## INDUCTIVE AND DEDUCTIVE REASONING IN FAIRY TALES

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#### ABSTRACT

This article explains inductive and deductive reasoning. Besides the article proposes the activities that can help to enhance the reasoning of the primary school children. The activities are selected based on the Uzbek fairy tales that are well-known in Uzbekistan.

**Keywords:** Logic, informal logic, deductive reasoning, logical fallacy, ad hominem, stereotyping, faulty sampling, false dilemma, Post Hoc/Ergo Propter Hoc, formal logic.

**Logic** is a tool to develop reasonable conclusions based on a given set of data. Logic is free of emotion and deals very specifically with information in its purest form.

There are many subsets in the study of logic including informal logic, formal logic, symbolic logic, and mathematical logic. In this article, we will discuss informal and formal logic and when it is appropriately used.

Informal logic is the mode used in everyday reasoning and argument analysis. Informal logic consists of two types of reasoning: deductive and inductive.

Deductive reasoning is used heavily in science. However, beyond that, one is likely to use deductive reasoning within one's daily life both at work on a fairly regular basis. For example, a manager of a company might notice a budget has been exceeded and deduces that travel expenses should be cut back to manage a business's finances better<sup>1</sup>.

Deductive reasoning uses information from a large set and applies that information to any member of that set.

For example:

All students of SamSIFL are clever (major evidence or premise) Madina is a student of SamSIFL (minor evidence or premise) Therefore, Madina is clever (conclusion)

The major premise makes a statement concerning students of the institute. The minor premise identifies a student of that institute. The conclusion declares that since Madina is a student of that institute, then she must have the characteristics attributed to the students as a whole. Another type of logical reasoning is inductive. Inductive reasoning uses specific data to form a larger, generalized conclusion. It is considered the opposite of deductive reasoning. For example:

- 1. The flamingos here are all pink.
- 2. All flamingos I've ever seen are pink.
- 3. All flamingos must be pink.

<sup>&</sup>lt;sup>1</sup> Oussi, Yassine. (2020). Understanding Inductive reasoning and deductive reasoning.

There are some problems with these examples. All students of SamSIFL are certainly not clever and not all flamingoes are pink.

Deductive reasoning only works when both major and minor premises are true. Using words like 'all' will generally falsify your statement (only one example of the contrary is needed). However, if you use words like 'many' or 'some,' it is less likely that your premises will be rejected. So, when using this type of reasoning, make sure your premises are verifiable.

Inductive reasoning can be compared to assumptions based on data. For example, pattern recognition. Consider a basket full of mangos, and you want to find out if they are raw or ripe, we pick up a mongo and observe it, let say we find the mongo to be raw, and we did the same with four mangos, and all of them are raw. We might use inductive reasoning to determine that all the mangos in the basket are raw<sup>2</sup>.

Inductive reasoning requires lots of data. The more data you present, the easier it is for your reader to make the necessary leap to your conclusion. The more data, the shorter the leap. Two data points regarding driving time are not enough. Those days happened to be sunny and clear. There was no traffic jam. There were no accidents.

**Logical fallacies** are incorrectly reasoned facts. There are many logical fallacies, but the more popular ones are as follows:

*Ad Hominem*: The literal translation of this term is 'to the person.' This is when we attack people instead of attacking the argument. Instead of saying that people are stupid for believing some argument a person's lack of data should be attacked.

**Stereotyping**: We use stereotypes all of the time, sometimes without even knowing it. Stating that all students are clever or not clever is a stereotype.

Faulty Sampling: Our argument concerning the fact that all flamingoes are pink is a faulty sample.

**False Dilemma**: Oftentimes we oversimplify. A false dilemma implies that there are only two options. For example, the statement "You are either with us or against us" is a false dilemma. The third option is indifference.

**Post Hoc/Ergo Propter Hoc**: The Latin translation is "It happened before this, therefore it happened because of this." Statements like, "Every time I wash my car, it rains," is committing the post hoc fallacy.

**Formal logic** deals with deductive reasoning and the validity of the inferences produced. For an argument to work, the conclusion must logically follow the premises and the premises must be true. For example:

Every English teacher must have C1 level.

Some of my friends are English teachers.

Therefore, some of my friends have at least a C1 level in English.

In formal logic, this type of inference would be represented thusly: Every A is a B. Some Cs are As. Therefore, some Cs are Bs. No matter what premise is used to represent the variables A, B, and C, as long as that premise is true, the conclusion some Cs are Bs will always follow. Should the conclusion not follow, the argument is invalid.

Taking into consideration above information I used the following activity with the fairy tale "Zumrad and Kimmat". "Zumrad and Kimmat" is one of the most well-known fairy tales in Uzbekistan. Every child is told this fairy tale from an early age. However, students are given time to revise the fairy tale. When they finish reading, teachers can use the activities below.

<sup>&</sup>lt;sup>2</sup> Oussi, Yassine. (2020). Understanding Inductive reasoning and deductive reasoning.

Activity 1. Answer the question.

Who is responsible for leaving Zumrad in the forest? Father or stepmother?

# Activity 2. Thinking.

Think about the factors which influenced stepmother's decision to send Zumrad to the forest. Write in the table below.

Zumrad's father did not resist his wife's order. What factors influenced this? Write in the table.

Activity 3. Critical thinking. Fill in the table below about Zumrad, Kimmat and yourself. If the two answers are the same, put a tick in the third column. Then compare your answers with your friend's.

	Zumrad	Kimmat	You (now or in the	The same answer
			future)	
City or village?				
Profession?				
Language?				
Age?				
Interests ?				

Activity 4. Critical Thinking: Conclusion. We can conclude from the fairy tale that Zumrad is a hard worker. Find and underline the sentences in the story that represent this.

From the fairy tale, we can conclude that Kimmat is lazy. Find and underline the sentences in the story that represent this.

**Note:** To infer is to understand what the writer did not say directly. When you make inferences about someone, for example, you infer information about them based on what they say or do. **Activity 5.** Stereotypes: the stepdaughter is always good, the stepmother is always bad, the youngest son is always smart, the elder sons are stupid. Why is that? Maybe the other way around? Maybe Kimmat also has good sides. Or maybe Zumrad has a bad side. Think about the good points of Kimmat and the bad points of Zumrad. Fill in the table.

Positive qualities of Kimmat	Negative qualities of Zumrad

Another set of activities can be used with the fairy tale "The Tiger and the Mouse". Activity 1. The PMI (Plus Minus Interesting) strategy

The tiger should have eaten the mouse.

The mouse shouldn't have helped the tiger because he made fun of her.

Plus	Minus	Interesting

Activity 2. Exploring hidden messages

People don't always say what they mean. For example, imagine you show a short story you've written to a friend and ask for their opinion. What do you think when they tell you, "I thought the beginning was great"? Was the beginning really good or are they trying to hide the fact that they didn't really like the rest of it? People do this for a number of reasons: they don't want to be rude, they're not brave enough to tell the truth or they don't really have an opinion.

1. Look at these sentences. What do you think they might really be hiding?

The tiger laughed his guts out.

The mouse, having escaped the danger, thought, "How good, I have become friends with the tiger," and happily continued on his way.

Activity 3. Read the controversial statements in the chart and think about your opinions. Are you in favor of or opposed to the idea expressed in each statement? Then check the boxes that reflect your opinions.

	In	Opposed
	favor	
The tiger should not help the mouse.		
The mouse should not help the tiger.		
The tiger shouldn't have laughed at the mouse.		

Activity 4. Making Inferences.

From the fairy tale, we can infer that the mouse is naïve. Find and underline sentences in the fairy tale that show this.

**Note:** Inferring means understanding something that the writer does not say directly. When you make inferences about a person, for example, you guess information about that person by the things he or she says or does.

Activity 5. Write answers to the questions.

Would you be interested in being the "tiger" in this fairy tale? Would you be interested in being the "mouse" in this fairy tale? Why, or why not? Activity 6. Synthesizing. Complete the Venn diagram to compare the tiger and the mouse.



Activity 7. Analyzing an Argument. With a partner, complete the chart below:

How was the tiger described in the fairy	
tale? Explain your answer.	
How was the mouse described in the	
fairy tale? Explain your answer.	

Activity 8. Are these statements from the fairy tale true (T) or false (F)

- 1. The tiger wanted to eat the mouse up.
- 2. The mouse asked the tiger to let her go.
- 3. The tiger ate the mouse up.
- 4. The tiger was trapped and roared from pain.
- 5. The mouse tried to release him but could not.

By using these activities, students can enhance their logical reasoning and critical thinking.

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