THE VALUATION OF HUMAN LIFE

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In cost-benefit analysis two major approaches to the valuation of life and injury have been developed: one focuses on the economic productivity of human beings and hence is called the human capital (HC) approach; the other seeks to quantify the amounts that individuals are willing to pay in order to reduce the risk of death or injury (or, alternatively, the amounts they require to compensate them for greater exposure to the risk of death or injury) and hence is referred to as the willingness-to-pay (WTP) approach.

The task of cost-benefit analysis is to put values on a collection of physically disparate things and arrive at an estimate of the net benefit or cost of some project, programme, or policy. Willingness-to-pay is the basic economic principle of valuation. (Opportunity cost may also be invoked as a basic principle, but on reflection can be seen to be only willingness-to-pay at one remove). Willingness-to-pay is revealed in individual acts of choice: if a person pays $10 for an item, it is clear that he values it at at least $10.

Marketed goods are normally valued at their market prices, both for purposes of national income accounting and for cost-benefit analysis. At least for divisible goods, their relative market prices measure the relative marginal evaluations of these goods for all persons consuming all of the goods concerned. Confronted by prices of, say, $2 and $1 for goods A and B respectively, consumers of both will so adjust their consumption that the additional satisfaction of consuming an additional unit of A is twice as great as that obtained from consuming an additional unit of B. If this relationship did not hold, the consumer could make himself better off by reducing his consumption of one, and increasing that of the other, until the relationship did hold. Market prices are thus a sensible set of weights for evaluating disparate items because they reflect the relative marginal evaluations of all persons consuming these items.

In the case of non-marketed items for which no explicit prices exist, it may not be possible to value them in accordance with economic principles. However, it may be possible to infer from persons' behaviour the average or marginal valuations which they place upon them. The valuation of reductions in risk of death or injury according to WTP principles has been attempted by various indirect methods. The most common strategy has been to ascertain the wage or cost differentials associated with situations involving different degrees of risk of death or injury, and to assume that these differentials measure, for the relevant population group, their willingness to pay for a (usually small) reduction in risk, equal to the difference between the statistical probabilities of death or injury in the different situations. Implicit valuations of life or injury can be calculated from these estimates. For example, suppose that each of 100,000 people is willing to pay at most \$25 for some programme that is expected to reduce the overall probability of death from 0.0009 to 0.0008. This is equivalent to a reduction in the death rate from 90 to 80 per 100,000, the 'implied value of each of the 10 "statistical" lives saved is \$250,000.[1]

One source of data is the wage differentials associated with occupations that differ in their hazard. Another is the willingness of consumers to pay for various items of safety equipment such as smoke detectors, seat belts, and child car safety seats. Most studies have utilized labour market data, and the usual methodology has been to fit hedonic wage equations. Wage differences among workers are explained by reference to the differences in risk of death or injury among industries or occupations, other non-pecuniary advantages and disadvantages of jobs, and characteristics of workers themselves. In the great majority of cases the risk variable used is the objective fatality or injury rates in different industries or occupations, derived from statistics published by several government agencies; however, in some cases, subjective estimates of risks by the workers themselves have been used. After the wage differences apparently

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[1]   The example is taken from Landefeld and Seskin, (1982).

associated with risk differences are estimated, the implicit value of life is calculated by dividing

the wage differential by the risk difference.

A summary of the results of empirical studies of risk trade-offs in the labour market,

expressed as implicit values of life, is given in Viscusi (1993). These estimates, all expressed in

December 1990 dollars, range widely from $0.6 million to $16.2 million. In discussing these

results, Viscusi wrote:

> "Although the tradeoff estimates vary considerably depending on the population
> exposed to the risk, the nature of the risk, individuals' income level, and similar
> factors, most of the reasonable estimates of the value of life are clustered in $3
> million - $7 million range[2]. Moreover, these estimates are for the population of
> exposed workers, who generally have lower incomes than the individuals being
> protected by broadly based risk regulations. Recognition of the positive elasticity
> of the value of life with respect to worker earnings will lead to the use of
> different values of life depending on the population being protected. Taste
> differences may also enter, as smokers and workers in very hazardous jobs, for
> example, place lower values on health risks."

In my opinion, these WTP estimates of the value of life have very little creditability. They

assume that workers and consumers respond rationally to very small variations in the risk of

death, but the people concerned have no way of knowing these probabilities. They are no doubt

aware that certain jobs are riskier than others, or that it is safer to strap your child into a car

safety seat, but are unable to quantify these risk differences. Yet the estimate of the value of

life depends critically on the magnitude of risk differences. In the case of child car seats, the

reduction in the risk of fatal injury associated with their use was estimated to be 0.0004119 over

the period from birth to age four[3] (Carlin and Sandy, 1991), while the work-related fatality risk

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[2] Since Viscusi does not reveal his criteria for judging the reasonableness of the estimates,
it is not clear whether $3 million - $7 million is judged to be a reasonable figure, or
whether the studies producing figures in this range used "reasonable" methodologies or
data.

[3] This figure involved some guesswork, being based on accident and accident mortality data
from the state of Washington (the survey data on use of car seats was from Indiana)
subjectively adjusted for improper use of car seats and using interpolation to estimate the
number of families with children aged 0-4 years.

in an ordinary job in the United States is about 1/10,000 on average (Viscusi, 1986). It strains credulity to think that persons can meaningfully react to such small probabilities, even if they had the same resources for estimating them (e.g., research assistants, computers) as the investigators. It is also apparent how these very small probabilities, when divided into the relevant cost or wage difference, can generate very high implicit values of life.

Proponents of the WTP methodology for valuing life claim as a principal virtue its congruence with the virtually universally-accepted basic principle of economic valuation. In the words of E.J. Mishan: "... it should be emphasised that the basic concept developed in this chapter is not simply an alternative or an auxiliary to any existing methods that have been proposed for measuring the loss, or saving, of life. *It is the only economically justifiable concept.* And this assertion does not rest on any novel ethical premise. It follows as a matter of consistency in the application of the Pareto principle in cost-benefit calculations." (Mishan, 1982, p.341 : *italics added*).

In my view this claim is false. The method goes beyond the inference that because someone was willing to pay X dollars for something, he valued that thing at at least X dollars, to make further inferences about how that person arrived at his valuation. For example, suppose that a mother pays $80 for a child's car safety seat. The economist infers from this action that the mother values a safety car seat at at least $80. We do not know, and normally do not care, how she arrived at her decision to buy the seat: concern about the safety of her child, concern about what the neighbours would think if she didn't use such a seat, a momentary impulse, whatever. But users of the WTP methodology go on to make two further inferences: (1) that the decision to buy the car seat was made by rational calculation, involving the risk of death or injury that would be averted during the child's infancy by the use of the seat, and the person's willingness to pay for such a reduction in risk of death or injury; and (2) that the risk was known.

Clearly, risk in the sense of the average relative frequency of avertable fatal accidents is
now known to the purchaser. This figure can be "guesstimated" by the investigator - as described
in footnote 3. It is possible that the seat purchaser has a subjective estimate of the relevant
probability and makes a decision based on this. But, if so, there is no reason to believe that the
subjective probability bears any relation to the objective relative frequency used by the
investigator. But more fundamentally, it is extremely unlikely that mothers buying car seats, or
economic actors making decisions involving risk generally, make any quantitative calculation at
all. Viscusi, in his survey article, conceded that the substitution of statistical probabilities (relative
frequencies) of death for subjective estimates of the risk was a weakness of most empirical
studies. Two relevant passages follow:

> "The ideal risk measure would reflect subjective assessment of the fatality risk of
> the job by both the worker and the firm. In practice researchers have a less
> perfect measure. Most studies have used information from calculable national
> data sets that typically provide information on several thousand workers and their
> jobs." (p.1918)

> "The main deficiency of industry-based data is that they pertain to industry wide
> averages and do not distinguish among the different jobs within that industry:
> perceptional differences in risk are also not recognized." (p.1928)

However, he does not seem to regard this as a serious weakness of the studies. He also
recognises - or rather, half-recognises - that workers' decision-making processes may bear little
relationship to those assumed in economists' models:

> "A related issue is the role of worker uncertainty. Apart from the fact that we
> do not know exactly what workers' risk perceptions are, there is the additional
> problem that these perceptions may not be precise. Thus, workers have a
> subjective risk perception pertaining to the hazards posed by the job, but these
> perceptions may not be as tight as an objective probability."

Indeed they may not! I would go beyond this and assert that they almost certainly are
not.

Assuming that economic actors use probabilities they do not know to make calculations that they do not make is to wield the economists's can-opener with a vengeance. That this particular use of it does not seem to have been remarked upon by other observers suggests that the practice of assuming an unrealistic degree of rational calculation in economic behaviour is sufficiently common to be unremarkable. Now in many cases the assumptions of rational behaviour and a high level of knowledge (if not "perfect knowledge") are unobjectionable because they do not give rise to misleading, or unjustified, conclusions. But in this case the value-of-life estimates critically depend on these unrealistic assumptions.

As an aside, let me offer an interpretation of the assumptions that people "act rationally", or "maximise utility", and that consumer sovereignty should be respected. They are not meant to be descriptively accurate; rather they are part of an ethic of non-paternalism, or, if you prefer, individual liberty. No one would deny that people sometimes lack the information to choose rationally; or that their preferences are not always well formed; or that they do not always know their own self-interest. The problem is not how do we know when the conditions for rational choice are met, but who is to judge? Paternalism is a dangerous principle in that it opens the door to interventions that are harmful in fact and/or intent, and may lead to a substantial loss of freedom. It is therefore more prudent to assume that people know their self-interest and act in it than to assume the opposite.

Applicability of WTP Estimates

Projects and policies affecting safety frequently involve the provision of public or quasi-public goods which are available to all potential users and for which no direct charge is (in many cases, none could be) made. Examples are highway improvements, better traffic control, change of road rules, etc. No opportunity exists for evaluating such safety improvements or disimprovements by directly ascertaining users' willingness-to-pay, so that indirect methods, if

available, are resorted to. Hence the development of the HC and WTP approaches which seek to infer persons' WTP for safety from choices made in other circumstances, or to value safety on a different basis altogether.

However, in many cases where estimates of the value of life are sought by policy makers, the safety is provided by ordinary market goods. A case in point is the provision of safety features in motor cars, e.g., seat belts, collapsible structures, air bags, etc. If these features are made available as optional extras, car buyers' evaluations of them can be ascertained directly, i.e., those who choose the feature value it at least as highly as its cost, while those who reject it do not think it is worth its cost. Safety features would thus seem to be ordinary private goods and the extent of their provision to be a matter for ordinary private decision, and hence there would be no need for public decision making with respect to them and no need for cost-benefit analysis.

Where such items are subject to cost-benefit analysis it is usually regarding a proposal to make their provision mandatory - on new cars only but sometimes on old cars too. Mandating the inclusion of safety features in motor vehicles clearly implies a rejection of consumer sovereignty. The rejection may be based on a number of beliefs, viz.: (a) that consumers are ignorant of the magnitude of risks associated with motor vehicle travel; (b) that consumers do not behave rationally; (c) that even if they do act rationally with respect to their own preferences, they do not know what is good for them. Any or all of these beliefs may be used to justify paternalistic interventions of the kind under consideration.

It would seem perverse and oxymoronic to seek information concerning the WTP of persons who it is proposed should be coerced into buying this equipment whether they want to

or not.[4] It seems to me that those who would override individual preferences and valuations by mandating the use of safety equipment should provide their own valuations of life and suffering. However, for essentially political reasons, governments and their agencies are reluctant to provide explicit value judgments.[5]

The incongruity of using WTP estimates of the value of life or injury in a context of paternalistic intervention, overriding individual preferences, seems to be lost on many investigators. However it is recognized by Mooney (1978), who devotes several pages to a discussion of the consequences for cost-benefit analysis of abandoning or modifying the notion of consumer sovereignty. His summing up is as follows (p.125):

> "What we can draw from this discussion is rather murky. It would seem that there is a continuum of possible approaches to valuation of life and suffering stretching from on the one hand a complete consumer sovereignty approach to on the other a set of wholly imposed values associated with merit goods and at some distance from a complete reflection of consumers' preferences."

Mooney sees the HC approach as a form of "imposed" valuation system. "It can be argued that the valuation of lost output can be considered as the minimum that society ought to be prepared to save a life, and if we wish to adopt a social welfare function with Gross National Product as its base then this would be the type of approach to adopt." (p. 127) The fact that the HC method is a species of "GNPism" is the principal objection to it. No, or only inadequate,

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4 If governments clearly reject consumer sovereignty in the case of mandated safety features in products, there is no reason to believe that they would accept value of life estimates based on consumer sovereignty (i.e. WTP) for the evaluation of public or quasi-public goods.

5 "The ... most important reason why the political process discourages rather than encourages explicit quantification of political value judgements with respect to the goals underlying calculations of national economic profitability is that political leaders rely on the support of distinct interest groups that are partially (at least) in conflict with one another. In such circumstances ambiguity has obvious advantages. One can hope to appear all things to all men. The corollary is an understandable if deplorable reluctance to take explicit positions that indicate the precise extent to which the political leader values one objective (with its particular lobby) over another objective (with its particular lobby)." United Nations Industrial Development Organization, 1972, p.137.

account is taken of the non-market economy and of non-pecuniary aspects of work and consumption.

Viscusi states that "in a democratic society, the appropriate starting point for analysing these tradeoffs is the value individuals bearing the risk place on the improved safety." (1993, p.1912) This seems to be an unambiguous endorsement of the principle of consumer sovereignty. At a later point in the same article he says that "the appropriate measure of the value of life from the standpoint of government policy is society's willingness to pay for risk reduction, which is the same benefit formulation in all policy evaluation contexts." (p. 1942) The meaning is now less clear, because of the use of that weasel-word, "society's". "Society's willingness to pay" could be construed as the collective decision of the legislature on how much they were willing to spend to save a life, arrived at either explicitly or implicitly by the amount it was prepared to devote to various safety programmes.

In 1976 I quoted with approval Mishan inveighing against "the mixing together, in one measure, of values derived from the political process and those based on the economic principle of accepting the individual subjective valuation of the affected persons," as being conducive to confusion rather than enlightenment. "For by 'doctoring' the method of evaluation so as to accommodate current political predilections, the economic facts are concealed from the public which is then misled into the belief that the proposal has the sanction of pure economic calculation, a belief that is likely to influence the course and outcome of any debate on the subject." (Parish, 1976, p. 312) The particular political value referred to in the context was the use of distributional weights.

I now find myself arguing in favour of the use of some politically derived value of life rather than one based on the subjective valuations of the affected persons. My argument is that

so-called WTP calculations are not really what they purport to be. The value of life would seem to me to belong to the category of items that are in principle amenable to economic methods of valuation but in practice are not. In such cases the analyst has several choices as to how to proceed:

1) make use of some political valuation, if available, while carefully noting what he is doing; or

2) do not attempt to evaluate the item, but note its existence among the costs and benefits in physical terms. The decision-making authority can then make its own tradeoffs.

3) Restrict the analysis to a cost-effectiveness study.

While none of these options may be very satisfactory, it seems to me that they are preferable to the use of spurious numbers derived from the WTP methodology.

Let me stress that I believe there is a need for more rationality in decision making on safety matters. The following costs per life saved (in the United States context) are quoted by Viscusi (1993, p. 1912-1913)

Airplane cabin fire protection	$200,000
Automobile side door protection	$1.3 million
Occupation Safety and Health Administration asbestos regulations	$89.3 million
Environment Protection Agency asbestos regulations	$104.2 million
A proposed OSHA formaldehyde standard	$72 billion

It is clear that no sophisticated analysis is needed to effect a great improvement in the allocation of resources to safety matters. A bit of cost-effectiveness analysis would go a long way.

Unpredictability of Safety Programmes

An aspect of safety programmes, not generally noted, but relevant to the argument of this paper, is the unpredictability and indeterminacy of their effects. I say unpredictable because the programmes frequently do not deliver, *prima facie*, the results which were forecast; and indeterminate because, given the complexity of social interaction, it is always difficult and not always possible to detect what their results have been. We know that crude engineering models of the effect of incorporating safety features in cars tend to overstate their effectiveness because they neglect the possibility of so-called "offsetting behaviour" or "risk compensation" by motorists. These terms refer to the tendency of individuals to choose their levels of safety rather than passively accept the greater safety the engineers give them. Motorists tend to take out some of the safety benefit of better brakes by faster driving, and the greater security provided by seat belts by more reckless driving. However, the importance of offsetting behaviour seems to vary widely as among different safety features and as among different populations. There is some reluctance among safety workers to accept the importance or even the existence of offsetting behaviour. For example, a study of the effects of the first two years of operation of the United Kingdom's seat belt law seemed to show fairly clear evidence of offsetting behaviour, but this was played down in the official report.[6]

The notion of offsetting behaviour comes from economic theory. It sees safety as one of many choice variables associated with driving a vehicle. The addition of safety features enlarges

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[6] The introduction in Great Britain of a law compelling the wearing of seat belts in the front seats of cars and vans was followed by a fall in the number of deaths and serious injuries of drivers and front-seat passengers, an increase in deaths, but a fall in serious injuries, of back-seat passengers, and an increase in deaths and serious injuries of pedestrians and cyclists. These changes, with the exception of the fall in rear-set passenger injuries, are in accordance with the predictions of risk compensation theory. Our critic argued that the effect of the seat belt law was compounded with the effect of less drunken driving, citing as evidence the fact that most of the reduction in fatalities occurred during the "drink drive hours" of 2200 to 0400. See Harvey & Durbin, 1986 and the ensuing Discussion.

the choice set, since motorists can either enjoy more safety, leaving other sources of satisfaction at existing levels, or they can enjoy more·thrills, or save time, at the existing level of safety. Typically one would expect the addition of safety features to result in both more safety and more thrills being experienced. However, there is nothing in the theory to predict the particular combination that will be chosen: indeed, the possibility of perverse (less safety, many more thrills) or super effective (even more safety, fewer thrills) outcomes cannot be ruled out on theoretical grounds, but they would seem to require rather peculiar preference maps.

Hence the chief contribution of economics to the discussion of safety matters has been to inject a note of caution concerning the effectiveness of safety engineering. A particularly interesting case is when the offsetting behaviour adversely affects other parties. Peltzman in 1975 pointed out that if seat belts caused motorists to drive less safely (because of the lowered probability that an accident would be fatal or result in injury) pedestrians and cyclists would be adversely affected, and he produced some evidence to this effect. Subsequent investigations have sometimes confirmed and some times failed to confirm the existence of the "Peltzman effect".

Another contribution of economists has been to draw attention to the role of economic variables in affecting the road toll. Deaths on the road are closely and positively correlated with the business cycle, for which unemployment is a frequently used indicator. Much of this effect is probably due to the greater amount of driving that is done in prosperous times, but there may be more complicated relationships, in that particular sorts of driving or drivers are inhibited by high rates of unemployment. (Partyka, 1984; Thoresen et al., 1992)

An engineer, Leonard Evans (1985), collated a number of studies showing varying degrees of risk compensation as well as super-effective and perverse outcomes. I reproduce his Figures 1 and 2 which summarize his material. Bearing in mind the grain of salt which should be taken

HUMAN FACTORS

TRAFFIC SAFETY

ACTUAL SAFETY BENEFIT

GREATER THAN ENGINEERING ESTIMATE

? Individual seat belt wearing

? 55 mph speed limit

EQUAL TO ENGINEERING ESTIMATE

? U.K. mandatory seat belt use law (Mackay, 1985)

DISCOUNTED

* Studded tires (Rumar, et al., 1976)
* Higher vehicle acceleration (Evans and Herman, 1976)
  Mandatory seat belt use laws (Jonah, 1984)
? Motor vehicle safety standards on occupant fatalities (Peltzman, 1975)

ZERO

Installing traffic signals (Short et al., 1982)
Driver education (for same exposure) (Ray, 1983)
? Motor vehicle safety standards on all fatalities (Peltzman, 1975)
? Mandatory seat belt use laws (Adams, 1983a; Hearne, 1981)

PERVERSE !! CHANGE DECREASED SAFETY

* Pedestrian cross-walk marking (Herms, 1972)
  Mandatory helmet wearing law for Nigerian motorcyclists (Asogwa, 1980)
  "Flashing green" traffic signal in Israel (Hakkert and Mahalel, 1978)
? Driving skill as reflected in competition license (Williams and O'Neill, 1974)

EFFECT OF CHANGE EXPECTED TO REDUCE SAFETY

PERVERSE !! ACTUAL SAFETY IMPROVEMENT

* Small cars crashing into small cars (Evans, 1985a)
? Small "K" cars in Japan (Sparrow, 1984)
  Short term effect of change to right hand driving in Scandinavia
  One study on truck near-accidents versus prolonged driving (McFarland and Mosley, 1954)
? Weather, as indicated by seasonal effects

ZERO

? Monocular vision

DISCOUNTED

* Car size effects on driver fatalities in single-car crashes (Evans, 1984b)
* Car size effects on driver fatalities in two-car crashes (Evans, 1985a)
  One study on truck driver risk taking versus prolonged driving (Fuller, 1983)
  Reduced braking and intersection crash potential (Evans and Rothery, 1976)

EQUAL TO ENGINEERING ESTIMATE

SAFETY REDUCTION GREATER THAN EXPECTED

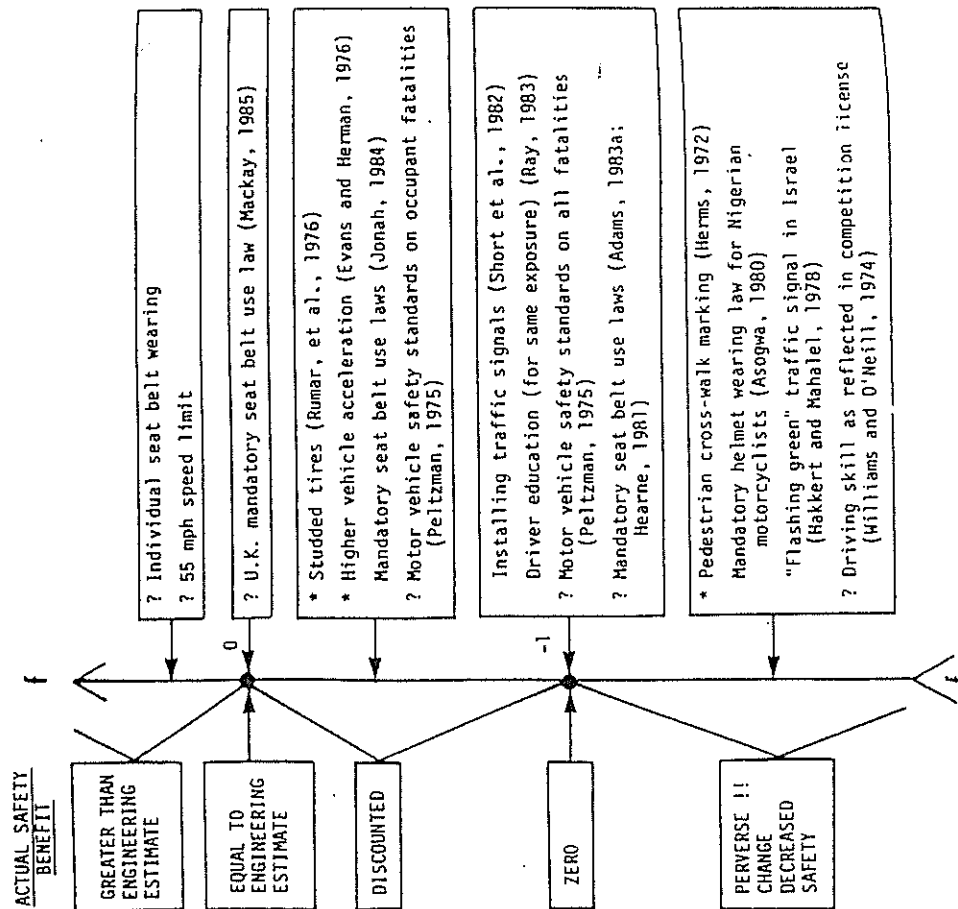* Driver distraction by passengers (Evans and Wasielewski, 1983)

Figure 1. Graphical representation of values of f associated with the safety measures discussed in the text. The absence of a reference indicates that the effect inferred in the present paper was based on a variety of information. The * indicates a fairly clear-cut result (e.g., based on good data and not critically dependent on questionable assumptions). The ? indicates a questionable or speculative result (e.g., weakly supported by data, subject to alternative interpretations, data subject to alternative or speculative interpretations). Note that, in contrast to Figure 2, both f and safety increase as one reads from the bottom to the top of the page.
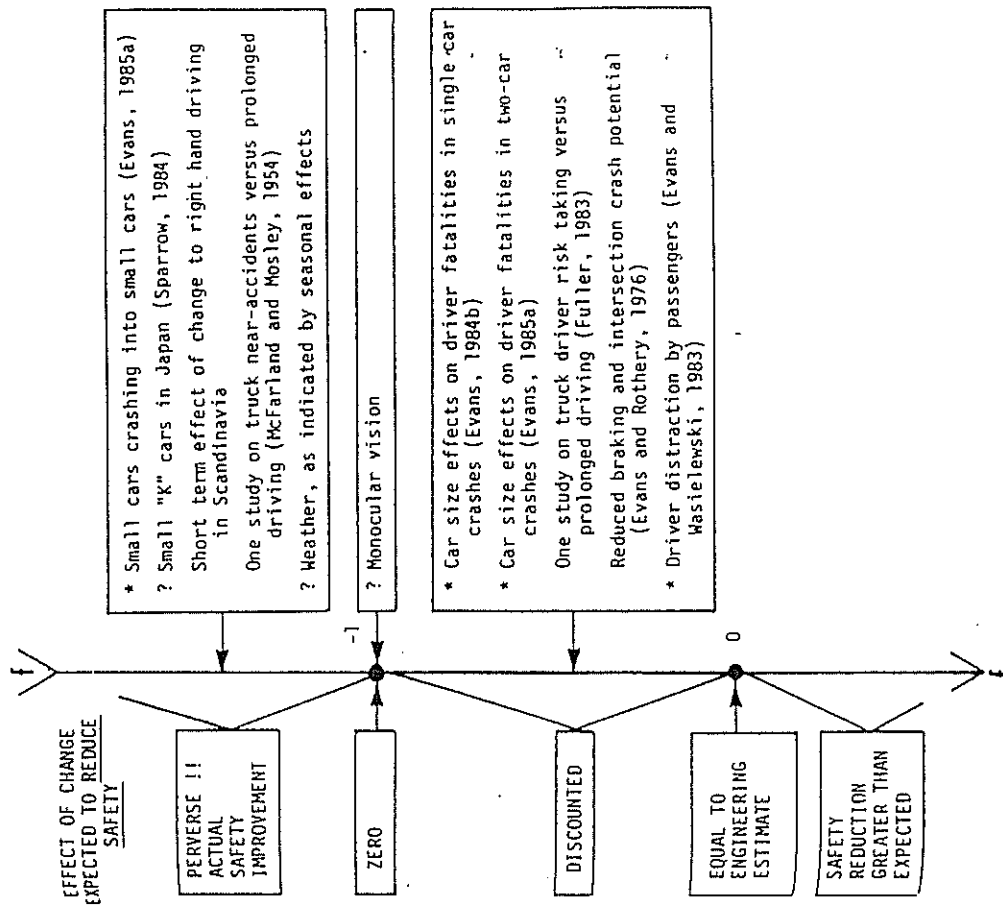
Figure 2. Graphical representation of values of f associated with changes that are expected to reduce safety, but which were made to achieve other goals. The absence of a reference indicates that the effect was inferred in the present paper based on a variety of information. The * indicates a fairly clear-cut result (e.g., based on good data and not critically dependent on questionable assumptions). The ? indicates a questionable or speculative result (e.g., weakly supported by data, highly dependent on questionable assumptions, data subject to alternative interpretations). Note that, in contrast to Figure 1, f decreases as one reads from the bottom to the top of the page. For both Figures 1 and 2, safety increases as one reads up the page.

with all statistical studies in the social sciences, these results show the difficulty of predicting the outcomes of safety programmes. Another case in point is child-proof caps for packages of analgesics, the use of which appears to have had a perverse effect on the ingestion of analgesic tablets by children. The explanation offered is that the child-proof caps lulled parents into a sense of false security, so that they neglected to take other precautions - such as keeping the analgesics in locked cupboards - to keep the tablets out of the reach of children (Viscusi, 1984).

Surveys of the literature on the impact of occupational safety regulations in the United States suggest that the activities of OSHA have had little effect (Curington, 1986; Viscusi, 1986). In Quebec, over the period 1983-87, safety policies appeared, at best, to have led to a minor reduction in the frequency of accidents (Lanoie, 1992).

I hope you won't think it a sign of desperation if in pursuing this line of argument I quote from a sociologist, Peter Rossi. He is concerned with the evaluation of social programmes, and has formulated several "metallic laws", as follows:

> "The Iron Law of Evaluation: the expected value of any net impact assessment of any large scale social program is zero."
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> "The Stainless Steel Law of Evaluation: the better designed the impact assessment of a social program, the more likely is the resulting estimate of the net impact to be zero."
>
> "The Brass Law of Evaluation: the more social programs are designed to change individuals, the more likely the net impact of the program will be zero."
>
> (Rossi, 1987, pp.4-5)

In justification of these propositions, he writes:

> "The laws would claim that a review of the history of the last two decades of efforts to evaluate major social programs in the United States sustain the proposition that over this period the American establishment of policy makers, agency officials, professionals and social scientists did not know how to design and implement social programs that were minimally effective, let alone spectacularly so."
> (p.5)

Lest you think I am quoting some over-excited running dog of *laissez faire*, let me inform you that Rossi's purpose is not to denigrate social engineering - it is to improve it. The last sentence of his paper reads: "In short, the double message of this paper is an argument for further development of policy relevant basic social science and the establishment of the new profession of social engineer." (p.19)

The difficulty in evaluating social programmes is exacerbated by the fact that they are frequently implemented as part of a crusade against a perceived evil, the crusade embracing a number of simultaneous programmes, so that it is difficult to disentangle the effects of any one from the effects of the others. A case in point is the road safety campaign in Victoria (and, I am sure, in other states). The Transport Accident Commission spends heavily on shock advertisements, showing traffic accidents and their aftermaths; the police step up random breath testing, and, via the introduction of red light and speed cameras, issue many more fines for speeding and running red lights. Credit for a substantial lowering of the road toll is claimed for all of these programmes but little credit is given to another principal player, viz the economic recession.

The fact that programmes with a similar aim are often introduced simultaneously suggests that governments and their agencies are not really interested in evaluating the different programmes. This would not be surprising, given the difficulty of evaluating social programmes which, in any case, are often judged, if at all, by reference to crude unanalysed data: the road toll goes down, ergo the programmes were successful, never mind that it would have gone down anyway. The upshot is that programmes tend to be judged by their intentions and projected effects, not by ex post facto analysis.