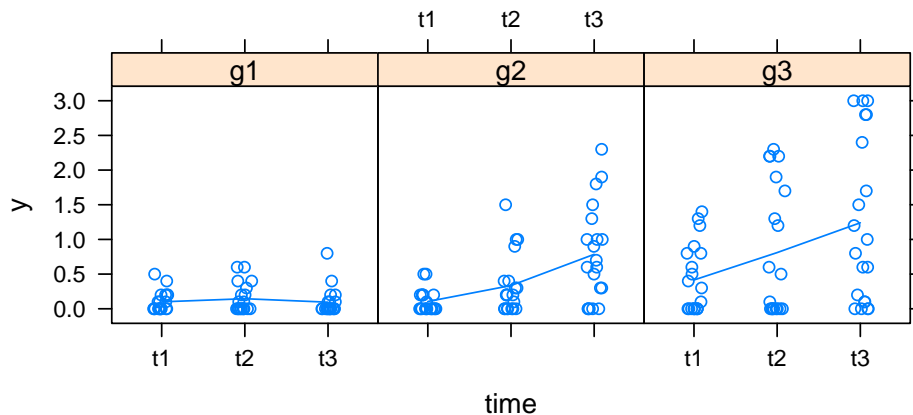**Case Study 4**
for February 18

Your client is a pediatric psychologist who is studying differences in development between normal children and children with two different developmental disabilities. To measure this, she is considering the following study. The parents of 60 children (20 per group) are to be given surveys at three different ages. These surveys have 10 questions each, and for each question, the parents can answer "no trouble," "a little trouble," "some trouble," or "lots of trouble." These are to be coded 0–3 and the average score recorded for each child for each of the three ages.

The resulting data is expected to look somewhat like the following. Group 1 (g1) is the normal children; groups 2 and 3 (g2 and g3) are the children with the two types of developmental disabilities. It's jittered on the x-axis for clarity. Note that there are many 0's in this data set (45% of the total); 0's occur when the parents answer "no trouble" for all 10 questions. The fitted line is the arithmetic average for each time point.

Is 20 children per group a sufficiently large sample size? If you need more information, what information would you need? Assume you have this information. How would you calculate the necessary sample size? Would you suggest any changes to the researcher's design that might result in additional power?

Also, how would you analyze the resulting data? Consider both simple and sophisticated methods. Would you suggest any changes to the researcher's design to make the analysis easier to perform and interpret?

Actual calculations are not expected, but if you'd like to play with the data from this graph, it is available on the website.

See the next page for groups.

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The chair for this week is Yunzhang Zhu.