那杯没化的糖，教会我控制变量

初二上学期，我在杯子里冲糖水，搅了半天，杯底还躺着一层糖。旁边那杯刚烧开的，糖下去几圈就没了。我盯着杯底那层白，冒出一个问题：糖化得快慢，到底跟水的什么有关？是温度，还是我搅的圈数？这个问题要是搁在以前，我会直接下结论：当然是温度。但那学期科学课正好在讲实验设计，我决定按课上的办法来一次。

我先把自己的猜测写下来：温度越高，糖化得越快。然后设计实验。要证明温度的作用，就得让别的条件都一样：同样的杯子，同样多的水，同样多的糖，同样的搅拌圈数，只有温度不同。我准备了三杯水，冷水、温水、热水，每杯二百毫升，每分钟加一勺糖、搅十圈。为了防自己耍赖，我把每一步都记在本子上，连水温用手试出来的冷热感觉也记了。

结果是热水到第九勺杯底才躺下糖粒，温水第七勺，冷水第四勺就不化了。我的猜测对了一半——温度确实有用，但我原来以为热水能化无穷多的糖，其实它也有饱和的时候。结论我写了两行：温度越高，糖化得越快，也化得越多；但每一杯水能吞下的糖都有上限。

这件事过去以后，我发现自己变了的地方不在厨房。背英语单词时，我老怀疑自己记性差。后来我把它当个问题做：两批难度差不多的词，一批睡前背，一批早上背，其他条件尽量一样，一周后互相测验。结果睡前那批记得牢。我没有再骂自己记性差，我只说：方法换了，结果就换了。这就是实验教我的——把模糊的抱怨变成一个能测的问题。

现在我做决定前会先问自己三句：我的问题是什么？我的猜测是什么？除了我要比的那个条件，别的条件一样吗？这三句是从那三杯糖水里带出来的。科学课会结束，实验器材会收进柜子，但这种把问题拆开、一项一项验证的思考方式，我觉得能带走一辈子。

The Sugar That Did Not Dissolve Taught Me to Control Variables

One morning in the first term of eighth grade, I was stirring sugar into a cup of water and stirred for ages, yet a layer of sugar still lay on the bottom. The cup beside it, just off the boil, swallowed the sugar in a few turns of the spoon. Staring at that white layer, a question popped up: whether sugar dissolves fast or slow - what exactly about the water does it depend on? The temperature, or the number of turns I stir? In the past I would have jumped to a conclusion: temperature, of course. But that term our science class was exactly on designing experiments, so I decided to do it properly, the way the class taught.

First I wrote down my guess: higher temperature, faster dissolving. Then I designed the test. To prove the role of temperature, everything else had to stay the same: the same cups, the same amount of water, the same amount of sugar, the same stirring turns, with only the temperature different. I prepared three cups - cold, warm, and hot - two hundred milliliters each, adding one spoonful of sugar per minute

and stirring ten turns. To keep myself honest, I recorded every step in a notebook, even the hot-or-cold feeling my hand judged the water by.

The result: the hot cup only showed sugar grains on the bottom at the ninth spoonful, the warm cup at the seventh, and the cold cup refused to dissolve anything past the fourth. My guess was half right - temperature does matter, but I had assumed hot water could dissolve unlimited sugar. In fact it has its own limit. I wrote the conclusion in two lines: the hotter the water, the faster and the more sugar it dissolves; but every cup has an upper limit on the sugar it can swallow.

After that, I noticed the change was not in the kitchen. When memorizing English words, I kept suspecting my memory was bad. Later I treated it as a question to test: two lists of similar difficulty, one recited before bed, one in the morning, other conditions kept as equal as possible, then a mutual quiz a week later. The bedtime list stuck better. I stopped scolding my memory. I just said: change the method, change the result. That is what the experiment taught me - turn a vague complaint into a question that can be tested.

Now before making a decision I ask myself three things: what is my question? what is my guess? apart from the one condition I am comparing, are all the others the same? Those three lines came out of those three cups of sugar water. Science class ends, the equipment goes back into the cabinet, but this way of thinking - taking a problem apart and checking it one condition at a time - is something I believe I can carry for a lifetime.