

CONSCIOUS WRITING

The Intrinsic Story Structure of Original Research Manuscripts

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The first scientific journal, *Philosophical Transactions*, was founded in 1665.¹ At that time, and for more than 2 centuries thereafter, scientific manuscripts did not have a standardized form or style. However, in the 1940s, a standard structure began to emerge. Decades later, in the 1980s, a standard structure was widely adopted for original research manuscripts in the sciences.^{2,3}

Most research manuscripts are now written in a standard structure known as IMRaD (Introduction, Methods, Results, and Discussion).^{2,3} In this structure, the Introduction describes the background of the study, the Methods describe how the study was carried out, the Results report what the study found, and the Discussion explains what the study findings mean.

This standard IMRaD structure makes the process of developing and publishing manuscripts more consistent and easier to manage. This structure helps authors organize their ideas and ensure they include all the important elements of the study. The IMRaD structure also helps editors and reviewers evaluate manuscripts more easily. And the structure helps readers to quickly locate specific information without going through the entire paper.³

The IMRaD structure has another valuable feature. This structure helps authors to tell a story with the most common story structure: the three-act structure.

THREE-ACT STORY STRUCTURE

The three-act structure contains 3 acts separated by 2 plot points (Figure 1A). In Act 1, the story starts with the Setup, or exposition, which is when readers learn about the setting and characters in the story. At the end of Act 1 is Plot Point 1. Here, readers encounter the Tension, or an inciting incident. This tension engages readers' curiosity, excitement, or other emotion so that they want to keep reading the story.

Act 2 is the Action in the story. The Action builds momentum, further engaging readers as the story approaches Act 3. Near the peak of the Action, the story hits Plot Point 2. At this point, readers reach a cliffhanger that heightens their emotions to entice them to keep reading the story.

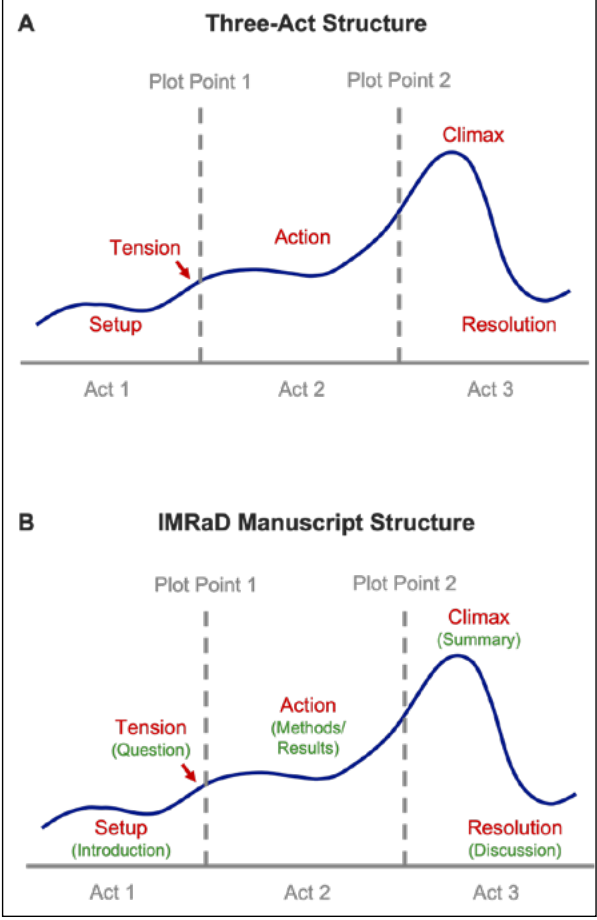


Figure 1. Three-act story structure in original research manuscripts. A) Three-act structure commonly found in stories. B) Three-act story structure found in original research manuscripts that follow the standard IMRaD (Introduction, Methods, Results, and Discussion) structure.

In Act 3, the story peaks at the Climax and then ties everything together in the Resolution, or denouement. In this way, Act 3 relieves the tension, or the heightened emotions, created at the end of Act 1.

THREE-ACT STORY STRUCTURE IN MANUSCRIPTS

The IMRaD structure of manuscripts maps onto the three-act story structure (Figure 1B).

Act 1

Setup

In a research manuscript, Act 1 is the Introduction section. This section is the exposition of the story, when readers learn about the characters and setting of the study. For example, the characters in a manuscript might be proteins, drug compounds, diseases, or patients. And the setting might be a particular cell type, organ, hospital, or population.

Act 1 also includes any other background details that might be important for readers to know to understand the story in the study. For example, readers may need to know statistics about a particular condition, why existing drugs are ineffective, or how the structure of a mutated protein influences a particular disease state.

These background details help to frame the purpose of the study—what problem the study aims to address. This purpose helps readers understand the relevance and significance of the study. And it helps to frame the Tension.

Tension

The Tension in a manuscript is the research question at the end of the Introduction. This question describes what the characters need to accomplish in the story. In other words, how can the characters help to solve the problem you framed in the Setup?

The Tension also needs to state what specific question the study proposes to answer and how that question is connected to the problem framed in the Setup. For example, does the new drug need to slow disease progression? Or does the gene mutation need to improve organ function? This framing sparks curiosity and excitement in readers to entice them to keep reading into Act 2.

Act 2

Action

In a research manuscript, the Action includes the Methods and Results sections. The Methods section starts the Action by describing what happens to address the question in the story. In other words, what approach was used, what experiments were carried out, what data were collected, and what analysis was done in the study?

The second part of the Action is the Results section. This section builds on the momentum created in the Methods section by reporting the findings in the study. These findings build on each other as the story approaches Act 3. At this point, readers learned the study findings, but they may not yet have a clear understanding of whether the findings answered the study question. This moment creates a cliff-hanger that propels readers into Act 3.

Act 3

Climax

The Climax is the first paragraph of the Discussion section. This paragraph describes whether the characters answered the question raised with the Tension. To maximize the impact of the Climax, this paragraph needs to remind readers of the study question, summarize the key findings of the study, and state how those findings answered the question in the Tension. This structure reinvigorates and then satisfies readers' curiosity and excitement about the study.

Resolution

Act 3 also contains the rest of the Discussion section, including the final conclusions paragraph. The Discussion section explains how the characters and their setting changed as a result of the Action in the study. In other words, how do the findings fit within the existing body of literature? Do they support or contradict findings published in other studies? And, importantly, how do the findings advance the field?

At the end of Act 3 is the Conclusions paragraph. This paragraph is the denouement of the manuscript that ties the entire study together by (1) reminding the reader of the problem in the Setup, (2) reiterating the question that creates the Tension, (3) highlighting the main study findings in the Action, (4) stating how the findings answer the question in the Climax, and (5) emphasizing how the study advances the field in the Resolution. In this way, the Conclusions paragraph leaves readers with a clear concept of the overall relevance and significance of the story in the study.

BUILDING THE STORY

The three-act story structure includes 5 stages—Setup, Tension, Action, Climax, and Resolution—that can be condensed to form the abbreviation STACR. Each of the STACR elements has an important function in a story that helps to engage readers and keep them reading. These STACR elements also map onto the IMRaD structure of original research manuscripts, creating a built-in story structure that engages and informs readers about a research study.

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