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Transcript for “How to Publish” series, Episode 09: Writing in Science

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All 0:00

[Intro music]

All 0:17

Welcome to STEMculture/podcast!

Dani 0:19

Oh I fucked up! [laughter]

Zach 0:23

Alright, we have an intro.

Dani 0:24

You guys it's really warm in here.

Welcome to STEMculture podcast. Today we're talking about writing in science with a focus on tips and tricks to provide clarity in your writing with your host, Dani,

Keighley 0:33

Keighley

Zach 0:34

and Zach. This episode goes out to all of those of us struggling with writer's block and shit, I forgot what I was going to say next.

Keighley 0:42

Today we are covering how scientific papers can be thought of as stories, and how we the scientists are authors and have to communicate your ideas clearly to our peers and the public will also discuss flow and the use of active and passive voice. As a disclaimer, we're using a variety of source material that we will list on our website. Remember that writing is often a reflection of your research group, and you will often have to mimic the style of your PI.

Dani 1:07

Specifically, we will discuss the importance of clarity and a narrative plus tips and tricks to improve your writing in science, including a discussion on passive versus active voice a question to get us started? Why is good writing important? What do you think good writing is? And what does that look like to you? So actually three questions.

Keighley 1:27

So when I first saw this, it reminded me of something that my boss told me about which are the three R's of good science. And in my attempt to remember what the third are was, I found that it comes from an article called the three R's of cancer research. But I really do think, and the article does talk about this, that it is applicable to all types of writing, especially in the STEM fields. And the three R's are rigor, reproducibility, and robustness. So rigor, obviously, we want it to be high quality work, when you're writing about something your science should be reflective of how good the quality of your work is, and what kind of advancements it makes to the field, it should be clear enough, especially in the methods that it is somewhat reproducible, or it invites the reader to contact you as the author, if there needs to be more details given in order for that experiment to be reproduced. It should be robust in that it is really thought out, it does fit into the scheme of current research, and it takes into consideration current findings um and currently work being done.

Dani 2:43

What about you, Zach?

Zach 2:46

To me, I think it's really important to effectively communicate with not only just our peers, but also the general public. And that's one thing I've been encouraged with when writing is to avoid the use of jargon. Because I know not everyone knows what stupid acronym I used represent a certain method. So it's handy to communicate that effectively in text and in person. Because if you can come to these thoughts and conclusions on your own, when writing, you can easily say that in public maybe like your elevator speech, for example. As for what I think good writing is, it's anything that's easily understandable and easily digested and clear. The big focus, I think, should be on the clarity here of where, where are you taking this conversation? And what is the point you're trying to get the reader to conclude at are the same conclusion you're hoping they agree with you? And what's it look like to me? Times New Roman 12?

All 3:37

[Laughing]

Zach 3:39

markings? A nice title. Not too cheesy.

Dani 3:44

I love a cheesy title.

Zach 3:45

I know I saw your paper.

Dani 3:47
[Meniacle laughing]

Zach 3:50
So those are my things.

Dani 3:52
Yeah, I definitely agree on the on the clarity side, because if you're clear, then it will be easy to reproduce your research, there will be robustness, because there won't be multiple ways to interpret the data. And it'll be clear that there's like you you have good methods for for what you were doing for the rigor. Yeah, for the most part, I think clarity for me is is the main thing that I'm looking for when I'm looking for good writing. And,

yeah, it's because we want to clearly state what we did, why it's important, and get that out to our peers. But just as you were saying, Zach, you know, there's other people besides our peers, and scientists or like academic scientists, they're actually reading our work, there's policymakers, people that work in government, that are trying to interpret what you've written, perhaps to help manage whatever they're doing a little bit better.

Keighley 4:53
I also thought that there's another way to interpret those questions. And it's not even the content of the what you're writing, but it's what is doing good writing or practicing good writing. And, you know, and we'll talk about this, I think, a little bit more at length, but just off the top of the head, you know, that's being consistent, having diligence, but also a lot of patience and forgiveness of yourself.

Zach 5:15
And I think a lot of the three R's in this case, they really kind of reflect method development to me, like that is very those three R's are really common, when you're looking at developing your own method, testing our own method, it must be rigorous and must be reproducible, and it must be robust so that it can be carried out there multiple labs. And so I think that's probably what the articles kind of going at. So I haven't read it. But that's something that should be in the back of your mind whenever you're writing, and also when you're doing science in general.

Storytime.

Keighley 5:47
Story time. So one of the things we kept talking about right was this idea of clarity. And the way to create a clear paper is to have a clear narrative, right, is to understand the trajectory of your paper, and thinking about what you are talking about as a story. And this is stemming from a article published..

...lols...from an article published in Nature relatively recently by Eric Buenez that talks about not only taught, you know, creating a storyline for your paper, and but really resurrecting the excitement of the science within it. So stories are a lot more exciting, and fun to listen to, when it's clear that the storyteller or you know, the person who's writing the book, or the article, or whatever you happen to be reading, is eager to share their findings with you. And you can sometimes tell when somebody's just done a paper because they needed to get a pub out, versus somebody who's really slaved away at this, or even just was really excited about what they found or what they did, it does translate between an

easier read and something that you might have to struggle with a little bit harder. And a couple of big points from the paper are, you know, to tell a story, and in a couple ways that he can, he suggested doing this is considering how people read your paper. And so if you think about, you know, you pick up an article, and there's a couple of different ways you might try to digest it, really consider how your audience is going to interact with your piece of literature. And a lot of times people look at the abstract, and then they immediately jumped to your figures. And so do you guys do that? When you you read papers sometimes? Do you just go abstract figures?

Dani 6:11
Stemming.

I'll skim it

really fast. But I mean, it kind of depends on what I'm looking at that paper for. So if it is, oh, I want to see their results. Yeah, I will just jump to the figures.

Zach 7:46

Same case in most, most of the time, I'll just look at the figures if I'm looking for results, because I should be able to glean all the information I need from the figures, maybe a conclusion glance, if that's provided, but if it's straight up methods, going straight to the methods.

Keighley 8:01

And kind of one other piece that I thought was really interesting from this article was highlighting a linked to a current topic. And I'm going to quote the article because I think he gave a really good example. And so Eric says, For example, last year, a colleague and I reported finding elevated levels of lead in the blood of a person who ate meat from animals, he had shot with lead bullets. In the cover letter and manuscript, we highlighted the 2017 reversal of a ban on lead and the mission uncertain US federal lands, we linked that policy change to the increased risk of lead exposure to hunters and their families through eating wild game shot with lead bullets. And that immediately makes the story so much more interesting, I think, is when you can have that in your not necessarily even your abstract, but in your conclusion or your discussion, I think it's really important. And he also talked about the importance of doing that in your cover letter. Because if the editor sees why this is important, or how it fits into the quote, unquote, real world, it's more likely to make your paper get accepted.

So kind of all of that tying together. And in terms of writing a story, you know, we tell you, it's important that like, how do you actually do it. So whenever you write even a sentence, or a paragraph, or you know, your whole paper, you you are writing a story, you're writing mini stories that all fitting together to Maxie stories to fit in together the whole story. So every story has a character and an action in the sentence. Those stories have a logical flow through the paragraphs. And then those stories have certain points or central themes that are told to those characters and their actions. And that's the entire paper. So these stories are nested within a broader context of your sub field of science.

Zach 9:39

So a lot of the content that we're providing today comes directly from "Writing in Science" by Anne Greene.

Dani 9:45

So now it's time for a specific tips and tricks to accomplish that clarity. So one of the first ones will talk about is minimizing abstract nouns. So an abstract noun would be something like a verb understand an abstract noun, be understanding, verb predict the abstract noun would be prediction, etc, etc. So, why do you think we should minimize abstract nouns?

Zach 10:09

I think it makes it more concrete when you remove abstract noun. So just kind of idea of abstract versus concrete. That's just opposite words again, but I think it's important to make it seem more forceful and absolute. When you use these non abstract nouns, or and use the verb and said like, manipulate or manipulated if it's past tense. So then you're focusing more on what you the researcher has done.

Keighley 10:34

Yeah, I think that plays into the idea of right you know, even in your sentence, there's characters and there's actions, your science is this character, and it does something or you as the researcher is doing something and that's going to be so much more interesting to read or listen about, is you know, hearing somebody's process kind of in quote, unquote, real time my seeming like, okay, you're part of it, you're reading it and experiencing it a little bit more, exactly what Zach said, concretely, rather than hearing about it in this whimsical land of maybe this happened, but I don't want to hear about the maybe people I want to hear about the real people and the real science,

Zach 11:12

Alright, so we're going to try something a little different, if not dumb on my part, we're going to try a game where I'm going to give Kaylee and Dani a word. And I have to come up with the shorter version because the goal of this exercise is to use shorter words. So abstract nouns are generally longer than the actual verb, unrelated, but at this point, we're trying to find longer words or overused words that are generally longer than necessary, and cutting those back down. So to do that, I'm going to come up with words which I have listed, and these guys are going to attempt to give me the shortest word possible for it.

Dani 11:46

Is this, like, whoever gets it first?

Keighley 11:48

Dani and I are far too

competitive.

Dani 11:50

I know.

Keighley 11:51

As I feel my blood pressure rising I'm like, game on.

Dani 11:54

And like, what do we get for winning, I need to know.

Keighley 11:56

I don't care.

Zach 11:57

Does anybody like chocolate and peanut butter.

Keighley 11:59

Yes, I think I should get that no matter what.

Dani 12:01

[Maniacle laughing]

Zach 12:05

Chocolate Peanut butter cookie bar?

Dani 12:08

Okay, I'm ready now.

Zach 12:09

Are you sure?

Keighley 12:10

I'm sweating.

Dani 12:13

I'm

so excited. My adrenaline is spiking. Let's do it.

Zach 12:16

So just to clarify, I'm going to give you a word you need to come up with a shorter word off the top of your head. Shorter the better. I have long words, short words in exchange already. Implement. You must match my word on the key though.

Dani 12:30

What?

Zach 12:31

Oh, one point for Dani. I'm keeping score. This is stupid. But.

Adhere.

Dani 12:39

Stay?

Keighley 12:43

Stick?

Dani 12:43
Use?

Zach 12:44
Stick.

Alright, develop.

Keighley 12:47
Create?

Dani 12:48
Make?

Zach 12:49
Gotta go smaller.

Keighley 12:52
I am far too wordy for this game.

Dani 12:53
Did I win? Did I win yet?

Zach 12:54
No, there's so many more. There are five. The six letters is the maximum size word everything else is four to five or smaller.

Dani 13:03
Okay.

Zach 13:04
Alright.

Retain.

Dani 13:06
Keep?

Zach 13:09
Utilize.

Keighley 13:10
Use?

Zach 13:11

OOhh Keighley beat you.

Terminate.

Dani 13:14
End?

Keighley 13:14
Stop?

Zach 13:15
I forgot how to Roman numerals.

Dani 13:17
Who got that one?

Keighley 13:18
Stop is the same thing as end!

Dani 13:20
I know but end is shorter.

Zach 13:23
Ascertain.

Dani 13:25
Oh um.

Keighley 13:26
Can you..[mumbling]

Find out? Find?

Zach 13:31
Find. Keighley got it.

Facilitate.

Dani 13:35
Ease?

Keighley 13:39
Create? Make? Find? Use?

Dani 13:44
Ha ha, that's your go to.

Shit. Help?

Zach 13:49
It is a four letter word but

Dani 13:50
Is it help?

Zach 13:50
Yes.

Dani 13:52
Nice.

Zach 13:54
Endeavor.

Dani 13:55
Try?

Zach 13:57
Got one.

Alright, transmitt.

Keighley 14:02
Signal?

Zach 14:03
Smaller.

Keighley 14:04
It's six letters!

Zach 14:06
Not that one yet. Transmit.

Dani 14:09
Now I can only think of signal.

Keighley 14:12
Go?

Dani 14:13
I said that already!

Zach 14:14
No.

Keighley 14:14
Um.

Dani 14:14
Signal? No, fuck.

Keighley 14:18
If you can't come up with this by now. Gosh, we're not doing great. Can you use it in a sentence? Maybe that'll help.

Dani 14:26
It might.

Zach 14:26
I often have to transmit my results to my collaborators.

[Annoyed tone] Thank you.

Dani 14:30
Send?

You're right. You're right. You're right.

Keighley 14:33
I think I get a half point for good suggestion.

Zach 14:39
Initiate.

Dani 14:39
Begin?

Keighley 14:41
Start?

Zach 14:42
Start.

Dani 14:42
Um, so just to point out though, that they're the same number but it has met so I should probably also get half a point just saying...

Keighley 14:48
...if we're doing half points.

Zach 14:53
[whispers 'what have I gotten myself into']

Generation.

Keighley 14:55
Change?

Zach 14:55
Yup, it's the longest word.

Investigation.

Keighley 14:59
Search? Start? Find? Look?

Zach 15:02
No, these all came from Greene's book.

Dani 15:03
Find?

Zach 15:04
Incorrect.

Keighley 15:07
Search?

Zach 15:08
Not quite. It's vaguer than that.

Dani 15:11
Look?

Zach 15:12
She already said that.

Dani 15:13
Okay, sorry.

Keighley 15:15
To search

rather than a search.

Zach 15:19
For reference

Fifth Harmony would tell you should you don't got....

Keighley 15:25
Work?

Zach 15:25
Ahh, there it is.

Dani 15:26
Work? Fifth Harmony? Is that a band?

Keighley 15:28
Work work work

Zach 15:29
They were.

Prescriptions.

Keighley 15:35
Drug?

Zach 15:37
No.

I've got two more games after this. We're going to do a full round of this for the end of the session.

Keighley 15:44
I?

Zach 15:45
What?

Keighley 15:46
I?

Dani 15:46
I think it's more like a like a list.

Like a pre script like an RX.

Zach 15:56

Sorta. So think of it is the doctor? No, that's going back to medication.

The dietitian gave me the prescription diet I needed to lose weight.

Keighley 16:08

Custom? Nope, that's still long.

Standard? So long. I'm getting closer. I feel like I'm getting closer. Routine? Still long.

Zach 16:17

Closest with that one.

Dani 16:20

Method? No.

Zach 16:22

Drake would say it's God's blank

Dani 16:25

Plan?

Zach 16:25

There you go.

Dani 16:26

Routine?

Zach 16:30

God's routine.

Subsequent.

Keighley 16:34

Next?

Dani 16:35

Next?

Zach 16:35

Yeah, Keighley beat you. So we've got two more games.

Unknown 16:40

Which....

Dani 16:40

Okay but like, can we have a total maybe?

Zach 16:42

So far? We've got..ah fuck it.

Dani 16:46

You started it. So

Zach 16:48

First round 8.5 from Dani,

Keighley 7.5.

Alright, so with that, we're going to continue on providing our regularly, regularly scheduled content.

Dani 17:02

Let us know if you played along in your car. Hopefully you did not crash.

Zach 17:06

Yeah, please don't crash, we're not liable for that.

Keighley 17:08

I also want to know who else is competitive as Dani and I are out there.

Zach 17:12

I know I didn't volunteer to be in the middle of all this. I'm just saying I was voluntold for this.

So with that, the goal is, of course, to use shorter words. At this point, you're communicating just as effectively. And you'll have to be careful with that word count or letter count, however you want to work with it. Fewer words, the better. Although you should effectively communicate, you don't want to be like Kevin from the office where few words do good and work better. It doesn't make sense.

Keighley 17:37

I can say as somebody who's recently had to submit several abstracts where there was a 500 character count, including spaces. And there were multiple questions that required this, it really would have helped to have this exercise before because I'm like, why can I never make my thoughts shorter?

Zach 17:55

This source is your best friend source dot com, small words.

Dani 17:59

I will say too

that when it comes to using shorter words and in my papers. Sometimes my advisor will push back and say that I'm sounding a little colloquial, not a little that I'm sounding colloquial, that I'm basically writing

how I speak. And so you might get some pushback from your whoever you're writing with, perhaps on this stuff, but

you can keep trying it. And I think there's certain ways to use shorter words that will make a sentence clearer, but without it sounding too chatty.

Zach 18:32

And you should always try to match the journals tone more than anything. If most of the journals are a little, I want to say pretentious. But as long as their users...

Dani 18:41

Flowery....

Zach 18:41

...yes, that works better, then you need to try to match that style as well. But in most cases, go with the gut of your PI. They're the ones who kind of make that final decision, particularly of where you're going to submit your paper to. So next up, we've got another game which I have to keep score on, because this is what I want volunteered for, voluntold, just kidding.

Keighley 19:02

All right, you said you're the one who decided to keep score.

Dani 19:06

I also might have demanded it.

Zach 19:08

So we're going to talk about rejecting or

we're going to talk about omitting extra words, and I just gave the first one away. So we're not going to do that. So I'm going to give you a phrase three to five more words. You need to give me the shortest single word answer that I can come back to so "Did not consider".

Keighley 19:28

Reject?

Zach 19:30

I said I was skipping that word.

Keighley 19:32

I know but it could also be reject.

Ignored.

Zach 19:34

Ignored. It's time now just throwing it there.

"Does not have".

Keighley 19:41
Reject?

Dani 19:41
Absent?

Keighley 19:42
Lack?

Dani & Keighley 19:43
Different?

Zach 19:43
"Not the same".

Lack.

Oh....

Dani 19:49
Tie don't give any points.

Zach 19:50
I was just going to give you both the point.

Cause I already made the mark. "Not possible".

Dani & Keighley 19:54
Impossible?

Zach 19:56
I was also another time it's a little weird that john same brain.

Keighley 19:59
Starting to think up.

Zach 20:01
"Not many".

Dani & Keighley 20:02
Few?

Zach 20:04
Oh, Keighley beat you on that one.

I have ears I can hear. If not we can go back to the tapes.

"Did not allow".

Keighley 20:13
Refused?

Dani 20:14
Disallowed?

Zach 20:17
No. Neither of those were correct.

Dani 20:22
Forbidden?

Keighley 20:23
Forbid?

Dani 20:24
Forboden? Sorry.

Keighley 20:27
What's the opposite of permit?

Reject?

Zach 20:38
So "Did not allow".

Dani 20:38
Say it again.

So did not include?

Keighley 20:46
Did not permit?

Zach 20:48
No.

Keighley 20:49
I think it made it any shorter.

Dani 20:50

What is the opposite of allow disallow?

Keighley 20:53

Mom and dad denied my ability to leave the house.

Deny?

Dani 20:59

This is amazing.

Zach 21:01

Not quite there. So um...

Keighley 21:03

What is the opposite of permission?

Zach 21:05

Taking the flu vaccine did not allow me to get the flu this flu season.

Dani 21:10

Maybe you should just tell us and we can move on.

Zach 21:12

Prevented.

Keighley 21:13

Oh, come on, we're like deny would have been... denied is also shorter.

Zach 21:17

The current score is 10.5 for Dani, and 12.5 for Keighley.

Keighley 21:23

Okay, but Keighley also should have 13.5 because deny is better.

Dani 21:30

Denied! Get it?

Keighley 21:32

Did not allow.

Zach 21:35

I prevented you from gaining any more.

Alright, so....

Dani 21:39

Another tip is to keep your terms the same. And I know you're probably thinking well, but doesn't that get repetitive, but it will make it much clearer and easier to follow throughout a sentence. So you know, don't use a transition word 15,000 times like my favorite transition word is however, but when you're talking about something in your research, you don't want to come up with 15,000 different ways of referencing a cell or....

Zach 22:06

A body of water.

Dani 22:08

....or a body of water...

Zach 22:09

The lake the sea...

other words for bodies of water, pond...

Keighley 22:14

but those are very different. You know, I think it'd be like

Dani 22:17

vegetation, trees, shrubs, whatever, just whatever you're talking about, make it make it consistent. And it'll make it easier to follow throughout the paper.

Zach 22:28

And also means the reader has to use less brainpower to try to remember all the words and sync them together that they are the same the reader can get through your statement easier. And that's what you want the reader to have fun and not necessarily fun. Learning isn't always fun. But you want the reader to completely understand what you're trying to convey as easy and as quickly as possible.

Keighley 22:48

So all of this goes on to "AAAAAAHHHHHH!!!"

Don't surprise your reader!!!!

Dani 22:56

Oh my gawd.

Keighley 22:59

You want to have some flow, you want to lead your reader by having good sentence structure and paragraph structure.

Zach 23:06

I feel like that alone goes out to all the people who say we keep them asleep at night when they're driving. You're welcome.

Dani 23:13

Take that.

Zach 23:15

Do you want another round to see who can win?

Dani 23:17

Yes.

Keighley 23:19

No, because I'm winning.

Zach 23:20

So I will give you a phrase and you need to give me two, a single word to two words to describe what I'm saying. So just transition it to make it smaller. So "in this study, we assess"

Dani & Keighley 23:34

We assess?

Zach 23:35

That's.....

I'm gonna give that one to you. How do you "conduct an investigation"

Keighley 23:41

Conduct?

Dani 23:42

Investigate?

Zach 23:44

Investigate. Conducted led a train.

Keighley 23:48

Science train

Zach 23:50

It is now time. "We're responsible for"

Dani 23:53

Responsible for?

Zach 23:55

This one's odd single word.

Keighley 23:58

Like is that a contraction? Or is that like something

Zach 24:01

Just were responsible for.

Blank was responsible for work? Blanks were responsible work because it's plural. And I had to fix that.

Keighley 24:08

Did?

Zach 24:10

Close.

Keighley 24:10

Were? Made? Became? Came about?

Caused?

Zach 24:17

There it was.

Keighley 24:19

I like how everybody gets to hear my thought process.

Zach 24:22

"Played a role in".

Keighley 24:24

Helped? Developed? Started? Created? Contributed to?

Dani 24:33

Is this is another one that's just one?

Zach 24:35

And relates back to the first word of the last statement.

Dani 24:37

I hate everything

Keighley 24:39

Already forgotten that.

Responsible? Were?

Zach 24:45

There it is.

"In order to".

Dani 24:49

To.

Zach 24:50

"For the following reasons".

Keighley 24:52

Because.

Zach 24:53

Yep.

Dani 24:53

Nice.

Zach 24:54

Y'all are tied, not tied.

"During the course of" or "during the process".

Keighley 25:00

During?

Zach 25:00

Correct.

"In the absence of".

Keighley 25:04

Without?

Zach 25:05

Yes.

Dani 25:05

Nice.

Zach 25:06

"Located in", "located at".

Keighley 25:08

At?

Dani 25:10

Yeah.

Zach 25:11

Yeah.

Super hard, isn't it? "In the vicinity of".

Keighley 25:15

Near?

Dani 25:15

Near?

Zach 25:16

An example. This is the fact that that is two different phrases.

Dani 25:21

Are you, is it like a slash?

Zach 25:22

Yeah.

Keighley 25:23

Can you just say it again,

Zach 25:24

In an example, semi colon, "this is the fact that".

Keighley 25:28

For example.

Zach 25:29

For example.

The final score is

Dani 25:33

I don't I don't want to hear about it.

Zach 25:35

Too bad 14.5 and 20.5 to Keighley.

Dani 25:42

Gawd Damn, I'm a very visual well, no, I won't qualify it because you did a really good job.

Keighley 25:46

Thank you. Did you notice I was doing very hard at the wall.

Dani 25:51

I could hear the intensity in your voice. It was really good.

Zach 25:55

Okay. So with that, we're going to talk about sentence structure. So the importance of sentence structure is to keep your subjects and verbs close together, environmentally sensitive solutions to problems associated with continued population growth and development will require and environmentally literate citizenry. One, I just love the word citizenry. So in this case, we were trying to put the subjects and verbs together. And in this case, we're going to try to substitute this with one is will require develop anything like that, that is the verb we're using in this case, and then who is doing the action in this step. So we will need environmentally literate citizens to develop sustainable solutions to problems of human growth and development. So now you're saying who the focus is who will be doing it, and keeping those subjects and verbs together,

Dani 26:42

makes a sentence a lot clear, which is really nice.

Zach 26:45

Yes, but it also loses the word citizenry. So hmmm...

Dani 26:49

It doesn't win in your book.

Zach 26:50

not in my book only because I haven't seen that word in a while. Since I last ran this workshop.

I can't read.

Keighley 26:58

You can still say, we will need environmentally literate citizenry to develop, you could still keep it in.

Zach 27:03

Good.

Dani 27:04

Citizen means just kind of a fluffy word like, do you really need it? Yeah, we're talking about using shorter words. Just saying...

Keighley 27:11

But does it spark joy?

Dani 27:13

Yeah.

Well, I guess for him citizenry sparks joy. So he has to keep it.

Zach 27:18

Thank you, Marie Kondo. Next step of this recording, take it away, Dani.

Dani 27:23

So the next thing that I always find really helpful to remind myself about is paragraph structure. So using that issue statement, and then developing that statement, and then having a conclusion, we're not going to give you an example, because I'm not reading you two paragraphs.

So really, each paragraph should have a topic or issue that tells the reader what the paragraph is going to be about. And that's what is called the topic or issue statement. Once you establish that topic, well actually let me say one more thing about the topic or issue statement, it doesn't have to be just one sentence, it could be one or two. After you establish what that paragraph is going to be about, you're going to lay out well defined steps to lead to a conclusion. So you're basically developing your topic or issue statement. And you're going to give examples or present an expert opinion or qualify the issue in some way. Sometimes the issue statement is a question that the development will then answer. And finally, your conclusion is going to end the paragraph as you might imagine, and it serves as a comprehension check, you might have just dropped a lot of knowledge on people in your on that with that paragraph. And so this statement, this conclusion statement is going to give the reader something to think about or help summarize all the information you just gave them. And so it gives the reader a moment to digest before really moving on to the next statement, aka the next paragraph.

Keighley 28:45

I also like to think about the conclusion kind of as a trampoline, where it does the things that you're talking about, but it also points the reader in the direction that you're about to be going.

Dani 28:54

Yeah.

Keighley 28:55

So I think that really does help keep people's brains kind of on one track is when one idea springboards you kind of to the next you can really follow the thought process. When I was in high school, my AP English teacher like to do this thing where he would say, tell me what you're going to tell me? And then tell me or then tell me what you told me. And obviously don't do it in a way that it sounds repetitive. And as boring as the tell me, tell me, tell me, does. But I think that's kind of the very quick and dirty way to think about a paragraph is tell me what you're going to tell me, tell me, and then tell me what you told me.

Dani 29:29

Yeah, that's part of the story structure to you know, start the stories, everyone knows where you're starting, and then develop the story. And then and so another way to improve clarity in your writing would be to use active voice instead of passive voice when appropriate. So you may have heard these terms before passive voice and active voice. And basically, the difference is where you're putting the emphasis. So active voice would be a biologist counted whales. So it's really about where you put the emphasis. So in passive voice, he would say, whales were counted. So the emphasis is more on the counting more on the method versus active voice would be the biologists counted whales, the emphasis

there is on the biologist doing the counting. And in a narrative format, it tends to be easier to follow active voice than it is passive voice.

Keighley 30:25

So why is passive voice considered bad in some places, this tends to be a heated conversation between two parties. There's pro passive, and there's anti passive, and then there's me, which is just a pacifist.

Zach 30:45

As a person, I'm going to watch your competitive ass come out for a game with a word, pacifist is not the word I would use to describe either of you.

Dani 30:55

I wouldn't necessarily say passive voice is bad, maybe not bad, but it's how we used to write. And it's how scientists have gotten really used to writing where you really emphasizing kind of the methods and the

and the science instead of emphasizing

what some people think, with active voice is that you're emphasizing the biologist, and it's kind of, it's not objective. So in the past, it's been seen as passive voice is objective and active voice is subjective. But it's just a writing style. You know, and, and writing passive voice, saying whales were counted. Just because you're writing that way doesn't mean you're being an objective scientist.

Keighley 31:44

It probably also has something to do with, you know, how we were originally taught how to write, if you think all the way back to the days that we were in English classes, it was a huge no, no, to have the words I, me, we, in any of your upper level essays, you know, when you're talking about book reviews, or

you know, anything, really, that's not just like an argumentative essay, or persuasive essay, and even though it's questionable, and if you should be using those kinds of language. So I think a lot of it comes from how we were exactly like you're saying how we were taught, and it goes way back to the fundamentals of how we were taught how to write in the first place.

Zach 32:24

So why is active voice instead, it reflects the way we speak to each other in person and often use this fewer words, and then using active can be a way to cut text down. So if you're speaking or writing more actively or inactive voice, you're often using fewer words, it's more clear, it's easier to understand what was done. Having a direct character action goal order is easier to follow for most readers, as you're taking your subject, verb, or your character and action close together.

Keighley 32:51

So if we're having a conversation about passive voice and active voice, how can you identify when you're using one or the other in your own writing. So a lot of times the passive voice uses the verb 'to be' not always, but often. And one example of a kind of quick and easy way to tell if your sentence is passive, is to use the by zombies method. And this came from Professor Rebecca Johnson, who's the Vice President of Academic Affairs at Marine Corps University. So one way to do this is to think about Dani's example.

So if you add by zombies at the end of the sentence, it makes sense. So think about Dani's biologists counted, whales versus whales were counted. Only one of those, the second makes sense, whales were counted by zombies, because, the subject has not explicitly already been given as who were doing, who was doing the counting, so you can provide whatever one you want. And in this case, zombies adds a fun little twist. So that kind of leads into not only identifying your passive voice, but deciding when it's okay. So a lot of us have conflict with our PIs. And I think Dani, is we had a really fun stories about that. But typically, and Methods section is, is one that's not very contested, over when it's a good idea to use passive voice, a lot of times people will use the passive voice in the Methods section, because it keeps the subject consistent. And it in general, kind of makes it, like Dani was suggesting earlier, a little bit more objective, these are the way in the methods were done, not necessarily the way that you did the methods. But this is more of a broad sweeping, you know, you're not gonna argue, necessarily really based methods. And, and, you know, you'll have to say I did this, it can just be this is the way it's done.

Dani 34:46

And the idea there too, is that when you keep the maybe the authors out of the methods, so using passive voice, it really emphasizes the methods themselves, instead of emphasizing who has done the methods. So that's definitely, most often and you can actually go into journals and check. So I've done this recently, where I looked at a journal trying to see if they're going to be okay with me using active voice or if I should be using passive voice and when, and I can actually check and, you know, Control F and look for we and see how often it is in certain sections. If they haven't and methods, then that tells me like how I need to structure my paper. So that is going to fit with the the journals expectations.

Zach 35:33

Are we all in agreement? That "I" is still a no, no?

Dani 35:35

I think "I" is a no, no, unless you're literally the only author.

Zach 35:41

Yeah.

I was thinking that it's rare. Well, I mean, there are a lot of people are just first authors and only authors. But I've always been told never use "I" when writing a paper regardless, that comes up to also essays from English as well like Keighley mentioned earlier.

Keighley 35:55

Yeah, I think that means, that makes just a lot of sense. Because when you're writing this, it is oftentimes representative of a collaborative effort. And to say "I" would just be I think really disrespectful to everybody involved, even if they didn't do that explicit experiment. You know, everybody kind of played a part in this paper overall. So it should always be a "we".

Zach 36:14

Exactly.

Dani 36:15

Yeah. A question that I often get asked and that we often hear about in Zach's writing workshops is, you know, what, if my advisor doesn't want me to use active voice, and that's definitely something that can

happen. So like we mentioned earlier, you may have to conform your writing style to what your what your advisor wants and expects, or you can be like me, and tell your advisor to stop changing all your active voice too passive voice and hold your ground.

But it really is about like your choice. So you know, why was I choosing to make this particular sentence active voice. For me, it makes a sentence so much clearer, but it's not like, so I have a paper I'm going to submit in just about a week. And it's not like the entire thing is all active voice methods are passive. And then even within the rest of the text, I have sentences that are passive, but it's been a really conscious choice on my part. So when my advisor goes in and edits, and literally all he's changing his active voice to passive voice, but not actually changing the essence of the sentence. You know, I tell him, Hey, you know, we have different writing styles, but I've checked with this journal, and, you know, other people are using "we" and they're using active voice and you know, methods are passive. And so I've confirmed my paper to that. But, you know, these edits, going back and forth between active and passive and passive to active are just like wasting both of our time. So let's just move on.

Keighley 37:50

And I think I mean, you obviously do want to listen to your advisor, there's a reason that they are your mentor, the person who kind of helping guide you, that the end of the day, especially if you're the first off on this paper, it's your paper. And they need to respect you enough to realize that you're putting your name out there and you want to be okay with the way it's done. And you know, you're not just meant to be a clone of your advisor. And hopefully, I know I know yours, pretty well, and I can think that he would have enough respect to to let you do that.

Dani 38:19

Yeah, that was an easier sell than my cheesy title. He was having an actual meltdown. As I was telling him the title stays.

But obviously if the reviewers don't like it, I will change it but I love it cheesy all the way.

Zach 38:35

As we mentioned, as early disclaimer, we are not the end all be all source for all this we're going to provide you with some interesting and useful sources.

So first off again, this came from and Anne E. Greene's, "Writing Science in Plain English". We also have the "Scientists Guide to Writing" by Stephen B. Heard. "Writing Science: How To Write Papers That Gets Cited And Proposals That Get Funded" by Joshua Schimel, Schimel?

Dani 38:59

Schimel.

Zach 39:01

Schimel. And lastly, "How To Write A Lot" by Paul J. Silvia.

"How To Write A Lot" mainly focuses on just actually getting through the writing process, which we'll discuss more in Episode Two.

Dani 39:14

Well, well rather Episode 10. But our next episode in this series.

Zach 39:19

Episode 10. One thing we do recommend is that you try your resources on your own campus. For example, you might have a campus Writing Center for graduate students not actually just undergraduate students, if not a writing center, you might look for quiet spaces that you can either check out or use at your own time with maybe a little booking involved. And then look for a writing group either in your department or in your building or in your college. Anything you want to try try to find a writing group or start one yourself which will also go into more detail on episode two as well. And then lastly, you might look for a dissertation support group. This is those who are just getting close to the end of their time at graduate school and are working on their dissertation. Sometimes you need a little bit of a push to finish it. I know I do. So in summary, which I will not sing we discussed about the importance of the story and clarity of your writing as well as tips and tricks to keep it simple. We also discuss the importance of flow and active and passive voice.

Keighley 40:14

Thank you so much for listening.

Next time we'll be talking about submitting your shit. Dani, Zach and Brooke will discuss exactly how to start writing, feedback, co author conversation, selecting the right journal, impact factor and copyright.

Dani 40:27

We are on Twitter, Instagram and Facebook as stemculture one word podcast search and you shall find and when in doubt, visit our website at stem culture podcast dot com for show notes, references and information about our guests and contributors. And Dani makes the website so please actually go visit it.

Also on a another note, please review us on iTunes or will actually I guess it's Apple podcast now. We really really appreciate it.

Zach 40:54

Until next time, don't forget to consensually hug a grad student or at least buy them a coffee or a London Fog hot tea with extra vanilla. And if you have a little chocolate syrup I think it becomes a London smog I just made that up.

Dani 41:06

Wow, you're clever.

Smokey.

Keighley 41:08

I was really hoping that the we're just gonna say that with like a lot of like, definitiveness like nope, you're going to add vanilla and chocolate syrup

End of conversation. Your letting your team down.

Transcribed by Brooke/<https://otter.ai>