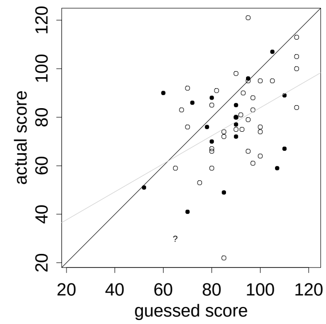

Figure B.5 *Actual versus guessed midterm exam scores for a class of 53 students. Each symbol represents a student; empty circles are men, solid circles are women, and ? has unknown sex. The* 45° *line represents perfect guessing, and the dotted line is the linear regression of actual score on guessed score. (The separate regression lines for men and women were similar.) Both men and women tended to perform worse than their guesses. That the slope of the regression line is less than 1 is an instance of the "regression effect" (see Section 4.3): if a student's guessed score is* x *points higher than the mean guess, then his or her actual score is, on average, only about* $0.6x$ *higher than the mean score. A square scatterplot is used because the horizontal and vertical axes are on the same scale.*

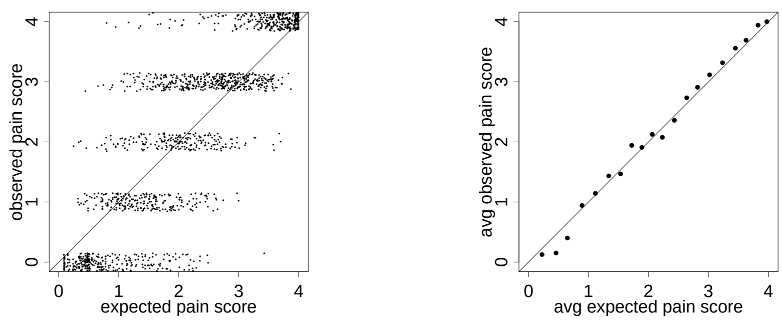

Figure B.6 *(a) Observed versus expected pain relief scores (0 = no pain relief, ..., 5 = complete pain relief) for data from the analysis of Sheiner, Beal, and Dunne (1997). Observed pain relief scores are jittered. (b) Average observed versus averaged expected pain relief scores, with data divided into 20 equally sized bins defined by ranges of expected pain relief scores.*

Whether in the continuous or discrete case, we prefer to put "observed" on the y-axis and "expected" on the x-axis (rather than the reverse), because in the calibration context, the expected value is the predictor and the observed value is the outcome. See Section 8.2 for related discussion of residual plots.

Residual plots

If all is going well, the points on the calibration plot will mostly fall near the 45-degree line, meaning there will be much empty space on the plot. A natural next step is to plot $y - x$ versus x; that is, "deviation from predicted" versus "predicted." This is the residual plot. In fact "deviation from predicted" can be plotted versus just about anything, not just predicted values (see Figure B.7). Residual plots should not be square and should have a dotted line at $y = 0$ rather than $y = x$.