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# HOW TO WRITE AND REVIEW CHI PAPERS



UNIVERSITY OF  
**WATERLOO**

# COME TO OUR BOOK SIGNING TOMORROW

- Tomorrow, 10:20am coffee break in 220BC Exhibit Hall at the Oxford University Press booth



# WHO AM I?



- Associate Professor, Games User Research and Gamification
- Associate Director, Graduate Studies in Digital Experience Innovation at University of Waterloo's Stratford Campus
- Ph.D. in Game Development, Keyword: Fun
- Director of the HCI Games Group at the University of Waterloo
- *Contact: @acagamic on Twitter or Lennart Nacke on LinkedIn*



ENGINEERING  
CONSULTANTS

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STRUCTURAL • CIVIL • MUNICIPAL



# TODAY'S AGENDA

## Unit 1 (11:30am)

1. Micro Lecture: Structuring your Research
2. Tutorial: Dissecting a CHI Paper

## Unit 2 (2:30pm)

1. Micro Lecture: The Importance of the Introduction
2. Exercise: Writing the Abstract and Introduction

## Unit 3 (4:30pm)

1. Revision of CHI Paper Structure
2. Tutorial and Exercise: Bullet pointing the CHI paper

# STRUCTURING YOUR RESEARCH

UNIT 1

# OUR LEARNING GOALS TODAY

Simplify

Become a better writer by learning how to avoid unnecessary words and give each sentence a strong meaning

Understand

Understand the goals of CHI research and what makes a strong CHI contribution

Structure

Learn how to structure your paper around a compelling research narrative to emphasize your research problem and solution as main drivers

Review

Write better reviews by understanding what is important to have as content for CHI research papers

## SURVEY RESPONSE

From my CHI Course Survey to senior CHI members

- ↗ **PICK A GOOD PROBLEM**
- ↗ **KNOW THE LITERATURE**
- ↗ **START EARLY**
- ↗ **GET FEEDBACK**
- ↗ **DISCUSS EARLIER WORK**
- ↗ **BE BOLD**

## SURVEY RESPONSE

From my CHI Course Survey to senior CHI members

- DON'T FOCUS ON STYLE, FOCUS ON CORRECTNESS, SCIENTIFIC VALIDITY AND ON A CONTRIBUTION THAT YOU THINK CHANGES OR PROGRESSES THE FIELD SIGNIFICANTLY.

# RESEARCH PROBLEMS

- Methodological contribution
  - Established method from other field but new to CHI
  - New approach that you've developed
- Systems contribution
- Clear research question and literature gap
  - Addressing unanswered questions and solving problems
- Literature review and synthesis of existing research

# HOW TO STRUCTURE RESEARCH

1. Define a research question
2. Test your questions against the literature
3. Refine your research question
4. Derive a method that answers your question
5. Plan out a detailed analysis
6. Refine your method and analysis
7. Execute your method
8. Execute your analysis (this is your Results draft)
9. Write your discussion
10. Polish! Polish! Polish!
11. Submit and wait
12. Do it all over again!

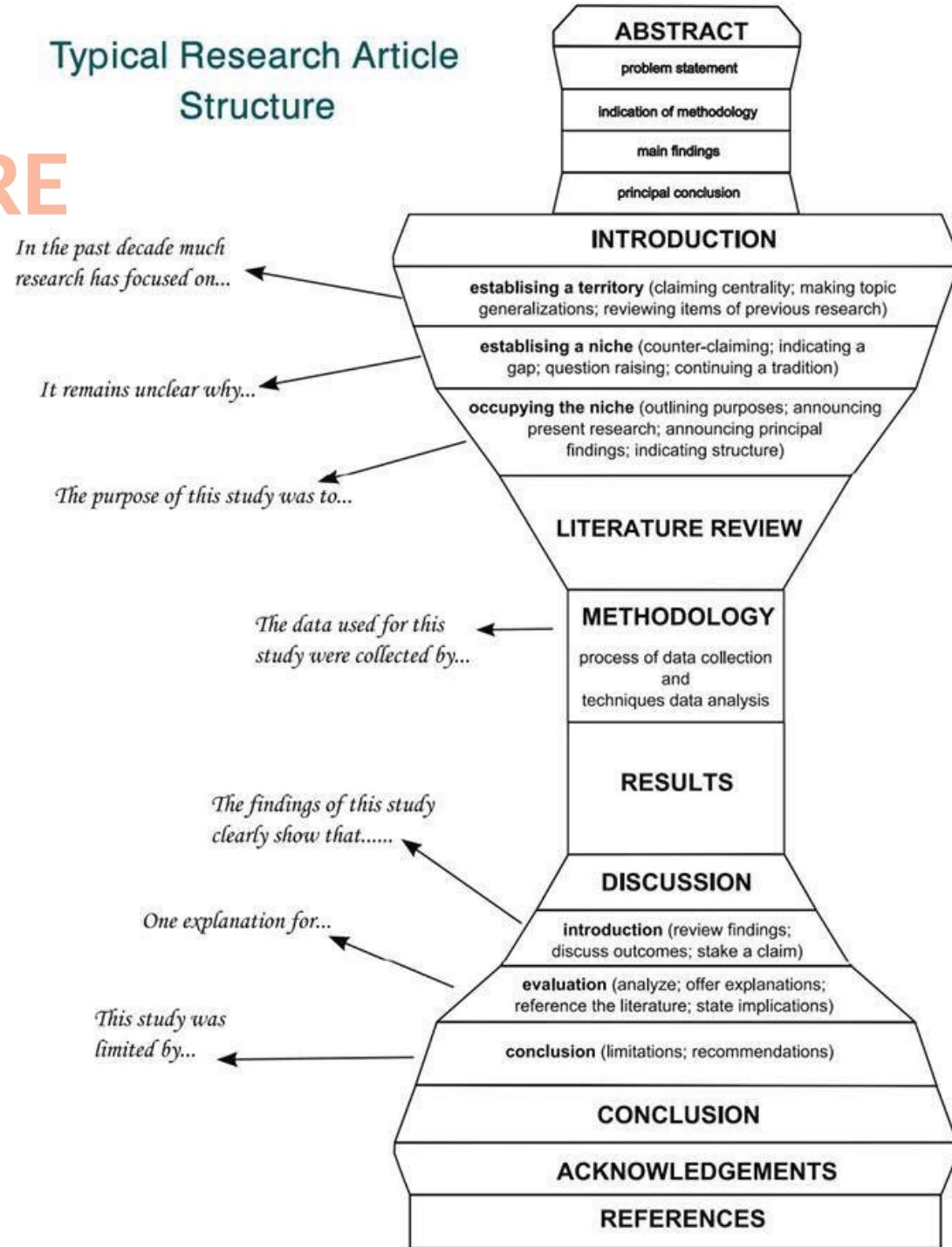
# NINE QUESTIONS TO ASK YOURSELF

1. If you could address just one problem in 10 years, what would it be?
2. Are you using your unique situation and resources to the fullest?
3. What's your HCI research genre?
4. Is your approach right for your research topic?
5. Why is your research interesting?
6. Can you fail in trying to answer the research problem?
7. Will your work open new possibilities of research?
8. Why do you build/prototype?
9. In one sentence, what is the contribution of your research?
  - ▶ Let's do this exercise now!

# THE HOURGLASS STRUCTURE

1. ABSTRACT
2. Introduction
3. Literature Review
4. Methodology
5. Results
6. Discussion
7. Conclusion
8. Acknowledgements
9. References

## Typical Research Article Structure



# WHAT IS THE PURPOSE OF YOUR WRITING?

*Your purpose is to create change in your reader!*



*To help them understand your research and act!*

# WRITE TO CONVEY MEANING

- *meaning ratio* = 
$$\frac{\text{meaningful words}}{\text{total words}}$$

# EXAMPLE

- Inovalon is a leading technology company that combines advanced cloud-based data analytics and data-driven intervention platforms to achieve meaningful insight and impact in clinical and quality outcomes, utilization, and financial performance across the healthcare landscape. Inovalon's unique achievement of value is delivered through the effective progression of Turning Data into Insight, and Insight into Action®. Large proprietary datasets, advanced integration technologies, sophisticated predictive analytics, data-driven intervention platforms, and deep subject matter expertise deliver a seamless, end-to-end capability that brings the benefits of big data and large-scale analytics to the point of care.

# EXAMPLE (WORDS THAT ARE NOT MEANINGFUL)

- Inovalon is a ~~leading~~ technology company that combines ~~advanced cloud-based data analytics~~ and ~~data-driven intervention platforms~~ to achieve ~~meaningful~~ insight and impact in clinical and quality outcomes, ~~utilization~~, and financial performance ~~across the healthcare landscape~~. Inovalon's ~~unique achievement of~~ value is delivered through the ~~effective~~ progression of Turning Data into Insight, and Insight into Action®. ~~Large proprietary datasets, advanced integration technologies, sophisticated predictive analytics, data-driven intervention platforms, and deep subject matter expertise deliver a seamless, end-to-end capability~~ that brings the benefits of ~~big data~~ and ~~large-scale analytics~~ to the point of care.

## EXAMPLE (REWRITE FOCUSED ON MEANING)

- Inovalon has more insight into health data than anyone else. We analyze that data and apply the knowledge to help you improve care options, reduce costs, and enhance compliance. We help hospitals, doctors, insurance payers, and patients. We identify gaps in care, quality, and data integrity, and we apply our unique capabilities to resolving them.

1

### Readers

- Who is the audience?

2

### Objective

- How will you change the reader?

3

### Action

- What do you want the reader to do?

4

### Impression

- What will the reader think of you?

DO A ROAM  
ANALYSIS  
BEFORE YOU  
WRITE

## SURVEY RESPONSE

From my CHI Course Survey to senior  
CHI members

- CONVINCE YOUR AC AND YOU HAVE A CHANCE. REVIEWERS DON'T MATTER IN THE GRAND SCHEME OF THINGS. IF YOUR PAPER IS EVEN CLOSE TO GETTING IN IN NOVEMBER, A STRONG REBUTTAL AND AN ADVOCATE ON THE AC IS ALL YOU NEED.

# FOUR CORE RESEARCH QUESTIONS

What is the real-world **problem** that we are trying to solve?



Why is it important to **solve** this problem?



What is the **solution** that we came up with to solve it?



How do we know that the solution is a **good solution** to the problem?

# QUICK INTRODUCTION

- Who are you and what are you working on?
- Why are you here?
- You have 20 seconds each

# TUTORIAL: DISSECTING A CHI PAPER

- Structured discussion of the following paper:
  - <http://ecologylab.net/research/publications/GameAwarenessCHI2018.pdf>
  - Jason Wuertz, Sultan A. Alharthi, William A. Hamilton, Scott Bateman, Carl Gutwin, Anthony Tang, Zachary Toups, and Jessica Hammer. 2018. A Design Framework for Awareness Cues in Distributed Multiplayer Games. In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18). ACM, New York, NY, USA, Paper 243, 14 pages. DOI: <https://doi.org/10.1145/3173574.3173817>
  - **Alternative:** Katja Rogers, Giovanni Ribeiro, Rina R. Wehbe, Michael Weber, and Lennart E. Nacke. 2018. Vanishing Importance: Studying Immersive Effects of Game Audio Perception on Player Experiences in Virtual Reality. In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18). ACM, New York, NY, USA, Paper 328, 13 pages. DOI: <https://doi.org/10.1145/3173574.3173902>
- Read the paper.
- Form groups of 3-4 and discuss:
  - Which parts of the paper are excellent? Why do you think they are?

# ABSTRACT

In the physical world, teammates develop **situation awareness** about each other's location, status, and actions through cues such as gaze direction and ambient noise. To support **situation awareness**, distributed multiplayer games provide **awareness cues**—information that games automatically make available to players to support cooperative gameplay. The design of awareness cues can be **extremely complex, impacting how players experience games and work with teammates**. Despite the importance of awareness cues, designers have little beyond experiential knowledge to guide their design. In this work, we describe a design framework for awareness cues, providing insight into what information they provide, how they communicate this information, and how design choices can impact play experience. Our research, based on a grounded theory analysis of current games, is **the first to provide a characterization of awareness cues**, providing a palette for game designers to improve design practice and a starting point for deeper research into collaborative play.

# INTRODUCTION - LAY OF THE LAND -> PROBLEM

Teams working together in the physical world **develop situation awareness** [13, 14] about teammate location, status and actions through cues such as body language, gaze direction, and ambient noise [29, 31, 61]. Distributed games help players coordinate by providing **awareness cues** – information that systems automatically make available to collaborators to support cooperative actions [44]. Distributed games are played together by players on separate devices typically arranged so that players cannot see each others' screens. Thus, it is primarily through awareness cues that teammates' status, characteristics, actions, experience, etc. are represented and understood. Because gameworlds , the virtual worlds that players experience as the interface to games [35], are artificial and lack the sensory cues that make coordination as natural as it is in the physical world, **awareness cues must be designed to provide the right information at the right time**. Game designers have additional latitude to create detailed and complex representations of actions and events that occurred in past, present and future, and are not limited only to approximating cues that exist in the physical world.

# INTRODUCTION: IMPORTANCE OF PROBLEM

Since teammates in distributed games are largely experienced through awareness cues, the **principal challenge for game designers is to create tools that will provide the right information at the right time** [62]. The design tension is to balance this information with ensuring that the game remains challenging, so giving a player omniscience is undesirable. If a game designer provides too little information, coordination will be cumbersome, awkward, and slow; if they provide too much information, cues could be overwhelming, difficult to learn, and distract from gameplay. On the other hand, some games opt to purposely limit awareness cues to increase uncertainty and realism, and some even provide this as a separate game mode (e.g., Left 4 Dead 2 (L4D2) [G21], Rainbow Six: Siege [G19]). In contrast, other games try to raise the ceiling on performance by providing many rich awareness cues and tools, which can be initially overwhelming and increase the game's learning curve (e.g., League of Legends (LoL) [G17], Dota 2 [G23]). Despite the importance of awareness cues in distributed games, there is currently little information about what information game designers provide, how it can be provided, and what trade-offs might exist with particular designs.

# INTRODUCTION: HOW WE SOLVED IT

Using a grounded theory approach, we examined 24 games, selected for maximum variability, from which we identified and analyzed 100 awareness cues. Our research provides a characterization of the range of awareness cues currently in use through game mechanics, interface components, and other information displays.

We do this by first articulating the **information made available through awareness cues to teammates**. Second, we describe the **essential design dimensions of awareness cues and how they make teammate information available**. Third, we discuss **potential consequences** for games and play experience when particular design choices are made.

# INTRODUCTION: WHY OUR WORK MATTERS

While **prior work** has considered synchronous verbal communications [8,56,67] and cooperative communication mechanics (game mechanics invoked by players to communicate with one another) [37, 60, 64, 70], **our work focuses on the understudied tools and techniques that games use to support coordination, which are made available to players without explicit effort.**

# INTRODUCTION: CONTRIBUTION TO CHI

Building on previous work in awareness, this work makes two main contributions. First, we provide a palette for game designers and researchers to identify and devise new awareness cues depending on the game experience they want to target. We expect that users of games (players and viewers) influence how cues should be designed and also consider how players adapt their play experience through cues. Second, we provide a starting point for future research and for informed design practices around awareness cues in online games, and in groupware more broadly.

# THE IMPORTANCE OF THE ABSTRACT AND INTRODUCTION

UNIT 2

# FOUR CORE RESEARCH QUESTIONS

What is the real-world **problem** that we are trying to solve?



Why is it important to **solve** this problem?



What is the **solution** that we came up with to solve it?



How do we know that the solution is a **good solution** to the problem?

# EXAMPLE (CURRENT CHI PAPER)

- Game audio has an immersive effect on players, and virtual reality (VR) is similarly known to increase immersion. We explore how these two factors influence each other, by comparing player experience in a commercial horror adventure game. We conducted a qualitative within-subjects experiment to explore differences in player experience and audio perception for a VR and non-VR version of the same game, and then explored effects of audio dimensionality in a quantitative between-subjects study in VR. Results indicate that audio takes a more implicit role in virtual reality due to the overall sensory experience, and that audio dimensionality in VR may not be a significant factor

# ABSTRACT REWRITE FOCUSED ON

- What is the research space?
- What is the problem or research gap?
- How are we fixing this problem in this paper?
  - Do we need to provide more details?
- What did we find out? What are our results?
- How does this contribute to CHI?

# EXAMPLE (CURRENT CHI PAPER)

- Sound and virtual reality (VR) are two important output modalities for creating an immersive player experience (PX). While prior research suggests that sounds might contribute to a more immersive experience in games played on screens and mobile displays, there is not yet evidence of these effects of sound on PX in VR. To address this, we conducted a within-subjects experiment using a commercial horror-adventure game to study the effects of a VR and monitor-display version of the same game on PX. Subsequently, we explored, in a between-subjects study, the effects of audio dimensionality on PX in VR. Results indicate that audio has a more implicit influence on PX in VR because of the impact of the overall sensory experience and that audio dimensionality in VR may not be a significant factor contributing to PX. Based on our findings and observations, we provide five design guidelines for VR games.

# JOFISH'S RESEARCH ON PAPER TITLES

- Conferences
  - Articles with question marks (?) in titles are less cited
  - Colons (:) increase citations
- Journals
  - Maximize citations with no colons, no question marks
- Transactions
  - More question marks in titles have more citations

# ONCE WRITTEN, EDIT FOR CLARITY

- Do I use simple, familiar words throughout?
- Have I eliminated all jargon and clichés, hedging?
- Have I avoided repeating words, points?
- Have I gone into too much detail anywhere?
- Have I avoided ambiguity?
- Do I avoid making simple points sound complicated?
- Are all my distinctions/comparisons crisp?
- Can I cut out any more words?

# ONCE WRITTEN, EDIT FOR CLARITY

- Are any sentences too long, or contain too many sub-clauses?
- Do I use the active voice?
- Do I avoid reversing into sentences?
- Are my tenses consistent?
- Do I avoid word echoes?
- Does my writing reflect clear, logical thinking?
- Will a reader be forced to reread anything?
- Have I removed all the unnecessary clutter?
- Have I got to the point immediately?
- Do I have a logical narrative structure?

## Avoid Passive

Minimize passive voice

## Find Rhythm

Find a rhythm to your writing

## Reduce Jargon

Reduce jargon and complex words

## Reduce Words

Reduce words that do not contribute to the meaning of a sentence

- Be clear and be brief in what you say
- Delete adverbs whenever possible

# MORE STYLE ADVICE

# EXERCISE: WRITING THE ABSTRACT AND INTRODUCTION

- Now, write your own *Title*, *Abstract*, and *Introduction* for the research plan you have developed (30 minutes).
- Use the four questions to guide you through the process of writing a fictional CHI paper about this research topic that you have in mind:
  - What is the real-world problem that we are trying to solve?
  - Why is it important to solve this problem?
  - What is the solution that we came up with to solve it?
  - How do we know that the solution is a good solution to the problem?
- Use the same process as many CHI authors:
  - Sketch the rough answers to each question into bullet points
  - Get together a maximum of 15 bullet points among all 4 questions
  - Start writing out the bullet points into paragraphs

# EXERCISE: WRITING THE ABSTRACT AND INTRODUCTION

- Now, discuss your abstracts in groups of 3-4 people
  - 20 minutes
  - Is the research question and problem statement clear?
  - What is the anticipated contribution?
    - What type of contribution do you think it is?

# BULLET POINTING YOUR CHI PAPER

UNIT 3

# NINE STEP EDITING SYSTEM (FROM SHANI RAJA)

1. Read through your text
2. Break it up into points (ideas, thoughts, arguments)
3. Make sure every single point makes sense
4. Delete nonessential or redundant points
5. Make sure each point is unique and distinguished enough
6. Create sections by creating categories for the points

# NINE STEP EDITING SYSTEM (FROM SHANI RAJA)

7. Make the sections flow into one another
8. Sort your points into the categories
9. Make it read well by focusing on simple, clear, and elegant language

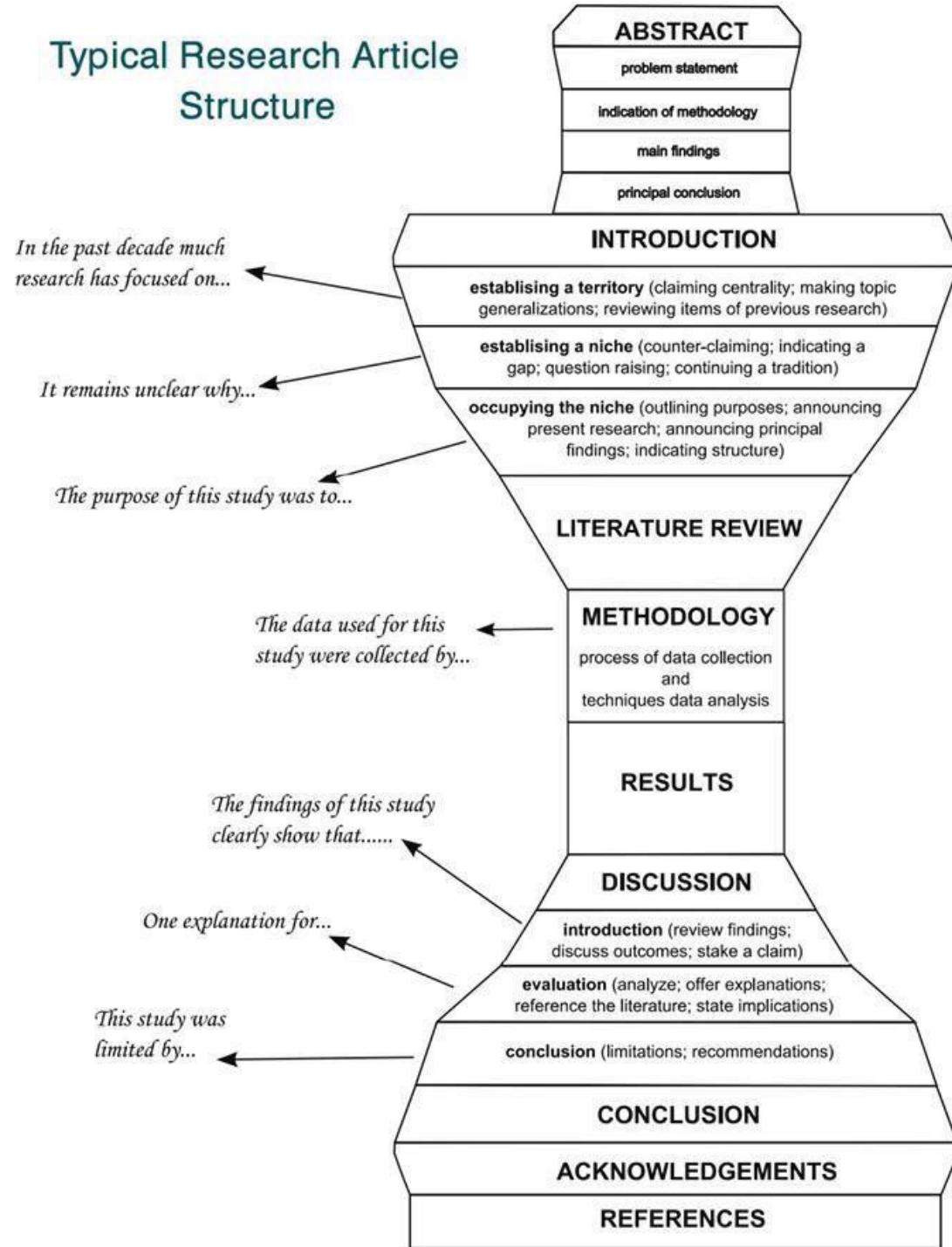
# LET'S WALK THROUGH AN EXAMPLE TOGETHER

- Volunteers, please
- Let's walk through an example of your research ideas based on the abstract and introduction you wrote in the last unit

# HOURGLASS REMINDER

1. ABSTRACT
2. Introduction
3. Literature Review
4. Methodology
5. Results
6. Discussion
7. Conclusion
8. Acknowledgements
9. References

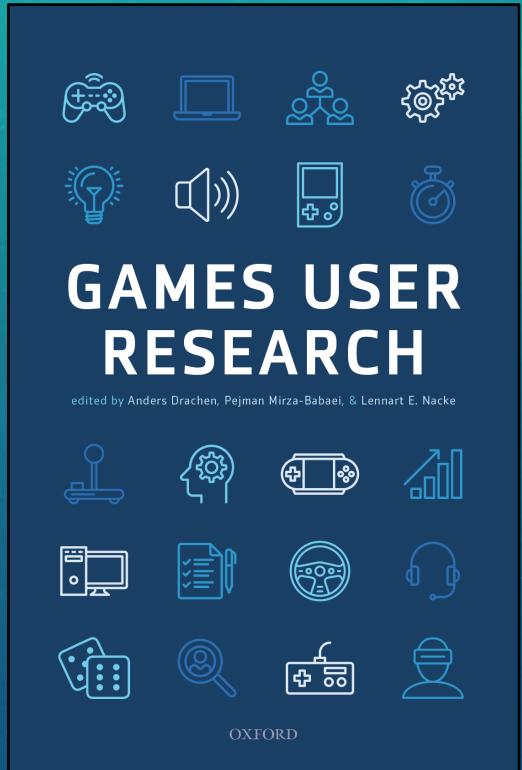
## Typical Research Article Structure



# BULLET POINT YOUR CHI PAPER

- What contribution do you envision?
- What research plan do you foresee?
- Can you expand on your existing work?
- What results do you need?

# QUESTIONS?



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*Get in touch*

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