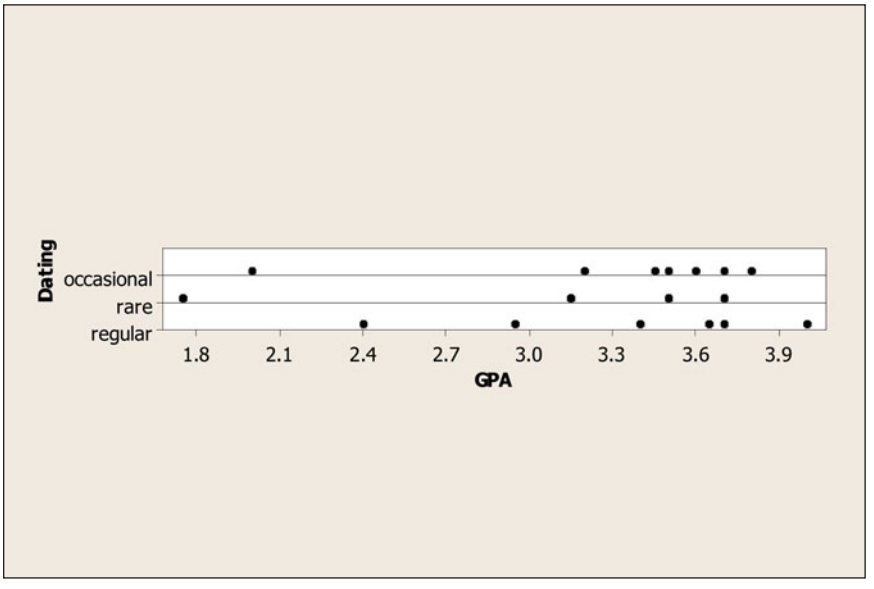
skew to the left and since the sample size was small in each group, he felt safer analyzing the data with the Kruskal-Wallis test than with the ordinary ANOVA *F* test.



▲ **Figure 15.4** Dot Plots of GPA by Dating Group. **Question** Why might we be nervous about using the ordinary ANOVA *F* test to compare mean GPA for the three dating groups?

Table 15.7 shows the data, with the college GPA values ordered from smallest to largest for each dating group. The table in the margin shows the combined sample of 17 observations from the three groups and their ranks. Table 15.7 also shows these ranks as well as the mean rank for each group.

Finding ranks for data in Table 15.7

GPA	Rank	
1.75	1	
2.00	2	
2.40	3	
2.95	4	
3.15	5	
3.20	6	
3.40	7	
3.44	8	
3.50	9.5	← average of 9 and 10
3.50	9.5	
3.60	11	
3.67	12	
3.68	13	
3.70	14	
3.71	15	
3.80	16	
4.00	17	

Table 15.7 College GPA by Dating Group

Dating Group	GPA Observations	Ranks	Mean Rank
Rare	1.75, 3.15, 3.50, 3.68	1, 5, 9.5, 13	7.1
Occasional	2.00, 3.20, 3.44, 3.50, 3.60, 3.71, 3.80	2, 6, 8, 9.5, 11, 15, 16	9.6
Regular	2.40, 2.95, 3.40, 3.67, 3.70, 4.00	3, 4, 7, 12, 14, 17	9.5

Question to Explore

Table 15.8 shows MINITAB output for the Kruskal-Wallis test. MINITAB denotes the chi-squared test statistic by H. Interpret these results.

Table 15.8 Results of Kruskal-Wallis Test for Data in Table 15.7

Kruskal-Wallis Test: GPA versus Dating

```
Dating          N     Median   AVE. Rank
rare            4      3.325        7.1
occasional      7      3.500        9.6
regular         6      3.535        9.5
H = 0.72     DF = 2   P = 0.696 (adjusted for ties)
```