

Stan V. Smith
Corporate Financial Group Ltd
1165 N. Clark Street, Ste 650
Chicago, IL 60610
Tel: 312-943-1551; FX -1016

Journal of Forensic Economics 3(1), 1990, pp. 1-8
© 1990 by the National Association of Forensic Economists

Hedonic Damages and Personal Injury: A Conceptual Approach

Edward P. Berla, Michael L. Brookshire and Stan V. Smith*

I. Introduction

This article describes a conceptual approach for applying estimates of the loss of the pleasure of life—estimates of “hedonic” damages—to personal injury cases. To our knowledge, no such system has been previously discussed. Forensic economists will note that this interdisciplinary approach involving psychologists and economists is analogous to the interrelated work of vocational experts and economists in personal injury cases. It is the greater predictability of fair jury awards, derived from the approach herein described, which may cause this new approach to be of interest to both plaintiff and defense attorneys.

II. Background

The value of intangible losses, such as pain and suffering, that result from personal injury has often been presented by a plaintiff attorney to a jury based upon some naive formula. For example, it might be argued that pain and suffering losses are two- or three-times earnings loss. In recent years, psychologists have been used as expert witnesses in personal injury cases to qualitatively establish the extent to which an injury has affected a person's life. Through interviews with this person and his or her family, psychological tests, and research, the psychologist arrives not only at a diagnosis but also a judgment as to the severity of the injury upon a person's functioning.

In a personal injury case, juries may also be asked to consider the loss of the pleasure of life. Economists and financial experts have sometimes been asked to testify in this area, but, again, a system for rating and quantifying such damages in personal injury cases has not been developed and communicated.

III. Major Issues

In developing an approach for calculating economic damages of this nature, the following issues emerged:

1. **Scale:** How can a scale be developed for assessing the degree of lost pleasure of life over time that resulted from particular injuries to a particular person? What units of measure should calibrate the scale: abstract units of the utility of life, hours, etc.?

* Ed Berla is a Clinical Psychologist and Professor at the University of Louisville, Michael L. Brookshire is a Professor of Economics at the University of West Virginia College of Graduate Studies in Charleston, and Stan V. Smith is an Adjunct Professor of Economics at the DePaul University College of Law in Chicago.

2. **Theory of Hedonic Loss:** What is the most reasonable theoretical underpinning for economic losses in this area—a replacement cost theory, an avoidance theory, or a theory of what governments and corporations spend to avoid a person's death or injury? Stated another way, how can the total loss of the pleasure of living be estimated by economists as the foundation for applying a loss scale for injury?
3. **Value:** How are units of loss to be converted to dollars of loss per year? Should minimum wages be used, average wages of workers, the person's own likely wage, or dollars which may be spent by persons or society to preserve the value of living?
4. **Pleasure versus Pain:** Can the losses from the diminution of the pleasure of living be sufficiently separated from the losses resulting from the onset of palpable pain and suffering?

In fact, the answers to some of these questions force the answers to others, and the development of a more systematic approach demands smooth and logical steps from one issue to the next.

IV. The Lost Pleasure of Life (LPL) Scale

A scale has been developed to measure the degree of lost pleasure of life that is independent of the traditional, imprecise concept of pain and suffering. As will be seen, the hedonic approach focuses upon the value placed on a person's life. A psychological evaluation determines the degree of the lost pleasure of life resulting from an injury. “Pleasure of Life” is used to mean the value and satisfaction that we receive from all of living, including the experiences not always deemed pleasurable. This is distinct from the impacts associated with the onset of palpable pain and suffering and its consequences.

The loss of the pleasure of life, or change in quality of lifestyle, can be divided into four very broad areas, and an injured person is evaluated in these four areas. The psychologist's evaluation compares the person's post-injury lifestyle with his or her pre-injury lifestyle. The four areas are:

1. **Practical functioning.** This refers to the extent a person's activity in daily living has been affected. Included in this area are any activities a person typically engages in as an integral part of daily life, such as reading, grooming, dressing, eating, sleeping, shopping, traveling, doing housework, and parenting.
2. **Emotional/psychological functioning.** This refers to a person's ability to live on a daily basis free of any debilitating emotional problems that diminish his capacity to enjoy life and compromise one's sense of self-worth, dignity, and integrity.
3. **Social functioning.** This refers to a person's capacity to derive pleasure from interacting with other people. Examples include family interactions, athletic activities, social events, hobbies, and any other interpersonal interactions.
4. **Occupational functioning.** This refers to a person's ability to engage in a career/vocation of one's choice and to derive pleasure from one's occupational identity independent of any monetary compensation.

Table 1
Lost Pleasure of Life (LPL) Scale

Degree of Loss		Examples
None	0	
Minimal	1-17%	Person is involved in automobile accident and misses some days of work; family functioning and relationships disrupted for days. Person returns to "pre-injury" level of functioning.
Mild	17-33%	Person breaks arm which results in a permanent inability to participate in recreational activities. Person has infrequent occurrences of mild depression. All other aspects of practical, emotional, social and occupational functioning are at a pre-injury level.
Moderate	33-50%	Person loses leg in car accident, which affects his practical functioning on a daily basis; recreational activities are restricted and he suffers infrequent occurrences of mild depression.
Severe	50-67%	Person is burned in a fire and experiences significant scarring. Social functioning substantially reduced, person experiences significant loss of self-worth and frequent periods of depression. Practical and occupational functioning remain at preinjury level.
Extreme	67-83%	Person is quadriplegic and requires attendant care on a daily basis. Practical, social and occupational functioning are significantly diminished. Person experiences severe depression and loss of a sense of self worth.
Catastrophic	83-100%	Person is bedridden requiring daily nursing care. All aspects of practical, emotional and social functioning are substantially reduced. Person is unable to work.

Through the use of psychological tests, questionnaires, and interviews, a judgment can be made concerning the degree of an individual's hedonic loss in these four areas. These losses can then be quantified by using a seven-point scale that rates an individual's percentage of loss (see Table 1).

The Lost Pleasure of Life (LPL) Scale is similar to those used by mental health professionals to assess the degree of functioning and the severity of stress in individuals (*Diagnostic and Statistical Manual of Mental Disorders*, pp. 11, 18-19). Using this scale, the mental health professional assigns a value of 0 to 100, with reference to the four areas of functioning described above. A zero rating means that an individual has lost nothing in functioning, while a 100 rating means that the individual is completely unable to function and cannot derive any pleasure in a particular area.

The mental health professional makes these ratings and judgments based upon his knowledge of the specific injury the individual has sustained and its probable effect on that individual's future life. This requires the professional to have an understanding of the stages of life that all humans experience and the relationship between the injury and future stages of a person's life. An individual will experience

an injury differently, depending upon his age and stage of life. For example, a specific injury, such as a leg amputation, will be experienced differently and will have different consequences to an individual if it is sustained at middle age, rather than during childhood. Using the LPL scale, the mental health professional rates an individual's degree of diminution of life that has been experienced from the date of injury to the date of the evaluation and then estimates the degree of diminution of life over the individual's remaining life span. The degree varies as a function of the injury, the time that elapses after the injury, and the age of the individual.

As another example, an individual who has been badly burned will have his life significantly affected in all four areas of functioning for a period of one year following the fire. He might be rated as having a 95 percent diminution of life (catastrophic). In subsequent years, the effect on his occupational and practical functioning might be changed to a mild loss (32 percent and 25 percent, respectively), while the effect on his social and emotional functioning would remain catastrophic (95 percent). His total or combined degree of diminution of life in this example with equal weighting would now be the average of these, or 62 percent (the severe category).

Thus, the psychologist's report would provide an economist with a percentage-of-loss, or range of such percentages, for each future age or stage of life. This age-by-age, or stage of life, analysis of the four possible areas of lost functioning would result in percentages that can be applied to dollar estimates of the (lost) pleasure of life per year by a forensic economist.

V. Quantifying The Lost Pleasure of Life

Assume that a psychologist has provided a percentage of the total (lost) pleasure of life for each age. Several theoretical approaches are available to a forensic economist for determining a dollar value for the total (100 percent lost) pleasure of life in each year. The psychologist's percentage applied to the dollar value of total (lost) pleasure of life would result in a hedonic damages estimate for each year or stage of life.

One such approach to arriving at hedonic values might be labeled the "societal value" approach. It is the predominant economic model for valuing life in the courts and is based on the willingness-to-pay (WTP) economic model. Testimony regarding the lost pleasure of life in wrongful death cases based on the willingness-to-pay model is being presented with increasing frequency. In this approach, the price associated with a change in the risk of death is estimated in several different ways through questionnaire studies, consumption studies, labor market studies, and studies analyzing the cost and impact of regulations imposed by rulemaking agencies. Most estimates range from high six-figure amounts to high seven-figure amounts. Among others, Bloomquist (1981) and Fisher, Chestnut, and Violette (1989) have summarized such estimates. The economist must choose the range of estimates that he will utilize and provide a rationale for choosing a central tendency measure or a range of values.

Economists may differ in their precise estimate of the value of life just as they will frequently differ as to the value of lost earning capacity. Estimates may vary for many reasons, including differences in discounting, growth projections, etc.

From the willingness-to-pay based estimate for the total value of life, we must subtract estimates of the labor component (earnings, fringe benefits, household services) for a statistically unknown person. Further, we must subtract an estimate for the value of preserving financial security, since this too is included in the total life value. The remaining "net" hedonic value may then be divided by the remaining life expectancy of a statistically average person to arrive at a hedonic value per year of life expectancy. Assume that the forensic economist has established this net hedonic value at \$50,000 per year. Percentages of total lost pleasure of life would be applied to this \$50,000 total, hedonic value per year. The application of the life expectancy of the injured person, and adjustments for annual growth in these values and discounting, would result in a present value of the lost pleasure of life or a range of such values.

A second approach to hedonic valuations, which has been used, might be labeled an "individual avoidance" approach. Under such an approach, the following question is asked. How much could or would the injured person have paid to avoid his lost pleasure of life in each year? Surely this must primarily depend upon his or her earning capacity. To be conservative and for ease of explanation, the economist may abstract from possible borrowing, gifts, or other funding sources to avoid the lost pleasure of life. Loss in dollars would be exclusively linked to earnings potential in wages, salary, and other direct forms of compensation.

How much could or would one work to avoid the 100 percent extreme of LPL? A reasonable number of hours per week seems to be 80 hours, or double the "normal" work week. We know that persons have maintained such a work schedule over time. It is not desirable, but we are focusing upon what a person would do to avoid the catastrophic loss of the pleasure of life. As one moves above an 80-hour "avoidance week," the credibility of the approach deteriorates. Even if a person would take major steps to avoid LPL, some sleep and personal time per week are necessary.

An issue now becomes the integration of an economist's estimate of lost earning capacity with his LPL estimate. Assume that John Doe suffers a severe injury on December 31, 1988; cannot work in 1989 and receives the \$20,000 in wages that he otherwise would have earned; and has the extreme of a 100 percent LPL rating. His \$20,000 in wages, plus his fringe benefits, would be captured in the earning capacity loss estimate of 1988; this would presumably cover 40 hours per week. The LPL estimate would be the 100 percent rating times \$20,000, or a \$20,000 loss in this simple example. If the rating percentage from the psychologist had been 50 percent, LPL for 1989 would be \$10,000, with a lost earning capacity plus LPL estimate of \$30,000.

The 40-hour-per-week lost earning capacity estimates would only continue through work-life expectancy. Standard tables might produce an age 62 end of work-life and age 75 end of life, although the life-participation-employment (LPE) model of work-life expectancy lends itself to the LPL system (Brookshire and Cobb, 1983). In our example, we have 40-hour-based estimates for both earning capacity and LPL through age 62. Then, the LPL estimate is based upon 80 hours per week of individual avoidance (times the percentage rating) at each age through life expectancy.

In the case of a mother and housewife, who had no plans to work, 80 hours

per week might exist in LPL throughout her life expectancy under the individual avoidance theory. Her wage potential might be based upon statistical averages for her demographic characteristics, but such estimates are commonly made in minor child and other cases involving lost earning capacity. Care must be taken, however, to be sure that an 80-hour estimate of LPL does not double-count with an hours-per-week estimate of lost household services.

Finally, other variations of a generalized willingness-to-pay approach have been presented to juries. The cost of maintaining maximum security prisoners, or of an indigent patient in a vegetative condition, have been used as benchmark values of how much society is willing to pay to preserve life. Such approaches also assign hedonic losses to particular ages and particular years, so that percentages from a psychologist can be applied in injury cases.

VI. An Illustration

To further illustrate these methods, let us use a version of a past case. Several years ago, a teenage female suffered a severe spinal injury when the automobile in which she was a passenger swerved off the road and overturned. Karen Doe spent a year in and out of the hospital undergoing several operations. The short term effects were dramatic, as this teenager spent the better part of a year in a body cast. The long term effects on her life are significant: her weakened back will never allow her to lift or carry more than a few pounds in her arms. It was clear that the accident would affect and alter every day of her future and that she would suffer a loss of the normal pleasures to which she would have otherwise looked forward.

The core of the psychologist's report in the Karen Doe case is shown in Table 2. The psychologist could be more specific about an LPL rating for each age, or the economist can apply the low and high percentage values of a range to his yearly estimate of the total (lost) pleasure of life. Under the societal value approach, we already assumed a \$50,000 value per year to which the percentages would be applied through Karen's life expectancy. A second-shift avoidance amount might be based on a likely educational level scenario for Karen. If this were a high school degree with some college, a base earnings estimate would be in the \$20,000-\$25,000 range. The amount of reductions to the earning capacity estimate for work-life probabilities, such as retirement, would shift to the LPL estimate. The same percentages from the psychologist's report would then be applied to these estimates of total (lost) pleasure of life for each year in present values.

VII. Further Issues and Refinements

The percentage of growth in annual losses, whether in nominal or real terms, should be the same in the LPL estimate and in the earning capacity estimate under an individual avoidance approach (Brookshire, 1987). Similarly, discounting to present values should be at the same interest rates for LPL and lost earning capacity estimates. Juries should still be providing lump sums which, with compound interest, will exactly restore projected, annual losses in future years.

Reductions for worklife expectancy, if made in estimating wages, must be added

Table 2

Psychological Assessment of LPL Ratings of Karen Doe

Age	Degree of Impact	Examples
18 (1 yr.)	Catastrophic 90%	Major operation, unable to attend school, inability and difficulty in caring for self and practical activities, normal social life completely disrupted, anxiety, fear, and concern over bodily condition. Steel rods permanently implanted for a period of at least 10-15 years. Body cast.
19-21 (3 yrs.)	Moderate to Severe 45-55%	Unable to participate fully in school life both academically and socially. Unable to lift or carry weight of more than few pounds. Difficulty in getting vigorous physical (aerobic) exercise. Anxiety/fear of being hurt. Self-consciousness about steel rods and back brace. Reduced social contact. Emotional dependency on boy friend. Flashbacks about accident and hospitalization.
22-30 (9 yrs.)	Moderate 33-50%	Continued difficulty in lifting weight. Difficulty in caring for young children. Reduced opportunity for marriage partners. Substantial reduction of potential enjoyment in engaging in preferred occupation (modeling). Reduced physical activities, some limitations in social activities.
31-55 (25 yrs.)	Mild to Moderate 24-45%	The quality of Karen's life will depend upon the extent to which she will find satisfaction in meeting normal goals of marriage, family (children) and occupational enjoyment. To the extent she achieves these, the less the impact upon her life.
56-79.7 (24.7 yrs.)	Moderate to Severe 33-67%	As Karen grows older she is more prone to physical trauma from medical complications/physical insults as well as arthritis. The degree of impact will decrease or increase as a function of the interaction between the aging process, her injuries, and her psychological reaction to them. Reduced capacity to function as a grandmother. Possible depression as a function of not being able to meet her life's goals.

back to the second shift wages in order to estimate the most that a person could incrementally earn (and be willing to pay). Similarly, if the fringe benefits have been reduced for worklife expectancy, these reductions for the first shift must be added back under the individual avoidance approach.

Most wrongful death statutes provide for personal consumption deductions from lost earning capacity estimates. The survivors of a deceased household head could only have received his earnings less the dollars which he exclusively consumed for his own benefit (Brookshire and Smith). At least a maintenance-level deduction is also relevant for individual avoidance estimates, as the person working up to 80 weekly hours must spend something on himself to subsist. For ages in which consumption has been deducted from earnings, the LPL estimate is

unaffected. For ages in which only an LPL estimate is made under an individual avoidance approach, at least a personal maintenance deduction should be made.

In applying the societal value approach, the hedonic loss estimate should have added to it the personal consumption of the average, statistically unknown person before applying the percentages from the LPL scale. What we pay to avoid death takes into account the personal consumption savings resulting from death. In injury, consumption continues.

Finally, the effects of income taxes must now be considered in railroad cases and in a few other jurisdictions. It has been shown that the net of all income tax effects is to raise lump sum estimates of lost earning capacity in many cases (Brady, Brookshire and Cobb, 1983). If income tax effects are to be considered in earning capacity estimates, logic would dictate that such effects must also be considered in LPL estimates. Avoidance earnings would now be after-tax earnings. On the other hand, lump sums would be raised so that interest could be earned on the lump sum, taxes paid on this substantial interest, and the exact stream of after-tax avoidance losses would result. As with earning capacity estimates, the net of the two income tax effects could raise or lower loss estimates.

VIII. Conclusion

An interdisciplinary approach for applying hedonic valuations to personal injury cases has been conceptually described, as one foundation for future work by forensic economists, psychologists, and related professionals. Juries are permitted, in a number of jurisdictions, to make an award for the loss of the pleasure of life, in addition to the lost value of an individual functioning as an "economic machine." Thus, expert testimony in this area may have a probative value for juries every bit as significant as traditional testimony by forensic economists regarding lost earning capacity.

References

- Bloomquist, Glen, "The Value of Human Life: An Empirical Perspective," *Economic Inquiry*, January 1981, pp. 157-164.
- Brady, Dennis, Brookshire, Michael, and Cobb, William, "Calculating the Effects of Income Taxes on Lost Earnings," *Trial*, September 1983, Vol. 18, No. 9.
- Brookshire, Michael L. *The Handbook for Plaintiff and Defense Attorneys*, Cincinnati: Anderson, 1987.
- Brookshire, Michael L. and Cobb, William E. "The Life-Participation-Employment Approach to Worklife Expectancy in Personal Injury and Wrongful Death Cases," *For the Defense*, July 1983, Vol. 25, No. 7, pp. 20-25.
- Brookshire, Michael L. and Smith, Stan V., *Economic/Hedonic Damages: The Practice Book for Defense and Plaintiff Attorneys*, Cincinnati: Anderson Publishing Co., 1990.
- Diagnostic and Statistical Manual of Mental Disorders*, Washington, D.C.: American Psychological Association, 1987, 3rd ed. (revised).
- Fisher, et al., "The Value of Reducing Risks of Death: A Note on New Evidence," *Journal of Policy Analysis and Management*, 1989, Vol. 8, No. 1, pp. 88-100