Simulation:

1. What does it mean by adjusting the distance between trait and item?
   1. Adjusting the item location parameters only while holding alphas and taus unchanged?
   2. Is this in fact just adjusting the frequency distribution? -- Does this mean you believe the problem is with the frequency distribution? -- Error items are the OK distribution items actually.

Mismatch between people and item; or multidimensionality? How can you break down GGUM2004?

BILOG: negative item-total correlation cracks;

FLOWCHART: for diagnosis

Alpha and tau: go to some of Jim Roberts simulation for taus and alphas that enable GGUM work perfectly. Then let’s move away from it; one situation:

One situations

1. Adjust the distance between trait and item location in order to adjust frequency distribution?
2. Trait: normal distribution; 2000 people
3. Item location: some items (the potentially problematic ones) from the most negative extreme to the most positive extreme – what about alphas and taus, and pars of the other items?
4. Use the traits and item pars to generate responses
5. Use the responses to run baseline models
6. Adjust pars in #3 to see when GGUM2004 returns errors

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How can Luyao break GGUM2004?

1. Do you mean adjusting the item location parameters while holding alphas and taus constant?
   1. If delta = 0 and trait distribution is N (0, 1), then this item will have a lot of information. But when the item gets offset, then your response categories are going to start having very low frequencies, zero frequency, which I suspect will cause GGUM2004 problems.
2. OK, so you still believe that the reason why GGUM2004 crashed was that the frequency distributions were, like, weird?
   1. Or the item doesn’t match the frequency. You know, there’s some mismatch between them. This is actually why I think this could be a really interesting study. What makes GGUM2004 run badly? Is it? I don’t know. Is it a mismatch between the item and the people?
   2. You know, for example, with BILOG, if you make the items too hard, or too easy, then it’s hard to estimate both the discrimination and location parameters. So low frequency, uh, or is it just some items have very low discrimination parameters. So we know BILOG chokes if you have an item that’s got a negative item-total correlation. If you run BILOG, BILOG doesn’t converge. But I think BILOG gives us a diagnostic that we can figure out which item’s the problem and then we can leave the item.
   3. I don’t know if GGUM2004 does that, or is it multidimensionality. You know, so some different things that could cause GGUM2004 to crash, and having a paper that documents when GGUM2004 crashes in different ways.
3. So one simulation situation would be just changing the deltas, and see what we have to do to the delta to make it crash. But then it would be that we change for a few items the alpha parameters, and the items become less discriminating, and see what there would cause to crash.