5 and 25: A reflection of my early career as a researcher

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2021 is the fifth year since I started doing research. It has been a long and hard road but full of beautiful moments. I started my research career with the simple and illustrious tasks of collecting and cleaning the data [1]. To be honest, my mentor had created a very meticulous protocol; I had a simple job of following them. Of course, a minimal amount of exercising my own judgment is required. I won't forget all the seemingly simple-minded and innocuous questions that I asked, to which my mentor always gave the answers that tailored to the exact level of understanding required to complete my tasks. Those small steps open my eyes to a very rigorous yet deceptively simple and elegant way of thinking, of organizing your own thoughts, of measuring progress [1, 2]. I truly feel grateful for those early days.

Then I am gradually given more tasks such as writing, revising manuscripts, drafting the letter of responses to the reviewers, etc. In early 2018, we started on a landmark research study on cultures and society. The thing I enjoyed the most was learning the method to 'datafy' a folktale and to transform it into a line of data points that could help us operationalize hypotheses that traditionally belong to qualitative research [3]. In that study, we hypothesized the existence of the cultural additivity phenomenon in Vietnamese folktale, where values of distinctive religions were mixing according to a well-defined pattern. Another thing I truly enjoy while pursuing this research is that this paper is the first Bayesian analysis we have done as a team. Tasked with compiling and presenting the analysis results, I feel very fortunate to learn first-hand how to make good Bayesian inference and argue and justify each of the judgments on the validity of the results given the evidence [3,4]. It seems so true that good things seem to happen in rapid succession.

This way of conducting research becomes a blueprint for so many studies we do later on [5,6]. Each provides me with a chance to reflect and improve on what I had internalized. Reflecting on all of these experiences, I realized it took my mentor over 20 years to fine-tune his method since 2021 will be his 25th year as a researcher. Let's take a detour. A recent podcast by two MIT researchers [7] gets me to contemplate how two advanced AIs will transmit knowledge to each other. For example, GPT-4 and GPT-3, would that be possible that the fastest way is GPT-3 [8] to dump all the parameters and data to GPT-4? No, that would make GPT-4 as dumb as GPT-3 and makes it waste all of its potentials. The two MIT researchers contend that dialogue would be the best way: GPT-3 talks to GPT-4 about what it has learned, and GPT-4 must decode from that information to build its own parameters and neural network structures.

Now let's come back to the story of how I grew as a researcher. From working with my mentor, it seems to me that dialogue might not be the best way. Since without writing down and organizing our thoughts in some ways, dialogue can be wasteful. Writing a paper together seems to be the best possible way. If we define intelligence seems to be about a strategic reduction in uncertainty [9] and understanding is about constructing and simulating different mental models of the world [10], writing a scientific paper together is the best way to reduce one's uncertainty about the world. It forces the coauthors, though dialogue, to constantly constructing not only their own models and simulating them in their mind to test whether they are logically coherent and fit with the data, but also to simulate and appropriate the mental models of their coauthors, the reviewers, the editors, and the readers at large.

Then for a young researcher working with a senior researcher, I cannot express my excitement enough when for a fleeting moment, I caught a glimpse of my mentor's knowledge, when I could simulate in my mind a part of his twenty-odd years' bodies of knowledge and experience. And I cannot express my excitement enough when I realize that there will be growth spurts of understanding after that initial spark of understanding.

But these growth spurts are most likely not happen on their own. One must continually put oneself into a condition of mind that allows such growth to happen. The best way to do it is to practice the 3D methods of creativity [11,12]: maintaining a disciplined working process, going out of one's discipline to forage ideas, going deep inside one's discipline to make the necessary connections for growth. That disciplined process and that proactive attitude required to make progress in any stage of one's own research require many trials and errors [13]. Hence, quantity has a quality of its own.

Learning from my short five-year career and looking at my mentor's twenty-five years career, I contend that an old saying should be among the top mantras for early career researchers. In our lab, all members are recommended to practice the art of hypothesizing, arguing, and reflecting on a daily basis by writing small perspective essays [14, 15, 16, 17]. These small exercises combined with the daily works of writing and submitting manuscripts to journals from different disciplines cultivate in us a willingness to frequently "unlearn to learn," an important principle of the mindsponge model of how the mind adopts new values and information [18]. These activities form our lab's distinct culture and identity, which is very important for any successful enterprise [19, 20]. Building such a culture on both the individual and organizational levels gives us, young researchers, a sense of purpose, a sense of togetherness, and competition that propels us forward to explore all the uncharted terrains.

In 2021, I am looking forward to doing more of these exercises and contributing more to my team. Hopefully, I will make significant progress both as a researcher and a thinker.

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