Introduction: Structure

Basic Structure of a Research Paper

Abstract

Introduction

Methods

Results

Discussion

Conclusion

Jigsaw Puzzle of a Research Paper

Introduction

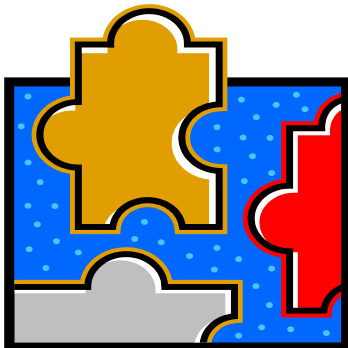**Methods**

Results

Discussion

Attributes of Paper Sections

- **Introduction**   the findings described, accompanied by variable amounts of commentary

- **Methods**   the findings interpreted, accompanied by references to the hypotheses

- **Results**   to state motivation and to establish the readability of research questions

- **Discussion**   the narrowest part of a research paper, with detailed explanation

Attributes of Paper Sections

- **Introduction**   the findings described, accompanied by variable amounts of commentary

- **Methods**   the findings interpreted, accompanied by references to the hypotheses

- **Results**   to state motivation and to establish the readability of research questions

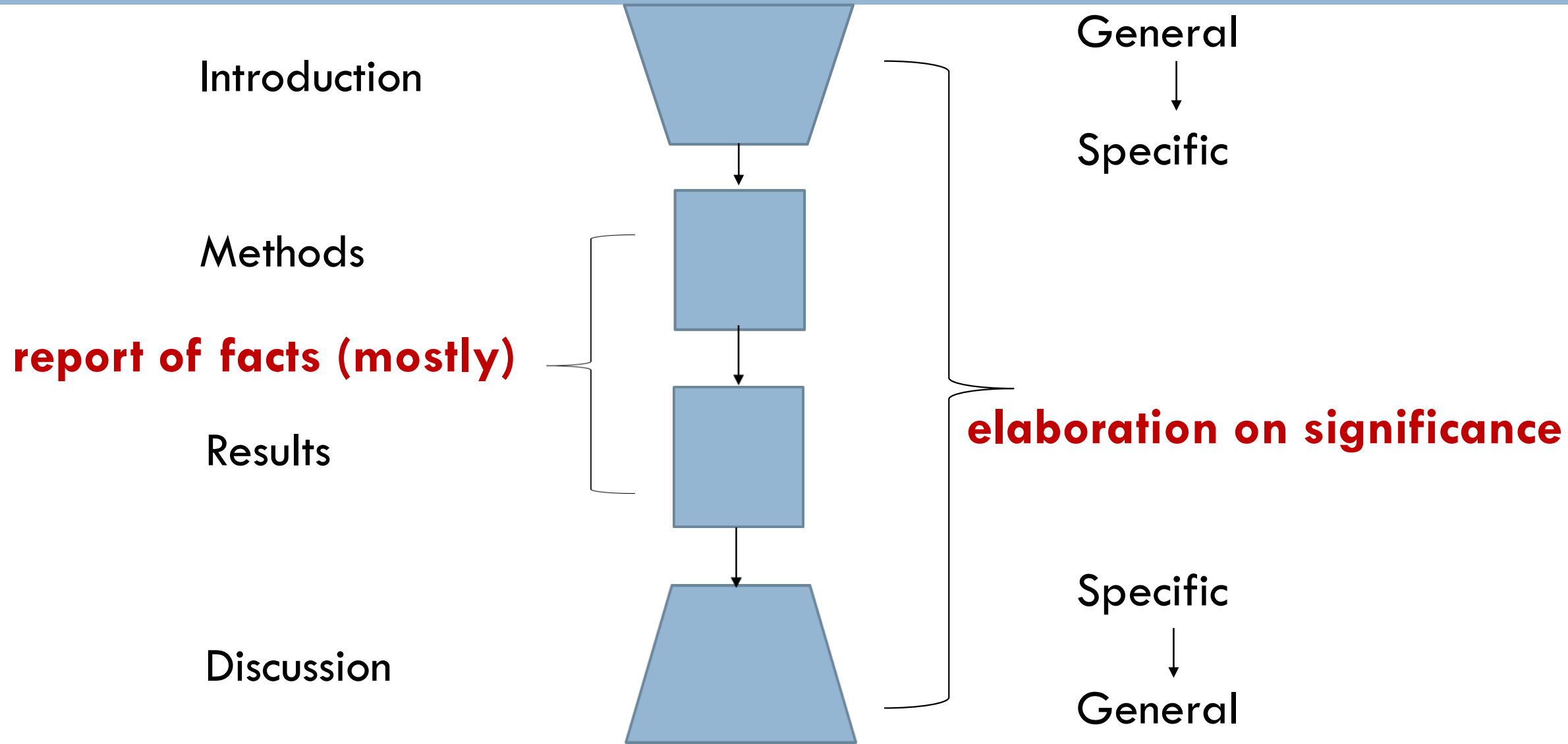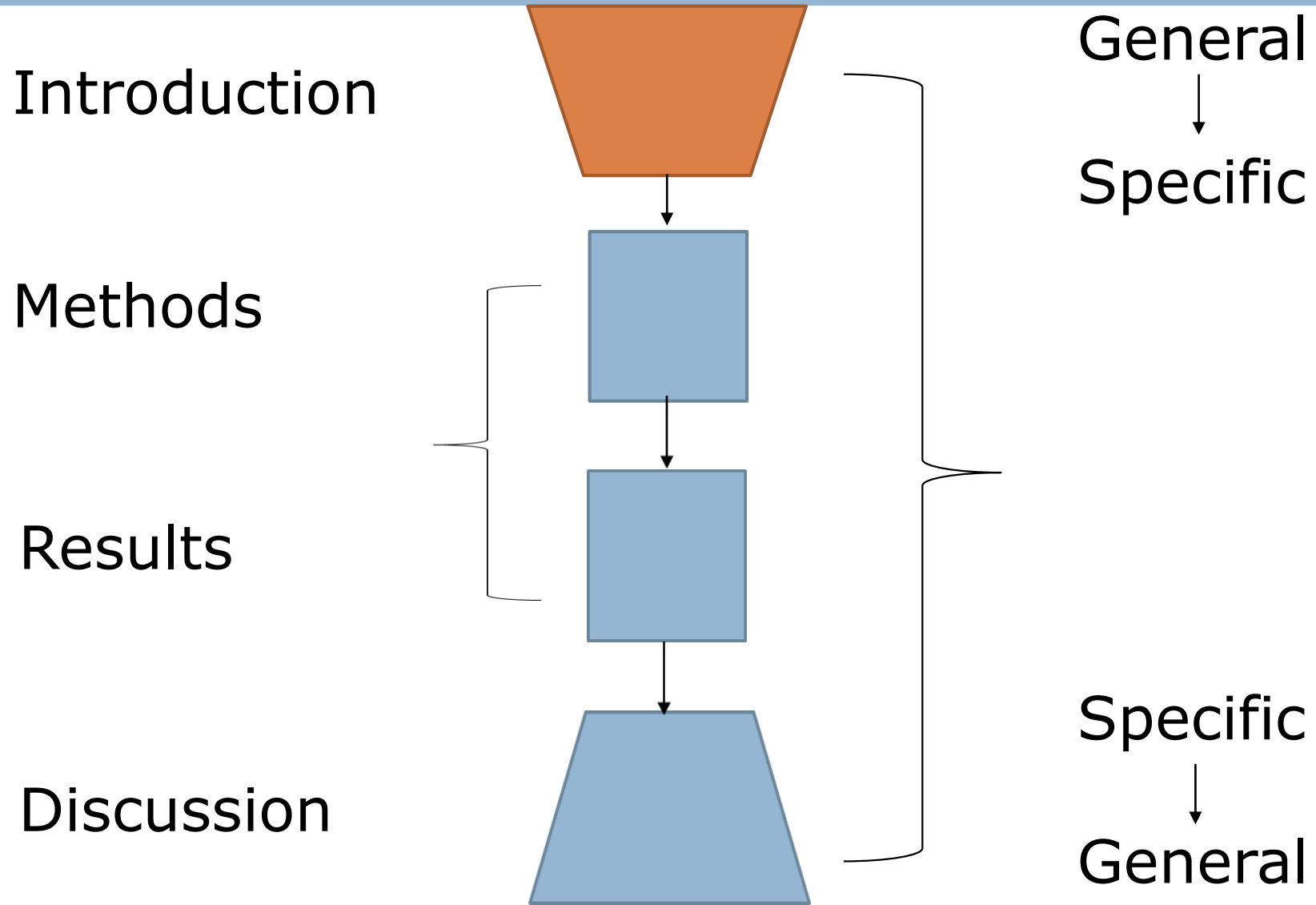- **Discussion**   the narrowest part of a research paper, with detailed explanation

The Overall Narrative (Swales & Feak, 2012)

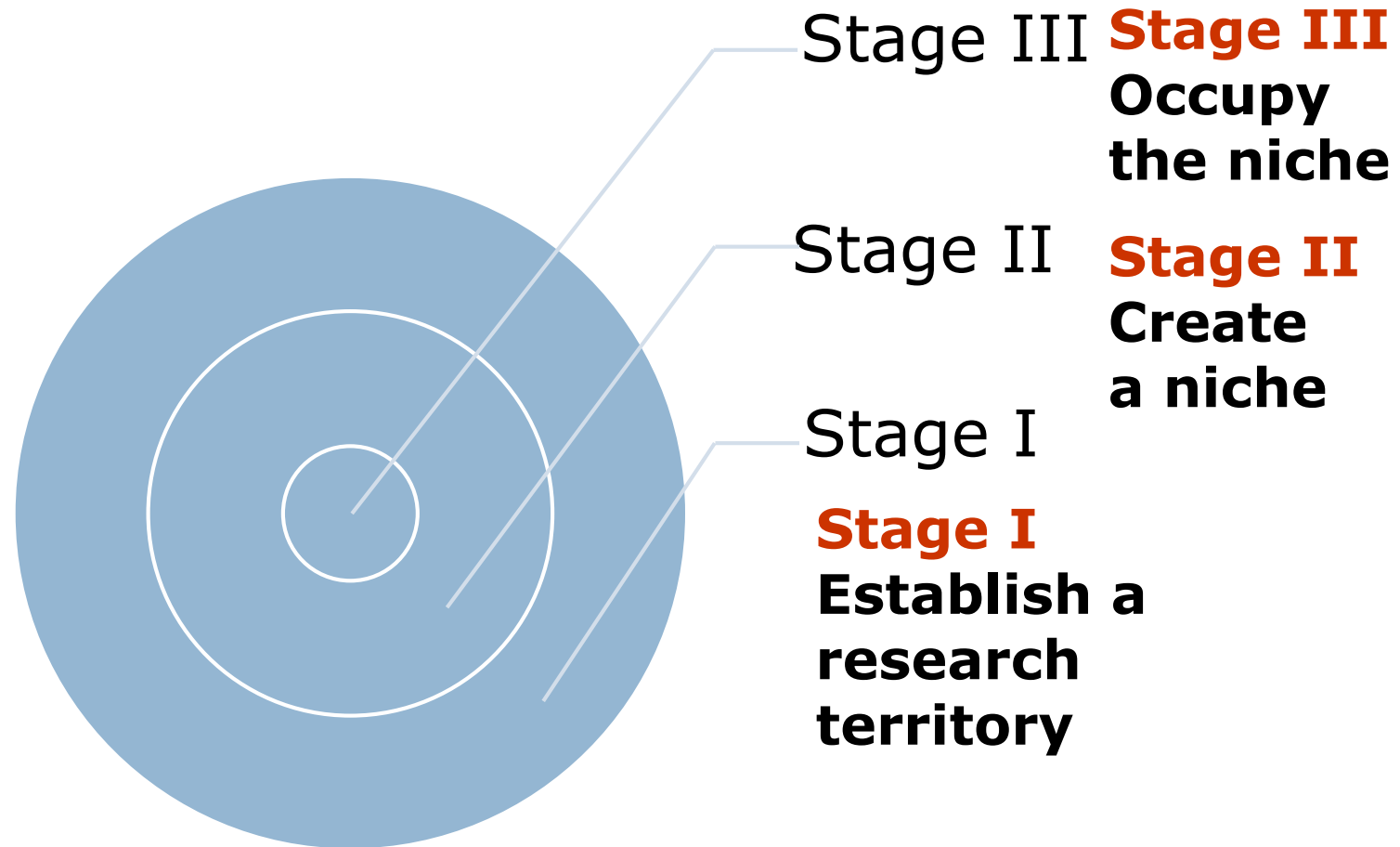Introduction

Methods

report of facts (mostly)

Results

Discussion

General

↓

Specific

elaboration on significance

Specific

↓

General

Introduction

Introduction

Methods

Results

Discussion

General

↓

Specific

Specific

↓

General

Creating a Research Space

Stage III

Stage II

Stage I

Stage III
Occupy the niche

Stage II
Create a niche
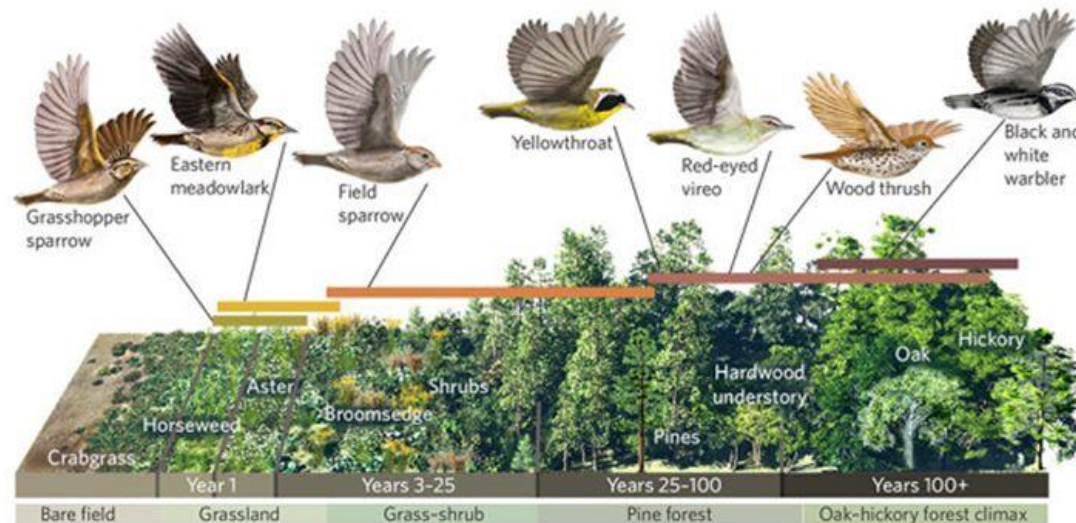
Stage I
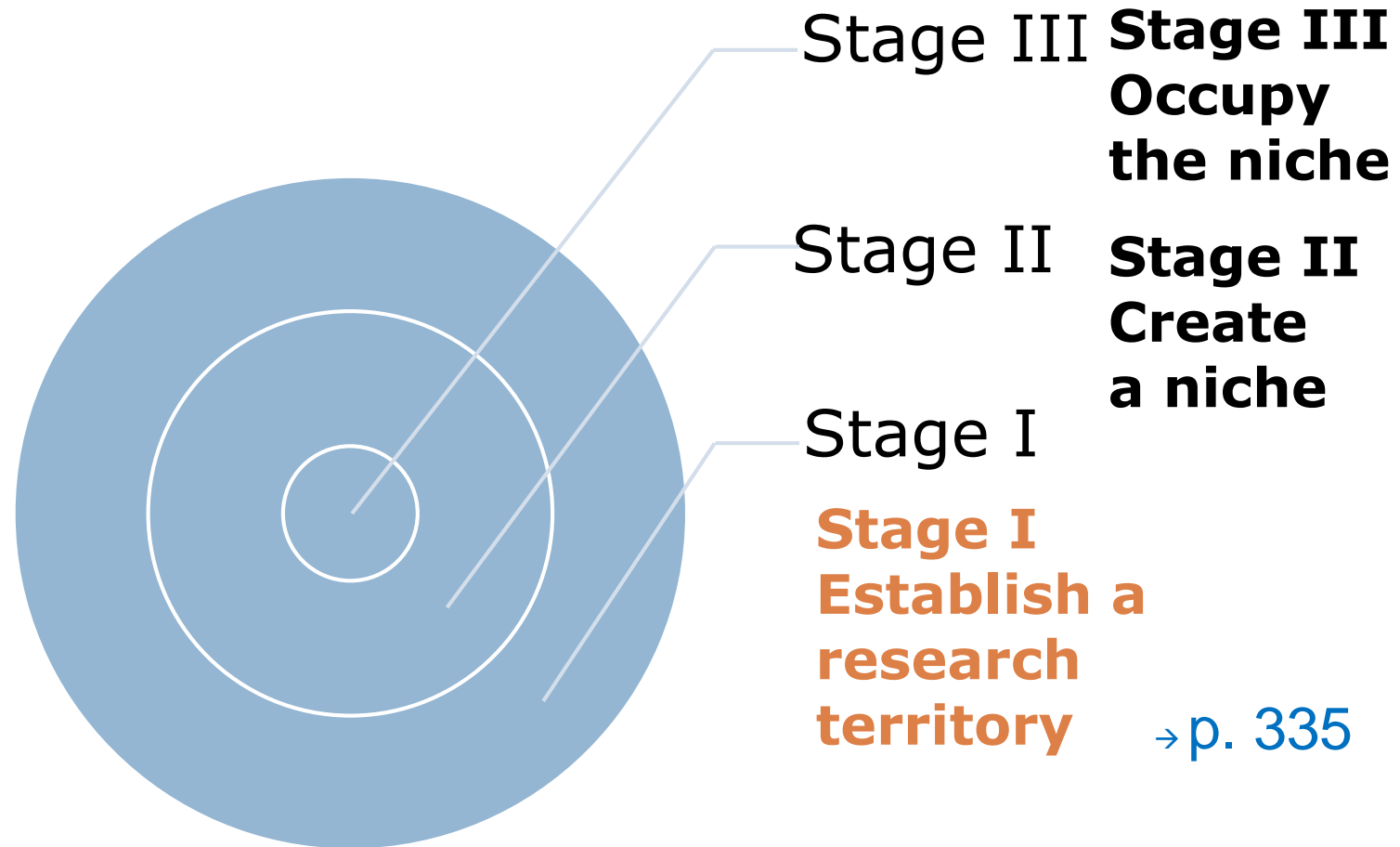**Establish a research territory**
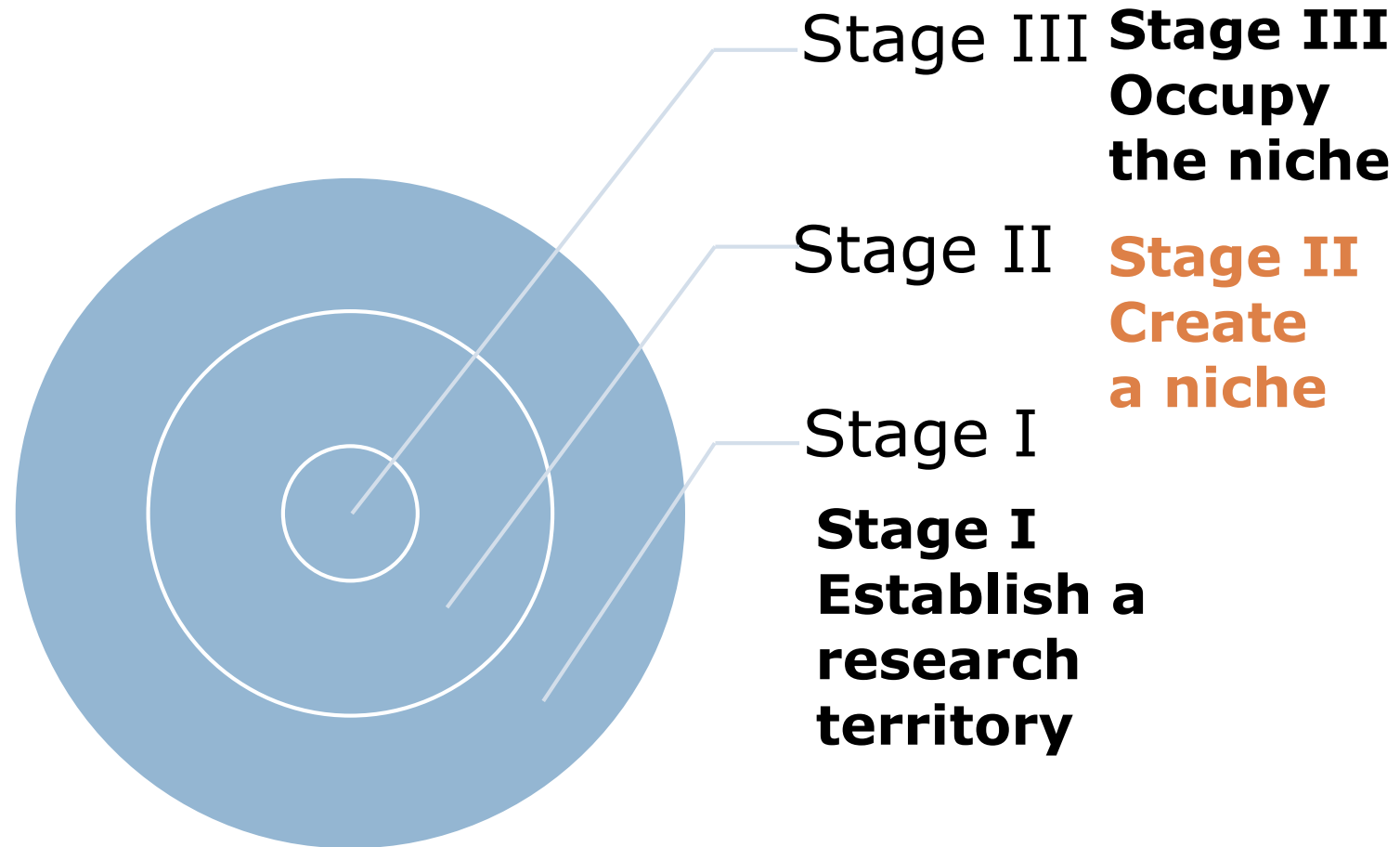
Ecological Niche

Ecological Niche

- **Ecological Niche** – the role a species serves in its ecosystem
  - including what it eats, what eats it, and how it behaves
  - No 2 species have the same ecological niche

Creating a Research Space

Stage III

Stage II

Stage I

Stage III Occupy the niche

Stage II Create a niche

Stage I Establish a research territory

→p. 335

Creating a Research Space

Stage III **Stage III Occupy the niche**

Stage II **Stage II Create a niche**

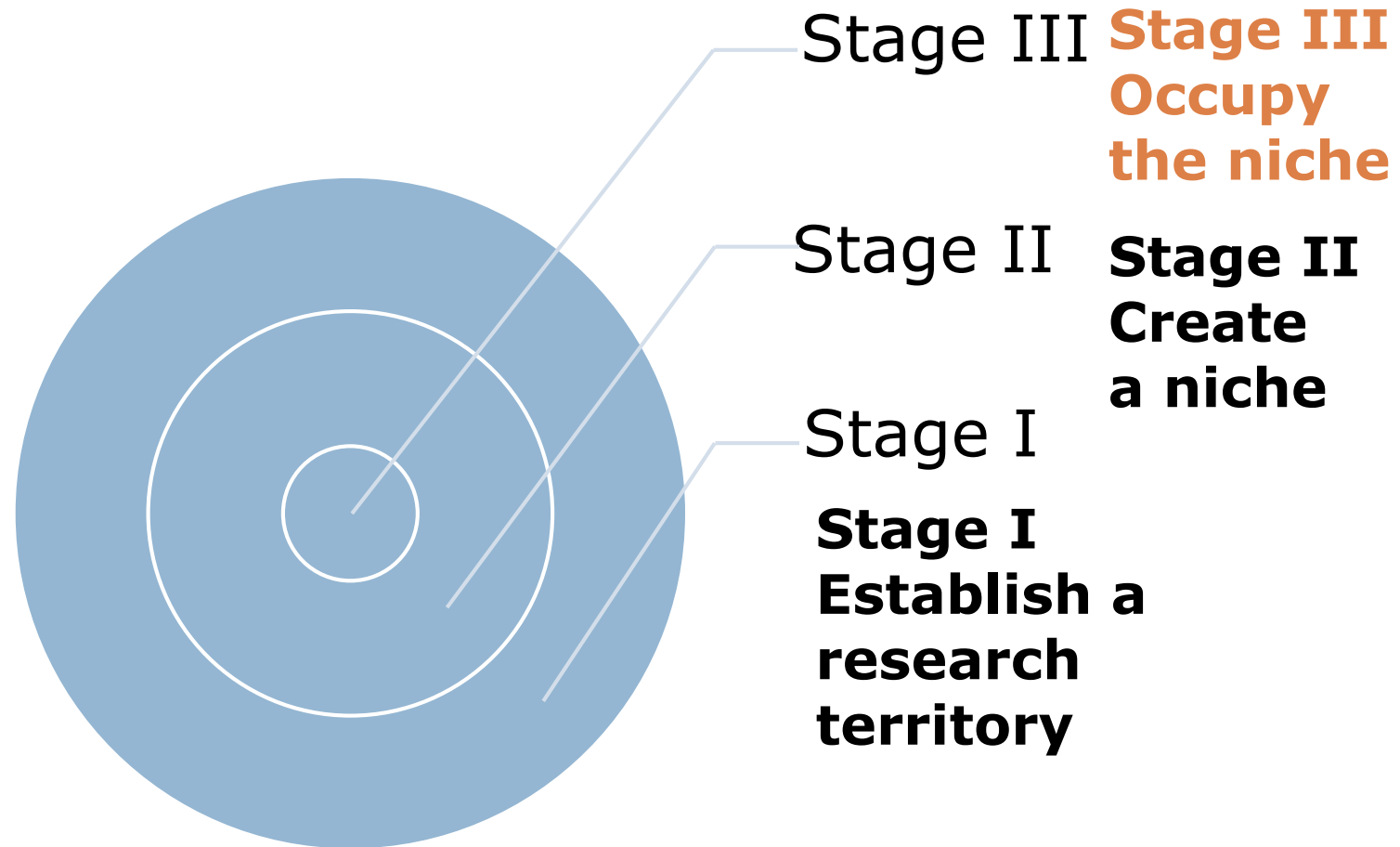Stage I **Stage I Establish a research territory**

Move II: Create a Niche

- Options for Creating a Niche
  - ➤ degrees of strength (pp. 348-9)
  - ➤ degrees of negativity (pp. 350-1)
  - ➤ neutral alternative (p. 352)

Creating a Research Space

Stage III

Stage II

Stage I

Stage III Occupy the niche

Stage II Create a niche

Stage I Establish a research territory

Move III: Occupy the Niche

☐ Tone

➤ descriptive / purposive / prescriptive

I. The findings obtained warrant the employment of this proposed model in rectifying the flaw.

II. The aim of this investigation was to test the durability of this newly applied material.

III. This study presents preliminary results for the application of this forecasting system.

(p. 355)

□ Tone

➢ descriptive / purposive / prescriptive

I. The findings obtained warrant the employment of this proposed model in rectifying the flaw. (prescriptive)

II. The aim of this investigation was to test the durability of this newly applied material. (purposive)

III. This study presents preliminary results for the application of this forecasting system. (descriptive)

(p. 355)

Move III: Occupy the Niche

- Principal findings
- announced or not in the Introduction?
- Abstract – Introduction – Results

trilogy?

(p. 359)

Findings in the Introduction?

- Avoid repetitive presentation of findings
- **Findings** in different forms:
- impact / value / potential

- Impact on this field
- Value of this study
- Potential contribution

Findings in the Introduction?

☐ Avoid repetitive presentation of findings

■ **Findings** in different forms:

➤ impact / value / potential

● Impact on this field (Abstract)

● Value of this study (Introduction)

● Potential contribution (Results)

(p. 360)

Assignments

- **Introduction Move Analysis** (5%)
- Analyze the Introduction structure (of your chosen journal paper) according to our introduction analysis table.
- Table Upload Deadline: 21:00 on 5 / 3 (Wed.)

- Everyone is required to present a short talk in class, which includes three aspects: **organization**, **sentence pattern**, and **wording**.

Liang et al. 2020. Metabolic Dynamics and Prediction of Gestational Age and Time to Delivery in Pregnant Women. *Cell*.

Introduction

Pregnancy is one of the most critical periods for mother and child (Alkema et al., 2016; Say et al., 2014). It involves a tremendous flow of physiological changes and metabolic adaptations week by week, and even small deviations from the norm might have detrimental consequences at different pregnancy stages. For example, approximately 20% of all pregnancies end in miscarriage (< 20 weeks), and around 10% end in preterm birth (<37 weeks) (Blencowe et al., 2013; Wang et al., 2003). The latter is the leading cause of global neonatal morbidity and mortality (Blencowe et al., 2013). Of 200 million annual pregnancies, 300,000 pregnancy- and birth-related maternal deaths and 7 million perinatal deaths occur worldwide (GBD 2013 Mortality and Causes of Death Collaborators, 2015; Sedgh et al., 2014). With a better understanding of how pregnancy is regulated, even small improvements in obstetric health care can enhance the well-being of many women and children.

An accurate estimation of the timing of pregnancy and birth is important for many clinical decisions in obstetrics, including determination of preterm birth and related treatment regimens (Committee on Obstetric Practice, the American Institute of Ultrasound in Medicine, and the Society for Maternal-Fetal Medicine, 2017). The current clinical method of determining the gestational age and due date is based on information about the last menstruation date, which can be imprecise, or ultrasound imaging, which depends on accessibility at early pregnancy (Committee on Obstetric Practice, 2017). Missing the time window is common even in developed countries: in the United States, approximately 900,000 pregnancies annually do not have a prenatal visit before the second or third trimester (Martin et al., 2018).

The maternal circulatory system connects with the fetal circulatory system through the placenta, carrying bioactive molecules and biomarkers such as steroid hormones, micronutrients, and circulating nucleic acids, whose concentrations alter as gestation progresses (King, 2000; Koh et al., 2014; Tulchinsky et al., 1972; Wang et al., 2016). Recent work on cell-free RNA suggests that markers in maternal blood can be used to estimate gestational age, but sequencing can be expensive and time-consuming, and the accuracy, at present, is not ideal (Ngo et al., 2018). Therefore, a more accurate and cost-effective method for estimating gestational age and delivery time, possibly using blood metabolites, is needed. In addition, current clinical tests often only focus on a few markers, whereas research covering more molecules often examines the profiles at one or a few time points during pregnancy (Bahado-Singh et al., 2012; Dudzik et al., 2014; Gagnon et al., 2008; Kenny et al., 2010; Romero et al., 2010; Sachse et al., 2012; Soldin et al., 2005). Thus, a high-resolution landscape of pregnancy related metabolites during healthy pregnancy and the postpartum period is still poorly understood.

Here, we use untargeted metabolomics (Kaddurah-Daouk et al., 2008) to systematically profile blood metabolites throughout pregnancy with weekly sampling of maternal blood. The study identified a large number of pregnancy-related metabolites and metabolic pathways offering a comprehensive view of the metabolite changes during healthy pregnancy and the postpartum period. Leveraging the high-resolution datasets, we built a metabolic clock that not only predicts gestational age in high accordance with the first-trimester ultrasound, the clinical gold standard, but also recovers personal pregnancy variations undetected by ultrasound but capable of affecting delivery time.

Introduction Analysis Table

Sentence (Underline the signal words)	Stage / Move (functions & purposes)	Tense	Voice	Useful sentence patterns (boldface your practice)
Pregnancy is one of the most critical periods for mother and child (Alkema et al., 2016; Say et al., 2014). It involves a tremendous flow of physiological changes and metabolic adaptations week by week, and even small deviations from the norm might have detrimental consequences at different pregnancy stages. For example, approximately 20% of all pregnancies end in miscarriage (< 20 weeks), and around 10% end in preterm birth (<37 weeks) (Blencowe et al., 2013; Wang et al., 2003). The latter is the leading cause of global neonatal morbidity and mortality (Blencowe et al., 2013). Of 200 million annual pregnancies, 300,000 pregnancy- and birth-related maternal deaths and 7 million perinatal deaths occur worldwide (GBD 2013 Mortality and Causes of Death Collaborators, 2015; Sedgh et al., 2014). With a better understanding of how pregnancy is regulated, even small improvements in obstetric health care can enhance the well-being of many women and children.	• Move 1a: Presenting central problems for mapping out a context	Present; Present; Modal; Present; Present; Present; Present; Modal	Active	"even small deviations from the norm" **This sentence pattern finds its echo at the end of this paragraph.** "The latter is …" **"The latter" means the "10% end in preterm birth"** "With a better understanding of …" **+ Noun Phrase or Noun Clause** "even small improvements in obstetric health" **parallelism of "even … even …"**
The maternal circulatory system connects with the fetal circulatory system through the placenta, carrying bioactive molecules and biomarkers such as steroid hormones, micronutrients, and circulating nucleic acids, whose concentrations alter as gestation progresses (King, 2000; Koh et al., 2014; Tulchinsky et al., 1972; Wang et al., 2016). In addition, current clinical tests often only focus on a few markers, whereas research covering more molecules often examines the profiles at one or a few time points during pregnancy (Bahado-Singh et al., 2012; Dudzik et al., 2014; Gagnon et al., 2008; Kenny et al., 2010; Romero et al., 2010; Sachse et al., 2012; Soldin et al., 2005).	• Move 1b: Introducing & Reviewing items of previous research in the area	Present	Active	"whose concentrations alter as gestation progresses" **= whose concentrations alter in accordance with gestation progress** "current clinical tests often only focus on a few markers, whereas research covering more molecules often examines the profiles" **clinical tests vs. research by using "whereas"**
Recent work on cell-free RNA suggests that markers in maternal blood can be used to estimate gestational age, but sequencing can be expensive and time-consuming, and the accuracy, at present, is not ideal (Ngo et al., 2018). Therefore, a more accurate and cost-effective method for estimating gestational age and delivery time, possibly using blood metabolites, is needed. Thus, a high-resolution landscape of pregnancy related metabolites during healthy pregnancy and the postpartum period is still poorly understood.	• Move 2: Indicating a gap in the previous research / Extending previous studies	Present; Modal; Present; Present; Present	Active; Active; Active; Passive; Passive	"sequencing can be expensive and time-consuming, and the accuracy, at present, is not ideal" **A prediction via "can" is followed by an affirmative be-verb "is" to enhance the tone.** **The passive voice is used twice to indicate a gap.**
Here, we use untargeted metabolomics (Kaddurah-Daouk et al., 2008) to systematically profile blood metabolites throughout pregnancy with weekly sampling of maternal blood.	• Move 3a: Outlining purposes (or stating the nature) of the current study	Present	Active	"Here, we use …" **"Here" can mean both "In this paper" and "Under this circumstance"**
	• Move 3b: Listing research questions or hypotheses			
The study identified a large number of pregnancy-related metabolites and metabolic pathways offering a comprehensive view of the metabolite changes during healthy pregnancy and the postpartum period.	• Move 3c: Announcing major findings	Past	Active	"The study identified a large number of pregnancy-related metabolites and metabolic pathways offering a …" **There should be a comma (,) before "offering"**
Leveraging the high-resolution datasets, we built a metabolic clock that not only predicts gestational age in high accordance with the first-trimester ultrasound, the clinical gold standard, but also recovers personal pregnancy variations undetected by ultrasound but capable of affecting delivery time.	• Move 3d: Stating the value or contribution of the present research	Past	Active	"Leveraging the high-resolution datasets, we built a metabolic clock that not only predicts gestational age […] but also recovers personal pregnancy" **"Leverage" as a verb means "to use something to maximum advantage" (*Fowler's Dictionary*, p. 475)** **Tense inconsistency (among "built," "predicts," and "recovers") is nicely used to indicate a good job done and its potential.**
	• Move 3e: Indicating the structure of the research paper			

Thank you.