Research Methods

CSCI 4108
Summer 2024

Lesson 2: the proposal

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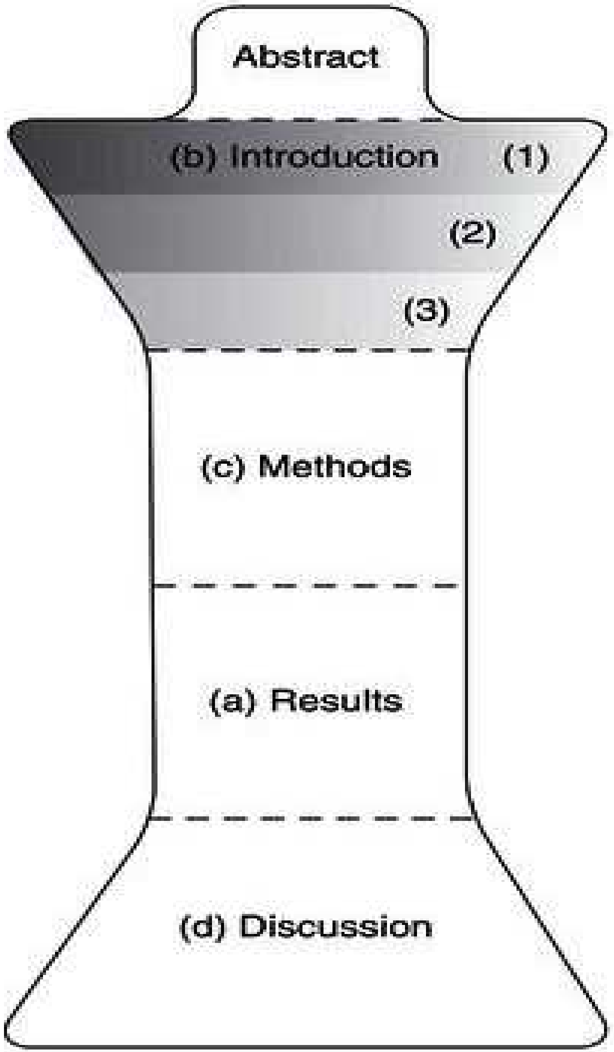
Abstract
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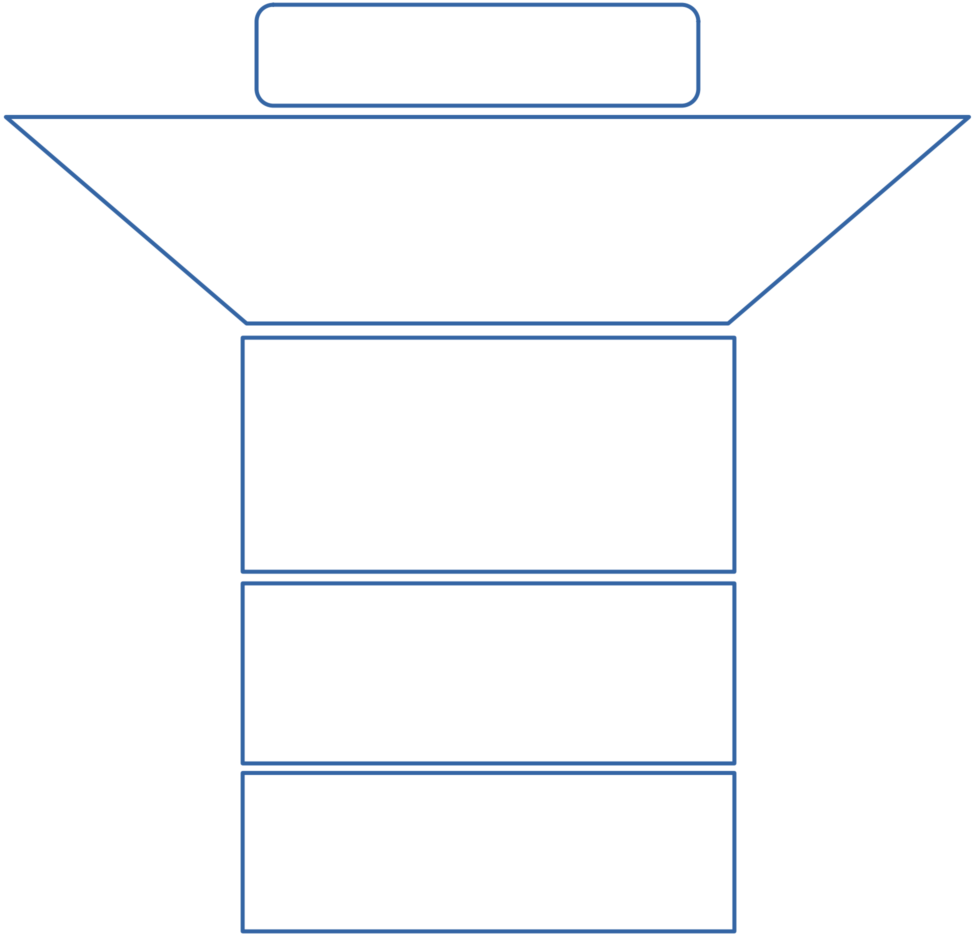

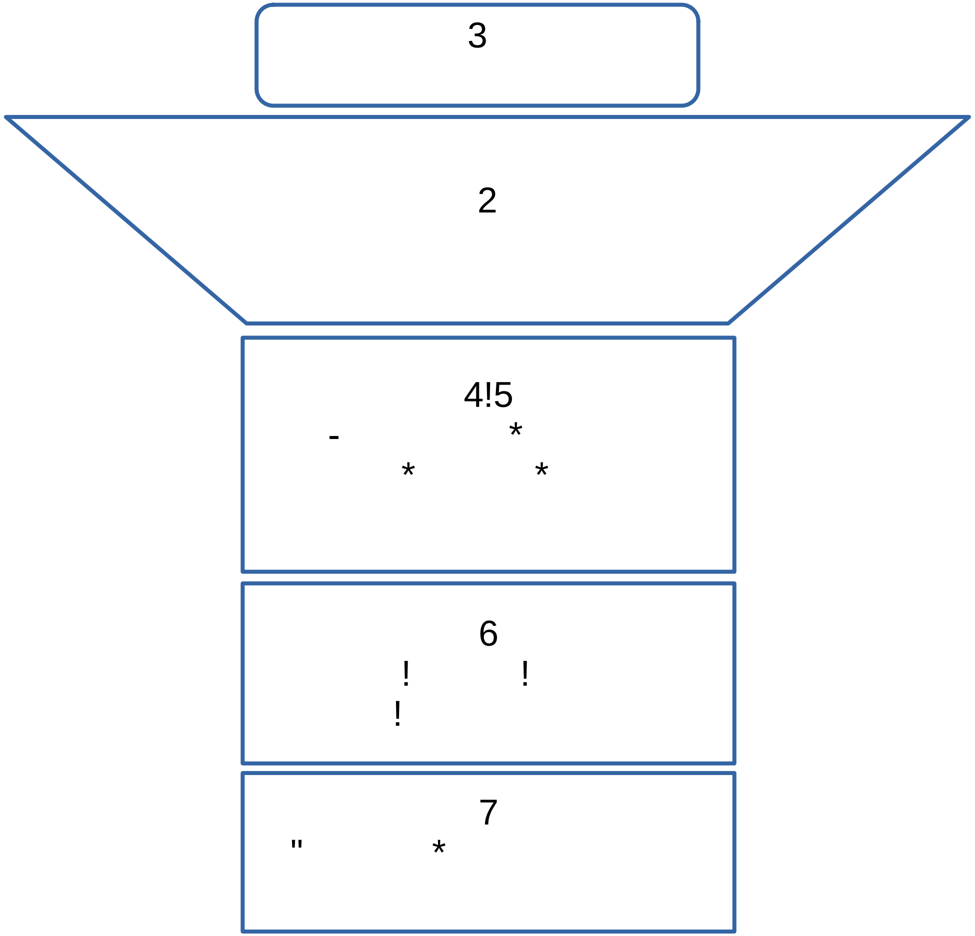

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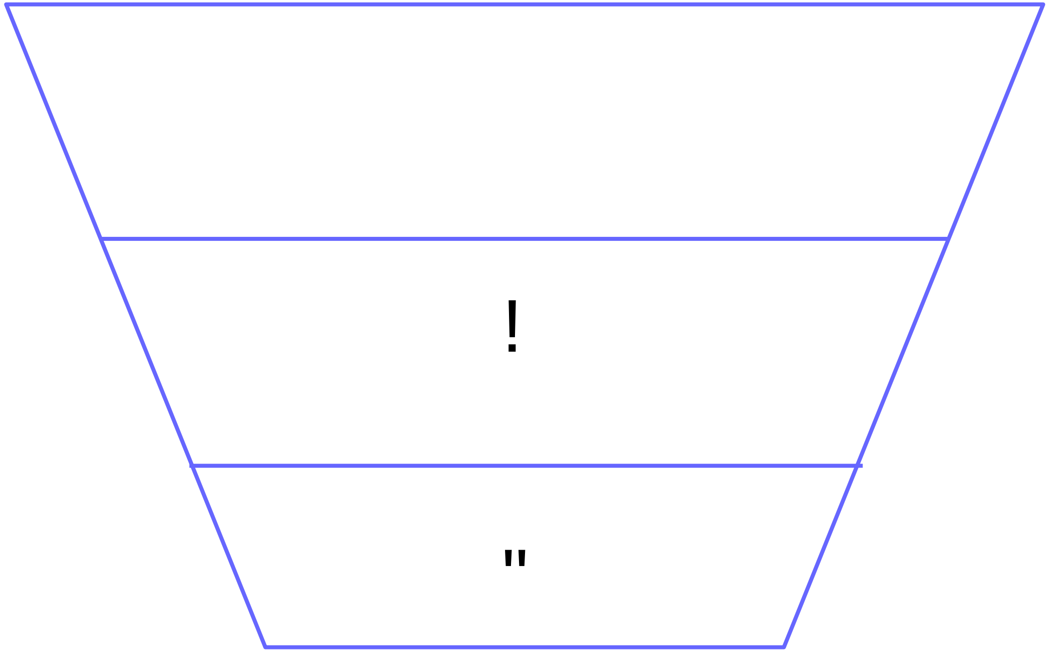

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The synthesis of flexible polymer blends from polylactide and rubber

Introduction.

Polylactide (PLA) has received much attention in recent years due to its biodegradable properties, which offer important economic benefits. PLA is a polymer obtained from corn and is produced by the polymerisation of lactide. It has many possible uses in the biomedical field and has also been investigated as a potential engineering material. However, it has been found to be too weak under impact to be used commercially.

One way to toughen polymers is to incorporate a layer of rubber particles and there has been extensive research regarding the rubber modification of PLA. For example, Penney et al. showed that PLA composites could be prepared using blending techniques and more recently, Hillier established the toughness of such composites. However, although the effect of the rubber particles on the mechanical properties of copolymer systems was demonstrated over two years ago, little attention has been paid to the selection of an appropriate rubber component.

The present paper presents a set of criteria for selecting such a component. On the basis of these criteria it then describes the preparation of a set of polymer blends using PLA and a hydrocarbon rubber (PI). This combination of two mechanistically distinct polymerisations formed a novel copolymer in which the incorporation of PI significantly increased flexibility.

Source: Adapt fromHilary Glasman Deal Science Research Writing For Non.Native Speakers.

The synthesis of flexible polymer blends from polylactide and rubber

Introduction

1 Polylactide (PLA) has received much attention in recent years due to its biodegradable properties, which offer important economic benefits. 2 PLA is a polymer obtained from corn and is produced by the polymerisation of lactide. 3 It has many possible uses in the biomedical field and has also been investigated as a potential engineering material. 4 However, it has been found to be too weak under impact to be used commercially.

5 One way to toughen polymers is to incorporate a layer of rubber particles and there has been extensive research regarding the rubber modification of PLA. 6 For example, Penney et al. showed that PLA composites could be prepared using blending techniques and more recently, Hillier established the toughness of such composites. 7 However, although the effect of the rubber particles on the mechanical properties of copolymer systems was demonstrated over two years ago, little attention has been paid to the selection of an appropriate rubber component.

8 The present paper presents a set of criteria for selecting such a component. 9 On the basis of these criteria it then describes the preparation of a set of polymer blends using PLA and a hydrocarbon rubber (PI). 10 This combination of two mechanistically distinct polymerisations formed a novel copolymer in which the incorporation of PI significantly increased flexibility.

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An example of an Introduction to a Research Report

The synthesis of flexible polymer blends from polylactide and rubber

Writer establishes importance of this research topic

Present simple: to state truths and facts

Present perfect tense: to indicate relevance

Polylactide (PLA) has received much attention in recent years due to its biodegradable properties, which offer important economic benefits. PLA is a polymer obtained from corn and is produced by the polymerization of lactide. It has many possible uses in the biomedical field and it has been investigated as a potential engineering material. However, it has been found to be too weak under impact to be used commercially.

Brief overview of key research projects in this area

A gap in the research

One way to toughen polymers is to incorporate a layer of rubber particles and extensive research has been done into the rubber modification of PLA. For example, Penney et al. (2006) showed that PLA composites could be prepared using blending techniques. More recently, Hillier established the toughness of such composites. However, although researchers have demonstrated the effect of the rubber particles on the mechanical properties of copolymer systems over two years ago, little attention has been paid to the selection of an appropriate rubber component.

Description of current paper

Present simple: to describe this work

Writing is impersonal

The present paper presents a set of criteria for selecting such a component. On the basis of these criteria it then describes the preparation of a set of polymer blends using PLA and a hydro-carbon rubber (PI). This combination of two mechanistically distinct polymerizations formed a novel copolymer in which the incorporation of PI significantly increased flexibility.

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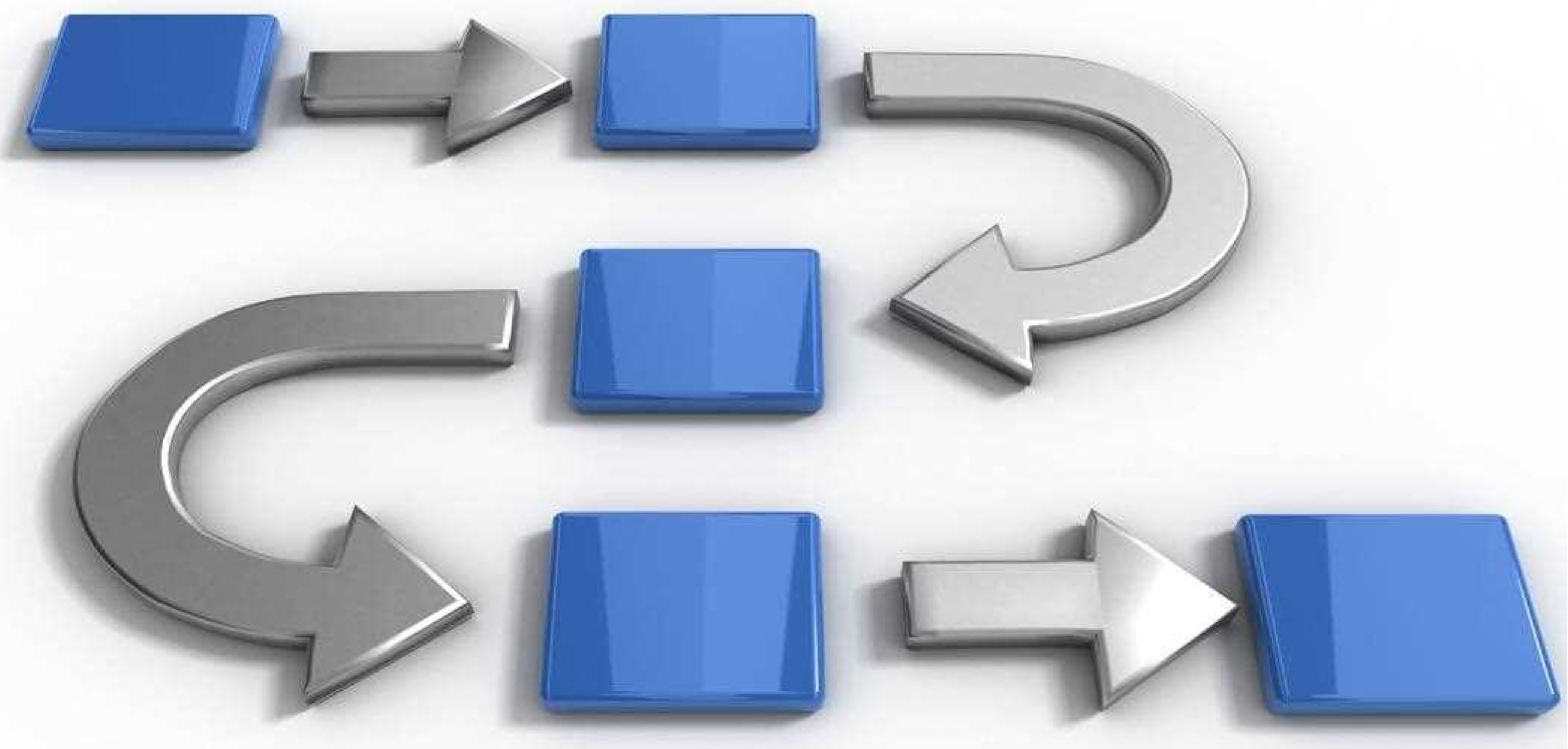

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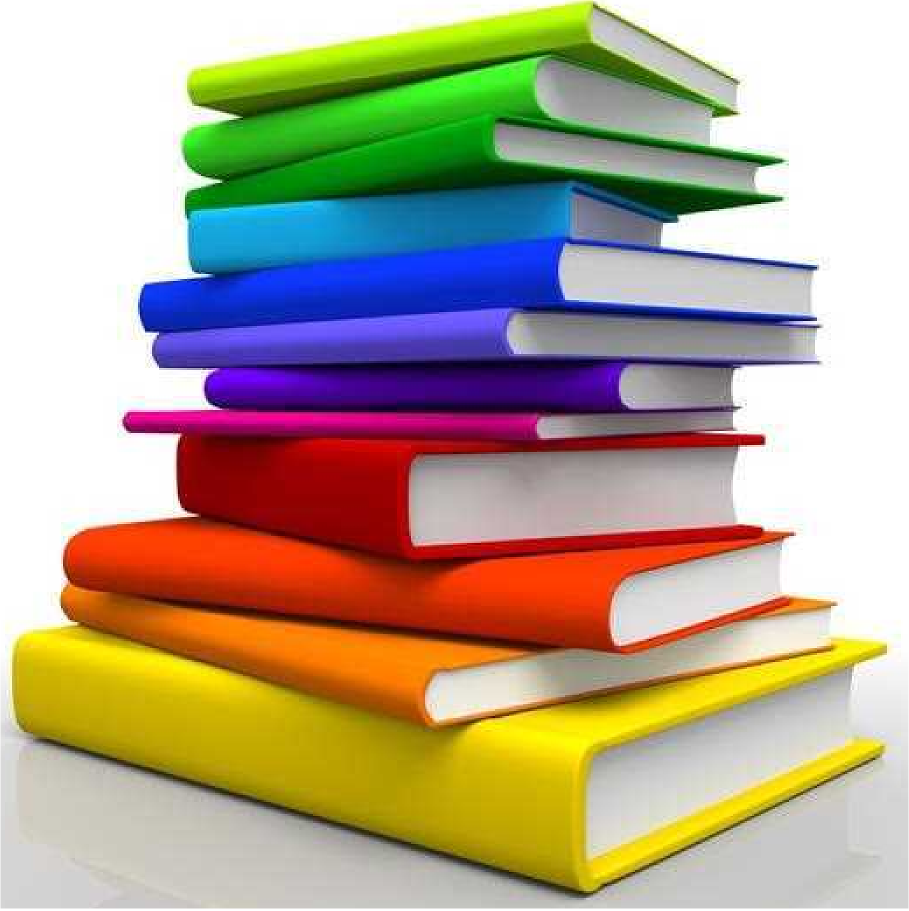

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