Welcome to Unity of Writing in the sciences. I'm Christin Tsunani from, Stanford University.

Last week I gave you an overview of three key principles of effective writing. And we went over the First of, those, which was cutting clutter from your writing. This week, we're going to review the latter two principles, both of which had to do with Verbs. First, I'm going to show you how to use the active voice in your writing. Then I'm going to talk about writing with verbs. This means using strong verbs, avoiding turning verbs into nouns, and keeping the subject of your sentence and the main verb close together at the beginning of the sentence.

In this First module, I'm going to focus on the active voice. First of all, what is the active voice? The active voice follows the format, subject-verb-object. This is the way we normally talk. We say, she throws the ball, or Martha will drive the car, or the president made mistakes. This is a natural way to talk and write. You'll see in a minute, if you change to the passive voice, it sounds very awkward. In the active voice, the person or thing doing the action, what I'm going to call the agent, comes before the verb. And the thing being acted upon, what I'm going to call the recipient of the verb, for lack of better terminology, that comes after the verb. So here she is, the person throwing the ball. So she is the agent. She's doing the throwing the ball. Is the recipient of the action. It's the thing being thrown. So I'll call that the recipient in Martha will drive the car. Martha is the agent, and the car is the recipient.

The passive voice inverts this structure. The recipient of the verb, the thing that's acted upon, is moved before the verb, and the agent, the person or thing doing the action, is moved after the verb, or omitted altogether. So instead of agent verb recipient, we get recipient verb agent. So instead of she throws the ball, you get the ball is thrown by her. Or instead of the Martha will drive the car, You get, the car will be driven by Martha. You can see how the passive voice is awkward and difficult to read. It's not the way we talk in the passive voice. We may also choose to drop the agent altogether. Or example we can drop the president out of this sentence. Mistakes were made, and we come up with the classic passive voice sentence. Mistakes were made. They just happened out of thin air. It's nobody's fault. They just happened. OK? One of the reasons the passive voice exists in the English language is that it is a way to abdicate responsibility. It's a way to avoid claiming responsibility for your action.

How can you recognize the passive a voice? You're going to look for a passive verb. And a passive verb has two parts to it. It always has a form of the verb to be, that is **is are was were be been and am**, and that it has a main verb that's going to be in the past tense, and that main verb has to take an object. It's what we call a transitive verb. It has to take an object or there's no way to invert it into the passive voice. So when you say she throws the ball, the verb throws takes the object ball. But if you say she runs like the athletic activity of running, there's no way to turn that into the passive voice, because run doesn't take an object here. Of course, if you say she runs the company, then runs takes the object company. And you can turn that into the passing voice by saying, the company is run by her.

A passive verb always has it to be verb. and sometimes you may see another form that has a bee or a bin with it, such as, could be, or shall be, or should be looking for these will help you to recognize passive verbs.

Here is an example of a passive voice sentence. I took this sentence from the classic writing book, the Elements of Style, by Strunk and White. If you want to pick up something else to read in this course, that book is highly recommended, and it's also available online for free. They give the sentence. My First visit to Boston will always be remembered by me. You can hear how awkward and funny sounding that is, right? You can recognize this as the passive voice, because it starts with the object of the verb. It starts with though, what was remembered, what I'm calling the recipient of the action, what was remembered, the visit was, remembered. And then you get to the passive verb. And you can recognize the passive verb, because you have a form of the verb to be, the will be and the past tense of a verb that takes an object remembered. And then you get to the agent, the person doing the remembering, that's at the end of the sentence, to turn that back into the active voice, you're going to flip it around. You're going to have agent verb recipient, rather than recipient, verb agent. So you would say, I will always remember my First visit to Boston. That's a much more natural way to speak. You can see how funny this sentence is in the passive voice, how awkward it is. Yet, unfortunately, a lot of the scientific and academic literature reads this way.

Here's another example. It says She is loved, which, of course brings up all sorts of interesting questions, like, who is loving her? This is an example of a passive voice sentence in which there is no agent. OK? You can recognize the passive verb here again, because we have a to be verb is and then we have loved, which is the past hands of love. And love is certainly a verb that takes an object. You usually love something. So that's our passive verb. And then we have the recipient of the love, the object of the love. That's the she. She's not the person doing the loving. She's the one being loved. But in this sentence, the person doing the loving, the agent, remains a mystery. This is an example of a passive voice sentence where the agent has been completely removed, leaving some intrigue.

Here is another example of a passive voice sentence in which the agent has been omitted from the sentence. Cigarette ads were designed to appeal especially to children. Notice, again, we've got the passive verb. Were designed, and what was designed was the cigarette ads. But who designed them? Well, when you read it in the passive voice, it's like it just happened. They were just designed that way. It wasn't intentional. Nobody's responsible. You can see why people might want to use the passive voice in some cases, since it takes out the responsible party. Well, contrast that passive voice sentence to the active voice version, which would be something like we designed the cigarette ads to appeal, especially to children. You can see that when you turn things to the active voice, it forces you to call out the responsible party.

So how do you turn the passive back to the active? First you have to recognize when the sentence is in the passive voice. Then to turn it back to the active voice, you ask yourself the question, who does what to whom? Who did the action, and who had the action done to them?

We're going to practice this. So here's an example of a passive voice sentence that we can turn back into the active voice. It says **by applying a high resolution 90 degree bending magnet downstream of the laser electron interaction region. The spectrum of the electron beams could be observed.** You can see that this is in the passive voice, because we know what was observed, but we don't know who did the observing. You can also recognize the passive verb. We've got could be, which is your to be verb. And then we've got observed, which is the past tense of a verb. That takes an object. To turn this one back to the active voice, we have to add an agent who did the observing, presumably the is that the authors of the paper this sentence came from. So in the active voice,, we could just say we could observe the spectrum of the electron beams by applying a high resolution, 90 degrees c bending magnet downstream of the laser electron interaction region. Much easier to read that in the active voice.

Here's another example in a passive voice, **it reads Increased promoter occupancy and transcriptional activation of p21 and other target jeans were observed.** To turn that into the active voice, we need to add an agent. So presumably that's again, the author's of the paper. So we could say we observed increased promoter occupancy and transcriptional activation of p21 and other target genes. Just this small changed the sentence makes it so much easier to read.

Here's another example. **The activation of calcium channels is induced by the depletion of endoplasmic reticulum calcium stores**. Now, this one is a bit more subtle, but you can see that it's in the passive voice, because cause and effect are inverted here, the activation of the channels is the effect, and the depletion of the calcium stores is the cause. So to turn this into, the active voice, you want to put the cause before the effect. So you would say the depletion, of those calcium stores induces the activation of calcium channels. But in fact, when you turn this into the active voice, you realize that you can actually get rid of a few extra words here. We don't need to say that the depletion induces the activation of that's very wordy. We can just instead say, activates depleting calcium from the endoplasmic reticulum, activates calcium channels. That's one of the nice things about the active voice. It helps you cut extra words and forces you to be more direct.

Another example, **additionally, it was found that pretreatment with antibiotics increased the number of super-shedders, while immunosuppression did not.** You could turn this into the active voice by saying, we found that pretreatment with antibiotics……. However, you can be even more direct here. You can drop that it was found, or that we found altogether, and just state directly. Pretreating the mice with antibiotics increased the number of super-shedders, while immunosuppression did not. When you turn things into the active voice, you realize that you can be more direct.

By now, you've probably guessed some of the advantages of the active voice, but I'm going to tell you three re key reasons why I prefer the active voice. One, it emphasizes author responsibility. Two, it improves readability, and three, it reduces ambiguity. And I'll give examples of each of these.

First of all, it emphasizes author responsibility. So here's an example. The sentence says, **no attempt was made to contact non responders because they were deemed unimportant to the analysis.** Here we actually have two passive verbs, right? Was made and were deemed. When you read the passive version, it seems like the decision about non responders was kind of handed down from on high, as if there was no other choice. It seems to be a foregone conclusion that they are unimportant to the analysis. Of course, we did it that way. When you put it into the active voice, it's a little different. We did not attempt to contact non responders because we deemed them unimportant to the analysis. When you put it in the active voice, it properly places more emphasis on the role of the authors in these decisions. It's more transparent that these decisions involved human judgment, and thus might be fallible. And I think it's important that we keep our focus on the fact that authors, humans were involved.

I've already shown you numerous examples of how the active voice improves readability, but here's one more. The passive version says **a strong correlation was found between use of the passive voice and other scenes of writing.** Now we could rewrite that as we found a strong correlation between use of the passive voice and other sense of writing. I think that's a slightly better. But we can do even better than that, because when we put things in the active voice again, it often leads us to be more direct. We realize that we can just say, use of the passive voice strongly correlated with other sins of writing. That's a much crisper and easier to read version. Finally, the active voice often gets rid of ambiguity because it forces you to be more direct. I was editing this sentence for a student. **General disfunction of the immune system at the leukocyte level is suggested by both animal and human studies.** That's the passive version. I went to put that back into the active voice, and I realized that I needed to specify who had immune dysfunction, I had to add a word. So when I put this in the active voice, I had to add the word diabetics. I wrote, both human and animal studies suggest that diabetics have general immune dysfunction at the leukocyte level. When I put this in the active voice, it forced me to realize that I had an ambiguity in here. It revealed the ambiguity and force me to be more specific. And that often happens when you put things into the active voice, you'll find that you end up being forced to reduce ambiguity.

Now, you may be wondering, um, am I saying that you always have to use the active voice? No, that that's not the case. It is sometimes okay to use the passive voice. It's a tool in our writing toolbox, and I will definitely use it on occasion when I think a passive construction does the job better. So there really is a place for the passive voice. What I am saying, though, is that you should be aware when you're using it, and you should have a good reason to do so. You shouldn't just be using it just out of habit. You need, to be using it purposefully and sparingly. One section in particular, where I tell students that it's fine to use the passive voice is the method section of a paper. In the method section, what was done, the recipient of the verb is more important than who did it. So the passive voice actually works well here because it emphasizes the what was done part. Also, in the method section, it's usually not the most exciting pros in the paper. Many people just skim this section, so it doesn't necessarily have to be as lively as other sections in the paper. You'll find that it's also very tricky to write a method section in the active voice, because you have to be quite creative to avoid starting every sentence with we So for all these reasons, I'm OK with the passive voice in the method section. I will, however, strongly encourage you to write your introduction results and discussion sections in the active voice.

欢迎来到《科学写作》的第二单元。我是斯坦福大学的克里斯汀·赛纳尼。上周，我向你概述了有效写作的三个关键原则。然后我们回顾了第一篇简化你写作混乱的文章。本周我们将回顾后两个原则，这两个原则都与动词有关。首先，我将向你展示如何在写作中使用主动语态。然后我要谈谈用动词写作。这意味着要使用强动词，避免将动词变成名词，并保持句子的主语和主动词在句子的开头紧密相连。在第一个模块中，我将重点介绍主动语态。首先，主动语音是什么？主动语态遵循“主语、动词、宾语”的格式。这是我们平时说话的方式。我们说：“她把球扔了。“，或者“玛莎会开车。”或“总统犯了错误。”这是一种自然的说话和写作方式。过@@一会儿你就会明白，如果你改成被动语态，听起来很尴尬。在主动语态中，做动作的人或事物，我要称之为代理人，出现在动词之前。而被处理的东西，我称之为动词的接受者，因为缺乏更好的术语，那是在动词之后。所以在这里，她是投球的人，所以她是经纪人。她在投掷。球是动作的接收者。这是被扔的东西，所以我称之为收件人。在《玛莎将开车》中，玛莎是特工，汽车是接收者。被动语态反转了结构。动词的接收者，即所作用的东西，在动词之前移动，而代理人，即执行动作的人或事物，则移到动词之后或完全省略。因此，我们得到的不是代理人、动词、接收者，而是接收者、动词、代理人。因此，你得到的不是她扔球，而是她扔的球，或者不是玛莎的车开你得到的车，而是由玛莎驾驶。你可以看到被动语态是多么尴尬而且难以阅读。这不是我们说话的方式。在被动语态中，我们也可以选择完全放弃代理。例如，我们可以将总统从这句话中删除。犯了错误，我们想出了经典的被动语音句子。犯了错误。它们只是凭空发生的。这不是任何人的错，它们只是发生了。好吧。英语中存在被动语态的原因是，这是一种放弃责任的方式。这是避免声称对自己的行为负责的一种方式。如何识别被动语态？你要找一个被动动词，一个被动动词有两个部分。它总是有一种动词的形式，即“是”、“是”、“是”、“是”、“是”、“是”、“是”、“做过”或“am”。而且它有一个主动词将是过去时，而那个主动词必须取一个宾语。这就是我们所说的及物动词。它必须选择一个无法将其反转为被动语态的物体。因此，当你说她投球时，动词throws会拿走物体球。但是，如果你说她跑步，比如跑步的体育活动，就不可能把它变成被动的声音，因为跑步不会带走这里的物体。当然，如果你说她经营公司，那么跑步就占据了目标公司，你可以说公司由她经营，从而把它变成被动的声音。被动动词总是有一个要成为的动词。因此，为了提醒你要成为的动词，那就是“是”、“是”、“是”、“是”、“是”、“是”、“是”和“am”。有时你可能会看到另一种带有“be”或“bebe”的形式，比如可能是、将来或应该是。寻找这些可以帮助你识别被动动词。这是被动语音句子的示例。我从StrunkandWhite的经典写作书《风格元素》中摘下了这句话。如果你想在本课程中读点别的东西，强烈推荐这本书，而且它也可以在网上免费获得。他们说：“我将永远记住我第一次访问波士顿”。你可以听到那听起来有多尴尬和滑稽。对吧？你可以将其识别为被动语态，因为它以动词的宾语开头。当我打电话给操作的接收者时，它以“记住的内容”开头。记住了什么？这次访问被人们铭记在心。然后你会看到被动动词。而且你可以识别被动动词，因为你有动词“tobe”、“willbe”和带有宾语的动词的过去时形式，即“被记住”。然后你去找特工，那个做记忆的人，那是句子的结尾。要把它变成活跃的声音，你要把它翻过来。你会有代理人、动词、接收者而不是接收者、动词、代理人。所以你会说，我会永远记得我第一次访问波士顿。这是一种更自然的说话方式。你可以看到这句话在被动语态中有多有趣，有多尴尬。然而，不幸的是，许多科学和学术文献都是这样读的。再举一个例子，上面写着“她被爱了”。当然，这会带来各种有趣的问题，比如“谁爱她？”。这是没有代理的被动语音句子的示例。好吗？你可以在这里再次认出被动动词，因为我们有一个“tobe”动词“是”，然后我们有“爱”，这是爱的过去式，而爱情肯定是一个带宾语的动词。你通常喜欢一些东西。这就是我们的被动动词。然后我们有了爱的接受者，爱的对象。那是“她”，她不是做爱的人，而是被爱的人。但是在这句话中，做爱的人，即经纪人，仍然是个谜。这是被动语音句子的一个例子，其中特工已被完全移除，留下了一些阴谋。这是被动语音句子的另一个例子，其中句子中省略了代理人。“香烟广告的设计特别吸引儿童”。再次注意，我们有被动动词“被设计了”，而设计的是香烟广告。但是谁设计了它们呢？好吧，当你用被动语态读它时，它就像刚刚发生一样。它们就是这样设计的。这不是故意的。没有人负责。你可以明白为什么人们可能想在某些情况下使用被动语态，因为它消灭了责任方。好吧，将那句被动语音句子与主动语音版本进行对比，主动语音版本就像“我们设计香烟广告是为了特别吸引孩子”。你可以看到，当你把话转向主动声音时，它会迫使你大声疾呼责任方。那么，如何将被动模式变回主动状态呢？首先，你必须识别句子何时是被动语态。然后要把它转回活跃的声音，你问自己一个问题：“谁对谁做了什么？”。谁采取了行动，谁对他们采取了行动？我们要练习这个。所以，这里有一个被动语音句子的例子，我们可以把它变成主动语态。它说：“通过在激光电子相互作用区域的下游施加高分辨率、90度弯曲的磁体，可以观察到电子束的光谱和光谱”。你可以看到这是在被动语态中，因为我们知道观察到了什么，但我们不知道谁进行了观察。你也可以识别被动动词。我们有“可能是”，这是你的“to be”动词。然后我们得到“观察”，这是带有宾语的动词的过去时。要将这个声音恢复为活跃的声音，我们必须添加一个代理。谁进行了观察？据推测，代理人就是这句话所来自的论文的作者。因此，在主动语音中，我们可以说：“我们可以通过在激光电子相互作用区域的下游施加高分辨率、90度弯曲的磁体来观察电子束的光谱”。用主动语音读起来要容易得多。这是另一个例子。在被动语态中，它写着“观察到p21和其他靶基因的启动子占用率增加和转录激活”。把它变成活跃的声音。我们需要添加一个代理。所以大概又是这些论文的作者。因此，我们可以说：“我们观察到启动子占用率增加，p21和其他靶基因的转录激活增加。”只要对句子稍作改动，就能让它更容易阅读。再举一个例子，“钙通道的激活是由内质网钙储存的耗尽引起的”。现在这个更微妙一些，但你可以看到它是在被动语态中，因为这里的因果关系是相反的。通道的激活是影响，而钙储存的耗尽是原因。因此，要把它变成主动的声音，你要把原因放在效果之前。所以你会说：“这些钙储存量的耗尽会诱发钙通道的激活。”但是，实际上，当你把它变成活跃的声音时，你会意识到你实际上可以省去一些额外的单词。我们不必说“消耗会诱发激活”。这太罗词了。相反，我们可以说“激活从血浆网末端消耗的钙激活钙通道”。这是主动语音的好处之一。它可以帮助您减少多余的单词并迫使您变得更加直接。另一个例子是，“此外，人们发现，抗生素预处理会增加超级脱落者的数量，而免疫抑制却没有”。你可以通过说“我们发现用抗生素进行预处理...”来把它变成积极的声音。但是，你可以在这里更直截了当。你可以把“发现了”或“我们发现的”放在一起，然后直接说“用抗生素预处理小鼠会增加超级脱落物的数量，而免疫抑制却没有”。当你把事情变成主动的声音时，你会意识到自己可以变得更加直接。到目前为止，你可能已经猜到了主动语音的一些优点，但我要告诉你为什么我更喜欢主动语音的三个关键原因。第一，它强调作者的责任。第二，它提高了可读性，第三，它减少了歧义。我将举例说明其中的每一个。首先，它强调作者的责任。因此，这里有一个例子。这句话说：“没有尝试联系没有回复的人，因为他们被认为对分析不重要”。这里实际上有两个被动动词，对，“被创造”和“被视为”。当你阅读被动版本时，关于无回应者的决定似乎是自上而下的，好像别无选择。它们对分析并不重要，这似乎已成定局，当然，我们是这样做的。当你把它放到主动语音中时，情况会有所不同。“我们没有尝试联系未回复的人，因为我们认为他们对分析并不重要”。当你用主动的声音说出来时，它会正确地更多地强调作者在这些决策中的作用。更透明的是，这些决定涉及人为判断，因此可能是容易犯错的。而且我认为重要的是，我们必须继续关注这样一个事实，即作者、人类都参与其中。我已经向你展示了许多关于主动语音如何提高可读性的例子，但这里还有一个。被动版本说：“人们发现被动语态的使用与其他写作罪恶之间存在很强的相关性。”现在，我们可以将其改写为“我们发现使用被动语态与其他写作罪恶之间存在很强的相关性”。我认为这稍微好一点，但我们可以做得比这更好，因为再说一遍，当我们用主动的声音说话时，它往往会使我们变得更加直接。我们意识到我们可以说“被动语态的使用与其他写作罪过密切相关”。这是一个更清晰、更易于阅读的版本。最后，主动的声音通常会消除模棱两可之处，因为它会迫使你变得更加直接。我在为一个学生编辑这句话，“动物和人类研究都表明白细胞水平的免疫系统功能普遍失调”。那是被动版本。我把它放回了活跃的语音中，我意识到我需要具体说明谁患有免疫功能障碍。我得加一个词，所以当我用主动语音写这个词时，我必须加上“糖尿病患者”这个词。我写道：“人类和动物研究都表明，糖尿病患者在白细胞水平上有全身免疫功能障碍”。当我用主动的声音说这个时，它迫使我意识到我这里有模棱两可之处。它揭示了模棱两可之处，迫使我说得更具体。当你用主动的声音说话时，这种情况经常会发生。你会发现你最终被迫减少歧义。现在你可能想知道，我是说你必须始终使用主动语音吗。不，事实并非如此。有时使用被动语态是可以的。它是我们写作工具箱中的一个工具，当我认为被动结构可以更好地完成工作时，我一定会使用它。因此，被动语态确实占有一席之地。但是我的意思是，当你使用它时，你应该意识到，而且你应该有充分的理由这样做。你不应该仅仅出于习惯而使用它。你需要有目的地谨慎使用它。我特别告诉学生使用被动语态是可以的，那就是论文的方法部分。在方法部分，做了什么，动词的接收者比谁做了更重要。因此，被动语态在这里实际上效果很好，因为它强调了所做的事情部分。同样在方法部分，它通常不是论文中最令人兴奋的散文。许多人只是浏览了本节，因此它不一定要像论文中的其他章节那样生动。你会发现，用主动语态写一个方法部分也非常棘手，因为你必须很有创造力，才能避免每句话都以we开头。因此，出于所有这些原因，我可以接受方法部分中的被动语态。但是，我强烈建议你用活跃的声音写出你的介绍、结果和讨论部分。