Independent but not alone

Growing up, I idealized independence. I always wanted my own efforts to be enough, whether it was completing school assignments without help from my parents or moving into a new apartment by myself. When I decided to pursue a graduate degree, I wanted to develop a novel research program and quickly establish myself as an independent scientist. I sought out an adviser who would give me complete agency over my doctoral work while also offering strong mentorship. But I was naïvely optimistic about what I could accomplish.

I figured that my adviser and labmates could help me learn to conduct sound experiments and become a successful researcher, and I could rely on published literature to learn the specific techniques I would need. As I began designing experiments to investigate the symbiotic relationship between legumes and nitrogen-fixing bacteria, my committee members applauded my ambition to pioneer a project far beyond the scope of my lab, which focuses on plant-pollinator interactions. They also warned me about the challenges I would face. But my need for independence drove me to push forward with my research plan. As a result, the first 4 years of my graduate career were defined by a series of failures. My head spun with possible questions to explore, but I struggled to translate these ideas into feasible studies. Because my research interests were distinct from ongoing work in the lab, I rarely asked for help. When I did seek assistance, my labmates were often at a loss because they didn’t have the expertise I needed.

During my second year, I solicited little feedback about the research proposal I was writing for my comprehensive exam—and I went on to fail part of the exam because it was unclear whether the experiments I proposed would lead to conclusive results. Unwilling to abandon my project, I spent the next 3 months rethinking, redesigning, and rewriting my proposal. I developed a clear vision for my research, but the setbacks weren’t over. During my third year, I had grand ambitions to genetically manipulate plants, only to discover that after treating thousands of seeds, I obtained just one plant I could use for experiments.

By my fourth year, my desperation to succeed overshadowed my desire for independence. The only thing I cared about was generating publishable data. I was disappointed by my inability to conduct a successful experiment on my own, but I knew that I needed to take a new approach.

A few months later, I packed my car and embarked on a cross-country road trip to develop the expertise I needed. My adviser and I had devised a somewhat unusual solution: I would spend a 3-month “sabbatical” in a collaborating lab to obtain specialized training. I worked extensively with other students, constantly asked questions, and offered to help with ongoing projects to learn everything I could. For the culmination of my sabbatical, I executed an elegant experiment that would not have been possible without the dedicated help of the principal investigator, three graduate students, and numerous undergrads.

But the experiment still failed. Thirty percent of my control plants were contaminated with bacteria. My data were unpublishable. I drove back to Pennsylvania with the same feeling of desperation I had earlier in my graduate career. Even asking for help was not enough to produce a successful experiment.

My adviser, on the other hand, saw this experience as a groundbreaking success, emphasizing the extensive skill set I acquired. A few months later, when I repeated the experiment in my home lab, I produced publishable data. By learning when to ask for help, I had found the perfect balance of independence and assistance, which ultimately led to success.

Being an independent scientist doesn’t require me to do everything on my own. I can address novel questions without feeling obligated to master every aspect of the scientific process. Now when I get stuck, I don’t hesitate to ask others for help, whether they’re across the country or in my own lab.

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