the wrong decision and the patient dies. The right decision would have saved the patient's life.

Courts are reluctant in practice to "second guess" the judgment of a doctor, accountant, lawyers, or other certified expert.²

In Example 2, the doctor's decision while operating is first order behavior, and the doctor's preparation for the operation is second order behavior. An expert who reasonably prepares for a decision, but nevertheless makes the wrong decision, sometimes escapes liability for harm that the right decision would have avoided. Thus courts sometimes allow a defense of second order reasonableness for a bad first order decision. Pockets of the law recognize a defense of second order reasonableness, and, as we will show, these pockets more often concern lapses in decisions than lapses in executions.

Lapses cause a high proportion of accidents, yet probabilistic precaution is under-theorized in liability law. This paper develops a theory of lapses based on the difference between first and second order behavior. We model first order precaution as a draw from a probability distribution, not an exact choice. We model second order precaution as behavior that changes the probability distribution over first order precaution, such as concentration when driving and preparation for an operation. Second order precaution reduces the probability of drawing a low level of first order precaution.

Our focus is on the question of allowing or disallowing a second order reasonableness defense for lapses. Under prevailing tort law, the injurer is liable for harm caused by unreasonable first order precaution, and the law does not allow a defense of second order reasonableness. Unlike the standard model, we assume that courts cannot

² *Infra.*

observe essential elements of second order precaution unless the injurer reveals it. Thus the court cannot obtain a GPS record unless the driver keeps it, and the same is true of records of a doctor's preparation for treatment.

Under certain conditions, modifying the prevailing tort rule to allow a defense of second order reasonableness will cause injurers to satisfy this legal standard and to make this fact observable. Three distinct advantages follow. *First*, the courts can set the legal standard to induce socially efficient second order behavior. This is desirable when uncertainty would otherwise cause precaution to be too high or too low. *Second*, this defense reduces the burden of liability on the underlying activity. This is desirable to encourage those activities that benefit others ("positive externalities"), such as practicing medicine. Conversely, it is undesirable to encourage those activities that harm others ("negative externalities"), such as driving. *Third*, this defense reduces the attraction of actors to activities and forms of precaution that decrease the probability of a lapse and increase the overall risk of an accident. As we will show, the defense will sometimes prevent people from substituting more dangerous capital for less dangerous labor, or it will prevent them from substituting actions with more lapses in judgment for actions with more lapses in execution.³

We advocate extending the defense of second order reasonableness more generally, when doing so captures some of these three kinds of benefits.

³ These are efficiency arguments. Liability for lapses also raises concerns from a retributive justice perspective. Consider someone who lapses no more often than other reasonable people. If the person lapses and harms someone, the injurer is arguably no worse morally than other reasonable people who did not lapse. The injurer, consequently, does not deserve a sanction in the form of tort liability: his bad luck should not count against him. Theorists who discussed the fairness (or retributive justification) of outcome responsibility (liability for materialized harms as opposed to liability for unrealized risks) often use such examples of lapses to illustrate the allegedly unfairness of outcome responsibility. Their arguments would be stronger if they distinguished between first and second order negligence, and offered examples of first order negligence without second order negligence. *See e.g.* Waldron (1995) (justifying outcome responsibility on ground of retributive justice, and using an example of a lapse); Honore (1988) (justifying outcome responsibility on fairness grounds); Schroeder (1990) (arguing from a corrective justice perspective for liability for unrealized risks instead of materialized harms). For a discussion of the moral luck argument from a corrective justice perspective, *see* Ripstein (2008) (Justifying liability for materialized harms only); Zipursky (2008) (justifying negligence-based liability); Goldberg & Zipursky (2007) (explaining that negligence law, while counting the injurer's bad luck against him, cannot be defended on moral grounds only).

The paper is organized as follows. Part I provides an account of the way prevailing tort law deals with lapses. Part II develops our behavioral model of lapses. Part III applies the model to situations where the activity creates negative or positive externalities. Part IV discusses the substitution of activities and forms of precaution that decrease the probability of a lapse and increase the overall risk of an accident. Part V develops a second order reasonableness defense and offers various ways to implement it. The conclusion follows.

I. Lapses under Prevailing Tort Law

A lapse from a legal standard of precaution is usually sufficient to trigger liability for any resulting harm. In such cases, the prevailing tort rule does not usually allow a defense of second order reasonableness. Close inspection will reveal circumstances where courts are open to a defense of second order reasonableness.

A. Road Accidents

In most jurisdictions, drivers are liable for harm caused by their negligence, and a driver is found negligent when his behavior is unreasonable. Examples are speeding (Example 1), not stopping at a stop sign, reacting too slowly in dangerous situations,⁴ taking eyes off the road,⁵ not maintaining a proper lookout,⁶ failing to slow down when necessary, and not keeping adequate distance from other cars. Lapses appear to be a

⁴ See *Bobstein v. Splinter*, 168 So. 2d 560. In this Guest Statute case, the defendant collided into another vehicle which was not expected to be there. The dissent was not convinced that gross negligence, which is a precondition for imposing liability on the driver under that statute, was proven. The judge reasoned that "it affirmatively appears that due either to a momentary lapse of attention, or the unnatural and unanticipated action of the driver of the other vehicle, defendant did not see such vehicle until it was too late to stop his automobile before the collision ensued. *While such action on the part of defendant may constitute simple negligence*, it falls far short of the standard required in order to allege gross negligence." (Emphasis added).

⁵ See *Pedersen v. Kinsley*, 25 Ill. App. 3d 567. In this Guest Statute case, the defendant driver swerved off the road and struck a lamppost. The court imposed liability on the driver, for taking her eyes off the road, and considered it not only as mere negligence, but as willful and wanton misconduct. For similar facts and same outcome, see also *Rosbottom v. Hensley*, 61 Ill.App.2d 198, 209 N.E.2d 655.

⁶ See *Security Timber & Land Co. v. Reed*, 398 So. 2d 174. In this case, a driver was found contributory negligent for not maintaining a proper lookout, resulting in a collision with another car.

common cause of unreasonable behavior of drivers, possibly *the* most common cause.⁷

In road accidents, a driver who lapses offers a second order defense by showing that he acted reasonably at an earlier stage to reduce the probability of lapsing. Courts are reluctant to admit such a defense in road accidents. In exceptional case, however, courts refuse to consider a momentary lapse of attention as negligence *per se*. One such case is *Plowman v. Digatono*. In this case, the plaintiff stopped its car at a red light, proceeded forward when the light turned green, then stopped in the intersection to avoid striking a car in front of him. Defendant ran into the rear end of plaintiff's car. The collision occurred as defendant looked away from traffic for a "moment" to hang up the microphone on his car radio. The jury found that the defendant was not negligent, and the Court of Appeals upheld the jury's decision, stating that "the district court did not err in ... allowing the jury to consider whether... [defendant's] momentary lapse of attention to replace his microphone was a reasonable excuse for his conduct."⁸

In two categories of cases, drivers' lapses are *insufficient* for imposition of liability. The first category concerns *guest statutes* that govern the liability of a driver toward a guest in his car. Under these statutes, a lapse in precaution is not enough to satisfy the requirements of driver's liability to a guest. Liability requires the driver's gross negligence or willful and wanton misconduct.⁹ Gross negligence and willful and wanton misconduct go to the quality of self-monitoring. They often imply a knowing or deliberate choice of unreasonable second order behavior.

The second category concerns *sudden emergencies* on roads and elsewhere. One

⁷ See *Porter v. State*, 88 So. 2d 924. In deciding a criminal case on manslaughter, Justice O'Connell noted that "There are few, if any, persons who drive automobiles who have not, through momentary lapse of attention, error of judgment, failing to see what they should have seen, particularly on roads not in municipalities, been guilty of running a stop sign at an intersection without slowing down. *Such, no doubt, constitutes negligence sufficient to support a damage suit based on simple negligence.* We doubt that it would support a verdict under our guest statute. Nor do we believe that it is sufficient to support a verdict of manslaughter." *Ibid.*, at 926 (Emphasis added).

⁸ See *Plowman v. Digatono*, 1995 Minn. App. LEXIS 1291. The defendant was a policeman who drove a police car.

⁹ See *Hoffman v. Slocum*, 219 Cal. App. 2d 100. The court imposed liability on a driver toward a guest, reasoning that "the trier of the fact was entitled to infer that this was not simply an error of judgment or a momentary lapse of attention on the driver's part". See also *Porter v. State*, *supra* note 3; *Bobstein v. Splinter*, *supra* note 4.

court formulated the sudden emergency doctrine, which many courts have recognized, as follows:

"One who suddenly finds himself in a position of imminent peril, without sufficient time to consider and weigh all the circumstances or best means that may be adopted to avoid an impending danger, is not guilty of negligence if he fails to adopt what subsequently and upon reflection may appear to have been a better method, unless the emergency in which he finds himself is brought about by his own negligence."¹⁰

According to this formulation, the sudden emergency doctrine does not lower the standard of care required of a motorist before the emergency occurs.¹¹ The sudden emergency doctrine cannot be invoked by one who has brought the emergency on himself by his own wrong or who has not used due care to avoid it. If the actor took reasonable care before the sudden emergency, then this legal doctrine lowers the standard of care applicable in the sudden emergency. In our language, second-order reasonableness provides a defense against liability for first order negligence in a sudden.

B. Medical Malpractice

Turning to medical malpractice, doctors are held liable for the consequences of their negligence in making decisions and executing them. Many medical accidents are the result of errors, and errors are often caused by lapses.¹² Lapses in decisions include failing to diagnose, choosing the wrong drug to administer, choosing the wrong technique to perform, using the wrong medical equipment, omitting tests needed to diagnose the patient's illness, or deciding to operate too early or too late. Lapses in execution include administering a different drug from the one intended, incorrectly performing a medical technique, using medical equipment improperly, misreading results of diagnostic tests, operating on the wrong patient or the wrong body part, leaving a sponge inside a patient's

¹⁰ *Hickman v. Southern Pacific Transport Company*, 262 La. 102, 262 So.2d 385 (La.1972).

¹¹ *Dick v. Phillips*, 253 La. 366, 218 So.2d 299, 302 (La.1969).

¹² For a profound analysis, both positive and normative, of errors, lapses, and related occurrences in the field of medicine, see Merry & McCall Smith (2006). For data on the medical errors and their huge contribution to patients' injury, see Cimasi (2005). For the argument that systemic errors are major causes for most medical accidents even if typically combined with individual errors, and for a comprehensive account of all types of medical errors based on extensive empirical evidence, see Mello & Studdert (2008).

body, failing to sterilize medical equipment, and failing to monitor the patient's condition.¹³

Anecdotal evidence from the case law suggests that doctors are more often found liable for failures in execution than for failures in judgment.¹⁴ One reason could be implicit recognition of a second order reasonableness defense. Thus courts sometimes exempt physicians from liability for an error of judgment if they acted in good faith.¹⁵ Good faith depends to a large extent upon second order behavior. When doctors prepared reasonably before making a decision, courts often exempt them from liability for making the wrong decision. For example, when a doctor decides to deliver a baby by Cesarean, courts will ordinarily not check the reasonableness of his decision so long as they are convinced he prepared properly to make it. In contrast, once the method is decided for delivering the baby, the courts are reluctant to excuse faulty execution on grounds of reasonable preparation.¹⁶

A second possible reason why courts are more hesitant in imposing liability for doctor's misjudgment is difficulties of proof. Lapses in execution are relatively easy to observe, whereas misjudgments require second-guessing. Many misjudgments remain undetected or unproved, so they do not trigger liability.

¹³ For a comprehensive list of causes for patients' injury which include those mentioned in the text and many others, see Orlikoff & Vanagunas (1988); Mello & Studdert, *supra* note. For case law illustrations of execution failures, see *Rivera v. Anilesh*, 869 N.E.2d 654 (2007) (negligent performance of injections of anesthesia and extraction of a tooth could result in dentists' liability); *Vanderpool v. Adirondack Neurosurgical Specialists, P.C.*, 846 N.Y.S.2d 832 (2007) (failing to diagnose plaintiff's bilateral pars defect, which was evident from X rays and an MRI, prior to performing spinal surgery.); *Powell v. Kleinman*, 151 Cal. App. 4th 112 (2007) (Failing to ascertain results of a test administered for the patient); *Mobile Infirmity Association v. Tyler* 2007 Ala. LEXIS 192 (2007).

¹⁴ Similarly, in the field of liability of public authorities, courts are much more willing to impose liability for execution of operational, rather than discretionary powers. Dobbs (2000) See also Brooth & Squires (2005) (distinguishing between policy and operational decisions of the public authority and indicating courts' enhanced willingness to impose liability for the latter rather than for the former).

¹⁵ See *Dotson v. Hammerman*, 932 S.W. 2d 880 (Mo. App. 1996); Dobbs, *supra* note. See also Hyman & Silver (2006) (citing several studies and stipulating that "[a]ll find that the merits matter, and some find that the merits matter more than anything else. Plaintiffs who received substandard care generally obtained compensation... plaintiffs who received proper care generally did not... and plaintiffs whose care quality was uncertain wound up in between").

¹⁶ See discussion *infra*.

Powell v. Kleinman, decided by a Californian Court of Appeal,¹⁷ illustrates these points. In this case a patient sued his doctors for harms resulting from failure to diagnose promptly and treat an injury to his spinal cord. The plaintiff alleged doctors' negligence manifested in three ways:

1. The doctors initially failed to test for spinal weakness, discover weakness, or note findings of weakness. Here the doctors seem to have weighed alternatives and decided that tests were unnecessary.
2. When the plaintiff's symptoms continued, the doctors decided to evaluate the patient using an MRI test, and they failed to do so.
3. The doctors allegedly decided to rely on the hospital to test for spinal cord compromise. The doctors assumed that the staff at the hospital had tested for cord compromise without confirming it had done so.

On defendant's appeal for summary judgment, the Court of Appeal faced the question of whether any of the plaintiff's allegations could give rise to the doctors' liability. The Court decided that the first allegation, which concern bad judgment, could not give rises to doctors' liability. The Court decided that the 2nd and 3rd allegations, which concern bad execution, could give rise to the doctors' liability.

Reluctance to second guess doctors' judgments is also reflected in Section 6.03 of the California Civil Jury Instructions¹⁸ which states as follows:

"Where there is more than one recognized method of diagnosis or treatment, and no one of them is used exclusively and uniformly by all practitioners of good standing, under the same or similar circumstances, a physician is not negligent if, in exercising [his] [or] [her] best judgment, [he] [or] [she] selects one of the approved methods, which later turns out to be a wrong selection, or one not favored by certain other practitioners."

Juries following these instructions will find no liability for many lapses in judgment. Thus a doctor's bad decision to deliver a baby by Cesarean, when vaginal birth would have been better, will seldom trigger liability.

¹⁷ *Powell v. Kleinman*, 151 Cal. App. 4th 112 (2007).

¹⁸ These are the official instructions for jury approved by the Judicial Council.

The preceding discussion of doctrine and cases suggests that courts' impose liability for faulty executions more readily than for faulty judgments. Do statistics bear this out? We know of no data explicitly on point, but available data implicitly suggests a positive answer. The National Practitioner Data Bank (2005)¹⁹ includes 191,082 medical malpractice claims, both tried and settled, brought by patients in 1991-2005. The claims are arranged by category. Upon examination, these categories suggest to us that roughly 80% of the claims were brought for faulty execution and 20% were brought for misjudgments.²⁰

C. Products Liability

Manufacturing inevitably results in some defective items, and quality control reduces the frequency with which defective items harm consumers. We distinguish the relevant behavior into first and second order. Roughly speaking, manufacturing the product is first order behavior, and quality control is second order behavior. Thus a manufacture of a soft drink must fill bottles, which is first order behavior, and he also must monitor the bottles for cracks or overcharging with gas, which is second order behavior. The more carefully the manufacturer monitors, the less often a cracked or overcharged bottle reaches consumers

At the beginning of the 20th century, the common law imposed a negligence rule on manufacturers for defective products that harmed consumers. To recover damages, the consumer had to prove that a defective product caused the injury and the manufacturer's negligence caused the defect. The second part of the proof usually involved showing that the manufacturer's quality control, which is second order behavior, was unreasonable.²¹

¹⁹ Public Use Data File (computer file): <http://www.npdb-hipdb.com/publicdata.html>.

²⁰ 37,805 claims were brought for failed diagnose—probably more judgment than execution claims. Most of the rest were brought for various types of faulty execution. Thus 16,356 claims were brought for delay in treatment, 3,286 for failed monitoring, 3,943 for failed performance of a procedure, 12,275 for improper management, 28,931 for improper performance, 857 for improper use of equipment, 2054 for administering treatment on a wrong body part, 1562 for administering wrong dosage of medication and 1,913 for administering wrong medication.

²¹ See Henderson & Eisenberg (1990) (claiming that "the growth of products liability undoubtedly has increased corporate safety consciousness..."); Epstein (1999). Imperfect quality control causes a few items in a manufacturing process to fall short of the design that the others satisfy. In contrast, a defect in design affects all items manufactured according to that design. Manufacturing and design defects require a

Thus we describe the rule of consumer products liability at the beginning of the 20th century as a second order negligence rule.

Consumers seldom had enough evidence about manufacturer's quality control to meet this burden of proof. To allow more recoveries by injured consumers, American courts in the early 20th century applied the doctrine of *res ipsa*. According to this doctrine, the court should infer the defendant's negligence if the specific accident belongs to a type that regularly results from negligence, and if two more conditions are satisfied.²² The manufacturer was liable when the consumer showed that he was injured by a defective product under these conditions, unless the manufacturer could prove that its quality control satisfied the legal standard.²³

The original liability rule required the plaintiff to prove second order unreasonableness in order to recover. The rule of *res ipsa* allowed the defendant to escape liability by proving second order reasonableness. Thus the change in rules reversed the burden of proof concerning second order reasonableness. The doctrine of *res ipsa* was an intermediate step towards the contemporary liability rule. In the course of the 20th century, most jurisdictions changed the rule to strict liability. This change eliminated the manufacturer's right to defend itself by showing reasonable quality control. If a product is unreasonably dangerous, the manufacturer is strictly liable for the harm the defect causes to consumers, and no amount of quality control excuses the manufacturer.²⁴

D. Violating Statutory Duties

Now we consider another example of a second order defense recognized in many jurisdictions. A breach of statutory duty that results in harm creates a presumption that

separate analysis in the law of torts. This article discusses the former and not the latter. For a discussion of the distinction, see Epstein, *supra* note, at 406-8; Cooter & Ulen (2007).

²² The other two conditions are that the event was caused by an agency or instrumentality within the exclusive control of the defendant; and that it was not due to any voluntary action or contribution on the part of the plaintiff. See Epstein, *supra* note, at 172; Porat & Stein (2001).

²³ *Richenbacher v. California Packing Corp.*, 145 N.E. 281 (Mass. 1924); *Escola v. Coca Cola Bottling Co.* 150 P. 2d 436 (Cal. 1944).

²⁴ Epstein, *supra* note, at 389-94;

the defendant was negligent. In many jurisdictions, the defendant is entitled to rebut this presumption by showing that he behaved reasonably. Many courts maintain that an actor is excused for violating a statute when he shows that "he did what might reasonably be expected of a person of ordinary prudence, acting under similar circumstances, who desired to comply with the law."²⁵ In the case where a lapse causes the breach of the statutory duty, proof of second-order reasonableness may provide a sufficient defense against liability.

The case of *Waugh v. Traxler*, decided by the Supreme Court of Appeals of West Virginia, illustrates our point.²⁶ In this case the defendant's vehicle crossed the center line of an icy roadway and struck the plaintiffs' oncoming vehicle. The defendant violated traffic regulations by losing control of her car and driving in the wrong lane. Notwithstanding, the jury found that the defendant was not negligent. The Court of Appeal maintained that "the undisputed facts indicate a violation of the statute," but they only create a "rebuttable prima facie presumption of negligence." The presumption of negligence was rebutted mostly by the reasonableness of the defendant's second order behavior:

"[T]he [defendant] offered evidence of her recognition of the hazardous conditions and her attempts to prevent the accident. She departed for work especially early... because she realized that the roads were hazardous. She further testified that she was fully aware of the hazardous conditions and had exercised extreme caution in the operation of her vehicle. She also directs attention to the testimony of State Police Trooper... to the effect that even he was unable to appreciate the full extent of the icy conditions until he stepped out of his vehicle

²⁵ *Alarid v. Vanier* 50 Cal. 2d 617, 624, 327 P. 2d 897 (1958); *Witham v. Norfolk & Western Ry. Co.*, 561 N.E.2d 484 (Ind. 1990) (a motorist was injured when his automobile was struck by a train, where the crossing flashers had been malfunctioning for many years. The court ruled in favor of the plaintiff, saying that "[t]he facts clearly demonstrate genuine issues regarding whether the notoriously malfunctioning flashers 'gave warning' so as to give rise to a possible statutory violation, and even if so, whether Witham acted as would a reasonable person under similar circumstances who desired to comply with the law."); *Leikin v. Wilson*, 445 A.2d 993 (D.C. App. 1982) (The defendant's brakes were defective, in violation of statute, and the brake failure caused the accident. Since the defendant neither knew nor reasonably could have known that the brakes were defective the District of Columbia Court of Appeals affirmed the decision of the lower court that the defendant was not negligent, stating that the evidence supported a finding that the defendant had effectively rebutted the presumption of negligence. *Id.* at 1002). *See also* Restatement 2d Torts §288A (containing a list of situations, in which violations are excused, e.g. when the actor is unable after reasonable diligence or care to comply.); *Dobbs, supra* note, §140, at 330.

²⁶ *Waugh v. Traxler*, 186 W. Va. 355, 412 S.E. 2d 756 (1991).

and attempted to walk on the road. She explained that she was exercising caution in driving but was unable to avoid the accident due to the icy conditions."

In other cases, courts have exempted defendants from liability for violation of statutory duties if the injurer did not know, and could not reasonably discover, that his act violated a statute.²⁷

E. Defamation

Under defamation law, a plaintiff must prove injury from the defendant's false assertion. The false assertion can be regarded as first order behavior. This proof, however, is not enough for liability. Thus communication errors, erroneous deductions, incorrect inferences, and ambiguous articulations are not enough for liability.²⁸ In addition, a plaintiff who is a private individual must establish that the defendant was negligent.²⁹ The relevant kind of negligence often involves failure to make reasonable effort to check information and verify its truth, which can be regarded as second order behavior.³⁰ Thus the required negligence under defamation law is typically second order,

²⁷ Restatement 2d Torts §288A(2)(b) ("Unless the enactment or regulation is construed not to permit such excuse, its violation is excused when he (the actor – R.C & A.P.) neither knows nor should know of the occasion of compliance". But the injurer will not be excused if the statute requires investigation and knowledge. See *Smith v. Owen* 841 S.W. 2d 828 (Tenn. App. 1992); *Dobbs, supra* note, §140, at 330. The same is true if the statute is interpreted to impose strict liability. See *Dobbs, ibid.*, §141, at 331-2.

²⁸ *Dobbs, supra* note, §419, at 1182. Even partial erroneous facts are often not enough for liability. Prosser and Keeton say that it is sufficient to show that the charge or imputation is "substantially true, or as it is often put, to justify the 'gist', the 'sting' or the 'substantial truth' of the defamation, Prosser & Keeton (1984). See also *Campbell v. Quad City Times*; *Hovey v. Iowa State Daily Publication*; in *Casteel v. News-Record Inc.* the Court concluded that "the ordinary and obvious meaning of *fair* does not require that the report be true or accurate... What is required for the privilege to apply is that the report have qualities of impartiality and honesty, and be free from prejudice, favoritism and self-interest."

On the other hand, in *Schiavone Construction Co. v. Time, Inc.* it was decided that "[a] report that intentionally excludes information that is... obviously exculpatory... simply cannot, under any definition, be deemed either fair or accurate."

²⁹ See *Gertz v. Robert Welch, Inc.* 418 U.S. 323 (1974) (deciding that so long as the states do not impose liability without fault, they may define for themselves the appropriate standard of liability for a publisher or broadcaster of defamatory falsehood injurious to a private individual). A different rule applies to public officials or public figures under the Supreme Court decision of *New York Times v. Sullivan*, 376 U.S. 254 (1964), according to which liability for defamation is conditioned upon the defendant being guilty of publishing a knowing or reckless falsehood.

³⁰ See *Dobbs, supra* note, § 419, at 1182. Cooter formulated the gathering of information to support an assertion as an optimal problem. In this framework, negligence consists in stopping too soon. See Cooter (2000), and Bar-gill & Hamdani (2003).

not first order.³¹

F. The "Business Judgment Rule"

Stockholders sometimes sue corporate directors when they make bad decisions and lower the value of the company's shares. As formulated in *Smith v. Van Gorkom* the business judgment rule prohibits courts in such cases from second-guessing directors' substantive decisions.³² Instead, courts may consider only the quality of the directors' decision-making *process*, especially the information that they gathered before deciding.³³ Thus a director who prepares to make a business decision, decides in good faith, and makes the wrong choice in the circumstances, escapes liability to stockholders for harm that the right decision would have avoided. To recover damages, the plaintiff must prove that the defendant's bad judgment caused the harm, and also prove that the defendant was negligent in preparing to make the decision.

In our language, the bad decision is first order behavior, and preparation to decide is second order behavior. The business judgment rule thus allows a defense of second order reasonableness for an unreasonable first order behavior.³⁴

³¹ In *Walker v. Colorado Springs Sun*, 188 Colo. 86, plaintiffs brought a libel suit against a newspaper, an editor, and a reporter. The court held that when a defamatory statement was published concerning one who was not a public official or a public figure, but the matter involved was of public or general concern, the publisher would be liable to the person defamed only if he knew that the statement was false or if he made the statement with reckless disregard of whether it was true or not. The court determined that "a simple negligence rule would cast such a chilling effect upon the news media that it would print insufficient facts in order to protect itself against libel actions". *Id.* In *St. Amant v. Thompson*, 390 U.S. 727 (1968) the Supreme Court held that "reckless conduct is not measured by whether a reasonably prudent man would have published, or would have investigated before publishing. There must be sufficient evidence to permit the conclusion that the defendant in fact entertained serious doubts as to the truth of his publication."

³² *Smith v. Van Gorkom*, 488 A.2d 858, 872 (Del. 1985). For a discussion, see Stout & Blair (2001). The business judgment rule is considered to be the main reason for the rarity of court decisions imposing liability on directors: *see* Black & Cheffins (2006). The rule was adopted by most states including Delaware: Barton, Block & Radin (1998).

³³ The business judgment rule has various formulations. A leading book phrased it: "the [business judgment rule's] terms are far less important than the fact that there is special deferential approach." Easterbrook & Fischel (1991).

³⁴ "The rule is simply that the business judgment of the directors will not be challenged or overturned by courts or shareholders, and the directors will not be held liable for the consequences of their exercise of business judgment – *even for judgments that appear to have been clear mistakes* – unless certain exceptions apply." (Emphasis added). Clark (1986). The main justification for the business judgment rule is that shareholders prefer a lenient standard of liability for their directors, believing it serves their goals. Many corporations adopted directors/officers liability indemnity provisions. *See* Danielson & Karpoff

G. Summary

Given that first order precaution is probabilistic, a crucial question for tort law is whether or not a liability rule allows a defense of second order reasonableness. We explained that the prevailing rule of negligence in everyday accidents, such as driving, usually *disallows* a defense of second order reasonableness. Likewise, the prevailing rule of strict liability for consumer injuries caused by manufacturing *disallows* a defense of second order reasonableness.³⁵ However, the prevailing rules of tort law sometimes allow a second order defense, especially for faulty *judgments* by expert decision makers, or emergency situations, or breach of statutory duties. Instead of the defendant having to prove second order reasonableness, defamation law sometimes requires the plaintiff to prove second order negligence by the defendant.

II. Model of Lapses

The first formal model of comparative tort rules, which was published in 1973, became the standard model.³⁶ Under all forms of the negligence rule, courts decide liability by comparing an actor's actual precaution to the legal standard. In the standard model, injurers exactly satisfy the legal standard in order to escape liability. Setting the legal standard at the optimal level of care, consequently, causes actors to take optimal precaution.

The standard model did not encompass uncertainty. In many economic models, introducing uncertainty does not change individual behavior, or does not change average

(1998) (documenting a large increase in the use of corporate governance provisions in the late 1980s, showing that in a sample of 513 companies – primarily S&P 500 – 17 companies had director / officer liability indemnity provision in 1984, and in 1989 the number of companies rose to 441).

³⁵ As we have explained, we focus on products liability for manufacturing defects: *supra* note. With design defects the distinction between first and second order negligence disappears.

³⁶ Brown (1973) In the standard model, no one is negligent in equilibrium (or else everyone is negligent in equilibrium), which contradicts the basic fact of tort liability: Some acts are negligently performed. A small modification of the standard model allows actors, for whom precaution is idiosyncratically expensive, to choose a level of care that courts judge to be unreasonable – hence the oxymoron “intentional negligence.” See Cooter (1983) (“If punitive damages exactly offset the injurer's illicit benefits, then his cost function will look just like that of an ordinary injurer in the zone of liability...”).

behavior, provided that the distribution of errors is unbiased³⁷ and actors are risk-neutral.³⁸ This was *not* the case when uncertainty was introduced into the standard model of negligence rules.³⁹ In the standard model without uncertainty, injurers exactly satisfy the legal standard in order to escape liability. With uncertainty, injurers do not know for sure whether or not a given level of precaution that they take will enable them to escape liability. An actor's costs usually jump up when his precaution falls below the legal standard of care.⁴⁰ When costs are discontinuous at the legal standard, uncertainty causes actors to change their individual and average behavior, even when errors are unbiased and actors are risk-neutral.⁴¹ In principle, the change can result in precaution above or below the social optimum. Under reasonable assumptions, however, the change results in excessive precaution.⁴² The standard model of negligence under uncertainty predicts that injurers will take socially inefficient precaution.

³⁷ An unbiased estimation of a value is equally likely to err in either direction -- too high or too low. Many errors are normally distributed with zero mean. The normal distribution is one form of an unbiased distribution.

³⁸ Economists traditionally assumed that people are neutral with respect to small risks and averse to large risks. See Arrow (1974). Cognitive psychology successfully challenged these assumptions by proving experimentally that the context of a decision frames the way an actor decides what to do. Cognitive psychology, or its fraternal twin, behavioral economics, improves the realism of assumptions about risk. This improvement, however, often does not change the traditional approach to modeling. Risk-averse or risk-seeking behavior differs from risk-neutral behavior in ways that are intuitive and easily modeled. So a formal theory of tort liability usually begins by assuming risk neutrality and later introduces corrections to increase the model's realism.

³⁹ Calfee & Craswell (1984) (saying that the standard model fails to explain why some acts are negligently performed).

⁴⁰ The discontinuity of liability under rule of negligence and its behavioral consequences were originally explained in Cooter, *supra* note 36, at 91 (claiming that "a negligence rule creates a threshold or jump in the potential injurer's costs."). Grady argued against Cooter that courts would not actually hold injurers liable for more harm than they actually caused by negligently untaken precautions. See Grady (1989) ("the economic modeler's claim that the negligence rule contains an incentive-distorting discontinuity crucially depends on the assumption that courts are trying to find global minima, and on the related supposition that the breach-of-duty and cause-in-fact issues are independent."). See also Kahan (1989); Craswell (1986) (advocating liability for incremental damages which is the difference between the social losses inflicted by injurers' activity and the social losses that would have been inflicted had they complied with the legal standard). Cooter replied that the discontinuity is due to incomplete information by the courts, which is the case in fact. See Cooter (1989) (commenting that "[i]mperfection in the court's causal attribution may be due to the fact that some of the needed information is difficult or impossible to obtain...").

⁴¹ See Calfee & Craswell, *supra* note 40, at 966 ("many traditional conclusions of the law-and-economics literature can no longer be defended on economic grounds... All of these conclusions hold even when defendants are risk-neutral."); Cooter & Ulen (1986) (discussing attitudes toward risk).

⁴² Calfee & Craswell (1984); Robert Cooter and Thomas Ulen, "An Economic Case for Comparative Negligence", 61 *New York University Law Review* 1067 (1987); Steven Shavell, *Economic Analysis of Accident Law* (Harvard University Press, 1987), pages 80-83; Robert Cooter and Thomas Ulen, *Law and Economics* (1st Edition, Scott Foresman, 1988) pages 400-403.

Uncertainty over liability can take various forms. One form arises from randomness in the legal standard of care, which makes the injurer uncertain about the standard that the court will apply to his behavior. Another form arises from randomness in observing the defendant's actual care, which makes the injurer uncertain about the actual level of care that the court will find that he has taken. A third form arises from randomness in precautionary behavior, which makes the actor uncertain about how much precaution his efforts will realize.⁴³

We use the term “lapses” to describe the third form of uncertainty—uncertainty about how much precaution the actor's efforts will realize. If lapses cause most negligent injuries, as we believe, then the existing literature is thin relative to the subject's importance. Some previous papers have discussed lapses by name,⁴⁴ but most authors have discussed the mathematical form of lapses while using different terminology.

To illustrate, we will restate the conclusion of the standard model under uncertainty in Shavell's language and in our language. Shavell (1987) defines “momentary care” as the sum of the care that the injurer can control and a random variable. The random variable prevents full control of momentary care. When deciding liability, courts focus on the instant of the injury. Courts hold the injurer liable for harm caused by momentary care that falls short of the legal standard, regardless of the injurer's level of controlled care. Courts do so because they can observe momentary precaution and they cannot observe controlled care. Under general assumptions, the injurer has incentives to take more or less controlled care than the socially efficient level. Under reasonable (but not general) assumptions, the injurer has incentives to take more than the socially efficient level of controlled care.⁴⁵

We restate this argument in our language. “Momentary care” corresponds to “first order precaution,” and the “controlled care” corresponds to second order precaution. Second order precaution and a random error determine first order precaution. The rule that the injurer is liable for harm caused by unreasonable momentary care corresponds to

⁴³ Shavell (1987) pages 81-83.

⁴⁴ Grady (1988); Grady (1989); Cooter (1991).

⁴⁵ Shavell (1987) pages 81-83, 93-96. Shavell also rightly pointed out that momentary level of care is an imperfect indicator of the true, but unobservable, level of care and wondered whether courts might sometimes lower the level of due care in implicit recognition of the injurers' problem in controlling their momentary level of care. *Ibid.*, at page 81-82.

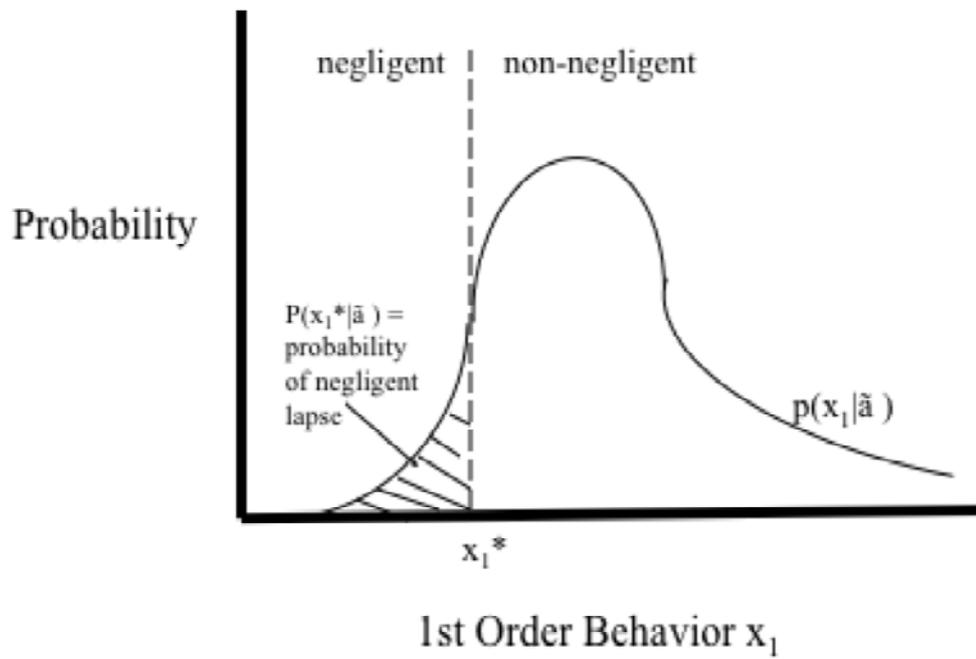
a “first order negligence rule.” Momentary care that falls below the legal standard corresponds to a “negligent lapse.” The proposition that a negligence rule causes the injurer to take socially inefficient controlled care corresponds to the proposition that a first order negligence rule causes socially inefficient precaution.⁴⁶

Now we use some notation to explain our model and how it differs from its predecessor. x_1 indicates first order precaution, which is a random variable. x_1^* indicates the legal standard for precaution x_1 . The vertical line at x_1^* partitions Figure 1 into negligent and non-negligent zones. If an accident occurs when $x_1 < x_1^*$, and the accident would not have occurred if $x_1 \geq x_1^*$, then the actor’s negligent lapse caused the accident. By definition, a first order negligence rule holds the actor liable for harms *caused* by negligent lapses.

x_2 indicates second order precaution (e.g. preparation and self-monitoring). $p(x_1|x_2)$ indicates the probability density function for first order precaution, conditional on second order precaution. In Figure 1, the actor’s particular value of second order precaution x_2 equals \tilde{a} . The shaded area in Figure 1 depicts the probability of first order negligence, which equals the cumulative probability: $P(x_1^*|\tilde{a}) = \int_0^{x_1^*} p(x_1|\tilde{a}) dx_1$. An injurer who takes second order precaution \tilde{a} will lapse with probability $P(x_1^*|\tilde{a})$, and not lapse with probability $1-P(x_1^*|\tilde{a})$.

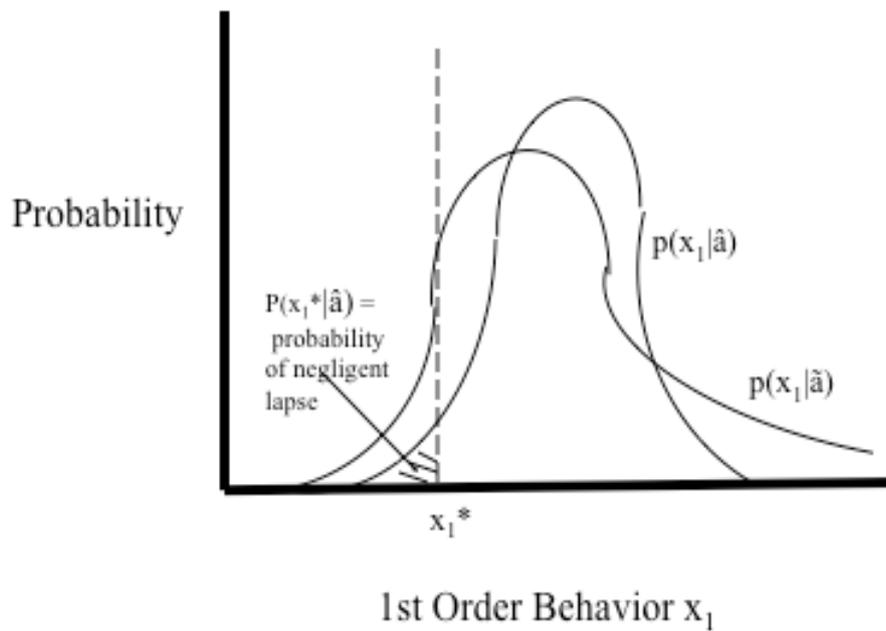
⁴⁶ Arlen and MacLeod’s model of medical malpractice makes a major advance by explicitly incorporating insurance and health care organizations. Our focus, however, is on a component of this model in which an individual physician has to make a decision. The probability that the physician knows which decision is the right one depends on luck and information. The physician’s “expertise” determines the extent of his information. In our terminology, the physician’s “decision” is first order precaution, and the physician’s “expertise” is second order precaution. The authors conclude that holding physicians liable for the harm caused by bad decisions provides socially efficient incentives, provided that courts set damages according to a novel formula that they specify. Arlen & MacLeod (2003, 2005).

Figure 1: Probability of a Negligent Lapse



More second order precaution x_2 will reduce the probability of a lapse, as indicated by a change in the probability density function. The increase in second order precaution may increase the mean of first order precaution as when a driver aims for a lower average speed, or reduce its variance as when a driver checks the speedometer more often. Figure 2 depicts a change in mean and variance caused by an increase in x_2 from the relatively low value denoted \tilde{a} in Figure 1 to the relatively high value denoted \hat{a} in Figure 2. The decrease in size of the shaded area in Figure 2 as compared to Figure 1 indicates a fall in the probability of a lapse.

Figure 2: Shift in Probability of a Negligent Lapse



By definition, the socially optimal level of *second* order precaution, which we denote x_2^* , minimizes the sum of the cost of accidents and the cost of precaution. In the standard model of negligence under uncertainty, as mentioned above, the possibility of lapses can result in excessive or deficient precaution relative to the social optimum.⁴⁷ To illustrate, assume that the socially optimal level of second order precaution equals the level of precaution \tilde{a} that generates the probability distribution in Figure 1. The prevailing liability rule, however, might induce the injurer to take second order precaution equal to \hat{a} that generates the probability distribution in Figure 2. Thus the socially optimal distribution of accidents in Figure 1 differs from the distribution in Figure 2 that minimizes the injurer's private costs.

The standard model of liability under uncertainty assumes that second order precaution is a control variable and first order precaution is uncontrolled. This stylization of the facts makes sense. At a minimum, random errors often infect first order precaution *more* than second order precaution. Thus drivers choose their intended speed and imprecisely control their actual speed; manufacturers choose their rate of product sampling and imprecisely control the number of defective products; and corporate directors prepare to decide and imprecisely control the consequences of their decisions. To study such cases, we retain the standard assumption that random errors infect first order precaution and not second order precaution. Modeling second order randomness, or even randomness in higher orders than second, is possible but not desirable for our purposes.⁴⁸

Now we analyze the incentive effects of applying a legal standard to second order precaution. Recall that a first order negligence rule assigns liability for harm as follows:

$$\begin{aligned} x_1 < x_1^* &\Rightarrow \text{injurer is liable} \\ x_1 \geq x_1^* &\Rightarrow \text{injurer is not liable.} \end{aligned}$$

⁴⁷ Calfee & Craswell (1984); Robert Cooter and Thomas Ulen (1987); Shavell (1987), pages 80-83; Robert Cooter and Thomas Ulen, *Law and Economics* (1st Edition, Scott Foresman, 1988) pages 400-403.

⁴⁸ To model second order errors, we could assume that third order precaution and a random variable determine second order precaution. And we can keep going to higher orders. Higher order of lapses are relevant to studying irresolute intentions of drivers, the failure of quality control workers to sample at the rate prescribed by management, and accidental failure of corporate directors to obtain information that they sought for making a decision.

Similarly, applying a standard of negligence to second order behavior has this form:

$$\begin{aligned}x_2 < x_2^* &\Rightarrow \text{injurer is liable} \\x_2 \geq x_2^* &\Rightarrow \text{injurer is not liable.}\end{aligned}$$

The injurer is liable for harm caused by x_2 falling below the legal standard x_2^* , and the injurer has a defense when x_2 equals or exceeds the legal standard x_2^* .

Now we extend the standard model of negligence under uncertainty by allowing the injurer to make an additional choice. Besides choosing second order precaution, the injurer in our model controls whether or not the court can observe the choice. Assume that the injurer can spend k before the accident occurs, which will make his precaution x_2 observable by the court. For example, a doctor can perform tests before deciding to operate on a patient and then provide the test data to the court; or a driver can record his speed and then provide the record to the court; or a CEO can document his diligence before selling a corporate opportunity and then provide the documents to the court. Without expenditure k , precaution x_2 is *not* observable by the court.

Different liability rules give different incentives for the injurer to make his precaution observable to the court. Consider the rule that dominates prevailing tort law: a rule of liability for first order negligence rule with no second order defense. The injurer's second order behavior is irrelevant to liability, so he has no legal incentive to make it observable. This is the standard situation analyzed above where a first order negligence rule and a random error in first order precaution cause the injurer to take socially inefficient precaution.

Next, consider a liability rule requiring the plaintiff to prove first and second order negligence. The plaintiff must prove both that $x_1 \leq x_1^*$ and that $x_2 \leq x_2^*$ in order to recover damages. This rule prevailed in the early 20th century in product liability cases. To recover under this rule, the consumer must prove that he was injured by a defective product ($x_1 \leq x_1^*$) and the manufacturer's negligence ($x_2 \leq x_2^*$) caused the defect.⁴⁹ If x_2 is unobservable, the plaintiff cannot prove $x_2 < x_2^*$, so the injurer escapes liability, regardless of whether his second order precaution is reasonable or unreasonable. So the injurer has no incentive to make his second order precaution observable. Having escaped liability, tort law provides no incentive for the injurer to take reasonable precaution. So a

⁴⁹ *Supra.*

second order negligence rule with the burden of proof on the plaintiff causes deficient second order precaution by the injurer.

Finally, consider a negligence rule with a defense of second order reasonableness. If the plaintiff proves that $x_1 \leq x_1^*$, then the defendant must prove that $x_2 \geq x_2^*$ in order to avoid liability. This rule exists in a limited way in some areas of law, as shown in Part I. The injurer can escape liability by making his second order precaution observable, provided it is reasonable. If cost k is not too high, the injurer will take reasonable second order precaution and make it observable to the court as a defense against liability.⁵⁰ Thus a rule of first order negligence with a defense of second order reasonableness will often causes injurers to satisfy the legal standard for second order precaution and make this fact observable.⁵¹

We summarize these arguments:

Proposition. Assume that the injurer controls second order precaution x_2 , and the injurer's first order precaution x_1 is a function of x_2 and a random error term. The injurer can spend k to make x_2 observable; otherwise it is unobservable.

- Under a negligence rule without a second order defense, x_2 will be unobservable and socially inefficient.
- Under a rule requiring the plaintiff to prove first and second order negligence, x_2 will be unobservable and socially deficient.

⁵⁰ Note, that if law allows a defense of second order reasonableness, then actors will tend to favor activities where second order precaution is easier for courts to observe. Thus courts should especially allow a defense of second order reasonableness when it wants to favor an activity with observable second order precaution and to disfavor a substitute activity with unobservable second order precaution. The court should favor one activity over a close substitute when the former has positive externalities. *See infra*.

⁵¹ This conclusion resembles the proposition that a rule of strict liability discourages corporations from reporting harms that they cause, whereas a rule of negligence encourages them to report cases where the corporation has a defense of reasonable precaution. See Arlen and Kraakman (1997).

Note that the second order reasonableness defense applies to lapses, not to intentional fault. Distinguishing between them can be difficult, as an example illustrates. (We are grateful to Mark Geistfeld for this example). Suppose that the driver of car swerves and hits a parked car. The driver contends that his foot accidentally slipped on the gas pedal, so the accident resulted from a lapse. The plaintiff contends that the driver swerved because he reached for a cassette on the floor, so the accident resulted from intentional fault. If the liability rule permits a defense of second order reasonableness for lapses, it applies to the first possibility and not to the second. Before determining whether the defendant can offer a defense of second order reasonableness, the court will have to decide whether the accident's cause was a lapse or intentional fault. This decision may be easy or hard, but it is no different in kind from many other factual questions that courts must resolve.

- Under a first order negligence rule with a second order defense, x_2 will be observable and equal to the legal standard, provided that k is not too large.

This proposition grounds our policy recommendation: Make a defense of second order reasonableness available more generally. The defense is an “information-forcing mechanism.” It is useful whenever courts need to induce injurers to reveal their second order behavior in order to improve incentives for precaution.⁵² The next two sections explain that the defense is also useful when the underlying activity has positive externalities, or when expanding the defense causes injurers to substitute less dangerous activities for more dangerous ones.

III. Negative and Positive Externalities

Under a first order negligence rule, the actor escapes liability whenever his first order behavior satisfies the legal standard of precaution. When the actor escapes liability, the harm from the accident is not a private cost of the actor, although it is a social cost of engaging in the activity. The standard model concludes that a negligence rule externalizes the social cost of engaging in the activity, so the activity level is excessive.⁵³ A defense of second order negligence opens the gap further by allowing some injurers to escape the social costs of their lapses. So a defense of second order negligence aggravates the problem of excessive activity caused by a first order negligence rule.

We have explained that the defense of second order reasonableness worsens incentives for activities with external costs,⁵⁴ such as driving in Example 1. The opposite

⁵² Arlen and MacLeod (2003 & 2005) do not favor defense of second order unreasonableness. Such a defense is unnecessary in their model because courts do not need to use it to force injurers to reveal information about second order precaution. So the Arlen and MacLeod model applies to a world where second order precaution is observable, and our model applies to a world where it is revealable.

⁵³ Shavell (1987), pages 21-32.

⁵⁴ Removing the defense of second order reasonableness reduces the expected cost of engaging in the activity while taking reasonable precaution. Consequently, more people engage in the activity, they have more lapses, and the lapses cause more injuries. So removing the defense improves incentives with respect to activity level. Incentives may not improve with respect to second order precaution. Most actors satisfy the legal standard of second order precaution in order to have a defense against liability. Appropriate choice of the legal standard for second order precaution x_2^* , consequently, can induce socially optimal second order behavior in spite of external costs. In our model, second order behavior is the only way to affect the

is true for activities with external benefits, such as practicing medicine in Example 2. Doctors benefit patients and some of the benefits are not captured by prices.⁵⁵ Doctors also create benefits to third parties who do not pay for them.⁵⁶ Similarly volunteers get paid nothing for helping others.

The two types of externalities – positive and negative – suggest a reason for allowing or disallowing a defense of second order reasonableness. They tend to allow the defense of second order reasonableness for activities that convey unpriced benefits on others. When external effects are beneficial, the law should encourage these activities by lightening the burden of liability. However, the law should not encourage activities that convey unpriced costs on others. When external effects are harmful, the law should discourage these activities by increasing the burden of liability.

External benefits of the underlying activity can justify at least one of the "pockets" of second order negligence discussed in the previous part of the paper. When journalists write stories about people, they risk being sued for defamation. However, journalism distributes information whose value to the public exceeds the price collected by the journalists who supply it. We previously explained that defamation law sometimes conditions liability on second order reasonableness. This reduces the burden of liability on journalists.

As discussed above, another pocket of second order negligence is the reluctance

probability distribution over first order behavior, so optimal second order behavior necessarily achieves the optimal distribution over first order behavior.

⁵⁵ See Bloch & Nelson Jr. (1997) ("Commentators who consider health a non-marketable good contend that there are elements of health which, though valuable, are unquantifiable, such as hope, compassion, and the extension and preservation of life ... Health's social benefits are not fully realized by the market price it commands"). Marmor, Boyer & Greenberg (1981) ("Improved health, the anticipated outcome of medical care, has positive externalities. This makes medical care a merit good, and, unlike many other economic goods, one that should not be allocated solely on the basis of ability to pay"). Rome (1981). See also Campbell-Eaton (1984) ("Moreover, health care usually is viewed as a "merit good," with benefits extending beyond its economic value. This view is reinforced by the ethical mandates of the health professions and by a widespread belief that "more is better" in the provision of medical services").

On the inability of doctors to pass higher insurance costs along to patients, see Eisler, Appleby & Kasindorf (2003) (Claiming that the cause of this inability is the limitations on reimbursements made by managed care insurers, Medicare and Medicaid).

⁵⁶ *Ibid.* See also Cooter & Porat (2006). We endorse the view that positive externalities exceed the negative externalities. See Cooter & Porat, *supra* note. For the argument that medical practice has negative externalities due to the fact that many patients who sustained injury as a result of negligence do not sue, see Baker (2005). For the argument that many patients do not bring suits and for the reasons for that, see Hyman & Silver, *supra* note.

of courts to second-guess the decisions of doctors. Allowing a second order defense for bad decisions by doctors reduces the burden of liability on the practice of medicine. The same case can be made in favor of recognizing a second order defense for bad executions of decisions by doctors. Why do courts treat decisions and executions by doctors differently? Perhaps judges can see that holding a doctor liable for a lapse in judgment during an operation increases the burden of liability on a beneficial activity, whereas judges have more difficulty seeing this fact when a doctor executes a medical procedure. In general, we believe that the defense of second order reasonableness should be more widely available when the underlying activities benefit others.

IV. Substitution

Having discussed positive externalities, we turn to another justification for having a defense of second order reasonableness. Some activities and some forms of precaution are more susceptible to lapses than others. A rule imposing liability for lapses creates an incentive to switch to activities and forms of precaution that are less susceptible to lapses. The switch creates a problem when the activities and forms of precaution that are less susceptible to lapses are also more dangerous inherently.

To illustrate numerically, assume that performing an activity without any second order precaution causes accidental harm of 500. Compare two forms of second order precaution. Precaution A reduces accidental harm from 500 to 300. Assume that lapses cause the harm of 300. The injurer who takes Precaution A is liable for 300 under a first order negligence rule. The cost of Precaution A is 100. So the actor's total private cost, which equals the total sum of liability (300) plus precaution (100), is 400. The total social cost, which equals the sum of accidental harm (300) plus precaution (100), is also 400.

Alternatively, compare these costs to second order Precaution B. Precaution B reduces accidental harm from 500 to 350. Assume that nature, not lapses, causes the harm of 350. The injurer who takes Precaution B is liable for 0 under a first order negligence rule. The cost of Precaution B is 120. So the actor's total private cost, which equals the

sum of liability (0) plus precaution (120), equals 120. The total social cost, which equals the sum of accidental harm (350) plus precaution (120), is 470.

With these numbers, Precaution A has lower social cost than Precaution B, and precaution B has lower private costs for the injurer than Precaution A. Thus a first order negligence rule gives the actor an incentive to substitute against A (the socially efficient precaution) and in favor of B (the socially inefficient precaution).

Alternatively, allowing a defense of second order reasonableness should reverse the incentives. Assume that taking Precaution A is reasonable, so the actor who chooses Precaution A has a defense against liability.⁵⁷ When the actor has a defense of second order reasonableness, the actor's private cost equals the cost of precaution. Precaution A costs 100 and Precaution B costs 120, so the actor will choose Precaution A, which is also socially efficient.⁵⁸

The preceding examples concern two forms of precaution. Previous authors have discussed incentives under "several dimensions of care". When two measures could be taken to reduce the expected harm, the question is how to incentivize the injurer to take the optimal combination of them. As Shavell (2004) indicated, under a negligence rule an injurer would have a motive to choose optimal levels "only to those dimensions of care that are incorporated in the due care standard... Some dimensions of care will usually be omitted from the due care standard because of difficulties that courts would face in ascertaining them... or in determining proper behavior in respect to them."⁵⁹ The substitution effect that we analyze in this paper is also a result of courts' failure to incorporate an important dimension into the standard of care: the second order behavior of the injurer.

The law should encourage the actor to use the forms of precaution that are socially more efficient. To do so, liability law should encourage the forms of precaution that are inherently less dangerous. Doing so sometimes requires liability law to allow a

⁵⁷ Alternatively, a court could hold Precaution A is reasonable because it is socially efficient, and Precaution B is unreasonable because it is socially inefficient. Equating "reasonable" with "efficient" requires that courts have a lot of information on untaken precautions.

⁵⁸ The other way to restore efficient incentives, which we do not discuss here, is to impose strict liability for any harm resulting from the activity.

⁵⁹ Shavell (1984), page 182.

defense of second order reasonableness. In the preceding numerical example, such a defense provides actors with an incentive to take reasonable precaution against lapsing, instead of providing them with an incentive to take precautions that are less susceptible to liability.

The substitution effect is not unique to lapses. Whenever liability law allows an actor to externalize part of the costs and benefits of his actions, there is a risk that the law will incentivize him to choose the more socially costly alternative.⁶⁰ This paper has shown that a defense of second order reasonableness should be available when it prevents actors from switching to less effective forms of precaution. Next we discuss some concrete examples.

A. Capital vs. Labor

Under the rule of first order negligence, the driver in Example 1 might aim for 65 mph, in which case he will be liable for accidents caused by his lapses in speed. Alternatively, the driver might install cruise control, which presumably does not "lapse." With cruise control, the driver's liability for lapses in speed will be nil. The driver can set the cruise control for 70 mph, which is the speed limit. Driving 70 mph with cruise control will have lower liability costs for lapses than driving 65 without cruise control. The former, however, may also result in more accidents than the latter. In general, liability law should not encourage inherently more dangerous mechanical precautions, even if they do not lapse.

Similarly, the following example illustrates that an organization can sometimes reduce its liability for lapses by performing a task with a machine instead of a person, even though the machine is more dangerous.

Example 3: Traffic Light and Policeman. The municipality must decide

⁶⁰ Here are some causes of the substitution effect: First, sometimes one form of precaution is harder to verify in court than another. Second, under a negligence rule, the extent of the unavoidable losses for which the actor is not liable may differ for each form of precaution. Third, one choice sometimes creates positive externalities that are higher than those created by the other choice. See Cooter & Porat (2006).

whether to post a policeman in the intersection or to install a traffic light. A policeman is more flexible than the traffic lights in directing traffic at the intersection. However, a policeman may be more susceptible to lapses than traffic lights are susceptible to defects. Assume that the social benefits of flexibility exceed the cost of lapses.

First order negligence creates an incentive for the municipality to replace a policeman with traffic lights. The reason for this could be that a machine does not lapse, and, even if it lapses, a second order behavior defense may be possible. Thus, even if traffic lights occasionally fail to operate properly, the municipality can argue in court that it used the best available technology, so it was not at fault.

The choice between labor and capital, or manpower and machines, often occurs in settings involving accidents. Employers must decide whether to reduce risks to employees in the workplace by using safer machines or imposing safer work rules on employees. Hospitals and other providers of medical services must decide whether to monitor their patients' condition by sophisticated equipment or by their medical staff. Airport authorities and airlines must decide whether to promote passengers' safety by new technologies or posting guards. Lastly, drivers must decide whether to rely on devices like cruise controls or human skills. Technology is sometimes more effective than manpower in avoiding accidents, and sometimes the opposite is true. Courts, however, are more likely to find fault when humans lapse than when machines fail. Unfortunately, this fact biases the choice between humans and machines.⁶¹

B. Susceptibility of Human Precautions to Lapses

A second form of substitution is between human precautions that are less susceptible to lapses and human precautions that are more susceptible to lapses. The following example illustrates such substitution.

Example 4: Deliveries of Babies. Doctors must decide between vaginal and caesarian delivery of a baby. Assume courts cannot verify *ex post* whether the doctor's decision was right or wrong, so no liability attaches to the doctor's

⁶¹Interesting, Grady argued that new technologies result in higher standards of liability, so tort liability obstructs innovation and development. Our argument points out to an opposite influence. Grady (1988).

decision to deliver by caesarian, even when the decision was bad. Courts, however, can verify whether the doctor lapsed in executing the delivery, and also whether that lapse caused the injury.⁶² Assume that doctors are more likely to lapse in executing a vaginal delivery than in executing a caesarian delivery. Also assume that caesarian delivery is inherently more dangerous in the long run than vaginal delivery.

In Example 4, the prevailing negligence rule gives doctors an incentive to perform too many caesarian deliveries.⁶³ To illustrate numerically, assume that vaginal delivery harms the mother 1% of the time, and a lapse by the doctor is the cause in 75% of these cases. Thus vaginal delivery results in doctor's liability to the injured mother in 0.75% of cases. In contrast, assume that caesarian delivery harms the mother 2% of the time and a lapse by the doctor is the cause in 25% of these cases. Thus caesarian birth results in doctor's liability to the injured mother in 0.50% of cases.⁶⁴ According to these numbers, a first order negligence rule makes the accident risk for mothers twice as great from caesarian birth as from vaginal birth, whereas the liability risk for doctors is half as great from caesarian birth as from vaginal birth.⁶⁵

A first order negligence rule creates a bias towards precautions that are less susceptible to lapses. For example, an organization that imposes strict rules on employees who engage in risky activities may reduce its liability by reducing the frequency of lapses by its employees. However, the elimination of employee's discretion may increase the

⁶² The distortions caused by tort law with respect to caesarian and vaginal birth are extensively analyzed by this paper's authors in Cooter & Porat (2006). According to a report of the U.S. Department of Health and Human Services, one of the explanations for the increasing use of cesarean section in the United States concerns malpractice liability: "[i]n 1976, almost all questionnaires returned from 50 representative medical school department chairpersons, other professors, and obstetricians, mentioned malpractice suits as a factor in increased cesarean section rates." The report quotes Marieskind, who interviewed 100 physicians, and concluded that the threat of malpractice suits was the chief causal factor in the increased use of cesarean section. See also "Caesarean section on the rise", the Lancet November 18th 2000 ("[f]rom a defensive medicine perspective, US obstetricians seem to be viewing caesarean section as a safe option since the rate of caesarean section in that country, now 22% has nearly quadrupled over the past 20 years.")

⁶³ We assume that doctors cannot adjust their prices to account perfectly for the different liability risks of liability posed by each procedure.

⁶⁴ For simplicity, we implicitly assume that the average harm from vaginal and caesarian deliveries is the same.

⁶⁵ In general, doctors are advised by risk management experts to choose procedures that reduce their liability potential, when the enhanced risk is not captured by prices. See Fenton & Marcinko (2005): "[Physicians] should evaluate their own practice and identify those procedures and those patient types that carry a high risk of malpractice for which the physician is not adequately reimbursed. Physicians then should tailor their practice so that they no longer provide those services. The revenue lost will be worth the risk of the malpractice suit and the collateral consequences". Id. 133.

total risk to the public. The following example illustrates this point.

Example 5. Regulation vs. Discretion. The police department considers how to regulate policemen in various circumstances. One alternative is to regulate policemen's behavior by a comprehensive set of specific rules. The police can apply these rules mechanically with few lapses. However, comprehensive rules make the police inflexible. Second, the police department can provide police with general principles. The application of general principles often results in lapses in judgment. However, general principles make the police more flexible and effective. Assume that cost of lapses under general principles is lower than inflexibility cost under comprehensive set of specific rules.

What will the police department do under the prevailing rule of negligence? It may wish to decrease its liability risks at the cost of decreasing its effectiveness.

C. Execution vs. Judgment

A third form of substitution is between judgments and executions. In some fields discussed in Part I of the paper, liability attaches to faulty execution more than to faulty judgment. In these circumstances, actors have an incentive to choose the precautions least susceptible to lapses in execution and more susceptible to lapses in judgment, even when the latter are less efficient than the former. Example 6 illustrates such a case.

Example 6. Treating Cancer. Hospital X must adopt procedure A or procedure B for treating a type of cancer. Procedure A involves more execution than judgment, and procedure B involves more judgment than execution. The *choice* between the procedures will *not* be considered negligence, because courts are unwilling to "second guess" the hospital's decision. However, lapses in execution will be considered negligence.

Courts, it seems, are less willing to impose liability for a lapse in judgment than for a lapse in execution.⁶⁶ If the hospital cannot perfectly adjust prices for each procedure to reflect liability risks, a first order negligence rule may cause the hospital to prefer procedure B. Procedure B may lower liability costs, even though it may raise accident costs.

⁶⁶ *Supra.*

V. Implementing Second Order Defenses

Now we turn to problems of implementing a defense of second order reasonableness against liability for lapses. It is hard to prove that the driver's self-monitoring in Example 1 was reasonable or unreasonable, or that the doctor in Example 2 made reasonable or unreasonable preparation for the operation, or the policeman who lapsed in directing traffic in Example 3 does so less or more often than a reasonable policeman. To answer such questions, the trier of facts should have information about the actors' lapses over a period of time, or alternatively, about the efforts he actually took at an earlier stage to decrease the probability or magnitude of his lapses.

Given the difficulty of proof, allocating its burden crucially affects the implementation of a second order negligence rule. Defendants can usually collect information with respect to their second order behavior better than plaintiffs. We explained that placing the burden of proof on the defendant—thus allowing a second reasonable defense—is more efficient than other alternatives. In particular a second order reasonableness defense provides incentives for potential injurers to satisfy the standard of second order precaution and to make this fact observable to courts. Thus cautious drivers may install recording devices to prove that they seldom speed, doctors may document preparations for an operation, and police departments may track accidents by officers.

Unreasonable second order behavior increases the *probability of lapsing*, which is less than causing it. What should the court do when second order negligence increases the probability of lapsing by less than 100%, which is most of the time? A court might feel compelled by the causation doctrine to find “no liability.” In that case, the court gives injurers no incentive to take precautions that decrease the probability of accidents. At the opposite pole, the court might presume that the defendant caused an accident whenever his second order unreasonableness increased its probability. This solution is a practical one and relatively easy to implement

We can imagine intermediate rules in between these polar types. First, a principle of probabilistic recovery can apply to lapses. Under this solution, a driver whose second

order negligence increased the probability of lapsing from 3% to 4%, would compensate the victim for 25% of her harm.⁶⁷ Probabilistic recovery raises many issues that we cannot discuss here.⁶⁸

Alternatively, a rule of liability for excessive harm can be applied for repeat harms. Assume that an actor caused n units of harm over a certain period of time, while only m units of harm would have been produced if the actor had behaved reasonably. Thus “ n ” might refer to the actual annual harm in a hospital, and “ m ” might refer to the annual harm that reasonable precaution would have caused. By the rule of liability for excessive harm, which we developed elsewhere,⁶⁹ the hospital is liable for the excessive harm, which is $n-m$. Applying this rule requires information on aggregate harm, both actual n and ideal m . However, applying this rule does not require information on individual harms. Avoiding proof on a case-by-case basis greatly reduces the information requirements for liability law.⁷⁰

We have explained that a second order negligence rule can reduce incentives for excessive care by reducing uncertainty about liability. To completely eliminate uncertainty about liability, the injurer must make his second order precaution x_2 observable to the courts, and the courts or other officials must make the legal standard x_2^* observable to the injurer. (The second order reasonableness defense raises some other issues that we leave for future research.⁷¹)

⁶⁷ In 1 out of 4 cases the lapse was caused by the second order negligence. The probability that the lapse in question is the one caused by the second order negligence is therefore 1/4.

⁶⁸ Porat & Stein (2001), at 101-29.

⁶⁹ Cooter & Porat (2007).

⁷⁰ Notice that the optimal units of harm m are the amount resulting from a reasonable level of second order precaution. So liability for excessive harm can be viewed a variant of the rule of second order negligence.

⁷¹ Here are two. The first issue relates to the alternatives of reducing risks: should a defendant who failed to take reasonable second order precautions be allowed to show that he took at an earlier stage second order precautions beyond the ones required by reasonableness, and in general reduced risks significantly? To illustrate, should a driver who lapsed and caused an accident be allowed to raise the argument that he installed in his car expensive safety devices which he was not obliged to install, thereby reducing risks dramatically, although given the existence of the devices his second order behavior was unreasonable? The second issue relates to third parties' second order behavior: Should a doctor who lapsed due to fatigue and caused injury be allowed to show that the hospital required him to work too many extra hours? If such a defense is allowed for the doctor, it will be essential to impose liability on the hospital, conditioned upon establishing its negligence. *Cf.* Mello & Studdert (2008), who argue that instead on focusing on individual

Conclusion

Lapses cause a high proportion of accidents, but they are under-theorized in liability law. To model lapses, we assume that actors do not choose an exact level of precaution. Instead, we assume that actors draw precaution from a probability distribution. We call the result of this draw “first order precaution” because it determines the probability of an accident. A lapse is a draw from the distribution’s lower tail. The prevailing tort rule is liability for harm caused by a lapse that falls below the standard of reasonable care.

“Second order precaution” refers to behavior that shifts the probability distribution for first order precaution. This shift decreases the probability of lapsing, which decreases the probability of an accident. Thus first order precaution directly reduces the probability of an accident, whereas second order precaution indirectly reduces the probability of an accident. Preparation and self-monitoring are two general forms of second order behavior.

Under the prevailing tort rule, an actor is usually liable for the harm caused by a lapse, regardless of how much precaution he takes to avoid lapsing. However, liability law sometimes permits a defense of second order reasonableness. Courts are reluctant to second-guess decisions made in emergencies or judgments by experts who balance various considerations. In these cases, an actor can often escape liability for a defective judgment by showing that he took reasonable preparations to make it. Consequently, courts more often allow a defense of second order reasonableness for a lapse in judgment than for a lapse in skill when executing a decision.

The prevailing tort rule makes sense most of the time because courts usually

doctors' negligence, tort law should focus on institutions, and impose enterprise liability; and that systemic errors are major causes for most medical accidents even if typically combined with individual errors. The authors also suggest that "most promising opportunities for injury prevention lie at the organizational level", id 601, and that "system factors may underlie many physician errors in the sense that they create conditions in which human error is likely to occur and to go unnoticed until injury results." Id. 609. An analogous question relates to gatekeeper's liability: under what conditions it is desirable to impose liability on gatekeepers in addition, or instead of, the direct cause of the injury. This general question is beyond the scope of this paper. *See* Lichtman & Posner (2006) (arguing for imposing liability on Internet Services Providers).

cannot verify the reasonableness of second order behavior. The prevailing tort rule, however, provides incentives for inefficient care. It also burdens activities whose positive externalities benefit others, such as practicing medicine or volunteering to help others. We advocate encouraging activities with positive externalities, and improving levels of care, by extending the defense of second order reasonableness to them. We also advocate allowing this defense when it prevents actors from substituting worse forms of precaution for better ones, as sometimes happens when machines substitute for people, or when activities requiring risky judgments substitute for activities requiring risky execution. The defendant should bear the burden of proving that his second order behavior was reasonable, rather than the plaintiff bearing the burden of proving that the defendant's second order behavior was unreasonable. The burden of proof should fall on the defendant because he is better situated than the plaintiff to provide evidence on his second order behavior.

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