Purpose of SL: To improve the quality of the student's decisions about issues for which statistical information is available. Two main categories of issues: personal (e.g., health) and citizenship (e.g., voting).

Definition of SL: The habit of noticing without specific prompting **the strengths and weaknesses** of such claims and reports of statistical information and arguments based thereon as commonly appear in the non-technical media.

- "the habit": NOT just the ability -- use it regularly in real life or lose it. Students need to do more than pass an exam; they need to build durable habits. See Moore on the non-innateness of the modes of thought of the liberal art and of stats; and Chance on developing habits and on the need to reinforce them in follow-up courses. Building the habit of SL will involve replacing any old habits which get in the way. See Garfield's examples of errors which students need to be taught to avoid.
- "... of noticing without specific prompting": if the student requires prompting about particular issues or aspects, then he doesn't have a durable habit and the impact on his life will be minimal. The ideal final exam for an SL course is about a half dozen short articles from the media, each followed by the single word "Comment." Any more detailed instructions or questions will trigger recognition rather than recall and will not test firm habitual knowledge and skills. It is regrettable that grading such a test is expensive, but I doubt that anything less will prove that the above-stated purpose has been fulfilled.
- "the strengths and weaknesses": that noticing strengths and weaknesses will improve the quality of decisions seems self-evident; the question is: which strengths and weaknesses should we expect students to learn to notice? Part of the answer is provided by the source material: statistical concepts and techniques which are hardly ever mentioned in the non-technical media may reasonably be excluded. Excluded items might include such things as stratified samples and specialized significance tests but not case-control studies and cohort studies. Border line items might include p-value.

  Basically, "strengths" refers to those aspects of sound statistical reasoning which are commonly found in media reports or which are normally associated with the terminology of such reports; and weaknesses includes the absence of strengths. Many more weaknesses will be omissions (not necessarily malicious) from the media reports of details and/or qualifications which appeared in the original report. Students need to know that certain types of arguments gain strength from the combinations of pieces of information, and they need to notice whether all of the pieces are reported. E.g., centers often need spreads, and associations usually need margins of error or confidence intervals.

I believe that the previous three items together presuppose an adequate degree of understanding, interpretation and reasoning, with one major exception: students need to be taught that certain words which sometimes appear in media reports are used in technical senses which differ substantially from the common senses of those words; e.g., explain, account for, control.

- "claims": does anyone doubt that fabricated, erroneous and/or excessively abbreviated reports are common enough to need to be recognized and dealt with?
- "reports of statistical information": the obvious subject
- "and arguments based thereon": the frequency of arguments which urge some action (personal or social) on the basis of cited statistics hardly needs comment. The student needs to recognize the difference between statistical conclusions and action decisions, and think clearly about whether the former is sufficient warrant for the latter. See Garfield on "the outcome orientation"; the conversion to a binary decision is not statistically valid but is involved in many real world decisions.
- "commonly appear in the non-technical media": a reasonable upper limit which (we hope) is attainable by most college students at an affordable cost.

Valuable but not obviously affordable additional issues to which (IMHO) students should be sensitized:

- Measurement issues, e.g., objective vs. subjective; direct vs. proxy.
- Common confounders, e.g., Hawthorne effect, placebo effect.
- Sampling problems. e.g., convenience sample, non-response bias.

A valuable but expensive exercise: have students evaluate a media report, then look up the original source and compare that with the media report.