

## HOW TO TELL A PURE ACTUARY FROM A LAY ACTUARY

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Acute powers of observation are hardly required to recognize that the casualty actuarial fraternity is divided, not sharply but nevertheless clearly, between “pure” actuaries and “lay” actuaries. To be sure, there is a degree of overlap between the two classifications: some actuaries covered by the overlap are more pure than lay, some more lay than pure, and some are almost equally pure and lay – they might be termed “pure-lay,” or, to simplify the language, “purely” actuaries. At any rate, the intention here is to provide guides so that those of our members who cannot instinctively tell a pure actuary from a lay actuary may become aware of the distinctions and from their newfound knowledge bring more understanding to their relationships with their fellows and associates.

For his approach to this discussion the writer is indebted to E. B. White, for almost forty years a writer for *The New Yorker* magazine and without question one of the great stylists and foremost masters of the casual essay in our time. In the mid-thirties Mr. White wrote a piece for *The New Yorker* entitled “How to Tell a Major Poet from a Minor Poet.”[1]

Mr. White said, for example, that any poem starting with “And when” is a serious poem written by a major poet. To illustrate, here are the first two lines of a serious poem:

And when, in earth’s forgotten moment, I  
Unbound the cord to which the soul was bound . . . .

On the other hand, any poem ending with “And how” is light verse, written by a minor poet, as in:

Placing his lips against her brow  
He kissed her eyelids shut. And how.

Mr. White also told us that all poets who, when reading from their own works, experience a choked feeling, are major, and that all women poets, dead or alive, who smoke cigars are major. And there was more, equally delightful.

But Mr. White’s differentiations of major and minor poets are not our concern. The important thing for us is that when a member of the Casualty Actuarial Society brings his wife, or a new Associate, to one of our welcoming Sunday night smorgasbords, and he knows he is going

to see Tom Murrin, or Norman Bennett, or Bill Hazam, or Lew Roberts, or Les Dropkin, he will want to introduce them to his guest properly: "This is Mr. So-and-So, the pure actuary," or, "This is my good friend Such-and-Such, the lay actuary," or even, "Here is You-Know-Who, purely actuary." Just to say, "This is Doc Masterson," is hardly satisfactory; it might even be embarrassing.

In the Casualty Actuarial Society it would be difficult to distinguish a pure actuary from a lay actuary by his character, his looks, his title or company affiliation, or the color or quantity of his hair. His drinking capacity, or the amount of sleep he gets, may provide clues, but not reliable ones. The recommendation here is that drinking and sleeping as criteria be discarded as unworthy, for to consider them would involve detached observation under circumstances where detachment is somewhat difficult and not at all conducive to a decent camaraderie.

Fundamentally, by their words shall ye know them, their words as revealed in formal papers, reviews, speeches, and reports. Here are a few rules:

Any paper whose mathematical demonstration includes a  $\chi^2$  test is a paper written by a pure actuary. On the other hand, any paper whose mathematical demonstration is consummated by an expression in  $x^2$  is a paper written by a lay actuary.

A discussion of an actuarial problem that includes the word "stochastic" is a discussion by a pure actuary. A discussion in which the favorite descriptive term is "fantastic" is probably a discussion by a lay actuary.

But this sort of labeling can be tricky. If our lay actuary suddenly throws a "Null Hypothesis" at us we have reason to suspect he may be a pure actuary in disguise. Earlier when he talked about "degrees of freedom" we were content that he was a lay actuary making a sophisticated allusion to a civil rights situation; but the Null Hypothesis alerts us, and if he follows this with "Yates' correction" we have him pegged as pure for sure.

Any actuary who can correctly both pronounce and spell P-o-i-s-s-o-n and B-e-r-n-o-u-l-l-i is a pure actuary.

The simplest way to learn that an actuarial student will live out his career as a lay actuary is to have him ask for a copy of *The Elements of Probability Theory* by Harold Craymer. Of course, if he asks for a copy

of *The Elements of Probability Theory* by Harald Crommaire, you can be reasonably sure he is destined to be a pure actuary.

A paragraph in a formal paper that reads, in part,

“Again speaking in general . . . the indicated proportional departure of each group . . . should be given a weight proportional to the square root of the expected number of losses for the group. This is based on the fact that the indication of each group should be given a weight inversely proportional to the standard deviation of the indication. The standard deviation of the indication is inversely proportional to the square root of the expected number of losses for the group. An equivalent credibility procedure would be to give the square of the indication a weight proportional to the expected number of losses.”[2]

— a paragraph like that one has to have been written by a pure actuary. Incidentally, reading that passage aloud can be lots of fun for a lay actuary.

Now, however, if while thumbing through old volumes of the *Proceedings* the unsophisticated reader finds the following lines,

“The time may never come when the underwriters will consider us as their equals, but let us carry on with the hope that some day they will admit that we are not such bad fellows and associates, after all. Until that happy day, let us be content with our lot. When some one raises the old question, ‘What is so peculiar about an actuary?’, we shall without malice make a simple but dignified answer, giving a Stoopnagle reverse English twist to the classical one concerning the southern exposure of a horse going north. Yes, our reply shall be, ‘There are so many fewer of them than there are underwriters.’”[3]

he may be sure that he has been exposed to a lay actuary, one of the most!

The passage quoted above was written by Syd Pinney, who was a president of this Society. But presidents of the C.A.S. have been both pure actuaries and lay actuaries, and purely actuaries too. Their presidential addresses might make one think they are all lay actuaries, but presidential addresses do not represent their total output and the reader can be fooled. Witness the following:

“The development initially assumes that these respective Poisson distributions are independent; but this complex multiple Poisson distribution of the number of claims reduces to the negative binomial distribution when the parameters of the independent distributions are reduced to two by making them interdependent through the assumed relationship . . .”[4]

Although the quotation is incomplete, clearly those words are penned by a pure actuary. Now consider this:

“I think there is merit to an idea that was considered some years ago in connection with boiler and machinery insurance, but which is equally applicable to other lines, that any risk producing an annual premium of \$25,000 at manual rates should be subject to (a) rate treatment, that is, individual risk rating on an underwriting judgment basis, possibly with the establishment of certain limitations within which the judgment modification must be contained.”[5]

Sounds like a lay actuary, doesn't it, displaying indeed, since it was written in 1951, remarkable prescience of the risk modification programs that are shaking the casualty insurance industry today. Both of the foregoing sentences came from the pen of Tom Carlson, a past president, who can hardly disavow the label, purely actuary.

Mr. Carlson's words of 1951 bring to mind the following paragraphs written in 1959:

"There remains still the fear that unregulated rates in the face of keen competition will be inadequate rates from the point of view of company solvency, thus endangering the very security of our system. Under today's operating procedures, however, the safety of a carrier is irretrievably given over to the judgment of its underwriting organization through the authority to accept and reject. A company can sink into insolvency with tragic speed through bad risk selection even with every rate charged strictly according to manual. Why should we expect our staffs, which we trust to exercise adequate restraint in risk selection, to cast that restraint to the winds if given some limited discretion in rate assignment? "Some will accuse me at this point of selling my actuarial profession down the river. I plead 'not guilty.' It has always seemed to me that when the law is too pervasive the atmosphere breeds shysterism. The present regulatory climate makes actuarial shysterism a distinct, though, I hope, as yet an unrealized, possibility." [6]

Those are the words of an actuary's lay actuary, and strong words they are, coming from a presidential address by Dudley Pruitt, who also, apparently, foresaw the rating programs currently being advanced.

From another of our presidents comes the following passage:

"We may liken our statistics to a large crumbly loaf cake, which we may cut in slices to obtain easily edible helpings. The method of slicing may be chosen in different ways—across the cake, lengthwise down the cake, or even in horizontal slices—but only one method of slicing may be used at a time. If we try to slice the cake more than one way at a time, we shall be left with a useless collection of crumbs." [7]

That is obviously too lay to be pure, yet suggestive of the kind of imagination expected of the pure—a fine example of a clue to an actuary with the "purely" label. Laurie Longley-Cook, who authored the lines, well deserves the label.

No inference should be drawn from the decision not to classify here other presidents of the C.A.S. as pure, lay, or purely; each of our members should be able, if he gives a hoot, to classify past presidents according to his understanding of, or interest in, the criteria in this report.

Here are a few more guidelines in the pure-lay classification system:

Any actuary who presents a paper to the International Congress is

a pure actuary. Any actuary who presents song parodies at an actuarial dinner is a lay actuary.

Any actuary named Arthur L. Bailey is a pure actuary.

A rate derived by the method of moments is one fashioned with care by a pure actuary. A rate derived in a matter of moments is one pulled out of the air by a lay actuary.

In E. B. White's essay there is a hint that probably a major poet is the higher form of the species. No similar hint is here intended with respect to pure and lay actuaries. Indeed, a statistical study may very well show that pure and lay actuaries attain executive positions in their organizations roughly in proportion to the relative frequency of pure and lay actuaries on the C.A.S. roster. It is safe to assume, however, that the attainment of the rank of company president is almost exclusively a prospect for a lay actuary, a circumstance which may reveal more about presidents than about lay actuaries.

There must be more ways of telling a pure actuary from a lay actuary, but it is hardly necessary to explore them all. Instead it is fitting to quote Mr. White's closing comment on the various ways to tell a major poet from a minor poet:

"The truth is," he said, "it is fairly easy to tell the two types apart; it is only when one sets about trying to decide whether what they write is any good or not that the thing becomes complicated."

#### BIBLIOGRAPHY

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- [3] Pinney, Sydney D., What is So Peculiar About an Actuary?, *PCAS XXX*, p. 96.
- [4] Carlson, Thomas O., Negative Binomial Rationale, *PCAS XLIX*, p. 179.
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- [6] Pruitt, Dudley M., St. Vitus's Dance, presidential address, *PCAS XLVI*, p. 157.
- [7] Longley-Cook, L. H., An Introduction to Credibility Theory, *PCAS XLIX*, p. 206.