

**Example 5.5 (continued from page 132)** In the Hecht *et al* experiments on threshold for visual perception of light, the response variable was an indication of whether or not light was observed by a particular subject (“yes” or “no”), and the explanatory variable was the intensity of the light (in units of average number of light quanta per flash). Several different intensities were used, and for each the experiment was repeated many times. The results for one series of trials in one subject are plotted in Figure 8.9.

As illustrated in Figure 8.9, the linear regression model (8.39) does not work very well in this example. The proportions vary between 0 and 1 but a line  $y = a + bx$  is unrestricted and can not represent the variation accurately, at least not for proportions that get close to 0 or 1. A solution is to replace the line  $y = a + bx$  by