LAIDLAW SCHOLARS

# Laidlaw Scholars Undergraduate Leadership and Research Programme
## Record of Reflection

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## Beginning of the Research Period

Before the beginning of the research period, I had done some preparatory work to get ahead. This included organizing the data that I needed to clean and learning a little more about functional linear modelling in R. I thought I would be off to a speedy start, but I realized the first couple of weeks were slower than I anticipated. I remember when the first week came, I ended up having a lot of questions about how I should go about my work, and there weren't exactly answes available at the time. With having a busy research advisor and trying to get ahold of collaborators, it was a pretty slow process. Also, I found myself getting really bored with having to do the same data file cleaning procedure for each participant. What made things all the more worse was when I would find data corrupt or unusable, and later, I would come to realize that some of the things I was doing while following the lab's actigraphy processing code would end up being extra work I did not need to do.

If I thought redoing my work was a nightmare, keeping track of it was even worse. This was the first time I ever documented every single miniscule edit I was making when cleaning data files. Sometimes the participants switched their watches, sometimes they took it off so many times that I couldn't tell a nap from physical activity. And sometimes… there wasn't even data to conduct my analysis with my exclusion criteria. All-in-all, I found the experience more than a little lonely. I wasn't exactly frustrated despite coming across a lot of these issues because I understood that these participants were children. I mean, I don't think at 11 years old I could understand the significance of this research. Some people told me that the retention rate of my data was good, from others I heard that it was terrible. But I think I made do with what I could do, and I was proud that I could infer a lot of the missing data correctly without even having been to the Congo to collect the data. Also, the collaborator who collected the data, Lee, was really helpful despite having done the collection a year before. He made an active effort to

contact all his field assistants to get answers. So despite the low yield of data for lack of a better term, I would say our progress was pretty great. Everyone on the project was working hard to get answers for me. My lab member that had worked with the Congo data that year ended up starting her new job as an assistant professor for a university in BC. She was in her final push before obtaining her PhD. She was going to defend in the end of July, but still made time out of her day to meet about the project and talk about how the data analysis would work. I found that making a list of things to present to her and my supervisor before a meeting would help a lot, and if we ran out of time, we resorted to a good ol' email in order to follow up. Back to my point about the lack of frustration in dealing with this, another reason I wasn't frustrated was because I learned that small samples are pretty normal in anthropological fieldwork. These pieces of data we work with are rare to obtain in the first place, which makes me appreciate the data even more since research is so focused on western society. So instead of feeling down while constantly cleaning the files, I tried to attribute each and every one of participants' sleep patterns to a story about how they worked in the summer. It makes me think that their high energy levels and low sleep quality are a result of capitalism. The BaYaka are people who live subsistence lifestyles, and forage for their food. They are responsible for being the primary producers of their food, and they commonly make up the primary producers in the market chain. Although they are not integrated with the market, far from it, they play a huge role in providing food as part of their day-to-day tasks. However, they don't reap the benefits of doing all the hard work. It makes me realize what a vicious cycle we live in, and so the least we can do is research the quality of their lives and how we can improve their lifestyles. In my case, I really want to make sure that they get good sleep. I will admit, I found myself thinking how lonely the research period was in the beginning, which is why I was glad we had those group logs. I guess my loneliness in doing the

work stemmed from the fact that I was cooped up at home, and if I went to the lab, I wouldn't really see my colleagues there. Also, it probably hit harder than expected because before that, I was always surrounded by peers when I did Scholars-in-Residence in May. Even my morning research would be done in a communal area with my peers. I couldn't imagine having lunch alone after there would be 15 of us seated at a long table, eating and laughing together. My vision of working together probably would destroy the definition of independent research (at least this was what I thought initially), but sometimes I couldn't help but reflect on those times. Still, I'm glad I was able to figure things out for myself.

## Middle of the Research Period

Then we move into the middle period. I had made great progress by the end of the second week, but I would say the third week was when things got a little bit tricky. What I had originally planned in my timeline was not going according to plan, mainly because I had conflated some aspects of my research project independent of one another, which ended up making me question how to proceed especially since I didn't seem to understand how to approach my own project. That was solved pretty quickly after I spoke to my supervisor, but I confess, since he had to leave early due to another meeting, he didn't exactly give me next steps, so I was a little confused. That's when Erica emailed me asking if I wanted to meet her because she said that it would be a good time to establish the next steps for the project. She explained to me that when it came to research, David would tend to throw as many ideas out there as possible since he would come across new methodologies about lab procedures. I hadn't really known this about him since I worked under him in my capacity as a lab manager. Other research supervisors were very clear about not exploring other avenues, but David was all for looking at things in many angles. I

remember research projects usually having deadlines, so this was new but very inspiring for me. I would like to do a lot with my work after Laidlaw in order to perfect my methodology, or at least foolproof it, since I can see some of the limitations with my research after conducting it. Anyway, I'm incredibly grateful for their insights.

Now, the most notable thing that happened during this time period was checking out the shipment for the second batch of watches that came from the Republic of Congo. At first, I kid you not, I was literally going to cry at the thought of opening all of them. For context, the MotionWatch has waterproof seal, and uses a twist and lock mechanism. It gets difficult to open these watches, as they're painful to do so with your bare hands. I tried opening 70 watches with my bare hands, and I could only get eight open. Naturally, I started panicking because there was no way that opening watches would be the blocker for me. That seems like too funny of a way to go down. So I asked ChatGPT how I could open the watches since they weren't working, and when it suggested rubber gloves, I brushed off the idea. I always thought it was terrible at giving advice anyway, so why follow it? But then I asked my colleague who shipped the same watches to Mexico how she did it, and she told me how she used rubber gloves. I went to grab some giant yellow gloves and upon being able to open them so easily and go through them super quickly, I had tears of joy coming out. My parents understood how menacing the twisting-to-unlock mechanism was, so they were pretty impressed that all it took was gloves. These watches were so bad that one time I had to postpone a meeting with someone two times because I couldn't get the data out of these watches. But ah well, it worked out in the end and the watches were cleaned, opened, with the old batteries taken out within two days. Now the reason why I wasn't able to work with this data actually came from a delay with the collaborator, because he didn't have the fieldnotes on hand and he also had to transfer them from paper to an Excel spreadsheet to give to

me. He couldn't get to it until the second week of August, so I said I could work on that data later. It could be dealt with later. Besides, I had more nights of data than a lot of other anthropological studies dealing with forager societies, and considering they would have two seasons of data while I only had one season to work with, I think that's an impressive sample size I have for the research report and presentation. Despite how things turned out and didn't go according to plan, I understand that everyone was trying their best, and in the end, I'm happy with the work I got done throughout the research period.

Oh, and one more encounter I should mention is that since I updated the MotionWare software (the software used to analyze the watch data), the outputs it was giving me were different from what others in my lab had done. So the mastersheet code for generating outputs was not working, and so I contacted one of my colleagues who frequently used that code to generate her participant outputs. We figured out that the CSV file had times in a different format than what the code was supposed to read, so I wasn't getting more than half of my outputs. Also, since some of my participants didn't have any nap periods (which was apparently a first in the lab), the code was reading some parts incorrectly. So, I had to go back and manually convert all the Excel times into a readable format. I tried creating a code to convert the times and parse them exactly how I wanted, but that terribly failed, and it would be faster to do it manually. However, nothing about this was fast at all. It took so long to get through it, but my code was smooth sailing from there. Special thanks to my colleague Leela for helping me with that, despite her being in Yukon rigorously conducting her own research.

## The End of the Research Period

By the beginning of my final two weeks, I had met with my supervisor and he suggested that for my data, I only need to report on sleep characteristics because it took so long to generate that data, and that in and of itself is enough for six weeks of data to compare to previous research with the BaYaka adults, since we report on nine distinct sleep variables there. He left off with a note to generate graphs to my liking, and that I could take inspiration from a bunch of the lab members' papers. He gave me his paper on actigraphy analysis methods on how to generate hypotheses, which is something I hadn't done because any research I did to this date was only exploratory. My supervisor, however, said that hypothesis-making really was the hard part of being a scientist. Also, I should mention this since it's super important, but Erica, who was defending her PhD previously, had come to the meeting. But her appearance was surprising because that week, she was moving to British Colombia, travelling with Leela and another lab member to get there. So, they both showed up to the meeting in their hotel room. Now that's what I call dedication! And overcame her defense with flying colours! Now back to the main story, after that meeting, I looked at Erica's BaYaka paper, and she had a linear mixed-effects model. At this point, I wasn't familiar with interpreting such graphs, much less generating them, but that all changed two weeks later, when I met up with a friend from the lab. She was in the midst of submitting her thesis for her master's and when she showed me her outputs for the linear mixed effects model, I asked if I could have her code to work with. She agreed and so after hours of modifying it, I was able to create a model using the weather data I had. It's not complete, and my supervisor was surprised I generated that additional output, but apparently the results were interesting! The things procrastination can make you do if you're desperate to get something done on time. Special thanks to my friend Dominick for lending me her code and teaching me how to interpret it. I'm so grateful for how helpful everyone has been in this project!

And thanks to ChatGPT for answering questions I had along the way about linear mixed effect models. That is the only reason why I accomplished this portion of the project so quickly. And so, that leads me to today, where I have great results thanks to all these wonderful individuals.

Yes, at the beginning of the research period I mentioned how this process was lonely, but I had so many interactions with my colleagues throughout the summer about this project, and they were able to be there for me when I needed them the most. At first, I thought independence meant wrestling with this entire thing yourself, but it's not that at all. To be independent is understanding the capacity in which you can troubleshoot blockers until you need a hand. I no longer attribute independent work to being lonely, because there are so many people you interact with along the way, and they can help you along the way. It's funny how my definitions change throughout experience. Also, I think I can say that I ended up building on the *fast* competency during the last two weeks. I'm not sure if that was because I went into fight-or-flight*ish* mode because I thought I was procrastinating, or if I was excited to write up my report. But I got the report done the next week, which was something I was dreading to think about at first because come August, I was still wrapping up some data analysis for completely new work that was either going to rock my world or be cast aside as some failed experiment. Perhaps luck did factor into my ability to complete my work early, so I'm happy with how things turned out. I think I got much better at managing my time, even if I didn't follow my timeline. This experience has made me realize many things about myself, but also about the research environment. It was so touching to be surrounded by people who were always willing to give you a hand. Whether it was a text I sent on WhatsApp to a whole Zoom meeting, I came to appreciate my lab so much more. Also, I came to appreciate You Jia's check-ins as well as everyone from Laidlaw in

general. Everyone's so sweet, and I'm incredibly grateful that I had the opportunity to be a Laidlaw Scholar.