Writing a page-turner: how to tell a story in your scientific paper

People love stories. We watch, read, tell, and listen to stories every day. Despite this, most researchers don't think in terms of story when they write a journal paper. To ***Anna Clemens****, that's a missed opportunity, because storytelling is easy to implement in your manuscript provided you know how. Think of the six plot elements – character, setting, tension, action, climax, resolution – and the three other story essentials – main theme, chronology, purpose. You'll soon outline the backbone of your narrative and be ready to write a paper that is concise, compelling, and easy to understand.*

Why are stories so powerful? To answer this, we have to go back at least 100,000 years. This is when humans started to speak. For the following roughly 94,000 years, we could only use spoken words to communicate. Stories helped us survive, so our brains evolved to love them.

Paul Zak of the Claremont Graduate University in California researches what stories do to our brain. He found that once hooked by a story, our brain releases oxytocin. The hormone affects our mood and social behaviour. You could say stories are a shortcut to our emotions.

There's more to it; stories also help us remember facts. Gordon Bower and Michal Clark from Stanford University in California let two groups of subjects remember random nouns. One group was instructed to create a narrative with the words, the other to rehearse them one by one. People in the story group recalled the nouns correctly about six to seven times more often than the other group.

What is a story?

So, humans are wired to love stories, they make us emotional and boost our memory. But what is a story? It seems the more people you ask, the more definitions you'll get. Zak also performed some experiments to find out which stories have the most effect on us. His conclusion? The stories that get us curious, excited, and emotionally involved have an element of tension. This can be a conflict, an accident, a problem. Something that just isn't quite right.

If we glance over to Hollywood, you'll notice that most dramas follow one simple structure: there is one main character who goes on with her life until she encounters a problem. The action kicks in when she tries to solve the problem, there will be some ups and downs, which will conclude in a big event like a fight or a party. Afterwards things get resolved in some way. We see how things have panned out for our protagonist, how the events of the story have changed her life.

Plot spirals

If a plot consists of the six essential elements of main character, setting, tension, action, climax, and resolution, the film has a good chance to become a hit. I illustrated this plot structure in a spiral, see the left panel in Figure 1, below. The circular form visualises that the protagonist is back where she started after the story has taken place. Now, a new story can start to wrap around again – hello, season two.

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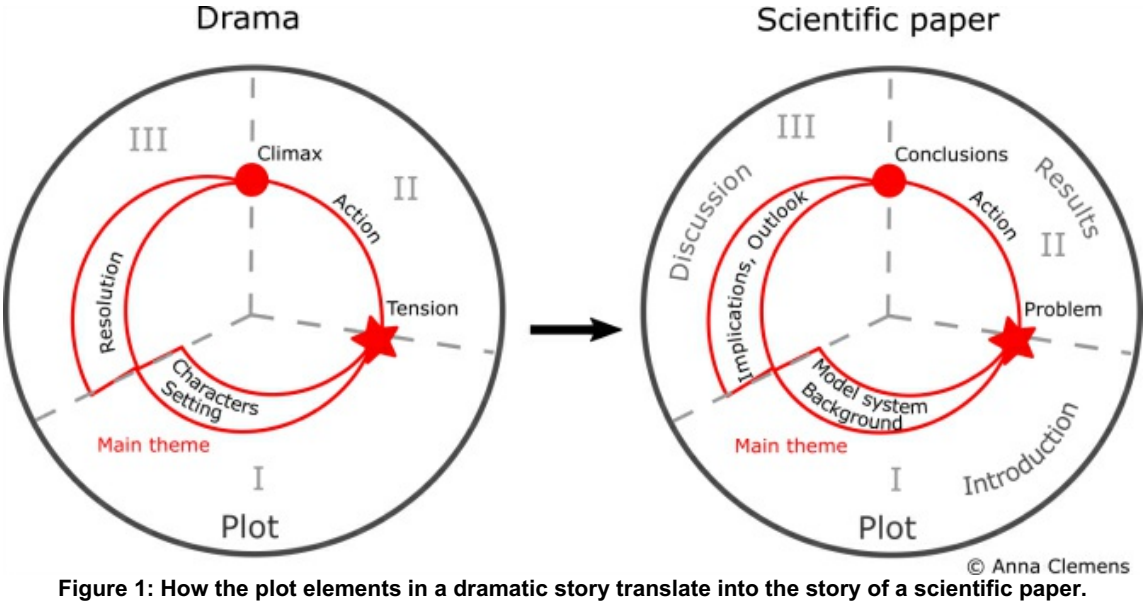

Figure 1: How the plot elements in a dramatic story translate into the story of a scientific paper.

So, how do we utilise these story elements for our paper and write a scientific story? Have a look at the right panel in Figure 1 and let me explain.

A scientific story

Let's start with the characters and setting. The *main character* in your paper is not Jessica Jones (too bad) but your object of study. Perhaps a certain disease, reaction mechanism, theory, or historic document? The *setting* translates to the background that you should provide to your study. That sounds like the introduction section of your paper, right? You cite previous work and give the reader a feeling about where the state of the art is.

But – just as with any Hollywood success in the box office – your paper will not become a page-turner, if you don't introduce an element of *tension* now. Your readers want to know what problem you are solving here. So, tell them what gap in the literature needs to be filled, why method X isn't good enough to solve Y, or what still isn't known about mechanism Z. To introduce the tension, words such as "however", "despite", "nevertheless", "but", "although" are your best friends. But don't fool your readers with general statements, phrase the problem precisely.

If you've covered the main character, setting and tension, the *action* can start. Now you can present your plots, schemes, interpretations; i.e. your findings. Throughout the results section you should gradually solve the problem you started out with. Eventually you'll arrive at the *climax* of your scientific story: the conclusions that you draw from your results.

But that's not all. As in a drama, your reader will be curious about the *resolution*: What do your findings mean in the context of the literature? How do you explain trend X and Y? How can your results be useful for application Z? What is the big picture? What should be further investigated? Often, I find, the discussion and outlook parts of papers are too short.

Take the reader by the hand

There are three more aspects that successful stories have in common. They are based on *one main theme*, the events are in *chronological order*, and everything in the story has a *purpose*. These three elements directly apply to scientific papers too. If you can't summarise your paper in one simple sentence you might not have a clear motif in mind. The main theme weaves through your narrative like a thread, bringing all the different things you mention together.

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You rarely see films with a timeline jumping back and forth. Even if it does, the order in which the scenes have been arranged makes sense. So should your scientific story. Chronology doesn't mean that you need to reiterate the thought process you went through when you performed the study. Just find the most logical arrangement of the different steps you took in order to come to your conclusion.

Purpose is linked to this. If you think in terms of a main theme and a logical order of arguments, you'll quickly identify the bits of your research that either don't quite fit in or provide additional detail. These may be better as part of the supporting information than the main text. Because your research is likely complicated stuff to anyone except you and your co-authors, take your reader by the hand and walk them through it.

That's it. If you want to tell a story in your paper, think of the six plot elements (character, setting, tension, action, climax, resolution) and the other three story essentials (main theme, chronology, purpose). In no time you'll have outlined the backbone of your narrative and be ready to create a paper that is concise, compelling, and easy to understand.

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About the author

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