Lab 10---Peer and real adult reviews

Part 1: Andrew

1. Andrew had misinterpreted the GSA guidelines, and had written his sections in terms of word count, not character count. So, he plans to trim each of his sections significantly. It certainly constituted a well-reasoned research plan, although I detected some issues with his approach as it related to the Permo-Triassic. Andrew was intending to compare tropical and extratropical terrestrial and marine taxa before and after the Permo-Triassic to determine relative mortality rates. I was concerned that this approach would bias his results strongly toward extra-tropical taxa, since
   1. The coalescing of Pangaea was not conducive to the formation of large-scale depositional lows.
   2. The extremely warm conditions presumed to have prevailed at the Permo-Triassic (which has been interpreted as a cause of mortality, alongside high pCO2) preferentially affected tropical taxa and may affect his similarity tests.

I suggested that he define his time interval more precisely, to take into account the multi-event nature of the PT. Also, I suggested that he confine his study to marine taxa (to avoid the biases listed above). Finally, I suggested he revise his hypothesis, which initially expected to see greater mortality rates among extra-tropical taxa (on the basis of them being more susceptible to seasonality). Instead, we worked out a modified hypothesis that would preserve his research plan.

2) Andrew’s objective was to use the PT extinction as a proxy for future extinctions. He hoped to assess what communities may be more susceptible to future climate change by comparing tropical and extra-tropical marine and terrestrial taxa. His hypothesis was that extra-tropical taxa would see elevated extinction rates relative to overall extinction due to their greater susceptibility to seasonal fluctuations.

3)

I found his hypothesis to be neither, unfortunately, for the reasons outlined above. His hypothesis failed to take into account the fact that seasonality is functionally irrelevant when considering a time interval as long as the Permo-Triassic, that it may not have existed due to very high temperatures and high atmospheric CO2, and that his understanding of the possible effects of greenhouse conditions was reversed. I stress, however, that we hashed out a much stronger hypothesis with a better understanding of the effects of the Permo-Triassic in mind. He now plans to compare extinction rates and amount of recovery between tropical and extra-tropical marine taxa, which I would consider to be fairly novel in its focus on extra-tropical taxa. Much of the PT research that I’m aware of seeks to understand the high mortality at the equator, but I think a solid understanding of community recovery in “temperate” climates is necessary to understand the full impact of the PT. In terms of testability, his methods make full use of the PBDB’s strengths; since his research relies on occurrence and paleolatitude data, he has many options as to how he chooses to analyze the data. In terms of social relevance, the PT extinction is a better analogue for the modern than any of the other big five (in that it was a warming event), though it isn’t ideal.

4) Andrew plans to revise his proposal to fit the GSA’s character limits, which will take care of the formatting issue. In terms of research, once Andrew has a better understanding of the paleoclimate context I think he will get some great things out of his data!

5) The length issue didn’t really require feedback. I did suggest he modify his hypothesis and some of his methods to work around the problems the PT present.

6) Unfortunately, no. I can’t speak to the relevance of his biological citations, but I think he could improve his research into the PT to tailor his research plan to its unique context.

Part 1: Erica

1. I definitely thought her proposal was complete and well-considered. She outlined her research plan, provided copious background information, and detailed how her results would further understanding in both a specific geological context and a broader, more basic sense.
2. Erica’s proposal was on the topic of ocean acidification; she planned to test the resilience of calcite in seawater samples of varying acidity, in order to better quantify the degree of dissolution seen in calcareous deposits. Her project was structured around the PETM, a well-studied pulse of ocean acidification that is commonly regarded as an analogue for anthropogenic effects on the global ocean. Her hypothesis was that dissolution can make faunal rebound after acidification events look faster than it truly was.

3) Erica’s hypothesis is well-suited to the research she intends on doing; although not novel in its approach (experimental examination of dissolution), there is comparatively little empirical work done in this area, relative to the amount of work on the PETM. So, any project that addresses the nature of dissolution in an analogous setting is worthwhile. Her project is eminently feasible, since it seeks to mimic natural processes (pretty much the definition of plausible), though I do think she needs to work out some of the specifics. The PETM is definitely considered relevant as an analogue for future climate change. So, Erica’s project is directed at better understanding the effect of dissolution on our known samples from that time.

4) I thought some of the particulars of her research plan could be made more specific, based on the examples posted to Github. She hadn’t worked out how she would obtain her calcite samples or her seawater samples, how she would ensure that they were standardizes, and so on. However, I found the rest of the proposal to be very strong!

5) I merely made a few suggestions for the research plan, since the rest of the proposal was solid and needed no stylistic improvements (to my mind). I suggested she make the components of her research plan more detailed, by outlining where she would obtain her samples and conduct her research with a mind to errors. For example, I suggested that she use the tests of lab-grown foraminifera (after they died naturally, of course) to ensure that they hadn’t been affected by any dissolution or diagenesis to begin with.

6) It was clear that Erica had done a ton of background research, so her citations were fine! I might want to see some more work done on the actual process of ocean acidification (reaction series, etc) and how different species respond to it; is it strictly a calcifying problem, or is the life habit of the organism affected, and how?

Part 2:

1) Erica and Andrew both understood my hypothesis; Erica suggested I make it more clear and distinguish it with more plain wording. Andrew suggested I ‘take sides’ between the behavioral or biological causes, which John told me I didn’t necessarily need to do.

So, I plan to discuss possible results in more depth, and tie them back into my hypothesis (i.e. “if we find this, then that means this…”) so that my research plan’s intent is more clear.

1. Erica and Andrew had no feedback in that regard.
2. I think Erica and Andrew had great feedback, and I will definitely take it into consideration. Andrew’s advice was more on the style side, suggesting I make my intro more concise, readable and clear. I am intending to rewrite my intro to make it more direct, so I will definitely consider his advice.
3. I plan to make my hypothesis more clear, and the better articulate how my expected results will inform my hypothesis. I also intend to make my justification section less BS (and make sure my logic in that regard is sound).