WOLLEGA UNIVESITY

COLLEGE OF SOCIAL SCIENCE AND HUMANITIES

DEPARTMENT OF CIVICS AND ETHICAL STUDIES

LOGIC AND CRITICAL THINKING (LoCT1011) MODULE

(3 CREDIT HOURS)

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Contents

Module Introduction

Dear student, the purpose of this module is to introduce you to the study of logic. Logic is the study of the methods and principles used to distinguish correct reasoning from incorrect reasoning. There are objective criteria by which correct reasoning may be defined. The aim of the study of logic is to discover and make available those criteria that can be used to test arguments, and to sort good arguments from bad ones. The logician is concerned with reasoning on every subject; science and medicine; ethics and law, politics and commerce, sports and games, and even the simple affairs of everyday life.

Course Content

The module has six units. Unit one introduces philosophy, unit two introduces the concepts of arguments. Here the nature, various forms and strength of arguments are considered. Unit three looks at the nature of definitions. Here the focus will be on the various types of function language plays and developing some techniques in the move towards a correct usage of language. Unit four introduces the concept of critical thinking. Unit five looks at the nature of fallacies. Fallacies being an error in reasoning takes different forms. This unit introduces and exposes some of the major forms of fallacies or errors in reasoning that occur in our day to day lives.

Unit six tries to consider the nature of categorical propositions. Here the focus will be on categorical propositions: components, attributes, distribution, Venn diagram, logical operations.

In the module, in text questions, activities and self-check exercises are included. Therefore, you are expected to do all the exercises to meet the objectives of learning stated in each unit and section of the module.

Objectives

After completing your study of this module, you will be able to ;

-familiarize yourself with the fundamental concepts of logic

-develop the skills required to construct sound arguments of their own and the ability to critically evaluate the arguments of others

-cultivate the habits of critical thinking and develop sensitivity to the clear and accurate use of language

-point out the manifestations of rational argumentation in everyday communication.

CHAPTER ONE

LOGIC AND PHILOSOPHY

Meaning and Nature of Philosophy

> ***Activity # 1:*** *Do you have a prior awareness of philosophy? If so, how do you understand philosophy?*

It is important to note first that giving a clear-cut definition of philosophy is difficult. It may be easy to define other disciplines, such as, chemistry, physics, geography, etc in terms of a subject matter, for they have their own specific subject matters to primarily deal with. However, it is difficult to do the same with philosophy, because philosophy has no a specific subject matter to primarily deal with. Philosophy deals primarily with issues. What contents philosophy has are not the specific subject matters, but issues, which are universal in nature. However, this should not lead us into thinking that philosophy is incomprehensible. It is only to say that whenever you want to understand philosophy, it is better to read different thoughts of philosophers, consciously see its salient features by yourself, participate in it, and do it.

Philosophy is not as elusive as it is often thought to be. Nor is it remote from our various problems. It is unanimously agreed that the best way to learn and understand philosophy is to *philosophize*; i.e., to be confronted with philosophical questions, to use philosophical language, to become acquainted with differing philosophical positions and maneuvers, to read the philosophers themselves, and to grapple with the issues for oneself. Socrates once stated that ***"Wonder is the feeling of a philosopher, and philosophy begins in wonder"***. It is true that most of us may not have a clear knowledge about the history, nature, language, and issues of philosophy. But, we all think and reflect in our own way about issues that matter us most. We all have touched and moved by the feelings of wonder from which all philosophy derives. Thus, we all participate, more or less, in philosophical issues, even though thinking alone cannot make us philosophers.

If, however, you still want to find its clear-cut definition, it is better to refer to the etymology of the word itself, instead of trying to associate it with a certain specific subject matter. Etymologically, the word "*philosophy*" comes from two Greek words: "*philo*" and "*sophia*", which mean "*love*" and "*wisdom*", respectively. Thus, the literal definition of philosophy is ***"love of wisdom".*** The ancient Greek thinker Pythagoras was the first to use the word "*philosopher*" to call a person who clearly shows a marked curiosity in the things he experiences. Anyone who raises questions, such as Does God exists? What is reality? What is the ultimate source of Being? What is knowledge? What does it mean to know? How do we come to know? What is value?, and the like, is really showing a curiosity that can be described as a vital concern for becoming wise about the phenomena of the world and the human experiences. Therefore, seeking wisdom is

among the various essences of philosophy that it has got from its etymological definition. Nevertheless, this is not sufficient by itself to understand philosophy, for not all wisdoms are philosophy.

Activity # 2: *what do you think is the wisdom that philosophers seek?*

The wisdom that philosophers seek is not the wisdom of the expertise or technical skills of professionals. Someone may be encyclopedic, and thus seemingly intelligent, but he may actually be foolish when it comes to understanding the meaning and significance of what he knows. According to Socrates, wisdom consists of a critical habit and eternal vigilance about all things and a reverence for truth, whatever its form, and wherever its place. Based on the Socratic understanding of wisdom, philosophy, as a pursuit of wisdom, is, thus, the development of critical habits, the continuous search for truth, and the questioning of the apparent.

Activity # 3: *What do you think does it mean to question the apparent? Does it mean to deny the fact or the practical reality?*

To interrogate the obvious means to deal creatively with the phenomenal world, to go beyond the common understanding, and to speculate about things that other people accept with no doubt. But, questioning/criticism is not the final end of philosophy, though raising the right question is often taken not only as the beginning and direction of philosophy but also as its essence. Raising the right question is an art that includes the ability to foresee what is not readily obvious and to imagine different possibilities and alternatives of approaching the apparent. When we ultimately wonder about the existing world, and thus raise different questions about its order, each question moves us from the phenomenal facts to a profound speculation. The philosophical enterprise, as Vincent Barry stated, is ***"an active imaginative process of formulating proper questions and resolving them by rigorous, persistent analysis".***

Therefore, *philosophy is a rational and critical enterprise that tries to formulate and answer fundamental questions through an intensive application of reason*- an application that draws on analysis, comparison, and evaluation. It involves reason, rational criticism, examination, and analysis. Accordingly, we can say that Philosophy has a ***constructive side***, for it attempts to formulate rationally defensible answers to certain fundamental questions concerning the nature of reality, the nature of value, and the nature of knowledge and truth. At the same time, its ***critical side*** is manifested when it deals with giving a rational critic, analysis, clarification, and evaluation of answers given to basic metaphysical, epistemological, and axiological questions.

The other thing, which is worthy of noting, is that ***philosophy is an activity***. It is not something that can be easily mastered or learned in schools. A philosopher is a great philosopher, not because he mastered philosophy, but because he did it. It is not his theory, but his extraordinary ability to critically think, to

conceptualize, to analyze, to compare, to evaluate, and to understand- i.e., to *philosophize*- that makes him so. Of course, the product of philosophizing is philosophy as a product. However, what makes someone a great philosopher is not the produced philosophy, but his/her outstanding ability to philosophize.

Basic Features of Philosophy

> ***Activity # 1:*** *List the possible features of philosophy you could think of based on your previous lessons and discuss about them with the student(s) beside you.*

The general features of philosophy can be summarized as follows:

1) *Philosophy is a set of views or beliefs about life and the universe, which are often held uncritically.*

We refer to this meaning as the informal sense of philosophy or "having" a philosophy. Usually when a person says "my philosophy is," he or she is referring to an informal personal attitude to whatever topic is being discussed.

2) *Philosophy is a process of reflecting on and criticizing our most deeply held conceptions and beliefs.*

This is the formal sense of "doing" philosophy. These two senses of philosophy-"having" and "doing"- cannot be treated entirely independent of each other, if we did not *have* a philosophy in the formal, personal sense, then we could not *do* a philosophy in the critical, reflective sense. However, having a philosophy is not sufficient for doing philosophy. A genuine philosophical attitude is searching and critical; it is open-minded and tolerant- willing to look at all sides of an issue without prejudice. To philosophize is not merely to read and know philosophy; there are skills of argumentation to be mastered, techniques of analysis to be employed, and a body of material to be appropriated such that we become able to think philosophically.

3) *Philosophy is a rational attempt to look at the world as a whole.*

Philosophy seeks to combine the conclusions of the various sciences and human experience into some kind of consistent worldview. Philosophers wish to see life, not with the specialized slant of the scientist or the businessperson or the artist, but with the overall view of someone cognizant of life as a totality. Philosophy's task is to give a view of the whole, a life and a worldview, and to integrate the knowledge of the sciences with that of other disciplines to achieve a consistent whole. Philosophy, according to this view, attempts to bring the results of human inquiry- religious, historical, and scientific into some meaningful interpretation that provides knowledge and insight for our lives.

4) *Philosophy is the logical analysis of language and the clarification of the meaning of words and concepts.*

Certainly, this is one function of philosophy. In fact, nearly all philosophers have used methods of analysis and have sought to clarify the meaning of terms and the use of language. Some philosophers see this as the main task of philosophy, and a few claim this is the only legitimate function of philosophy. Such persons consider philosophy a specialized field serving the sciences and aiding in the clarification of language rather than a broad field reflecting on all of life's experiences. This outlook has gained considerable support during the twentieth century. It would limit what we call *knowledge* to statements about *observable facts* and their interrelations i.e., to the business of the various sciences. Not all linguistic analysts, however, define *knowledge* so narrowly. Although they do reject and try to "clean up" many non-scientific assertions, many of them think that we can have knowledge of ethical principles and the like, although this knowledge is also experientially derived. Those who take the narrower view neglect, when they do not deny, all generalized worldviews and life views, as well as traditional moral philosophy and theology. From this narrower point of view, the aim of philosophy is to expose confusion and nonsense and to clarify the meaning and use of terms in science and everyday affairs.

5) *Philosophy is a group of perennial problems that interest people and for which philosophers always have sought answers.*

Philosophy presses its inquiry into the deepest problems of human existence. Some of the philosophical questions raised in the past have been answered in a manner satisfactory to the majority of philosophers. Many questions, however, have been answered only tentatively, and many problems remain unsolved. What are philosophical questions? The question "Did Ram make a false statement on his income tax return?" is merely a question of fact. However, the questions "What is truth?" and "What is the distinction between right and wrong?" have philosophical importance. Sometimes we think seriously about fundamental life issues: What is life and why am I here? Why is there anything at all? What is the place of life in this great universe? Is the universe friendly or unfriendly? Do things operate by chance or through sheer mechanism, or is there some plan, purpose, or intelligence at the heart of things? Is my life controlled by outside forces, or do I have a determining or even a partial degree of control? Why do people struggle and strive for their rights, for justice, for better things in the future? What do concepts like "right" and "justice" means, and what are the marks of a good society? Often men and women have been asked to sacrifice their lives, if need be, for certain values and ideals. What are the genuine values of life and how can it attained? Is there really a fundamental distinction between right and wrong, or is it just a matter of one's own opinions? What is beauty? Should religion count in a person's life? Is it intellectually valid to believe in God? Is there a possibility of a "life after death?" Is there any way we can get an answer to these and many related questions? Where does knowledge come from, and can we have any assurances that anything is true?

The above questions are all philosophical. The attempt to seek answers or solutions to them has given rise to theories and systems of thought, such as idealism, realism, pragmatism, analytic philosophy, existentialism, phenomenology, and process philosophy. Philosophy also means the various theories or systems of thought developed by the great philosophers, such as Socrates, Plato, Aristotle, Augustine, Aquinas, Descartes, Spinoza, Locke, Berkeley, Kant, Hegel, Nietzsche, Royce, James, Dewey, Whitehead, and others. Without these people and their thoughts, philosophy would not have the rich content it has today. Even though we may be unconscious of the fact, we are constantly influenced by ideas that have come down to us in the traditions of society.

Core Fields of Philosophy

Metaphysics

> ***Activity # 1: -*** *What do you think is metaphysics? List any question that you might think is a metaphysical question. Show your question to student(s) beside you, and discuss about your questions together.*

Metaphysics is the branch of philosophy that studies the ultimate nature of reality or existence. It deal with issues of reality, God, freedom, soul/immortality, the mind-body problem, form and substance relationship, cause and effect relationship, and other related issues. Metaphysicians seek an irreducible foundation of reality or 'first principles' from which absolute knowledge or truth can be induced and deduced. The term *metaphysics* is derived from the Greek *words "meta" means* ("beyond", "upon" or "after") *and physika*, means ("physics"). Literally, it refers 'those things after the physics.' Aristotle's writings on 'first philosophy' came after his treatise on physics, therefore, Aristotle's editor, Andronicus of Rhodes, named them metaphysics.

Here are some of the questions that Metaphysics primarily deals with:

- *What is reality?*
- *What is the ultimately real?*
- *What is the nature of the ultimate reality?*
- *Is it one thing or is it many different things?*
- *Can reality be grasped by the senses, or it is transcendent?*
- *What makes reality different from a mere appearance?*
- *What is mind, and what is its relation to the body?*
- *Is there a cause and effect relationship between reality and appearance?*
- *Does God exist, and if so, can we prove it?*
- *Are human actions free, or predetermined by a supernatural force?*

- *What is human being? A thinking mind? A perishable body? Or a combination of both?*
- *What is time?*
- *What is the meaning of life?*

At first, questions like, 'What is real?' seem too simple to bother asking. But consider George Knight's example about the existence of a floor and one will see that the question has far reaching implications: What is exactly the nature of the floor upon which you stand? It may seem to have a rather straightforward existence. It is obviously flat, solid, and smooth; it has a particular color; it is composed of an identifiable material, such as wood or concrete; and it supports your weight. Suppose, however, that a physicist enters the room and questioned about the reality of the floor. She will reply that the floor is made of molecules; that molecules consist of atoms, electrons, protons, and neutrons; and these, finally, of electric energy alone. A third position is offered by a passing chemist. To him the floor is a hotbed of hydrocarbons associated in a particular way and subject to certain kinds of environmental influences, such as heat, cold, wetness, dryness, and oxidation.

It is evident that the question of reality is not as simplistic as it appears. If the reality of a common floor is confusing, what about the larger problems that presents themselves as humankind searches for the ultimate reality of the universe?

Metaphysical questions are the most basic to ask because they provide the foundation upon which all subsequent inquiry is based. Metaphysical questions may be divided into four subsets or aspects.

i) ***Cosmological Aspect*:** Cosmology consists in the study of theories about the origin, nature, and development of the universe as an orderly system. Questions such as these populate the realm of cosmology: "How did the universe originate and develop? Did it come about by accident or design? Does its existence have any purpose?"
ii) ***Theological Aspect:*** Theology is that part of religious theory that deals with conceptions of and about God. "Is there a God? If so, is there one or more than one? What are the attributes of God? If God is both all good and all powerful, why does evil exist? If God exists, what is His relationship to human beings and the 'real' world of everyday life?"
iii) ***Anthropological Aspect:*** Anthropology deals with the study of human beings and asks questions like the following: What is the relation between mind and body? Is mind more fundamental than body, with body depending on mind, or vice versa? What is humanity's moral status? Are people born good, evil, or morally neutral? To what extent are individuals free? Do they have free will, or are their thoughts and actions determined by their environment, inheritance, or a divine being? Does each person have a soul? If so, what is it? People have obviously adopted different positions on these

questions, and those positions influence their political, social, religious, and educational ideals and practices.

iv) ***Ontological Aspect :***Ontology is the study of the nature of existence, or what it means for anything to exist. Several questions are central to ontology: "Is basic reality found in matter or physical energy (the world we can sense), or is it found in spirit or spiritual energy? Is it composed of one element (e.g., matter or spirit), or two (e.g., matter and spirit), or many?" "Is reality orderly and lawful in itself, or is it merely orderable by the human mind? Is it fixed and stable, or is change its central feature? Is this reality friendly, unfriendly, or neutral toward humanity?"

Epistemology

> ***Activity # 2: -*** *What do you think is epistemology? List any question that you might think is an epistemological question. Show your question to student(s) beside you, and discuss about your questions together.*

Epistemology is the other field of philosophy that studies about the nature, scope, meaning, and possibility of knowledge. It deals with issues of knowledge, opinion, truth, falsity, reason, experience, and faith. Epistemology is also referred to as "theory of knowledge".

Etymologically, the word epistemology has been derived from the Greek words *episteme*, meaning "knowledge, understanding", and *logos*, meaning "study of". In other words, we can say that Epistemology is the study of the nature, source, and validity of knowledge. It seeks to answer of the basic questions as "What is true?" and "How do we know?" Thus, epistemology covers two areas: the *content* of thought and *thought* itself. The study of epistemology deals with issues related to the dependability of knowledge and the validity of the sources through which we gain information.

The following are among the questions/issues with which Epistemology deals:

- *What is knowledge?*
- *What does it mean to know?*
- *What is the source of knowledge? Experience? Reason? Or both?*
- *How can we be sure that what we perceive through our senses is correct?*
- *What makes knowledge different from belief or opinion?*
- *What is truth, and how can we know a statement is true?*
- *Can reason really help us to know phenomenal things without being informed by sense experiences?*
- *Can our sense experience really help us to know things beyond our perception without the assistance of our reasoning ability?*
- *What is the relationship and difference between faith and reason?*

Epistemology seeks answers to a number of fundamental issues. One is whether reality can even be known. *Skepticism* in its narrow sense is the position claiming that people cannot acquire reliable knowledge and that any search for truth is in vain. That thought was well expressed by Gorgias, the Greek Sophist who asserted that nothing exists, and that if it did, we could not know it. A full-blown skepticism would make intelligent action impossible. A term closely related to skepticism is *agnosticism*. Agnosticism is a profession of ignorance in reference to the existence or nonexistence of God.

Most people claim that reality can be known. However, once they have taken that position, they must decide through what sources reality may be known, and must have some concept of how to judge the validity of their knowledge. A second issue foundational to epistemology is whether all truth is relative, or whether some truths are absolute. Is all truth subject to change? Is it possible that what is true today may be false tomorrow? If the answer is "Yes" to the previous questions, such truths are relative. If, however, there is Absolute Truth, such Truth is eternally and universally true irrespective of time or place. Closely related to the issue of the relativity and absoluteness of truth are the questions of whether knowledge is subjective or objective, and whether there is truth that is independent of human experience.

A major aspect of epistemology relates to the sources of human knowledge. If one accepts the fact that there is truth and even Truth in the universe, how can human beings comprehend such truths? How do they become human knowledge? Central to most people's answer to that question is ***empiricism*** (knowledge obtained through the senses). Empirical knowledge appears to be built into the very nature of human experience. Thus, when individuals walk out of doors on a spring day and see the beauty of the landscape, hear the song of a bird, feel the warm rays of the sun, and smell the fragrance of the blossoms, they "know" that it is spring. Sensory knowing for humans is immediate and universal, and in many ways forms the basis of much of human knowledge.

The existence of sensory data cannot be denied. Most people accept it uncritically as representing "reality." The danger of naively embracing this approach is that data obtained from the human senses have been demonstrated to be both incomplete and undependable. (For example, most people have been confronted with the contradiction of seeing a stick that looks bent when partially submerged in water but appears to be straight when examined in the air.) Fatigue, frustration, and illness also distort and limit sensory perception. In addition, there are sound and light waves that are inaudible and invisible to unaided human perception.

Humans have invented scientific instruments to extend the range of their senses, but it is impossible to ascertain the exact dependability of these instruments since no one knows the total effect of the human mind in recording, interpreting, and distorting sensual perception. Confidence in these instruments is built upon speculative metaphysical theories whose validity has been reinforced by experimentation in which predictions have been verified through the use of a theoretical construct or hypothesis. In general, sensory

knowledge is built upon assumptions that must be accepted by faith in the dependability of human sensory mechanisms. The advantage of empirical knowledge is that many sensory experiences and experiments are open to both replication and public examination.

A second important source of human knowledge is reason. The view that reasoning, thought, or logic is the central factor in knowledge is known as ***rationalism***. The rationalist, in emphasizing humanity's power of thought and the mind's contributions to knowledge, is likely to claim that the senses alone cannot provide universal, valid judgments that are consistent with one another. From this perspective, the sensations and experiences humans obtain through their senses are the raw material of knowledge. These sensations must be organized by the mind into a meaningful system before they become knowledge. Rationalism in a less extreme form claims that people have the power to know with certainty various truths about the universe that the senses alone cannot give. In its extreme form, rationalism claims that humans are capable of arriving at irrefutable knowledge independently of sensory experience. Formal logic is a tool used by rationalists. Systems of logic have the advantage of possessing internal consistency, but they risk being disconnected from the external world. Systems of thought based upon logic are only as valid as the premises upon which they are built.

A third source of human knowledge is ***intuition***- the direct apprehension of knowledge that is not derived from conscious reasoning or immediate sense perception. In the literature dealing with intuition, one often finds such expressions as "immediate feeling of certainty." Intuition occurs beneath the threshold of consciousness and is often experienced as a sudden flash of insight. Intuition has been claimed under varying circumstances as a source of both religious and secular knowledge. Certainly many scientific breakthroughs have been initiated by intuitive hunches that were confirmed by experimentation. The weakness or danger of intuition is that it does not appear to be a safe method of obtaining knowledge when used alone. It goes astray very easily and may lead to absurd claims unless it is controlled by or checked against other methods of knowing. Intuitive knowledge, however, has the distinct advantage of being able to bypass the limitations of human experience.

A fourth influential source of knowledge throughout the span of human history has been ***revelation***. Revealed knowledge has been of prime importance in the field of religion. It differs from all other sources of knowledge because it presupposes a transcendent supernatural reality that breaks into the natural order. Christians believe that such revelation is God's communication concerning the divine will. Believers in supernatural revelation hold that this form of knowledge has the distinct advantage of being an omniscient source of information that is not available through other epistemological methods. The truth revealed through this source is believed by Christians to be absolute and uncontaminated. On the other hand, it is generally realized that distortion of revealed truth can occur in the process of human interpretation. Some

people assert that a major disadvantage of revealed knowledge is that it must be accepted by faith and cannot be proved or disproved empirically.

A fifth source of human knowledge, though not a philosophical position, is ***authority***. Authoritative knowledge is accepted as true because it comes from experts or has been sanctified over time as tradition. In the classroom, the most common source of information is some authority, such as a textbook, teacher, or reference work. Accepting authority as a source of knowledge has its advantages as well as its dangers. Civilization would certainly stagnate if people refused to accept any statement unless they personally verified it through direct, firsthand experience. On the other hand, if authoritative knowledge is built upon a foundation of incorrect assumptions, then such knowledge will surely be distorted.

Axiology and Logic

Axiology

> ***Activity # 1: -*** *What do you think is Axiology? List any question that you might think is an axiological question. Show your question to student(s) beside you, and discuss about your questions together.*

Axiology is the study or theory of value. The term Axiology stems from two Greek words- "Axios", meaning "value, worth", and "logos", meaning "reason/ theory/ symbol / science/study of". Hence, Axiology is the philosophical study of value, which originally meant the worth of something. Axiology asks the philosophical questions of values that deal with notions of what a person or a society regards as good or preferable, such as:

- *What is a value?*
- *Where do values come from?*
- *How do we justify our values?*
- *How do we know what is valuable?*
- *What is the relationship between values and knowledge?*
- *What kinds of values exist?*
- *Can it be demonstrated that one value is better than another?*
- *Who benefits from values?*
- *Etc.*

Axiology deals with the above and related issues of value in three areas, namely *Ethics, Aesthetics, and Social/Political Philosophy*.

Ethics

> ***Activity # 2: -*** *How do you define ethics? What ethical rules, principles, and standards do you know and follow, and why? Discuss about it with the student(s) beside you.*

Ethics, which is also known as *Moral Philosophy*, is a science that deals with the philosophical study of moral principles, values, codes, and rules, which may be used as standards for determining what kind of human conduct/action is said to be good or bad, right or wrong. Ethics has three main branches: meta-ethics, normative ethics, and applied ethics. Ethics raises various questions including:

- *What is good/bad?*
- *What is right/wrong?*
- *Is it the Right Principle or the Good End that makes human action/conduct moral?*
- *Is an action right because of its good end, or it is good because of its right principle?*
- *Are moral principles universal, objective, and unconditional, or relative, subjective and conditional?*
- *What is the ultimate foundation of moral principles? The supernatural God? Human reason? Mutual social contract? Social custom?*
- *Does God exist? If so, is He Benevolent and Omnipotent?*
- *If God is Benevolent, why He creates evil things? If God does not create evil things, then, there must be another creator who is responsible to creation of the evil things? But, if it is so, how can God be an Omnipotent creator?*
- *Why we honor and obey moral rules? For the sake of our own individual benefits? or for the sake of others?, or just for the sake of fulfilling our infallible duty?*

Ethics, or ethical studies, can be grouped into three broad categories: *Normative ethics*, *Meta-ethics*, and *Applied Ethics.*

Normative Ethics refers to the ethical studies that attempt to study and determine precisely the moral rules, principles, standards and goals by which human beings might evaluate and judge the moral values of their conducts, actions and decisions. It is the reasoned search for principles of human conduct, including a critical study of the major theories about which things are good, which acts are right, and which acts are blameworthy. *Consequentialism or Teleological Ethics*, *Deontological Ethics*, and *Virtue Ethics* are the major examples of normative ethical studies.

Meta-ethics is the highly technical philosophical discipline that deals with investigation of the meaning of ethical terms, including a critical study of how ethical statements can be verified. It is more concerned with the meanings of such ethical terms as *good* or *bad and right or wrong* than with what we think is good or bad

and right or wrong. *Moral Intuitionism, Moral Emotivism, Moral Prescriptivism, Moral Nihilism,* and *Ethical Relativism* are the main examples of meta-ethical studies.

Applied Ethics is a normative ethics that attempts to explain, justify, apply moral rules, principles, standards, and positions to specific moral problems, such as capital punishment, euthanasia, abortion, adultery, animal right, and so on. This area of normative ethics is termed applied because the ethicist applies or uses general ethical princes in an attempt to resolve specific moral problems.

Aesthetics

> ***Activity # 3:*** *How do you define and understand aesthetics? What Discuss about it with the student(s) beside you.*

Aesthetics is the theory of beauty. It studies about the particular value of our artistic and aesthetic experiences. It deals with beauty, art, enjoyment, sensory/emotional values, perception, and matters of taste and sentiment.

The following are typical Aesthetic questions:

- *What is art?*
- *What is beauty?*
- *What is the relation between art and beauty?*
- *What is the connection between art, beauty, and truth?*
- *Can there be any objective standard by which we may judge the beauty of artistic works, or beauty is subjective?*
- *What is artistic creativity and how does it differ from scientific creativity?*
- *Why works of art are valuable?*
- *Can artistic works communicate? If so, what do they communicate?*
- *Does art have any moral value, and obligations or constraints?*
- *Are there standards of quality in Art?*

Social/Political Philosophy

> ***Activity # 4:*** *How do you define politics and society? What political and social rules, principles, and standards do you know and follow, and why? Discuss about it with the student(s) beside you.*

Social/Political Philosophy studies about of the value judgments operating in a civil society, be it social or political.

The following questions are some of the major Social/Political Philosophy primarily deals with:

- *What form of government is best?*

- *What economic system is best?*
- *What is justice/injustice?*
- *What makes an action/judgment just/unjust?*
- *What is society?*
- *Does society exist? If it does, how does it come to existence?*
- *How are civil society and government come to exist?*
- *Are we obligated to obey all laws of the State?*
- *What is the purpose of government?*

Logic

> ***Activity # 5:*** *How do you define and understand logic? Discuss about it with student(s) beside you.*

Logic is the study or theory of principles of right reasoning. It deals with formulating the right principles of reasoning; and developing scientific methods of evaluating the validity and soundness of arguments. The following are among the various questions raised by Logic:

- *What is an argument; What does it mean to argue?*
- *What makes an argument valid or invalid*
- *What is a sound argument?*
- *What relation do premise and conclusion have in argument?*
- *How can we formulate and evaluate an argument?*
  What is a fallacy?; What makes an argument fallacious?

Importance of Learning Philosophy

> ***Activity # 1: C****an you list, based on our previous lessons, the possible benefits of studying philosophy? Who do you think needs philosophy? Why? Discuss with the student(s) beside you.*

Dear learners, if you ask any philosophy student 'what is the necessity of studying philosophy', he/she may give you the following famous philosophical statement: "***The unexamined life is not worth living****"*. The ancient Greek philosopher, Socrates, once said that *"I tell you that to let no day pass without discussing goodness and all the other subjects about which you hear me talking and examining both myself and others is really the best thing that a man can do, and that life without this sort of examination is not worth living…."* Thus, among the various benefits of learning philosophy is that philosophy provides students with the tools they need to critically examine their own lives as well as the world in which they live. Let us clarify it more.

Some modern psychologists point out that human beings have both *maintenance* and *actualizing* needs. The former refer to the physical and psychological needs that we must satisfy in order to maintain ourselves as human beings: food, shelter, security, social interaction, and the like. The later appear to be associated with self-fulfillment, creativity, self-expression, realization of one's potential, and being everything one can be. Although philosophy may not necessarily lead to this sort of self-actualization, it can assist us to actualize ourselves by promoting the ideal of self-actualization. There are many characteristics of self-actualization to whose achievement studying philosophy has a primordial contribution. Here below are some of them.

1) *Intellectual and Behavioral Independence:-* This is the ability to develop one's own opinion and beliefs. Among the primary goals of philosophy, one is the integration of experiences into a unified, coherent, and systematic world views. Studying philosophy helps us not only to know the alternative world views but also to know how philosophers have ordered the universe for themselves. As a result, we can learn how to develop and integrate our experiences, thoughts, feelings, and actions for ourselves, and thus how to be intellectually and behaviorally independent.
2) *Reflective Self-Awareness:-*self-actualization cannot be realized without a clear knowledge of oneself and the world in which one lives. Philosophy helps us to intensify our self-awareness by inviting us to critically examine the essential intellectual grounds of our lives.
3) *Flexibility, Tolerance, and Open-Mindedness:-*by studying different philosophical perspectives we can understand the evolutionary nature of intellectual achievement and the ongoing development of human thought. As we confront with the thoughts of various philosophers we can easily realize that no viewpoint is necessarily true or false- that the value of any attitude is contextual. Finally, we become more tolerant, open-minded, more receptive, and more sympathetic to views that contend or clash with ours.
4) *Creative and Critical Thinking: -* this is the ability to develop original philosophical perspective on issues, problems, and events; and to engage them on a deeper level. From the study of philosophy, we can learn how to refine our powers of analysis, our abilities to think critically, to reason, to evaluate, to theorize, and to justify.
5) *Conceptualized and well-thought-out value systems in morality, art, politics, and the like: -*since philosophy directly deals with morality, art, politics, and other related value theories, studying philosophy provides us with an opportunity to formulate feasible evaluations of value; and thereby to find meaning in our lives.

The other benefit of studying philosophy that should not be missed is that it helps us to deal with ***the uncertainty of living***. Philosophy helps us to realize the absence of an absolutely ascertained knowledge. But, what is the advantage of uncertainty? What Bertrand Russell stated in his book, The *Problem of Philosophy*, can be a sufficient answer for this question.

*The value of philosophy is, in part, to be sought largely in its very uncertainty. The man who has no tincture of philosophy goes through life imprisoned in the prejudices derived from common sense, from the habitual benefits of his age or his nation, and from convictions which have grown up in his mind without the cooperation or consent of his deliberate reason. To such a man the world tends to become definite, finite, obvious; common objects rouse no questions, and unfamiliar possibilities are contemptuously rejected. As soon as we begin to philosophize, on the contrary, we find… that even the most everyday things lead to problems to which only very incomplete answers can be given. Philosophy, though unable to tell us with certainty what is the true answer to the doubts which it raises, is able to suggest many possibilities which enlarge our thoughts and free them from the tyranny of custom. Thus, while diminishing our feeling of certainty as to what things are, it greatly increases our knowledge as to what they may be; it removes the somewhat arrogant dogmatism of those who have never traveled into the region of liberating doubt, and it keeps alive our sense of wonder by showing familiar things in an unfamiliar aspect (*Bertrand, 1912, P; 158).

Chapter Summary

Logic, as a field of study, is a branch of philosophy that deals with the study of arguments and the principles and methods of right reasoning. Etymologically, the term 'philosophy' can be defined as ***"love of wisdom"***, being wisdom a critical habit and eternal vigilance about all things and a reverence for truth, whatever its form, and wherever its place. Therefore, philosophy, as a pursuit of wisdom, is the development of critical habits, the continuous search for truth, and the questioning of the apparent. It is, however, important to note that 'questioning the apparent' does not mean denying the obviously real. It simply refers to the extraordinary ability and curiosity to deal creatively with the phenomenal world, to go beyond the common understanding, and to speculate about things that other people accept with no doubt. Philosophy, as a rational and critical enterprise that tries to formulate and answer fundamental questions through an intensive application of reason, is a dual-sided universal discipline: *critical* and *constructive* sides. While, as a critical discipline, it deals with giving a rational critic, analysis, clarification, and evaluation of answers given to basic metaphysical, epistemological, and axiological questions, it attempts, as a constructive discipline, to formulate rationally defensible answers to certain fundamental questions concerning the nature of reality, the nature of value, and the nature of knowledge and truth.

Philosophy, as an academic discipline, has its own salient features that distinguish it from other academic disciplines. Its systematic, logical and flexible approach to the ultimate reality of the universe, human life, knowledge experience, truth and values and its holistic and evolutionary nature are some the fundamental features of philosophy. Philosophy uses its major branches to deal with the most important issues human beings face, namely *Metaphysics, Epistemology, Axiology,* and *Logic*. Metaphysics deals with the studies of

ultimate reality and existence. Epistemology deals with the study of the meaning, nature, source, scope and possibility of human knowledge. Axiology deals with the philosophical studies of human values, such as moral values, aesthetic values, as well as political and social values. Logic, on the other hand, is a philosophical study of arguments and the methods and principles of right reasoning.

Philosophy provides various fundamental benefits to learners. It provides students with the tools they need to critically examine their own lives as well as the world in which they live, it assist them to actualize themselves by promoting the ideals of self-actualization. That is, studying philosophy helps to achieve the most important characteristic of self-actualization: *Intellectual and Behavioral Independence*, *Reflective Self-Awareness, Flexibility, Tolerance, and Open-Mindedness, Creative and Critical Thinking*, and *Conceptualized and well-thought-out value systems in morality, art, politics, and the like*. Moreover, studying philosophy helps us to deal with ***the uncertainty of living***, meaning it helps us to realize the absence of an absolutely ascertained knowledge, and hence prepare ourselves to the ever growing human knowledge.

Self-Check Exercise

1. Define philosophy as a pursuit of wisdom.

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2. It is said that 'seeking wisdom' is one of the various essences of philosophy. Explain the wisdom that philosophers seek.

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_____

3. List and discuss the major features of philosophy.

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4. Discuss briefly the core branches of philosophy.

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5. Explain the major aspects of metaphysical study.

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6. Discuss the fundamental epistemological debates concerning the source of human knowledge.

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7. Discuss briefly the major branches Ethics or Moral Philosophy.

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8. Discuss the importance of studying philosophy.

References

Emmet, E.R. Learning to Philosophize, London, Penguin Books, 1964.

Hurley, Patrick J. (2014) A Concise Introduction to Logic, 12th Edition, Wadsworth, Cengage Learning.

Jones Gerald, Cardinal Daniel, et al (2006) Moral Philosophy: a guide to ethical theory, London, Hodder Murray: A Member of the Hodder Headline Group.

Mabott, J. D. (1966) An Introduction to Ethics, London, Hutchinson University Library, Hutchinson & Co Publisher.

Mautner, Thomas (2000) The Penguin Dictionary of Philosophy, London, Penguin Books.

Plato *„Republic: Book I",* in Cahn, M. Steven (1999) Classics of Western Philosophy, 5th ed. United States of America, Indianapolis/Cambridge, Hackett Publishing Company, Inc.

Pojman, P. Louis (1998) Philosophical Traditions: A Text with Readings, United States of America. Wadsworth Publishing Company: A Division of International Thomson Publishing, Inc.

Ratner, Joseph, ed. Intelligence in the Modern World: John Dewey‘s Philosophy, New York, The Modern Library, 1939.

Woodhouse, Mark B. A Preface to Philosophy, (6th Edition) Belmont Wordsworth, 2000.

CHAPTER TWO

LOGIC AND BASIC CONCEPTS IN LOGIC

Introduction

The unit introduces you with the nature and types of arguments. Logic is the study of argument. In particular, logic is the study of criteria for distinguishing successful from unsuccessful arguments and the study of methods for applying those criteria. An argument is a set of statements, some of which—the *premises*—are supposed to support, or give reasons for, the remaining statement—the *conclusion*. Such statements, and so the argument they constitute, may be written, spoken, thought, or otherwise communicated or privately considered. Usually the intent behind an argument is to produce understanding or conviction in oneself or another.

There are many sources for our beliefs—the influence of our parents and friends, newspapers, television, internet, government, churches, schools, textbooks, our own observations, and our own thought processes—but not all these sources are equally good, nor is any of them good all the time. Most of us form most of our beliefs without ever consciously attending to the fact that we have acquired a belief. Many of the beliefs attained through casual observation and most of the teaching and socialization of childhood is simply absorbed without our realizing it. Despite our best efforts, this uncritical acceptance of claims and formation of beliefs continues through adulthood. But such uncritical thinking can be a dangerous thing, for it enslaves us to the influence and manipulations of other individuals and institutions. Thus, since our beliefs (the claims we accept) constitute our view of the world and of ourselves, and affect how we act, it is important to examine more carefully the beliefs we hold. This applies both to large scale philosophical issues (Does God exist? Do I have a soul? Am I free? Does it matter?), and to small scale mundane issues (Should I buy this car? Should I believe what she said? How should I dress?). Amongst other things, the module tries to point the manifestations of rational argumentation in everyday communication.

Objective

upon the accomplishment of this unit, you will be able to;

-identify the nature of an argument

-distinguish between arguments and non-arguments

-differentiate between deductive and inductive arguments

-develop some of the skills through which one could distinguish between strong and weak arguments.

2.1. WHAT IS AN ARGUMENT

Session Objective

-identifying the nature of an argument

-introducing premises and conclusion as the two basic components of an argument

-distinguishing arguments from non-arguments

Brain storming

?Dear learner . what do you understand by the term argument?(use the next space to give your answer)

_____

_____.

Logic may be defined as the science that evaluates arguments. All of us encounter arguments in our day-to-day experience. We read them in books and newspapers, hear them on television, and formulate them when communicating with friends and associates. The aim of logic is to develop a system of methods and principles that we may use as criteria for evaluating the arguments of others and as guides in constructing arguments of our own. Among the benefits to be expected from the study of logic is an increase in confidence that we are making sense when we criticize the arguments of others and when we advance arguments of our own.

An **argument,** as it occurs in logic, is a group of statements, one or more of which(the premises) are claimed to provide support for, or reasons to believe, one of the others (the conclusion). All arguments may be placed in one of two basic groups: those in which the premises really do support the conclusion and those in which they do not, even though they are claimed to. The former are said to be good arguments(at least to that extent), the latter bad arguments. The purpose of logic, as the science that evaluates arguments, is thus to develop methods and techniques that allow us to distinguish good arguments from bad.

As is apparent from the above definition, the term ‘‘argument’’ has a very specific meaning in logic. It does not mean, for example, a mere verbal fight, as one might have with one’s parent, spouse, or friend. Let us examine the features of this definition in greater detail. First of all, an argument is a group of statements. A **statement** is a sentence that is either true or false—in other words, typically a declarative sentence or a sentence component that could stand as a declarative sentence. The following sentences are statements:

Wollega University was established in 1959.

Haile Sellassie I was the last emperor of Ethiopia.

The first statements is true, the second false. Truth and falsity are called the two possible **truth values** of a statement. Thus, the truth value of the first two statements is true, the truth value of the second two is false, and the truth value of the last statement, as well as that of its components, is true. Unlike statements, many sentences cannot be said to be either true or false. Questions, proposals, suggestions, commands, and exclamations usually cannot, and so are not usually classified as statements. The following sentences are not statements:

What is your name?(Question)

Let's go out. (Proposal)

I suggest that you start using public transportation. (Suggestion)

Put it down. (Command)

oh! (Exclamation)

The statements that make up an argument are divided into one or more premises and one and only one conclusion. The **premises** are the statements that set forth the reasons or evidence, and the **conclusion** is the statement that the evidence is claimed to support or imply. In other words, the conclusion is the statement that is claimed to follow from the premises. Here is an example of an argument:

All students must abide by the rules of Wollega university.

Tola is a student of Wollega university.

Therefore, Tola must abide by the rules of Wollega university.

The first two statements are the premises; the third is the conclusion. (The claim that the premises support or imply the conclusion is indicated by the word ''therefore.'') In this argument the premises really do support the conclusion, and so the argument is a good one. But consider this argument:

Some crimes are misdemeanors.

Murder is a crime.

Therefore, murder is a misdemeanor.

In this argument the premises do not support the conclusion, even though they are claimed to, and so the argument is not a good one.

One of the most important tasks in the analysis of arguments is being able to distinguish premises from conclusion. Frequently, arguments contain certain indicator words that provide clues in identifying premises and conclusion.

Some typical **conclusion indicators** are:

therefore	*wherefore*	*accordingly*	*we may conclude*
entails that	*hence*	*thus*	*consequently*

we may infer *it must be that* *whence*
so *it follows that* *implies that* *as a result*

Whenever a statement follows one of these indicators, it can usually be identified as the conclusion. By process of elimination the other statements in the argument are the premises.

Example:

Corporate raiders leave their target corporation with a heavy debt burden and no increase in productive capacity. ***Consequently****, corporate raiders are bad for the business community.*

The conclusion of this argument is ‘‘Corporate raiders are bad for the business community, ‘and the premise is ‘‘Corporate raiders leave their target corporation with a heavy debt burden and no increase in productive capacity.’’ If an argument does not contain a conclusion indicator, it may contain a premise indicator.

Some typical **premise indicators** are:

since as indicated by because for in that may be inferred from
as given that seeing that for the reason that in as much as owing to

Any statement following one of these indicators can usually be identified as a premise.

Example:

Expectant mothers should never use recreational drugs, ***since*** *the use of these drugs can jeopardize the development of the fetus.*

The premise of this argument is ‘‘The use of these drugs can jeopardize the development of the fetus,’’ and the conclusion is ‘‘Expectant mothers should never use recreational drugs.’’

One premise indicator not included in the above list is ‘‘**for this reason**.’’ This indicator is special in that it comes immediately *after* the premise that it indicates. ‘‘For this reason’’ (except when followed by a colon) means for the reason (premise) that was just given. In other words, the premise is the statement that occurs immediately *before* ‘‘for this reason.’’ One should be careful not to confuse ‘‘for this reason’’ with ‘‘for the reason that.’’ Sometimes a single indicator can be used to identify more than one premise. Consider the following argument:

The building of the Abay power plant will benefit Ethiopia in various ways, since it provides many job openings, fulfills the country’s energy demands and also enables the country to export hydroelectric power to neighboring countries.

The premise indicator ‘‘since’’ goes with ‘‘it provides many job openings’’ ‘’ fulfills the country’s energy demands’’ and ‘‘enables the country to export hydroelectric power to neighboring countries.’’ These are the

premises. By process of elimination, ‘‘The building of the Abay power plant will benefit Ethiopia in various ways’’ is the conclusion.

Sometimes an argument contains no indicators. When this occurs, the reader/listener must ask himself or herself such questions as: What single statement is claimed(implicitly) to follow from the others? What is the arguer trying to prove? What is the main point in the passage? The answers to these questions should point to the conclusion.

Example:

The Gimbi campus of Wollega university needs to demonstrate the crucial role played by the social sciences in the academic world. The social sciences can foster a dialogue amongst the various disciplines. It’s also the social sciences that can reflect on the social foundations of knowledge. We must not also forget that the social sciences can develop a profound critique of the various sciences.

The conclusion of this argument is the first statement, and all of the other statements are premises. The argument illustrates the pattern found in most arguments that lack indicator words: the intended conclusion is stated first, and the remaining statements are then offered in support of this first statement. When the argument is restructured according to logical principles, however, the conclusion is always listed *after* the premises:

P1: The social sciences can foster a dialogue amongst the various disciplines.

P2: It’s also the social sciences that can reflect on the social foundations of knowledge.

P3: We must not also forget that the social sciences can develop a profound critique of the various sciences.

C: The Gimbi campus of Wollega university needs to demonstrate the crucial role played by the social sciences in the academic world.

When restructuring arguments such as this, one should remain as close as possible to the original version, while at the same time attending to the requirement that premises and conclusion be complete sentences that are meaningful in the order in which they are listed. Passages that contain arguments sometimes contain statements that are neither premises nor conclusion. Only statements that are actually intended to support the conclusion should be included in the list of premises. If a statement has nothing to do with the conclusion or, for example, simply makes a passing comment, it should not be included within the context of the argument.

Example:

Wollega university is currently expanding in its overall scope. The university opened campuses in Gimbi and Shambu. Masters programs are currently being inaugurated in various fields. The student enrollment capacity of the university is growing. These are some of the issues currently being raised in relation to Wollega university.

The conclusion of this argument is ‘‘Wollega university is currently expanding in its overall scope,’’ and‘’ The university opened campuses in Gimbi and Shambu ‘’ ‘’ Masters programs are currently being inaugurated in various fields ‘’ and ‘’ The student enrollment capacity of the university is growing ‘’are the premises. The last statement makes only a passing comment about the argument itself and is therefore neither a premise nor a conclusion.

Not all passages contain arguments. Because logic deals with arguments, it is important to be able to distinguish passages that contain arguments from those that do not. In general, a passage contains an argument if it purports to prove something; if it does not do so, it does not contain an argument. Two conditions must be fulfilled for a passage to purport to prove something: (1) At least one of the statements must claim to present evidence or reasons. (2) There must be a claim that the alleged evidence or reasons supports or implies something—that is, a claim that something follows from the alleged evidence. As we have seen, the statements that claim to present the evidence or reasons are the premises, and the statement that the evidence is claimed to support or imply is the conclusion. It is not necessary that the premises present actual evidence or true reasons nor that the premises actually support the conclusion. But at least the premises must *claim* to present evidence or reasons, and there must be a *claim* that the evidence or reasons support or imply something.

The first condition expresses a **factual claim,** and deciding whether it is fulfilled usually presents few problems. Thus, most of our attention will be concentrated on whether the second condition is fulfilled. This second condition expresses what is called an **inferential claim.** The inferential claim is simply the claim that the passage expresses a certain kind of reasoning process-that something supports or implies something or that something follows from something. Such a claim can be either explicit or implicit. An *explicit* inferential claim is usually asserted by premise or conclusion indicator words (‘‘thus,’’ ‘‘since,’’ ‘‘because,’’ ‘‘hence,’’ ‘‘therefore,’’ and so on).

Example:

The human eye can see a source of light that is as faint as an ordinary candle from a distance of 27 kilometers, through a non-absorbing atmosphere. Thus, a powerful search light directed from a new moon should be visible on earth with the naked eye.

The word ‘‘thus’’ expresses the claim that something is being inferred, so the passage is an argument. An *implicit* inferential claim exists if there is an inferential relationship between the statements in a passage.

Example:

The price reduction [seen with the electronic calculator] is the result of a technological revolution. The calculator of the 1960s used integrated electronic circuits that contained about a dozen transistors or similar

components on a single chip. Today, mass-produced chips, only a few millimeters square, contain several thousand such components.

The inferential relationship between the first statement and the other two constitutes an implicit claim that evidence supports something, so we are justified in calling the passage an argument. The first statement is the conclusion, and the other two are the premises.

In deciding whether there is a claim that evidence supports or implies something, keep an eye out for (1) indicator words and (2) the presence of an inferential relationship between the statements. In connection with these points, however, a word of caution is in order. First, the mere occurrence of an indicator word by no means guarantees the presence of an argument.
For example, consider the following passages:
Since Edison invented the phonograph, there have been many technological developments.
Since Edison invented the phonograph, he deserves credit for a major technological development.

In the first passage the word ‘‘since’’ is used in a *temporal* sense. It means ‘‘from the time that.’’ Thus, the first passage is not an argument. In the second passage ‘‘since’’ is used in a *logical* sense, and so the passage *is* an argument. The second cautionary point is that it is not always easy to detect the occurrence of an inferential relationship between the statements in a passage, and the reader may have to review a passage several times before making a decision. In reaching such a decision, it sometimes helps to mentally insert the word ‘‘therefore’’ before the various statements to see whether it makes sense to interpret one of them as following from the others. Even with this mental aid, however, the decision whether a passage contains an inferential relationship (as well as the decision about indicator words) often involves a heavy dose of interpretation. As a result, not everyone will agree about every passage. Sometimes the only answer possible is a conditional one: ‘‘*If* this passage contains an argument, then these are the premises and that is the conclusion.’’

To assist in distinguishing passages that contain arguments from those that do not, let us now investigate some typical kinds of non-arguments. These include simple non-inferential passages, expository passages, illustrations, explanations, and conditional statements.

Simple Non- inferential Passages

Simple non- inferential passages are unproblematic passages that lack a claim that anything is being proved. Such passages contain statements that could be premises or conclusions (or both), but what is missing is a claim that any potential premise supports a conclusion or that any potential conclusion is supported by premises. Passages of this sort include warnings, pieces of advice, statements of belief or opinion, loosely associated statements, and reports.

A **warning** is a form of expression that is intended to put someone on guard against a dangerous or detrimental situation. Examples:

Watch out that you don't slip on the ice.

Whatever you do, never confide personal secrets to Gemechu.

If no evidence is given to prove that such statements are true, then there is no argument.

A **piece of advice** is a form of expression that makes a recommendation about some future decision or course of conduct. Examples:

It's dangerous to have sex without condoms.

Before accepting a job after class hours, I would suggest that you give careful consideration to your course load. Will you have sufficient time to prepare for classes and tests, and will the job produce an excessive drain on your energies?

As with warnings, if there is no evidence that is intended to prove anything, then there is no argument.

A **statement of belief** or **opinion** is an expression about what someone happens to believe or think at a certain time. Examples:

I think that the government should decrease the current tax rates.

I think a nation such as ours, with its high moral traditions and commitments, has a further responsibility to know how we became drawn into this conflict, and

to learn the lessons it has to teach us for the future.

Because neither of these authors makes any claim that his belief or opinion is supported by evidence, or that it supports some conclusion, there is no argument.

Loosely associated statements may be about the same general subject, but they lack a claim that one of them is proved by the others. Example:

Ethiopians are hospitable. Ethiopia has never been colonized. Ethiopia is a developing country. Ethiopia is rich in raw materials and resources

Because there is no claim that any of these statements provides evidence or reasons for believing another, there is no argument.

A **report** consists of a group of statements that convey information about some topic or event. Example:
Even though more of the world is immunized than ever before, many old diseases have proven quite resilient in the face of changing population and environmental conditions, especially in the developing world. New diseases, such as AIDS, have taken their toll in both the North and the South.
These statements could serve as the premises of an argument; but because the author makes no claim that they support or imply anything, there is no argument. Another type of report is the news report:

A powerful car bomb blew up outside the regional telephone company headquarter in Medellin, injuring 25 people and causing millions of dollars of damage to nearby buildings, police said. A police statement said the 198-pound bomb was packed into a milk churn hidden in the back of a stolen car.
Again, because the reporter makes no claim that these statements imply anything, there is no argument.
One must be careful, though, with reports *about* arguments:
‘‘*colonel Gaddafi argued that N.A.T.O strikes on Libya amount to renewed Western imperialist intentions. Gaddafi mentioned how Westerners degrade non Westerners in their popular art forms, and also how the Western ideal is always set as the litmus test for the correct ways of being’’.*

Properly speaking, this passage is not an argument, because the author of the passage does not claim that anything is supported by evidence. Rather, the author reports the claim by Kaddafi which is supported by evidence.

Expository Passages

An **expository passage** is a kind of discourse that begins with a topic sentence followed by one or more sentences that develop the topic sentence. If the objective is not to prove the topic sentence but only to expand it or elaborate it, then there is no argument.

Examples:

The Abay dam is currently under construction. The dam will supply vast amounts of energy for the country. The Abay dam is going to be one of the largest in Africa.
There is a stylized relation of artist to mass audience in the sports, especially in baseball. Each player develops a style of his own-the swagger as he steps to the plate, the unique windup a pitcher has, the clean-swinging and hard-driving hits, the precision quickness and grace of infield and outfield, the sense of surplus power behind whatever is done.

In each passage the topic sentence is stated first, and the remaining sentences merely develop and flesh out this topic sentence. These passages are not arguments because they lack an inferential claim. However, expository passages differ from simple non-inferential passages (such as warnings and pieces of advice) in that many of them can also be taken as arguments. If the purpose of the subsequent sentences in the passage is not only to flesh out the topic sentence but also to prove it, then the passage is an argument.

Example:

Skin and the mucous membrane lining the respiratory and digestive tracts serve as mechanical barriers to entry by microbes. Oil gland secretions contain chemicals that weaken or kill bacteria on skin. The respiratory tract is lined by cells that sweep mucus and trapped particles up into the throat, where they can be swallowed.

The stomach has an acidic pH, which inhibits the growth of many types of bacteria.

In this passage the topic sentence is stated first, and the purpose of the remaining sentences is not only to *show how* the skin and mucous membranes serve as barriers to microbes but to *prove* that they do this. Thus, the passage can be taken as both an expository passage and an argument.

In deciding whether an expository passage should be interpreted as an argument, try to determine whether the purpose of the subsequent sentences in the passage is merely to develop the topic sentence or also to prove it. In borderline cases, ask yourself whether the topic sentence makes a claim that everyone accepts or agrees with. If it does, the passage is probably not an argument.

Illustrations

An **illustration** consists of a statement about a certain subject combined with a reference to one or more specific instances intended to exemplify that statement. Illustrations are often confused with arguments because many of them contain indicator words such as ‘‘thus.’’ Examples:

Chemical elements, as well as compounds, can be represented by molecular formulas.

Thus, oxygen is represented by ‘‘O2,’’ water by ‘‘H2O,’’ and sodium chloride by ‘‘NaCl.’’

Whenever a force is exerted on an object, the shape of the object can change. For example, when you squeeze a rubber ball or strike a punching bag with your fist, the objects are deformed to some extent.

These selections are not arguments because they make no claim that anything is being proved. In the first selection, the word ‘‘thus’’ indicates how something is done-namely, how chemical elements and compounds can be represented by formulas. In the second selection, the example cited is intended to give concrete meaning to the notion of a force changing the shape of something. It is not intended primarily to

prove *that* a force can change the shape of something. However, as with expository passages, many illustrations can be taken as arguments. Such arguments are often called **arguments from example.** Here is an instance of one:

Water is an excellent solvent. It can dissolve a wide range of materials that will not dissolve in other liquids. For example, salts do not dissolve in most common solvents, such as gasoline, kerosene, turpentine and cleaning fluids. But many salts dissolve readily in water. So do a variety of nonionic organic substances, such as sugars and alcohols of low molecular weight.

In this passage the examples that are cited can be interpreted as providing evidence that water can dissolve a wide range of materials that will not dissolve in other liquids. Thus, the passage can be taken as both an illustration and an argument, with the second sentence being the conclusion. Thus, in reference to the first two examples we considered, most people are aware that elements and compounds can be expressed by formulas—practically everyone knows that water is H2O—and most people know that forces distort things—that running into a tree can cause a dent in the car bumper. But people may not be aware of the fact that water dissolves many things that other solvents will not dissolve. This is one of the reasons for evaluating the first two examples as mere illustrations and the last one as an argument.

Explanations

One of the most important kinds of non-argument is the explanation. An **explanation** is a group of statements that purports to shed light on some event or phenomenon. The event or phenomenon in question is usually accepted as a matter of fact. Examples:

The *Challenger* spacecraft exploded after liftoff because an O-ring failed in one of the booster rockets.

The sky appears blue from the earth's surface because light rays from the sun are scattered by particles in the atmosphere.

Cows can digest grass, while humans cannot, because their digestive systems contain enzymes not found in humans.

Every explanation is composed of two distinct components: the explanandum and explanans. The **explanandum** is the statement that describes the event or phenomenon to be explained, and the **explanans** is the statement or group of statements that purports to do the explaining. In the first example above, the explanandum is the statement ''The *Challenger* spacecraft exploded after liftoff,'' and the explanans is ''An O-ring failed in one of the booster rockets.''

Explanations are sometimes mistaken for arguments because they often contain the indicator word ''because.'' Yet explanations are not arguments because in an explanation the purpose of the explanans is to

shed light on, or to make sense of, the explanandum event-not to prove that it occurred. In other words, the purpose of the explanans is to show *why* something is the case, while in an argument, the purpose of the premises is to prove *that* something is the case.

In the first example above, the fact that the *Challenger* exploded is known to everyone. The statement that an O-ring failed in one of the booster rockets is not intended to prove *that* the spacecraft exploded but rather to show *why* it exploded. In the second example, the fact that the sky is blue is readily apparent. The intention of the passage is to explain *why* it appears blue—not to prove *that* it appears blue. Similarly, in the third example, virtually everyone knows that people cannot digest grass. The intention of the passage is to explain *why* this is true.

Thus, to distinguish explanations from arguments, identify the statement that is either the explanandum or the conclusion (usually this is the statement that precedes the word ‘‘because’’). If this statement describes an accepted matter of fact, and if the remaining statements purport to shed light on this statement, then the passage is an explanation. This method works for practically all passages that are either explanations or arguments(but not both). However, as with expository passages and illustrations, there are some passages that can be interpreted as both explanations and arguments.

Example:

Women become intoxicated by drinking a smaller amount of alcohol than men because men metabolize part of the alcohol before it reaches the bloodstream whereas women do not.

The purpose of this passage could be to prove the first statement to those people who do not accept it as fact, and to shed light on that fact to those people who do accept it. Alternately, the passage could be intended to prove the first statement to a single person who accepts its truth on blind faith or incomplete experience, and simultaneously to shed light on this truth. Thus, the passage can be correctly interpreted as both an explanation and an argument.

Conditional Statements

A **conditional statement** is an ‘‘if . . . then . . .’’ statement; for example:

If air is removed from a solid closed container, then the container will weigh less than it did.

Every conditional statement is made up of two component statements. The component statement immediately following the ‘‘if’’ is called the **antecedent,** and the one following the ‘‘then’’ is called the **consequent.** (Occasionally, the word ‘‘then’’ is left out, and occasionally the order of antecedent and consequent is reversed.) In the above example the antecedent is ‘‘Air is removed from a solid closed container,’’ and the consequent is ‘‘The container will weigh less than it did.’’ This example asserts a causal

connection between the air being removed and the container weighing less. However, not all conditional statements express causal connections. The statement ‘‘If yellow fever is an infectious disease, then Jima Aba Buna is a football team’’ is just as much a conditional statement as the one about the closed container.

Conditional statements are not arguments, because they fail to meet the criteria given earlier. In an argument, at least one statement must claim to present evidence, and there must be a claim that this evidence implies something. In a conditional statement, there is no claim that either the antecedent or the consequent presents evidence. In other words, there is no assertion that either the antecedent or the consequent is true. Rather, there is only the assertion that *if* the antecedent is true, then so is the consequent. Of course, a conditional statement as a whole may present evidence because it asserts a relationship between statements. Yet when conditional statements are taken in this sense, there is still no argument, because there is then no separate claim that this evidence implies anything.

while no single conditional statement is an argument, a conditional statement may serve as either the premise or the conclusion (or both) of an argument, as the following examples illustrate:

If cigarette companies publish warning labels, then smokers assume the risk of smoking.
Cigarette companies do publish warning labels.
Therefore, smokers assume the risk of smoking. If banks make bad loans, then they will be threatened with collapse.
If banks are threatened with collapse, then the taxpayer will come to the rescue.
Therefore, if banks make bad loans, then the taxpayer will come to the rescue.

The relation between conditional statements and arguments may now be summarized as follows:
1. A single conditional statement is not an argument.
2. A conditional statement may serve as either the premise or the conclusion (or both) of an argument.
3. The inferential content of a conditional statement may be re-expressed to form an argument.
The first two rules are especially pertinent to the recognition of arguments. According to the first rule, if a passage consists of a single conditional statement, it is not an argument. But if it consists of a conditional statement together with some other statement, then, by the second rule, it *may* be an argument, depending on such factors as the presence of indicator words and an inferential relationship between the statements.

Brainstorming? Dear learner, based on the previous discussion, what do you think are the two basic components of an argument?(use the next space to give your answer)

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Summary

In deciding whether a passage contains an argument, one should look for three things:(1) indicator words such as ‘‘therefore,’’ ‘‘since,’’ ‘‘because,’’ and so on; (2) an inferential relationship between the statements; and (3) typical kinds of non-arguments. But remember that the mere occurrence of an indicator word does not guarantee the presence of an argument. One must check to see that the statement identified as the conclusion is intended to be supported by one or more of the other statements. Also keep in mind that in many arguments that lack indicator words, the conclusion is the first statement. Furthermore it helps to mentally insert the word ‘‘therefore’ ’before the various statements before deciding that a statement should be interpreted as a conclusion. The typical kinds of non-arguments that we have surveyed are as follows: warnings ,pieces of advice, statements of belief, statements of opinion, loosely associated statements, reports ,expository passages, illustrations, explanations and conditional statements.

Self-check Exercise 2.1

Each of the following passages contains a single argument. Using the letters ‘p’ and ‘c’ , identify the premises and conclusion of the argument, writing premises first and conclusion last.

1.Titanium combines readily with oxygen, nitrogen, and hydrogen, all of which have an adverse effect on its mechanical properties. As a result, titanium must be processed in their absence.

2. When individuals voluntarily abandon property, they forfeit any expectation of privacy in it that they might have had. Therefore, a warrantless search or seizure of abandoned property is not unreasonable under the Fourth Amendment.

3. The psychological impact and crisis created by birth of a defective infant is devastating. Not only is the mother denied the normal tension release from the stress of pregnancy, but both parents feel a crushing blow to their dignity, self-esteem, and self-confidence. In a very short time, they feel grief for the loss of the normal expected child, anger at fate, numbness, disgust, waves of helplessness and disbelief.

2.2. TYPES OF ARGUMENTS; DEDUCTIVE AND INDUCTIVE ARGUMENTS

Session Objective

-distinguishing between deductive and inductive arguments-

-identifying deductive forms of argumentation

-identifying inductive forms of argumentation

Brainstorming ? Dear learner, how can we categorize the arguments of others based on their strength and weakness? (use the next space to provide your answer)

Arguments can be divided into two groups: deductive and inductive. A **deductive argument** is an argument in which the premises are claimed to support the conclusion in such a way that it is *impossible* for the premises to be true and the conclusion false. In such arguments the conclusion is claimed to follow *necessarily* from the premises. On the other hand, an **inductive argument** is an argument in which the premises are claimed to support the conclusion in such a way that it is *improbable* that the premises be true and the conclusion false. In these arguments the conclusion is claimed to follow only *probably* from the premises. Thus, deductive arguments are those that involve *necessary* reasoning, and inductive arguments are those that involve *probabilistic* reasoning.

Examples:

The meerkat is closely related to the suricat.

The suricat thrives on beetle larvae.
Therefore, probably the meerkat thrives on beetle larvae.

The meerkat is a member of the mongoose family.
All members of the mongoose family are carnivores.
Therefore, it necessarily follows that the meerkat is a carnivore.

The first of these arguments is inductive, the second deductive. The distinction between inductive and deductive arguments lies in the strength of an argument's inferential claim. In other words, the distinction lies in how strongly the conclusion is claimed to follow from the premises. Unfortunately, however, in most

arguments the strength of this claim is not explicitly stated, so we must use our interpretive abilities to evaluate it. Three factors that influence our decision about this claim are (1) the occurrence of special indicator words, (2) the *actual* strength of the inferential link between premises and conclusion, and (3) the character or form of argumentation the arguer uses.

The occurrence of special indicator words is illustrated in the examples we just considered. The word ‘‘probably’’ in the conclusion of the first argument suggests that the argument should be taken as inductive, and the word ‘‘necessarily’’ in the conclusion of the second suggests that the second argument be taken as deductive. Additional inductive indicators are ‘‘improbable,’’ ‘‘plausible,’’ ‘‘implausible,’’ ‘‘likely, ’’‘‘unlikely,’’ and ‘‘reasonable to conclude.’’ Additional deductive indicators are ‘‘certainly,’’ ‘‘absolutely,’’ and ‘‘definitely.’’ (Note that the phrase ‘‘it must be the case that’’ is ambiguous; ‘‘must’’ can indicate either probability or necessity).

Inductive and deductive indicator words often suggest the correct interpretation. However, if they conflict with one of the other criteria (discussed shortly), we should probably ignore them. Arguers often use phrases such as ‘‘it certainly follows that’’ for rhetorical purposes to add impact to their conclusion and not to suggest that the argument be taken as deductive. Similarly, some arguers, not knowing the distinction between inductive and deductive, will claim to ‘‘deduce’’ a conclusion when their argument is more correctly interpreted as inductive.

The second factor that bears upon our interpretation of an argument as inductive or deductive is the *actual* strength of the inferential link between premises and conclusion. If the conclusion actually does follow with strict necessity from the premises, the argument is clearly deductive. In such an argument it is impossible for the premises to be true and the conclusion false. On the other hand, if the conclusion does not follow with strict necessity but does follow probably, it is usually best to consider the argument inductive.

Examples:

All saleswomen are extroverts.
Chaltu is a saleswoman.
Therefore, Chaltu is an extrovert.

The vast majority of saleswomen are extroverts.
Marartu is a saleswoman.
Therefore, Marartu is an extrovert.

In the first example, the conclusion follows with strict necessity from the premises. If we assume that all saleswomen are extroverts and that Chaltu is a saleswoman, then it is impossible that Chaltu not be an

extrovert. Thus, we should interpret this argument as deductive. In the second example, the conclusion does not follow from the premises with strict necessity, but it does follow with some degree of probability. If we assume that the premises are true, then based on that assumption it is improbable that the conclusion is false. Thus, it is best to interpret the second argument as inductive.

Occasionally, an argument contains no indicator words, and the conclusion does not follow either necessarily or probably from the premises; in other words, it does not follow at all. This situation points up the need for the third factor to be taken into account, which is the character or form of argumentation the arguer uses. Five examples of argumentation that are typically deductive are arguments based on mathematics, arguments from definition, and categorical, hypothetical, and disjunctive syllogisms.

An **argument based on mathematics** is an argument in which the conclusion depends on some purely arithmetic or geometric computation or measurement. For example, a shopper might place two apples and three oranges into a paper bag and then conclude that the bag contains five pieces of fruit. Or a surveyor might measure a square piece of land and, after determining that it is 100 feet on each side, conclude that it contains 10,000 square feet. Since all arguments in pure mathematics are deductive, we can usually consider arguments that depend on mathematics to be deductive as well. A noteworthy exception, however, is arguments that depend on statistics.

An **argument from definition** is an argument in which the conclusion is claimed to depend merely upon the definition of some word or phrase used in the premise or conclusion. For example, someone might argue that because Claudia is mendacious, it follows that she tells lies, or that because a certain paragraph is prolix, it follows that it is excessively wordy. These arguments are deductive because their conclusions follow with necessity from the definitions of ‘‘mendacious’’ and ‘‘prolix.’’

A syllogism, in general, is an argument consisting of exactly two premises and one conclusion.

A **categorical syllogism** is a syllogism in which each statement begins with one of the words ‘‘all,’’ ‘‘no,’’ or ‘‘some.’’ Example:

All lasers are optical devices.

Some lasers are surgical instruments.

Therefore, some optical devices are surgical instruments.

Arguments such as these are nearly always best treated as deductive. A **hypothetical syllogism** is a syllogism having a conditional statement for one or both of its premises. Examples:

If electricity flows through a conductor, then a magnetic field is produced.

If a magnetic field is produced, then a nearby compass will be deflected. Therefore, if electricity flows through a conductor, then a nearby compass will be deflected.

If quartz scratches glass, then quartz is harder than glass.
Quartz scratches glass.
Therefore, quartz is harder than glass.

Although certain forms of such arguments can sometimes be interpreted inductively, the deductive interpretation is usually the most appropriate. A **disjunctive syllogism** is a syllogism having a disjunctive statement (i.e., an ‘‘either . . . or . . .’’ statement) for one of its premises.
Example:
Either breach of contract is a crime or it is not punishable by the state.
Breach of contract is not a crime.
Therefore, it is not punishable by the state.

As with hypothetical syllogisms, such arguments are usually best taken as deductive. Now let us consider some typically inductive forms of argumentation. In general, inductive arguments are such that the content of the conclusion is in some way intended to ‘‘go beyond’’ the content of the premises. The premises of such an argument typically deal with some subject that is relatively familiar, and the conclusion then moves beyond this to a subject that is less familiar or that little is known about. Such an argument may take any of several forms: predictions about the future, arguments from analogy, inductive generalizations, arguments from authority, arguments based on signs, and causal inferences, to name just a few.

In a **prediction,** the premises deal with some known event in the present or past, and the conclusion moves beyond this event to some event in the relative future. For example, someone might argue that because certain meteorological phenomena have been observed to develop over a certain region of central Missouri, a storm will occur there in six hours. Or again, one might argue that because certain fluctuations occurred in the prime interest rate on Friday, the value of the dollar will decrease against foreign currencies on Monday. Nearly everyone realizes that the future cannot be known with certainty; thus, whenever an argument makes a prediction about the future, one is usually justified in considering the argument inductive.

An **argument from analogy** is an argument that depends on the existence of an analogy, or similarity, between two things or states of affairs. Because of the existence of this analogy, a certain condition that affects the better-known thing or situation is concluded to affect the similar, lesser-known thing or situation. For example, someone might argue that because Christina’s Porsche is a great handling car, it follows that

Angela's Porsche must also be a great handling car. The argument depends on the existence of a similarity, or analogy, between the two cars. The certitude attending such an inference is obviously probabilistic at best.

An **inductive generalization** is an argument that proceeds from the knowledge of a selected sample to some claim about the whole group. Because the members of the sample have a certain characteristic, it is argued that all the members of the group have that same characteristic. For example, one might argue that because three oranges selected from a certain crate were especially tasty and juicy, all the oranges from that crate are especially tasty and juicy. Or again, one might argue that because six out of a total of nine members sampled from a certain labor union intend to vote for Johnson for union president, two-thirds of the entire membership intend to vote for Johnson. These examples illustrate the use of statistics in inductive argumentation.

An **argument from authority** is an argument in which the conclusion rests upon a statement made by some presumed authority or witness. For example, a person might argue that earnings for Hewlett-Packard Corporation will be up in the coming quarter because of a statement to that effect by an investment counselor. Or a lawyer might argue that Mack the Knife committed the murder because an eyewitness testified to that effect under oath. Because the investment counselor and the eyewitness could be either mistaken or lying, such arguments are essentially probabilistic.

An **argument based on signs** is an argument that proceeds from the knowledge of a certain sign to a knowledge of the thing or situation that the sign symbolizes. For example, when driving on an unfamiliar highway one might see a sign indicating that the road makes several sharp turns one mile ahead. Based on this information, one might argue that the road does indeed make several sharp turns one mile ahead. Because the sign might be misplaced or in error about the turns, the conclusion is only probable.

A **causal inference** underlies arguments that proceed from knowledge of a cause to knowledge of the effect, or, conversely, from knowledge of an effect to knowledge of a cause. For example, from the knowledge that a bottle of wine had been accidentally left in the freezer overnight, someone might conclude that it had frozen (cause to effect). Conversely, after tasting a piece of chicken and finding it dry and crunchy, one might conclude that it had been overcooked (effect to cause). Because specific instances of cause and effect can never be known with absolute certainty, one may usually interpret such arguments as inductive.

Brainstorming? Dear learner, what do you think is the effect of inferential strength on the nature of an argument?(use the next space to give your answer)

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Summary

In summary, to distinguish deductive arguments from inductive, we look for special indicator words, the actual strength of the inferential link between premises and conclusion, and the character or form of argumentation. If the conclusion follows with strict necessity from the premises, the argument is always deductive; if not, it could be either deductive or inductive depending on the other factors. The deductive and inductive arguments that we have surveyed in this section are as follows: deductive arguments: arguments based on mathematics; arguments from definition; categorical syllogisms; hypothetical syllogisms; disjunctive syllogisms; inductive arguments; predictions; arguments from analogy; inductive generalizations; arguments from authority; arguments based on signs and causal inferences.

Self-check Exercise 2.2

Determine whether the following arguments are best interpreted as being inductive or deductive. Also state the criteria you use in reaching your decision (i.e., the presence of indicator words, the nature of the inferential link between premises and conclusion, or the character or form of argumentation).

1. Because triangle A is congruent with triangle B, and triangle A is isosceles, it follows that triangle B is isosceles.

2. No E-mail messages are eloquent creations. Some love letters are eloquent creations. Therefore, some love letters are not E-mail messages.

3. Paying off terrorists in exchange for hostages is not a wise policy, since such action will only lead them to take more hostages in the future.

2.3. VALIDITY AND INVALIDITY; TRUTH AND FALSITY

Session Objective

-distinguishing between valid and invalid arguments

-identifying the effect of factual truth on the nature of an argument

Brainstorming: Dear learner, Can you think of any techniques through which one can introduce further divisions within deductive and inductive arguments?(use the next space to give your answer)

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This section introduces the central ideas and terminology required to evaluate arguments. We have seen that every argument makes two basic claims: a claim that evidence or reasons exist and a claim that the alleged evidence or reasons support something (or that something follows from the alleged evidence or reasons). The

first is a factual claim, the second an inferential claim. The evaluation of every argument centers on the evaluation of these two claims. The most important of the two is the inferential claim, because if the premises fail to support the conclusion (that is, if the reasoning is bad), an argument is worthless. Thus we will always test the inferential claim first, and only if the premises do support the conclusion will we test the factual claim (that is, the claim that the premises present genuine evidence, or are true). The material that follows considers first deductive arguments and then inductive.

The previous section defined a deductive argument as one in which the premises are claimed to support the conclusion in such a way that it is impossible for the premises to be true and the conclusion false. If the premises do in fact support the conclusion in this way, the argument is said to be valid. Thus, a **valid deductive argument** is an argument such that it is impossible for the premises to be true and the conclusion false. In these arguments the conclusion follows with strict necessity from the premises. Conversely, an **invalid deductive argument** is a deductive argument such that it *is* possible for the premises to be true and the conclusion false. In invalid arguments the conclusion does not follow with strict necessity from the premises, even though it is claimed to.

An immediate consequence of these definitions is that there is no middle ground between valid and invalid. There are no arguments that are ‘‘almost’’ valid and ‘‘almost’’ invalid. If the conclusion follows with strict necessity from the premises, the argument is valid; if not, it is invalid. To test an argument for validity we begin by assuming that all premises are true, and then we determine if it is possible, in light of that assumption, for the conclusion to be false.
Here is an example:
All banks are financial institutions.
Awash is a bank.
Therefore, Awash is a financial institution.

In this argument both premises are actually true, so it is easy to *assume* that they are true. Next we determine, in light of this assumption, if it is possible for the conclusion to be false. Clearly this is not possible. If Awash is included in the group of banks (second premise) and if the group of banks is included in the group of financial institutions (first premise), it necessarily follows that Awash is included in the group of financial institutions (conclusion). In other words, assuming the premises true and the conclusion false entails a strict *contradiction.* Thus the argument is valid. Here is another example:
All automakers are computer manufacturers.
United Airlines is an automaker.
Therefore, United Airlines is a computer manufacturer.

In this argument, both premises are actually false, but it is easy to assume that they are true. Every automaker could have a corporate division that manufactures computers. Also, in addition to flying airplanes, United Airlines could make cars. Next, in light of these assumptions, we determine if it is possible for the conclusion to be false. Again, we see that this is not possible, by the same reasoning as the previous example. Assuming the premises true and the conclusion false entails a contradiction. Thus, the argument is valid. Another example:

All banks are financial institutions.

Siiqqee is a financial institution.

Therefore, Siiqqee is a bank.

As in the first example, both premises of this argument are true, so it is easy to assume they are true. Next we determine, in light of this assumption, if it is possible for the conclusion to be false. In this case it *is* possible. If banks were included in one part of the group of financial institutions and Siiqqee were included in another part, then Siiqqee would *not* be a bank. In other words, assuming the premises true and the conclusion false does not involve any contradiction, and so the argument is invalid.

In addition to illustrating the basic idea of validity, these examples suggest an important point about validity and truth. In general, validity is not something that is determined by the actual truth or falsity of the premises and conclusion. Both the Awash example and the Siiqqee example have actually true premises and an actually true conclusion, yet one is valid and the other invalid. The United Airlines example has actually false premises and an actually false conclusion, yet the argument is valid. Rather, validity is something that is determined by the *relationship* between premises and conclusion.

Nevertheless, there is *one* arrangement of truth and falsity in the premises and conclusion that does determine the issue of validity. Any deductive argument having actually true premises and an actually false conclusion is invalid. The reasoning behind this fact is fairly obvious. If the premises are actually true and the conclusion is actually false, then it certainly is *possible* for the premises to be true and the conclusion false. Thus, by the definition of invalidity, the argument is invalid.

The idea that any deductive argument having actually true premises and a false conclusion is invalid may be the most important point in all of deductive logic. The entire system of deductive logic would be quite useless if it accepted as valid any inferential process by which a person could start with truth in the premises and arrive at falsity in the conclusion.

Self-check question? Dear learner, what do you think is the criteria for distinguishing between valid

and invalid arguments?(use the next space to give your answer)

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Summary

For a deductive argument to be valid, at least the following conditions must be fulfilled. In other words, a deductive argument is valid only if the:

a) premises imply the conclusion; or
b) premises entail the conclusion, or
c) conclusion follows from the premises, or
d) premises necessitate the conclusion, or
e) conclusion can be inferred from the premises. If none of these conditions is fulfilled, then the argument is invalid.

Self-check exercise 2.3

The following arguments are deductive. Determine whether each is valid or invalid, and note the relationship between your answer and the truth or falsity of the premises and conclusion.

1. Since *Moby Dick* was written by Shakespeare, and *Moby Dick* is a science fiction novel, it follows that Shakespeare wrote a science fiction novel.

2. The longest river in South America is the Amazon, and the Amazon flows through Brazil. Therefore, the longest river in South Africa flows through Brazil.

3. All leopards with lungs are carnivores. Therefore, all leopards are carnivores.

2.4. SOUND AND UNSOUND ARGUMENTS

Session Objective

-distinguishing between sound and unsound arguments

Brainstorming? Dear learner, Using factual matters what kind of divisions can we introduce within deductive arguments?(use the next space to give your answer)

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A **sound argument** is a deductive argument that is *valid* and has *all true premises.* Both conditions must be met for an argument to be sound, and if either is missing the argument is unsound. Thus, an unsound argument is a deductive argument that is invalid, has one or more false premises, or both. Because a valid argument is one such that it is impossible for the premises to be true and the conclusion false, and because a

sound argument does in fact have true premises, it follows that every sound argument, by definition, will have a true conclusion as well. A sound argument, therefore, is what is meant by a ‘‘good’’ deductive argument in the fullest sense of the term. In connection with this definition of soundness, a single proviso is required: For an argument to be unsound, the false premise or premises must actually be needed to support the conclusion. An argument with a conclusion that is validly supported by true premises but with a superfluous false premise would still be sound. Analogous remarks, incidentally, extend to induction.

Self-check question. Dear learner, what do you think is the difference between sound unsound arguments?(use the next space to give your answer)

Summary

A valid argument is said to be sound if the premises of that argument as well as the conclusion are all true prepositions. On the other hand, a valid argument is said to be unsound if the premises of that argument are either all false or contain a mixture of true and false prepositions, notwithstanding the truth value of its conclusion.

Self-Check Exercise 2.4

The following arguments are deductive. Determine whether the argument is sound or unsound.

1. Since Winston Churchill was English, and Winston Churchill was a famous statesman, we may conclude that at least one Englishman was a famous statesman.

2. All physicians are individuals who have earned degrees in political science, and some lawyers are physicians. Therefore, some lawyers are persons who have earned degrees in political science.

3. Since the Department of Defense Building in Washington, D.C. has the shape of a hexagon, it follows that it has seven sides.

2.5. STRENGTH AND WEAKNESS; TRUTH AND FALSITY

Session Objective

-distinguishing between strong and weak inductive arguments

Brainstorming: Dear learner, taking the probable relation between the premises and conclusion in an inductive argument into consideration, what kinds of further divisions can we introduce within inductive arguments?(use the next space to give your answer)

We defined an inductive argument as one in which the premises are claimed to support the conclusion in such a way that it is improbable that the premises be true and the conclusion false. If the premises do in fact support the conclusion in this way, the argument is said to be strong. Thus, a **strong inductive argument** is

an inductive argument such that it is improbable that the premises be true and the conclusion false. In such arguments, the conclusion follows probably from the premises. Conversely, a **weak inductive argument** is an inductive argument such that the conclusion does not follow probably from the premises, even though it is claimed to. The procedure for testing the strength of inductive arguments runs parallel to the procedure for deduction. First we assume the premises are true, and then we determine whether, based on that assumption, the conclusion is probably true.

Example:

All dinosaur bones discovered to this day have been at least 50 million years old.

Therefore, probably the next dinosaur bone to be found will be at least 50 million years old.

In this argument the premise is actually true, so it is easy to assume that it is true. Based on that assumption, the conclusion is probably true, so the argument is strong.

Here is another example:

All meteorites found to this day have contained gold. Therefore, probably the next meteorite to be found will contain gold.

The premise of this argument is actually false. Few, if any, meteorites contain any gold. But if we assume the premise is true, then based on that assumption, the conclusion would probably be true. Thus, the argument is strong. The next example is an argument from analogy:

When a lighted match is slowly dunked into water, the flame is snuffed out. But gasoline is a liquid, just like water. Therefore, when a lighted match is slowly dunked into gasoline, the flame will be snuffed out. In this argument the premises are actually true and the conclusion is probably false.

Thus, if we assume the premises are true, then, based on that assumption, it is not probable that the conclusion is true. Thus, the argument is weak.

Another example:

During the past fifty years, inflation has consistently reduced the value of the American dollar. Therefore, industrial productivity will probably increase in the years ahead.

In this argument, the premise is actually true and the conclusion is probably true in the actual world, but the probability of the conclusion is in no way based on the assumption that the premise is true. Because there is no direct connection between inflation and increased industrial productivity, the premise is irrelevant to the conclusion and it provides no probabilistic support for it. The conclusion is probably true independently of the premise. As a result, the argument is weak.

Self-check question? Dear learner, what do you think is the determining factor for distinguishing between strong and weak inductive arguments?(use the next space to give your answer)

Summary

In an inductive argument, the words strong and weak are used to indicate the level and strength of evidence or data used as premises and the degree of certainty contained in the conclusion. Any inductive argument is based on probability. Therefore, its weakness or strength depends on the degree of evidence contained in the conclusion.

Self-check exercise 2.5

The following arguments are inductive. Determine whether each is strong or Weak.

1. The vast majority of Rose Bowl games (in Pasadena, CA) have been played in freezing cold weather. Therefore, probably the next Rose Bowl game will be played in freezing cold weather.

2. Most famous movie stars are millionaires. Leonardo Di Caprio is a famous movie star. Therefore, probably Di Caprio is a millionaire.

3. The Declaration of Independence says that all men are endowed by their creator with certain unalienable rights. Therefore it probably follows that a creator exists.

2.6. COGENT AND UNCOGENT ARGUMENTS

Session Objective

-distinguishing between cogent and uncogent arguments

Brainstorming: Dear learner, taking factual matters into consideration what kinds of divisions can we introduce within inductive arguments?(use the next space to give your answer)

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A **cogent argument** is an inductive argument that is *strong* and has *all true premises;* if either condition is missing, the argument is uncogent. Thus, an uncogent argument is an inductive argument that is weak, has one or more false premises, or both. A cogent argument is the inductive analogue of a sound deductive argument and is what is meant by a ‘‘good’’ inductive argument without qualification. Because the conclusion of a cogent argument is genuinely supported by true premises, it follows that the conclusion of every cogent argument is probably true.

There is a difference, however, between sound and cogent arguments in regard to the true-premise requirement. In a sound argument it is only necessary that the premises be true and nothing more. Given such premises and good reasoning, a true conclusion is guaranteed. In a cogent argument, on the other hand, the premises must not only be true, they must also not ignore some important piece of evidence that outweighs the given evidence and entails a quite different conclusion. As an illustration of this point, consider the following argument:

Swimming in the Caribbean is usually lots of fun. Today the water is warm, the surf is gentle, and on this beach there are no dangerous currents. Therefore, it would be fun to go swimming here now.

If the premises reflect all the important factors, then the argument is cogent. But if they ignore the fact that several large dorsal fins are cutting through the water, then obviously the argument is not cogent. Thus, for cogency the premises must not only be true but also not overlook some important factor that outweighs the given evidence and requires a different conclusion.

Self-check question? Dear learner, what do you think is the criteria for distinguishing between cogent and uncogent arguments?(use the next space to give your answer)

Summary

A cogent argument is inductive, strong , having all true premises. On the other hand, an inductive argument, which is weak and having one or more false premises or both is uncogent.

Self-Check Exercise 2.6

The following arguments are inductive. determine whether each argument is cogent or uncogent.

1. The grave marker at Arlington National Cemetery says that John F. Kennedy is buried there. It must be the case that Kennedy really is buried in that cemetery.

2. Franklin Delano Roosevelt said that we have nothing to fear but fear itself. Therefore, women have no reason to fear serial rapists.

3. People have been listening to rock and roll music for over a hundred years. Probably people will still be listening to it a year from now.

Chapter Summary

Arguments are the main tools of reasoning; they are attempts to bring someone to believe the truth of a claim by giving them good reasons for doing so. Arguments are made up from statements (sometimes also called 'claims' or 'propositions'). When someone makes a statement they **assert** that something is the case; they say something that either correctly describes how things are, or does not. Statements, therefore, are either **true** or **false**. As we have seen, the conclusion of an argument is the claim that the argument seeks to prove. Those statements used in the argument in support of the conclusion are known as **premises**. Furthermore one could distinguish between arguments and non-arguments by looking at their factual and inferential claims.

Arguments could further be subdivided into deductive and inductive ones. In summary, for both deductive and inductive arguments, two separate questions need to be answered: (1) Do the premises support the conclusion? (2) Are all the premises true? To answer the first question we begin by *assuming* the premises to be true. Then, for deductive arguments we determine whether, in light of this assumption, it *necessarily* follows that the conclusion is true. If it does, the argument is valid; if not, it is invalid. For inductive arguments we determine whether it *probably* follows that the conclusion is true. If it does, the argument is strong; if not, it is weak. For inductive arguments we keep in mind the requirements that the premises actually support the conclusion and that they not ignore important evidence. Finally, if the argument is either valid or strong, we turn to the second question and determine whether the premises are actually true. If all the premises are true, the argument is sound (in the case of deduction) or cogent (in the case of induction). All invalid deductive arguments are unsound, and all weak inductive arguments are uncogent.

Self-Check Exercise 2.7

Which of the following statements are true? Which are false?

1. All valid arguments have at least one false premise.

2. A sound argument can have a false conclusion.

3. Some arguments are true.

4. Every argument is valid.

5. Every unsound argument is invalid.

References

Copi, Irving M.and Carl Cohen, (1990) Introduction to Logic, New York: Macmillan Publishing Company.

Damer, Edward. (2005). Attacking faulty reasoning. A practical guide to fallacy free argument. Wadsworth Cengage learning, USA.

Fogelin, Robert, J, (1987) Understanding Arguments: An Introduction to Informal Logic, New York: Harcourt Brace Jvanovich Publisher.

Guttenplan, Samuel: (1991) The Language of Logic. Oxford: Blackwell Publishers

Simico, N.D and G.G James. (1983) Elementary Logic, Belmont, Ca: Wadsworth Publishing Company.

Stephen, C. (200) The Power of Logic. London and Toronto: Mayfield Publishing Company.

Walelign, Emuru, (2009) Freshman Logic, Addis Ababa.

CHAPTER THREE

LANGUAGE AND LOGIC

Introduction

Dear students, this is the third unit of the module. This unit, generally, discusses about language and logic. Since the formal pattern of the correct reasoning can all be conveyed through ordinary language, learning how language works is indispensable for forming good arguments of our own and identifying good arguments from bad ones . This chapter has five different sections. The first section is devoted for the discussion of the functions of language. The second section deals with the meaning of terms. The third section is all about definitions and their purposes. Definitional techniques are the concern of the fourth section. Last but not least, section five will take a look at on criteria for lexical definitions.

Objectives:

Up on a successful completion of this chapter, distance students will be expected to:

Explain the functions of language;

- Identify the intentional meaning of a term;
- Describe the extensional meaning of a term;
- Discuss the kinds of definitions and their purposes;
- Discuss the denotative definitions; and,
- Identify the criteria for lexical definitions.

3.1. COGNITIVE AND EMOTIVE MEANINGS OF TERMS

Brainstorming: Dear learners, what do you think is the functions of language?

Dear distance learners, this section discusses about the function of language. In this section the three basic functions of language and the function of language which is important to construct arguments are discussed. From this section, therefore , you may learn the functions of language in general; and, the function of language which is relevant for logic in particular.

Session objectives

At the end of this section, you will be able to:

- Recognize the functions of language;
- List the three basic functions of language;

- Discuss the three basic functions of language; and,
- Identify the function of language which is relevant for the study of logic.

3.1.1 Functions of Language

Individuals use language in many different ways, for various purposes in order to meet their various needs. Ludwig Wittgenstein , the contemporary philosopher, argued that the number of this functions as they are ultimate. Among others different individuals use language to ask questions, to respond to questions, to tell stories, to tell lies, to tell jokes, to form hypothesis, to launch verbal assaults, to give directions, to sing songs, to greet someone, and so forth. Although, we use language in these many different ways, some of these ways are irrelevant to any attempt to form or provide arguments.

Generally, language has three basic functions. These are emotive (expressive) function; directive function and cognitive (informative) function.

A. Emotive (Expressive) Function

Dear students, what do you think is the Emotive Function of Language?

Emotive or expressive function of language is a function of language which is important for individual to express their feeling or emotions. This function of language, therefore, enables individuals to express their positive or negative feelings, emotions, like and dislike and so forth. Examples:

- I love Solane.
- I like my logic teacher.
- She is beautiful!

Owing to the fact that the speakers, in these examples, are trying to express their feeling and emotions all the above sentences are instances of emotive function of language. Because of the very reason that emotive function obliges individuals to provide subjective, partial, irrational and unfair judgment based on their emotions or feelings about something, this function of language is not relevant for the science that evaluates argument-logic.

B. Directive Function

Dear students, what do you think is the Directive Function of language ?

Directive function of language serves the speaker or the writer in order to pass commands or orders to others. For example, when different individuals say, “Don’t close that door”, ”Study hard.” Or “Give me that book.” They are using language directly. The point in each of these cases is to make someone to perform a particular action.

Even though directive function of language has significant linguistic function, it is irrelevant for logic. This is owing to the fact that when we define logic, in the previous chapter, we have said that logic is the science that evaluates arguments; and, an argument is a group of statements that intends to produce a new assertion from the already established ideas. This point again implies that a statement is the backbone of an argument

C. Cognitive (Informative) Function

What is the Cognitive (Informative) function of language?

Cognitive or informative function of language is used to describe about the world and its inhabitants. This function of language also helps individuals to reason about the world and different things that are found in the world. Besides this it is also used to deny or affirm the truth of different proportions or statements. Since cognitive function enables individuals to deny or affirm the truth of different propositions or statements, cognitive statements can be evaluated as true or false. Therefore, they can serve as premises or conclusions of different arguments.

Example:-

- WWII started in 1939.
- Nile is the longest river.
- Wollega is found in the eastern part of Ethiopia.

These examples deny or affirm the truth of the objects about whom the statements are all about and convey information about them. The first and the second statements are true and the third is false. Therefore, if statements or propositions can be stated cognitional they can be either the premise or the conclusion of arguments. As a result it is only this function of language which is relevant for the science of logic. Although emotive and directive functions are significant linguistic functions in the daily life of individuals, Because of the very reason the two function fails to convey or disseminate information that could be evaluated as true or false these two function of language have no importance in the study of logic.

Brainstorming : Dear learner, what is the cognitive aspect of language?

Summary

It is very much important to avoid emotive words and sentences while arguing to provide an argument with a reasonable ground although it is not always easy to achieve emotively neutral language in every respect. In many instance, the informal fallacies (that will be discussed in the third chapter) result from an improper use of emotionally and psychologically charged language in the effort to persuade others to accept an argument

at an emotional level without providing important reasons or evidences through which the readers or listeners rely on.

Self-check exercise 3.1

Identify whether the following sentences are expressed through cognitive, directive and emotive function of language.

1. I hate watching football.
2. Eat your lunch as soon as possible in order to avail yourself in your exam hall before the exam started.
3. There are more than seventy languages that are spoken in Ethiopia.
4. I like the Ethiopian music and cultures of the south.
5. The world's tallest mountain is found in Ethiopia.

3.2. THE INTENSION AND EXTENSION OF TERMS

Brainstorming: ***Dear learns, what do you think is the intensional and extensional meanings of terms?***

Dear students, in this section you will learn about the meanings of terms. There are two different types of meanings that are symbolized by terms: Intentional and extensional meanings. Therefore, in this section, we will discuss the two types of meanings that the term symbolizes. In doing so, the relationships of intentional and extensional meanings of terms are identified.

Session Objectives:

Dear learners, upon the successful completion of this section, you will be able to;

- Identify the types of meanings that the term symbolizes;
- Distinguish intentional meaning from extensional meaning; and,
- Discuss the relationships of intentional and extensional meaning.

Though the primary goal of logic is the identification of good arguments from bad ones, because of different significant reasons raising concepts of meaning and definition of terms in the discussion of logic is crucial. In the previous chapter you have seen that arguments are composed of statements, statements which make up an argument are made up of words, and these words in turn have meanings.

Accordingly there are two types of meanings that are symbolized by words or terms. These are intensional meaning and extensional meaning. Intensional meaning, which is also called connotative meaning, which

consists of the qualities, properties, features, attributes or essential characteristics that the term connotes. In other words, connotative meaning is the summation of the essential feature or properties of an object or class of objects connoted in the term. Extensional meaning which is also called denotative meaning, on the other hand, refers to the members of the class that the term denotes.

Examples:

1. Philosopher means a person who is, critical, reasonable, logical, and analytic and who questions the foundations of everything.
2. Philosopher means such as Socrates, Plato, Aristotle, Hegel, Frederick Nietzsche and so forth.

The first example is the meaning of the term philosopher based on its attributes, qualities or essential characteristics. This is owing to the fact that concepts like ”critical”, “reasonable”, “logical”, and “analytic” and “questions the foundation of things” implies the attributes or essential feature of the term being defined-- philosopher. Therefore this term has an intentional meaning. On the other hand, the second example is the meaning of the term philosopher based on its class member. This is because this sentences provide lists of individuals who are the member of the class of the term being defined- philosopher.

An intentional and extensional meaning of terms can be increased based on the decrease or increase of attributes and class of things added to the term which is being defined. Hence the concepts of intension and extension can be used to give order to random sequences of terms. We might put terms in the order of increasing intension, increasing extension, decreasing intension, and decreasing extension.

Series of terms are in the order of increasing intension when every term in the series consist more attributes or qualities than the one which comes before it. On the other hand, the sequences of terms are in the order of increasing extension when each term in the series consist a class having more members than the class denoted by the terms which comes before it. To put matters in other way, when a series of terms are arranged in the order of increasing extension the class size acquire more member with each consecutive term.

Examples:

Increasing Intension: Animal, mammal, feline, tiger

Increasing extension: tiger, feline, mammal, animal

Decreasing Intension: tiger, feline, mammal, animal

Decreasing extension : Animal, mammal, feline, tiger

From the above example we can deduce the fact that the order of increasing intension is usually the same as that of decreasing extension; and, the order of decreasing intension is usually the same as that of increasing

extension. However, there is one exceptional case that violates the relation of intensional and extensional meanings. This happens when a term is defined intensionally using additional attributes or qualities of the term being defined in sequence of terms its intentional meaning increases where as its extensional meaning remains as it is.

Example:-

Commander, Commander of 65 years old, Commander of 65 years old having six children, Commander of 65 years old having 6 children and dependent upon his retirement fund.

In this example it is obvious that the qualities or attributes of the term being defined is in the increasing order but the extension of the term commander remains as it is. In all the series the term commander is concerned with a single commander having an increasing quality or attribute while the class member denoted by the term remains as it is. In other words, the class member of the term commander does not change though the qualities or attributes of the term commander increases in the series.

Note that the meaning of terms, however, should refer usually the reality. That is, it should refer the attributes of the set of things which existed in the past and the attributes or set of things which exist in the present day. However there are some forms of realities which do not exist in the present day. This things include myths, extinct creatures(like Dinosaur, Dragon) mythical stories, current king of America, Chirak, Unicorn, dodo bird and so forth.

These terms designated existing entities at once in the past, but today all such entities have no existence (these terms have no class members that represent them). Accordingly, these terms today have what is known as empty extension. Even though these terms have empty extension, they do not have empty intension .Because of the very reason that the living class members of these things do not exist, individual's knowledge of these things is based on their attributes or essential features that is known in the past and not based on their living class member's characteristics or attributes.

We can, therefore, deduce that the intentional meaning of different terms that symbolizes those things that do not exist today remains the same through the course of time, whereas the extensional meanings of these terms change through time. This point in turn asserts that intentional meaning of a term determines extensional meaning.

Brainstorming

Dear learner, how does intension determine extension?

Summary

In tensional or connotative meaning refers to the basic characteristics of a term, whereas extensional or denotative meaning refers to the members of a class denoted by a term.

Self-check exercise 3.2

Answer the following questions

1. What are the two meanings of terms?
2. Explain the intentional meanings of terms?
3. Discuss the extensional meanings of terms.

3.3. DEFINITIONS AND THEIR PURPOSES

Brainstorming ?Dear learners, what do you think about the concept of "definition"? Why do you learn about "definition" In logic?

Dear students, in the previous two sections you have learnt about the basic function of language and the intentional and extensional meaning of terms. Now it is time for you to learn about the concept of 'definition', the kinds of definition and their purposes. This section, therefore, discusses and deals with the concept of 'Definition' and its purposes'; and the kinds of definitions with their purpose. The section consists of two sub-sections; whereby the first sub-section deals with the meaning of the term 'definition' and the purpose of defining a term, and the second sub-section briefly discusses the different kinds of definitions with their purposes.

Session Objectives:-

Dear learners, at the end of this section, you are expected to:

- Discuss what is meant by "Definition"
- Recognize the functions or purposes of definition;
- Identify different kinds of definitions;
- Discuss some of the varieties of definition; and,
- Describe the purposes of different definitions.

The construction of good arguments not only requires clearer use of words and phrases, but it also requires defining different terms correctly. Incorrect and careless use of words or phrases and their definitions in arguments obviously result unsound, uncogent and fallacious argument. To make a good and a sound argument, therefore, we need to use words or phrases and their definitions correctly. Definition implies providing meaning to a term or to a phrase that is concerned with the essential attributes of a term or a

phrase. Accordingly, when we define a term, on the one hand we are providing meaning on the context to which the term applies or uses; and we are distinguishing the function of the term, which we are defining, from the function of other terms; and, on the other hand we are focusing on the essential characteristics or attributes that make a given term or phrase to have a certain connotation or denotation.

Many logicians define the term 'definition' as a group of words that assigns a meaning to some words or group of words. There are two important technical parts in every definition. These are the "definiendum" and the "definiens". The Latin term "Definiendum" refers to the word or group of words that is being defined. In other words, the definiendum in a certain definition is a word or a term which its meaning is revealed by other words. On the other hand, the Latin "definiens" is the word or a group of words that does the defining .

(The definiendum is a word to be defined while definiens is a group of words that accomplish the act of defining).

Example:

In the definition "philosophy' is a rational, critical enquiry in to the underlining ideas of human thought, experience and conduct." The term 'philosophy' is the definiendum, and everything that comes after the word "is" is the definiens of this definition.

Among others, definitions have the following important purposes.

- Definitions enable us to avoid confusing or misleading use of words like vague and ambiguous expressions;
- Definitions enable us to prevent obscurity, subjectivity and complexity of words and definitions are also helpful to introduce new words and to persuade others;
- Definitions enable us to avoid disagreements over the meaning of terms and to avoid differences over the use of different interpretations of words, phrases and passages, particularly passages which considered as an argument;
- It enables us to provide correct reasoning, to correct mistakes in reasoning, to develop the ability to reason logically.

3.3.1 Kinds of Definition

Dear learners, how many definitions are there? Can you mention some of the types of definitions?

Well, there are five kinds of definitions. This includes stipulative definition, lexical definition, précising definition, theoretical definition and persuasive definitions. This section discusses about these five kinds of definitions with their purposes.

A. Stipulative Definition

Dear students, what is a stipulative definition?

A stipulative definition provides meaning to a new term for the first time. This may be done through either creating a new word or giving a new meaning to an old word. The purpose of a stipulative definition is usually to replace a complex expression or an expression which one can't be easily understand by a simple expression.

Beside this, stipulative definition has a further purpose of introducing new or unfamiliar words .

Examples:

"Operation Barbarosa" means the name the Germans gave to the invasion of Russia.

"Operation Desert storm" means the code name given to the military invasion of Iraq.

"Tigon" was taken to mean the offspring of a male tiger and a female lion.

The assignment of meaning in the above terms (Operation Barbarosa, Operation Desert Storm, and Tigon) is carried out through stipulative definition. This is because the terms are new and they are defined for the first time. Different individuals invent new words and define either intentionally or extensionally for the sake of military secret codes operation in scientific inventions, introducing new social and natural phenomena and so on. And all this is accomplished through stipulative definition.

B. Lexical Definition

Dear learners, what is a Lexical definition? This definition is used to report the meaning that a word already has in a language.

Dictionary definitions are instances of lexical definition. In contrast to stipulative definitions, lexical definitions may be true or false depending on whether these definitions does or does not report the way a word is actually used.

The purpose of a lexical definition is to eliminate ambiguity that would arise over the use of different words. A term is ambiguous when it has two or more meaning in a certain context. Many words that are used commonly have two or more relatively precise meanings. Accordingly, unless we use the meanings of different terms or words in their proper contexts the problem of ambiguity would be created. For instance words like" light", "bank", "sound", "right" and "race" is subject to ambiguity . The term "Bank", for example, can mean a financial institution or the slope bordering river," right" can mean freedom, liberty or correct; and so forth.

C. Précising Definitions

Dear learners, what is a précising definition?

A précising definition is a definition which provides a more precise, specific, exact and restricting meaning to a term. The purpose of this definition is to avoid or reduce the vagueness of a word. A word is said to be vague when it is impossible or difficult to tell whether this word applies to specific cases or not. For example words such as happiness, love, rich, poor, bald, crowded, conservative and so forth are vague. This is because it is difficult to tell whether these words apply to specific situations or not. In other words, we can hardly apply these words to the specific situation because of the very reason that these words lack attributes like exactness and preciseness.

For example, the definition "poor" means having a daily income of less than 10 birr; is an example of a precise definition because the term "poor" is defined exactly and precisely. Unlike stipulative definitions, which involve a purely arbitrary assignment of meaning of a term, the assignment of meaning in précising definition is not at all arbitrary. Due care must be given for the assignment of meaning in a précising definition to ensure that the meaning given are correct and legitimate for the context within which terms are applied or used.

D. Theoretical Definition

Dear learners, what is a theoretical definition?

A theoretical definition provides a theoretical meaning to different terms or words based on the context of broader intellectual framework. For example "Heat" means the energy associated with the random motion of the molecules of a substance. This definition provides a theoretical meaning to the word "Heat". Other examples of theoretical definition includes the definition of "light", "force", "mass", "acceleration" etc that are found in science. But this does not mean that all theoretical definitions are associated with science. There are many terms in philosophy such as "substance", "form", "cause", "change", "idea", "good", "mind", "justice" and so forth which have been given theoretical definition by different philosophers. The purpose of a theoretical definition is to avoid disagreements over the use of different terms by providing theoretically adequate and reliable description of the entities which are designated by different terms or words.

E. Persuasive Definition

Dear learners, what is a persuasive definition?

A persuasive definition assigns meaning to different terms using emotively charged words or phrases to create a favorable or unfavorable attitude towards what is designated by the definiendum. The purpose of persuasive definition, as its name indicates, is to persuade listeners or readers over a certain issue.

Example:

"Capitalism' means the economic system in which individuals are afforded the God given freedom to own property and conduct business as they choose."

"Capitalism' means the economic system in which humanity is sacrificed to the wanton quest for money; and mutual understanding and respect are replaced by alienation , greed, and selfishness.

"Abortion' means the ruthless murdering of innocent human beings".

"Abortion" means a safe and establishes surgical procedure whereby a woman is relieved of an unwanted burden"

Dear students, all of these definitions are instances of persuasive definitions because the writers or the speakers of these definitions use different emotively charged words and phrases in each of the above definitions and thereby they try to influence, change, or persuade others.

Brainstorming

Dear learner, what are some of the purposes of definitions?

Summary

Definitions usually try to elaborate on the meaning of a term. Based on their current usage, one could identify stipulative, lexical, précising, theoretical and persuasive definitions.

Self-check exercise 3.3

Answer the following questions

1. List the five kinds of definitions.
2. Which kind of definition reports the meaning of a word?

3.4. Definitional Techniques

Dear learner. What are some of the ways of producing definitions?

Dear students, in the last section you have learned some of the kinds of definitions and the functions that these definitions intended to serve. In this section you will learn some of the techniques used to produce

these definitions. These techniques may be classified in terms of the two kinds of meaning that a term has: intentional and extensional meaning .

It is worth recalling the section that discusses about the meaning of terms.

Session Objectives:

Dear distance students, up on the completion of this section, you will be able to:

- Identify the denotative definitions;
- Discuss some of the denotative definition;
- Identify the connotative definitions; and
- Discuss some of the connotative definitions.

3.4.1. Extensional (Denotative) Definition

An extensional or denotative definition is a definition that assigns meaning to a term by indicating or listing the members of the class that the definiendum denotes. In other words, extensional definition provides meaning to a term by listing examples to the term which is being defined by definiendum. There are at least three different ways of indica[pting the members of a class. First, we can indicate the members of the class by pointing physically to them; second, by naming them individually; and third, by naming them in groups.

Accordingly, these three ways of indicating the members of a class would result three kinds of definitions. These definitions which are created by the three ways of indicating the members of a class are: Ostensive(demonstrative) definition, enumerative definition and definition by sub-class.

A. Ostensive (Demonstrative) Definition

Ostensive (demonstrative) definition assigns meaning to a term being defined by pointing physically to the object. Sometimes different individuals nod their head to indicate the object which is symbolized by a certain term and which is being defined. The word ostensive comes from the Latin word "*ostender*", which means to show. Ostensive definition, therefore, attempts to define a term showing the object, which is designated by a certain term or word, physically. This way of providing meaning to a term is called demonstration.

Examples:

1. "pen" means this.(by pointing to the pen)
2. "House" means this one. (using a picture demonstrating a house)

B. Enumerative Definition

Enumerative definition assigns a meaning to a term, which is being defined, through providing complete or partial list of objects or entities that a term symbolizes.

Enumerative definition is, therefore, carried out through listing some or all of the objects or entities symbolized by the definiendum .

Example:

- Planet means such as mercury, Venus, Earth, Mars, Saturn, Jupiter, Neptune, Venus, or Pluto
- Scientist means such as Albert Einstein, Isaac Newton, Charles Darwin, Galileo Galilee and so forth.

Even though complete enumeration of objects denoted by the definiendum is difficult; it is more satisfying than partial ones because it guarantees to identify the term which is being defined with greater clarity. The above definitions are enumerative definitions of

the term "planet" and "scientist" in which the term planet is defined by listing all of the members or entities that are designated by the term planet and also the second definition is defined by listing some of the entities that are designated by the term "scientist".

C. Definition by Sub-Class

This type of definition assigns a meaning to those subgroups of subclass of the class denoted by the term which is being defined. Like enumerative definition, definition by subclass can be carried out by listing either all or some of the subclass denoted by the term being defined.

Example:

- reptile means such as snake, crocodiles, and tortoise
- Tree means such as acacia, sycamore, tid, wanza, warka and the like.

These definitions are definitions by sub-class, because the two terms "reptile" and "tree" are defined by listings the subgroups or subclass of the class term which is being defined.

Extensional definitions are mostly used as techniques for producing lexical and stipulative definitions. Lexical definitions are aimed at reporting how a word is actually used, and one of the ways of accomplishing this task is by identifying the members of the class that the word symbolizes. Dictionaries usually provide us the meaning of different terms which involve meaning to individual members or to the subclass symbolized by the word being define definiendum. Even sometimes dictionaries may give us demonstrative or ostensive definitions if and only if they are capable of providing pictures of the object that the word being defined symbolizes. Such attempts of providing meaning to a word lexically often involve all three kinds of extensional definitions.

Stipulative definition, as you can remember from your knowledge of the kinds of definitions, is used to assign meaning to a completely new term. This task of assigning meaning to a completely new term may be carried out by all three kinds of extensional definition. For example a zoologist who tries and classify the types of birds might assign names to the specific varieties by pointing to them individually using ostensive definition.

And then she or he may also give a class name to the whole group by referring to the names of the specific varieties – definition by subclasses. And still a teacher who tries to organize some students in two groups for a certain debate might say, "Birhanu, Gemeda, Chaltu and Mohammed will be called 'Democrats", and "Abraham" Gemechu, Billile and Asefa will be called 'Republicans." Enumerative definition.

Although extensional definition could rarely serve as techniques for developing theoretical and persuasive definition, these definition cannot properly serve as techniques for developing précising definitions. One of the tasks of a précising definition is to clarify a vague word and vagueness is a problem that is associated with intentional meaning of a term.

3.4.2. Intensional (Connotative) Definitions

Dear distance learners, what do you understand by connotative definitions?

A connotative definition is a definition that assigns meaning to a word by indicating the qualities or attributes that the word which is being defined connotes. In other words, a connotative definition provides a meaning to a term describing the essential characteristics or features possessed by the term being defined. At least there are four ways that might be used to indicate the attributes or essential feature that different words connote. These ways of indicating the attributes or essential feature that the word connotes in turn provide us the four kinds of intentional definitions: synonymous definition, etymological definition, operational definition, and definition by genus and difference. The next discussion discusses these four kinds of intentional definitions.

A. Synonymous Definition

Dear distance learners, what is a synonymous definition?

Synonymous definition is a type of definition that provides a synonym meaning or a single word that connotes the same attributes with the definiendum- a word or a term which is being defined. In other words, in a synonymous definition the definiens is a synonym of the word being defined.

Examples:-

- "Astonishing" means "Surprising"

- "Disorder" means "instability"
- "Chaos" means " disorder"

The above definitions are instance of a synonymous definition because the definitions of these definitions is equivalent in connotation and denotation with their definiendum . We can, therefore, interchangeable use the definiens and the definiendum of synonymous definitions.

B. Etymological Definition

Dear students, what is an Etymological definition?

An etymological definition assigns meaning to the term being defined based on or referring to the words roots or ancestor. For example, an individual will defines the term "Ethics" through the following ways, the word "Ethics" comes from the "Greek" word "Ethos" which means habits, customs, principle, conduct, manner of acting and etc.

Thereby ethics studies that actions of an individual or social group and determine these actions whether they are right or wrong, good or bad, vice and virtues and so forth. This definition is an etymological definition. This is because the word "Ethics" is defined referring to or based on its root or ancestor word.

C. Operational Definition

Dear distance learners, what is an operational definition?

An operational definition assigns meaning to a term by specifying certain operations or experiments for determining whether the word which is being defined applies to a certain thing or rot. Operational definition, therefore, carried out by performing the actions, operations, activities and procedures that the word implies and when these actions, operation, and activities performed serve as its meaning.

Examples:

- A solution is an "acid" if and only if this solution turns blue litmus paper red when dipped in to it.
- "Water vapor" is when water boils at 100 degree calicoes and changes in to gaseous state.

The above definitions are operational definitions because each of these definitions prescribes an activity or operation to be performed. The first example prescribes that 'to dip blue litmus paper in to the solution' and observe for color change. And the second definition also prescribes 'to boil water at 100 degree calicoes' and observe for a change on the state of water.

Operational definition serve as a method for developing, stipulative, lexical, précising, and persuasive definitions, but this definition could not be used to produce a pure lexical definitions because of various limitations.

D. Definition by Genus and Difference

Dear students, what is definition by genus and difference?

Definition by genus and difference assigns a meaning to a term by stating a general class term being defined genus term, that contains the term which refers its sub class specious term, and then stating the specific difference of the genus term that distinguish it from species term. To understand the definition by genus and difference it is essential to identify or clearly know the meaning of the terms:"Genus"," species", and "specific difference".

The terms "Genus" and "species", in logic, have relatively different meaning than in other subjects. In logic " Genus" refers to a larger class, and "species" refers to a smaller sub-class of the genus. And "difference "or specific difference" is the essential character or attributes that distinguish the specious term from the genus term.

Examples:-

- Mother means a female parent;
- Wife means married woman; and, Son means male offspring

In the above definitions terms: 'parent', 'woman' and 'offspring' are the genus term which connotes the general class term; and, terms 'mother', 'wife', and 'son' are species terms which symbolizes the sub-class of the genus term. Terms 'female', 'married woman', and 'male' are the differentia terms that distinguish a species term from the genus term. Hence the above definitions are instances of definition by genus and difference.

This way of defining a term is helpful for developing the five kinds of definitions. Stipulative, lexical, précising, theoretical and persuasive definitions can be constructed by the techniques of genus and differentia. Although lexical definitions are typically definitions by genus and difference, these definitions are constructed or developed by etymological definitions.

Brainstorming ?Dear learner, can you think of any definitional techniques?

Summary

Definitional techniques are specific methods of producing definitions. Alongside this line one could identify intentional and extensional techniques.

Self-check exercise 3.4

Answer the following questions accordingly

1. List the three definitions that are considered as a Denotative types of definition.
2. List the four definitions that are considered as instances of intensional definitions .

3.5. Criteria For Lexical Definitions

Dear students, what criteria do you think are important for producing lexical definition?

Dear distance learners, this is the last section of this chapter. It focuses on some of the important rules or criteria for lexical definitions. Therefore this section lists and discusses those rules or criteria which are considered as significant rules or criteria for developing lexical definitions.

Session Objectives:

Dear students, after the completion of the lesson in this section, you will be able to:

- Tell why these criteria are needed ;
- List some of the criteria for lexical definition; and,
- Discuss some of the rules or criteria for lexical definition.

Because of the very reason that a lexical definition aimed at reporting the way a word is used in a language, these definitions are the ones we usually come across and the one that most people use when they present a "definition" of a word. Accordingly, it is appropriate to have a set of rules and criteria's that may serve us in constructing lexical definitions of our own and in evaluating the lexical definition of others. Establishing rules or criterion for lexical definitions has special significance in that, among other things, it enables us to control extreme subjectivity in defining terms. The following are the important criteria's or rules for lexical definitions.

Rule 1: *Lexical definition should be stated or constructed with a proper grammar*.

Unless otherwise definition should constructed with a proper or correct grammar, it creates disagreements and disputes among individuals over the meaning of terms.

Example:

- "Breakfast" is when a man eats something.
- "Construction" is when an individual constructs a bridge,

These definitions are grammatically incorrect. Their correct version is:

"Breakfast" is when an eating take place in the morning after an individual gets up from bed'. "Construction" is a process of building something like bridge, house, apartment etc.

Rule 2. *Lexical definition should indicate the essential attributes of the word being defined- the definiendum* . A good definition tries to point out the features that are essential to the designation of a thing which is symbolized by the word being defined.

Example:

"Human being" means a featherless biped.

This definition does not indicate the essential attributes' of the term human being. A correct and adequate definition would be: "Human being" means a rational animal that has the capacity to speak.

Rule 3: *Lexical definition should capture the correct extension i.e. it must not be too broad and too narrow.*

Dear students, what do you think is too broad definition? A definition is too broad if the definiens applies to things to which the definiendum does not. In a too broad definition the definiendum is less than the definiens.

Example:

- "A snake" is a reptile.
- "Chalk" is a tool used for writing.

These two definitions are too broad, because the term reptile, in the first definition, includes crocodiles and tortoises which the definiendum fails to include. The phrase "a tool used for writing", in the second definition, includes things like pen, pencil, marker, highlighter, chalk etc, which are not found in the definiendum. Therefore, these two definitions are too broad because their definiens applies to those things the definiendum do not.

Dear learners, what do you think is a too narrow definition?

A definition is said to be too narrow if the definiendum includes those things which the definiens does not .

Examples:

- A "roof" is part of the house used to prevent light from penetrating in to the house.
- A "gun" is a tool used in the battle to defend the enemy.

These definitions are too narrow because the term roof in the first definition is defined by a few attributes that fail to include all functions of a roof. On the other hand the term gun is defined using a few attributes, i.e. the definiens fails to include different attribute of a gun.

Rule 4: *Lexical definition should avoid circularity.* In a circular definition the definiendum appears with grammatical variation in the definiens.

Since a circular definition uses the term being defined as part of its own definition, it can't provide any use full information about the term being defined.

Examples:

- "Card less phone" means a telephone that has no card.
- A "teacher" is one who teaches.

The above definitions are circular in the sense that their definiendum appeared in the definiens, or in other words, their definiendums are restated in other way. One should not be mistaken circular definition with synonymous definition which provides appropriate meaning of a terms and it is carried out through

providing a single word which has identical or the same meaning with the word being defined- the definiendum.

Rule 5*:* *Lexical definition should be Affirmative rather than negative*.

Negative definition is a definition that provide meaning to a term based on what the term does not mean or apply rather than what the term does really mean.

Example :

- "Honest person" is someone who rarely lies.
- "War" is the absence of peace.
- "Good" means that which is not bad.

These definitions are negative because the terms "Honest person", "War" and "Good" are defined based on what they are not, they are not defined based on what they mean or what they are. We should not here the fact that there are terms that require negative definitions but the point is when a term can be defined positively it should not be defined negatively.

Rule 6*:* *Lexical definition should avoid figurative or obscure language*.

Figurative definition is a definition that provides meaning to a term using different figurative language particularly metaphors.

Examples:

- "Camel" means a ship of the desert
- "Lion" means a king of the animal world.

Obscure definitions occurred as a result of defective or incorrect use of language or when the meaning of the term being defined is hidden.

Example:

- " Happiness" is a worm puppy.(Old fashioned English word).

Besides these figurative and obscure languages, lexical definition should also avoid ambiguous and vague language. An ambiguous definition is a definition that geared towards providing more than one distinct meaning.

Example:

- "Human being" is a rational animal which is created in the image of God.
- In this definition the term human being is ambiguously defined. i.e. it provides two meanings which are ambiguous for the term human being .

A vague definition is a definition which lacks preciseness or specific application. This definition assigns a meaning which is inaccurate and not specific . In a vague definition it is hardly possible to tell exactly to which the things that the definition applies.

Example:

- "Bald" means a person who has little hair.

- "Crowded" means when a certain place is occupied by many individuals or some other things

Rule 7: ***Lexical definitions should avoid affective expression.***

Affective expression is an expression that influences others positively or negatively.

Example:

- "Ethiopia" is a country of illiterate and hungry people
- "Africans" are uncivilized and have no history.

These definitions are not good definitions because they affect Ethiopians and Africans negatively. For example, expressions like "illiterate, hungry" in the first definition and "uncivilized, have no history" in the second definition are affective expressions that affect individuals who are in question negatively.

Rule 8: ***Lexical definitions should indicate the context to which the term is being defined***.

Whenever the definiendum – a term or a word that is being defined has different meanings in different time and contexts, referring or indicating the context in which we are using to define the term is indispensable.

Example:

- "Strike" means (in fishing) a pull and a line made by a fish taking the bait.

"Strike" means (in bowling) the act of knocking down all the pins with the first ball of a frame.

Brainstorming ?Dear learner, what are some of the rules that must be kept in mind in producing lexical definitions?

Summary

Lexical definitions are the most commonly used forms of definitions and as such a great deal of care must be taken while producing them.

Self-check exercise 3.5

Answer the following questions carefully

1. Why we establish rules or criteria for a definition?
2. What are the eight criteria for lexical definition?

Chapter Summary

To sum up, learning how language works has a paramount significance to form good arguments to our own and for identifying good arguments from bad ones. Language, generally, has three basic functions. This includes: Emotive, Directive and cognitive functions. Emotive function of language is a function of language through which individuals express their positive or negative feelings, emotions, like and dislikes and etc. Directive function is a function of language through which individuals express their command order towards others. Cognitive function is a function of language which is used to describe and to reason about

things that are found in the world. Among these three functions, it is only the cognitive aspect of language which is relevant for the science that evaluates argument- logic.

There are two types meanings that a term or a word symbolizes. These are intentional and extensional meaning. Intensional meaning, also called connotative meaning, constitutes of the qualities, attributes, of essential characteristics that the term connotes.

On the other hand, extensional meaning, which is also called denotative meaning consist of the members of the class that the term denotes.

There are five kinds of definitions. These are Stipulative, lexical, précising, Theoretical, and persuasive definitions. Stipulative definitions assigns meanings to a new word for the first time. Lexical definition is a definition that reports the meaning that a word has in a Language. Precising definitions are definitions which provide a more precise, specific exact and restricting meaning to terms. A theoretical definition provides theoretical meaning of different terms based on the context of broader intellectual framework. And persuasive definitions assigns meanings to different terms using emotively charged words or phrases to create a favorable or unfavorable attitude towards what is designated by the definiendum.

There are two techniques that help to produce or develop these five kinds of definitions. These are called Extensional (Denotative) definitions and Intensional (Connotative) definitions. Extensional (Denotative) definitions are those definitions that assign meaning to a term by indicating or listing the members of the class that the definiendum denotes.

There are, for instance, three ways of indicating the members of a class : by pointing physically to them, naming them individually and naming them in groups. These three ways of indicating the members of a class results three kinds of definition. These definitions are: Ostensive definition, Enumerative definition and definition by sub- class. Ostensive definition assigns a meaning to a term by pointing physically to the object.

Enumerative definition assigns meaning to a term through providing complete or partial of objects that the term symbolizes. And definition by sub-class assigns meaning to a term naming those sub-groups or sub-classes of the denoted by the term being defined , Extensional (denotative) definitions are chiefly used as techniques for producing lexical and stipulative definitions.

Intensional (Connotative) definitions are those definitions that assigns meaning to terms through indicating the qualities or attributes that the definiendum connotes, There are four definitions which are considered as instances if Intensional definitions. These are: Synonymous, Etymological, Operational definitions and definitions by Genus and Differentia. Synonymous definition is a definition in which its definiens is a single

word that connotes the same attribute as the definiendum. An etymological definition is definition that assigns meaning to a word based on the words root or ancestor. Operational definition assigns meaning to a term specifying certain experimental procedures or operations. And definitions by Genus and Differentia definition is a definition which assigns meaning to a term by stating general class term and its sub-class term differentiating them through stating their differentia.

Last but not least, there are about eight rules or criteria's for lexical definition. These include; Lexical definition should be stated with proper grammar; should indicate the essential attribute of the term; should be precise ; should avoid circularity; should not be negative when it can be positive; should avoid figurative, obscure, vague or ambiguous language; should avoid affective expressions; and should indicate the specific context to which the term applies.

Self- check Exercise 3.6

Part I :say true or False

1. Emotive function of language is the function of language that most logicians rely on to form different arguments.
2. Cognitive function of language is insignificant for the science that evaluates arguments .
3. Precising definitions serve to reduce vagueness and source of confusion in argument.
4. In a too broad definition the definiendum is less the definiens.
5. Ostensive definition provides meaning to a term based on the ancestor or root term of the definiendum.

References

Hurley Patrick j a concise introduction to logic 1994 sixth edition university of san Diego wadsworth publishing company a division of wadsworth inc

O'Connor D.J and B. Powell elementary logic 1980 London Hodder

Copi, I.M Introduction to logic 1968 London; Macmillan

Kahane, Howard logic and philosophy 1968 California; Wadsworth

Lehmann, Scott, A quick Introduction to logic 2001 Connecticut, USA

Priest , Graham logic A very short introduction 2000 oxford university press , New York

CHAPTER FOUR

BASIC CONCEPTS OF CRITICAL THINKING

Chapter Overview

This chapter is about the power of disciplined thinking. It is about learning to think for yourself and being your own person. In many high schools, the emphasis of education tends to be on -lower-order thinking. Students are simply expected to passively absorb information and then repeat it back on tests. In college and universities, by contrast, the emphasis is on fostering -higher-order thinking: the active, intelligent evaluation of ideas and information. *As* Martin Luther King Jr rightly puts it as "The function of education is to teach one to think intensively and to think critically". The main goal of teaching Critical Thinking is therefore, to teach students how to think; that is, how to become independent, self-directed thinkers and learners. It is about the personal empowerment and enrichment that result from learning to use your mind to its fullest potential. In short, it is about critical thinking. In this chapter, we deal with the Meaning, Standards, Principles, Characteristics, Barriers, and Benefits of critical thinking,

Chapter Objectives:

At the end of this chapter, students will be able to:

- Define critical thinking.
- Understand the standards of critical thinking.
- Appreciate the principles of good argument and critical thinking.
- Understand the characteristics of critical thinking.
- Identify the barriers of critical thinking.
- Recognize the benefits of critical thinking.

4. 1. Meaning of Critical Thinking

Critical thinking can be defined as a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims. In this lesson, we will learn the meaning and general picture of critical thinking.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Understand the meaning and general picture of critical thinking.

Activity # 1: *Dear learners, what do you think is critical thinking?*

Critical means involving or exercising skilled judgment or observation. In this sense, critical thinking means thinking clearly and intelligently. More precisely, critical thinking is the general term given to a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims. Moreover, it helps to discover and overcome personal preconceptions and

biases; to formulate and present convincing reasons in support of conclusions; and to make reasonable, intelligent decisions about what to believe and what to do.

However, it does not automatically follow that being intelligent means being able think critically or reason about information in a useful, effective and efficient manner. Being smart and intelligent is not sufficient. Critical thinking is a process or journey that helps us to arrive at the most useful, helpful, and most likely destinations when evaluating claims for scientific truth. Critical thinking, thus, is thinking clearly, thinking fairly, thinking rationally, thinking objectively, and thinking independently. It is a process that hopefully leads to an impartial investigation of the data and facts that remains not swayed by irrelevant emotions. Therefore, the aim of critical thinking is to arrive at well-reasoned, considered, and justifiable conclusions. The American philosopher, John Dewey, has defined critical thinking as an *active, persistent, and careful consideration of a belief or supposed form of knowledge in the light of the grounds, which support it and the further conclusions to which it tends.* In this definition, there are three main points that we should focus on: *active, persistent* and *grounds.*

The first point is that critical thinking is an 'active' process. By defining critical thinking as an 'active' process, Dewey is contrasting it with the kind of thinking in which you just receive ideas and information from other people – what you might reasonably call a 'passive' process. For Dewey, critical thinking is essentially an active process – one in which you think things through for yourself, raise questions yourself, find relevant information yourself and so on, rather than learning in a largely passive way from someone else. The second point is that critical thinking is persistent and careful consideration. Here, Dewey is contrasting critical thinking with the kind of unreflective thinking we all sometimes engage in. For example, we sometimes jump to a conclusion or make a quick decision without thinking about it. Of course, sometimes, we may have to do this because we need to decide quickly or the issue is not important enough to warrant careful thought, but we often do it when we ought to stop and think – when we ought to persist a bit.

However, the most important point in Dewey's definition lies in what he said about the 'grounds which support' a belief and the 'further conclusions to which it tends'. What Dewey is saying, to express it in a more familiar language, is that what matters are the *reasons* we have for believing something and the implications of our beliefs. It is no exaggeration to say that critical thinking attaches huge importance to reasoning, to giving reasons and to evaluating reasoning as far as possible. There is more to it than that, but skillful reasoning is a key element.

Dewey's definition, though it is important, misses some important features of critical thinking. Let us now see the other definition given by Edward Glaser. Edward Glaser defined critical thinking as: *(1) an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experience; (2) knowledge of the methods of logical enquiry and reasoning; and (3) some skill in applying those methods.*

if we closely observe Glaser‘s definition, it is immediately obvious that this definition owes a lot to Dewey’s original definition. Glaser uses the term ‘evidence’ in place of ‘grounds’ but otherwise the second sentence is much the same. But there are two points which stands out in this definition. The first sentence speaks about an attitude or disposition to be thoughtful about problems and recognizes that you can apply what he calls ‘the methods of logical enquiry and reasoning ‘with more or less skill‘. The tradition has picked up on both these elements, recognizing that critical thinking is partly a matter of having certain thinking skills. But it is not just a matter of having these skills; it is also a matter of being disposed to use them. Critical thinking combines these habits and abilities in approaching and understanding our experience.

The other most famous contributors to the development of the critical thinking tradition is Robert Ennis. He defined critical thinking as *reasonable, reflective thinking that is focused on deciding what to believe or do*. Notice that the emphasis on being ‘reasonable’ and ‘reflective’ in this definition is similar with the above two definitions. But notice also that Ennis speaks of deciding what to . . . do‘, which was not explicitly mentioned in the above definitions. So decision-making is an important part of critical thinking in Ennis‘s conception. What we learn from Ennis‘ definition is that when we make a decision, we should be serious about it. The decision may be about purchasing a phone, or it may be about choosing a department, or any other issues. But we should employ critical thinking to make a decision.

Here is another important definition of critical thinking is given by Richard Paul: *Critical thinking is that mode of thinking – about any subject, content or problem – in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them.* Paul associates critical thinking with reflecting on thoughts. This definition is interesting and somehow looks different from the other definitions given above. It draws attention to a feature of critical thinking on which scholars in the field seem to be largely agreed - that the only realistic way to develop one‘s critical thinking ability is through thinking about one‘s thinking‘ (often called meta-cognition‘), and consciously aiming to improve it by reference to some model of good thinking in that domain.

One last definition is worth reviewing. Michael Scriven has defined critical thinking as *skilled and active interpretation and evaluation of observations and communications, information and argumentation.* He argued that critical thinking is an academic competency akin to reading and writing and is of similarly fundamental importance. It is worth unpacking Scriven’s definition a little. He defines critical thinking as a skilled‘ activity for reasons similar to those mentioned above. He points out that thinking does not count as critical merely because it is intended to be, any more than thinking counts as scientific simply because it aims to be. To be critical, thinking has to meet certain standards, (clarity, relevance, reasonableness and so on), and one may be *more* or *less* skilled at this. He defined critical thinking as an active‘ process, partly because it involves *questioning* and partly because of the role played by *meta-cognition*. He includes interpretation‘ of texts, speech, film, graphics, actions and even body language, because like explanation,

interpretation typically involves constructing and selecting the best of several alternatives, and it is a crucial preliminary to drawing conclusions about complex claims‘. He includes ‗evaluation‘ because ‗this is the process of determining the merit, quality, worth, or value of something‘ and much critical thinking is concerned with evaluating the truth, probability or reliability of claims.

The above definitions, though may not give exhaustive definition by themselves, they nevertheless provide an important conception of critical thinking together. Before closing the explication of critical thinking, however, we should focus on the other aspects of critical thinking.

Critical thinking is sometimes referred to as "critico-creative" thinking. This word is the combination of two words: *critical* and *creative*. There are two related reasons for this. The first is that the term 'critical thinking' is sometimes thought to sound rather negative, as though one's only interest is in adversely criticizing other people's arguments and ideas. This would be a serious mistake since (and this is the second reason) to be good at evaluating arguments and ideas, one often has to be very imaginative and creative about other possibilities, alternative considerations, different options and so on. To be a good judge of issues, it is not enough to see faults in what other people say. You need to base your judgment on the best arguments you can devise in the time available; and this often requires you to think of relevant considerations other than those presented, look at issues from different points of view, imagine alternative scenarios and perhaps find other relevant information – in short, you will need to be quite creative. For these reasons, some writers have wanted to speak of 'critico-creative' thinking to emphasize the positive, imaginative aspects of critical thinking. Unfortunately, the result is a rather cumbersome expression so we shall use the term 'critical thinking', which is now so widely used, whilst understanding it in this positive, imaginative sense. In short, critical thinking is a kind of evaluative thinking – which involves both criticism and creative thinking – and which is particularly concerned with the quality of reasoning or argument that is presented in support of a belief, or a course of action.

4.2. Standards of Critical Thinking

Critical thinking is a disciplined thinking governed by clear intellectual standards. But, not every thinking is critical. To identify a critical thinking from the uncritical, we refer to some standards. There is a consensus among philosophers that for thinking to be critical, it has to meet certain standards. Standard of critical thinking refers a conditions or a level that critical thinking should meet to be considered as normal and acceptable. Among the most important of these intellectual standards are clarity, precision, accuracy, relevance, consistency, logical correctness, completeness, and fairness. In this lesson, we will discuss these standards.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Recognize the important intellectual standards of critical thinking.

Activity # 2: *Dear learners, do you know any standard of critical thinking? How do you identify good critical thinking from bad critical thinking? What basic standards do you think critical thinking should meet?*

Dear learners, we have seen that the term ‗critical thinking' generally refers to a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims. It is critical thinking is a disciplined thinking governed by clear intellectual standards that can be used to identify a critical thinking from the uncritical. Standard of critical thinking refers a conditions or a level that critical thinking should meet to be considered as normal and acceptable. *Clarity, precision, accuracy, relevance, consistency, logical correctness, completeness,* and *fairness* are some of the most important intellectual standards of critical thinking. Let us discuss these standards in detail.

1) Clarity

Clarity refers to clear understanding of concepts and clearly expressing them in a language that is free of obscurity and vagueness. When we construct argument, we should take into consideration or pay close attention to clarity. Before we can effectively evaluate a person's argument or claim, we need to understand clearly what the person is saying. Unfortunately, that can be difficult because people often fail to express themselves clearly.

But clarity is a gateway standard. If a statement is unclear, we cannot determine whether it is accurate or relevant. In fact, we cannot tell anything about it because we do not yet know what it is saying. For example, the question ―What can be done about the education system in Ethiopia?‖ is unclear. In order to address the question adequately, we would need to have a clearer understanding of what the person is asking. The question is considering the ―problem to be. A clearer question might be What can educators do to ensure that students learn the skills and abilities which help them function successfully on the job and in their daily decision-making?

Sometimes lack of clarity is due to laziness, carelessness, or a lack of skill. At other times, it results from a misguided effort to appear clever, learned, or profound. As William Strunk Jr. and E. B. White, in their classic, "*The Elements of Style",* remark that -*Muddiness is not merely a disturber of prose, it is also a destroyer of life, of hope: death on the highway caused by a badly worded road sign, heartbreak among lovers caused by a misplaced phrase in a well-intentioned letter. . . .Only by paying careful attention to language can we avoid such needless miscommunications and disappointments.*

Critical thinkers, however, not only strive for clarity of language but also seek maximum clarity of thought. To achieve our personal goals in life, we need a clear conception of our goals and priorities, a realistic grasp of our abilities, and a clear understanding of the problems and opportunities we face. Such self-understanding can be achieved only if we value and pursue clarity of thought.

2) Precision

Precision is a matter of being exact, accurate and careful. Most ideas are vague and obscures though we think we have precise understanding of them. When we try to meticulous these ideas, we will find that they are imprecise. To get precise understanding, we should pay close attention to details. Everyone recognizes the importance of precision in specialized fields such as medicine, mathematics, architecture, and engineering.

Critical thinkers also understand the importance of precise thinking in different contexts. They understand that to cut through the confusions and uncertainties that surround many everyday problems and issues, it is often necessary to insist on precise answers to precise questions: What exactly is the problem we are facing? What exactly are the alternatives? What exactly are the advantages and disadvantages of each alternative? Only when we habitually seek such precision are we truly become critical thinkers.

3) Accuracy

Accuracy is about correct information. Critical thinking should care a lot about genuine information. If the ideas and thoughts one processes are not real, then once decision based on wrong and false information will likely to result in distorting realities. John Rawls, in his book entitled as "*A Theory of Justice"* argued that *truth is the first virtue of systems of thought. A theory however elegant and economical must be rejected or revised if it is untrue.* Whether an idea is attractive or sophisticated should be abandoned if it is based on false information.

Accuracy is about having and getting true information. There is a well-known saying about computers: Garbage in, garbage out. Simply put, this means that if you put bad information into a computer, bad information is exactly what you will get out of it. Much the same is true of human thinking. No matter how brilliant you may be, you are almost guaranteed to make bad decisions if your decisions are based on false information. Critical thinkers do not merely value the truth; they also have a *passion* for accurate, timely information. As consumers, citizens, workers, and parents, they strive to make decisions and this decision should be based on true information.

4) Relevance

The question of relevance is a question of connections. When there is a discussion or debate, it should focus on relevant ideas and information. That is, only those points that bear on the issue should be raised. A favorite debaters' trick is to try to distract an audience's attention by raising an irrelevant issue. Critical thinkers do not collect any information; they focus and carefully choose only the information that has logical relation with the ideas at hands. Issues raised should have logical connection with the question at hand. Two ideas are relevant when they have logical connection. A critical thinker should be relevant in his ideas and thoughts.

5) Consistency

Consistency is about the quality of always behaving in the same way or of having the same opinions or standards. It is easy to see why consistency is essential to critical thinking. Logic tells us that if a person holds inconsistent beliefs, at least one of those beliefs must be false. Critical thinkers prize truth and so are

constantly on the lookout for inconsistencies, both in their own thinking and in the arguments and assertions of others.

There are two kinds of inconsistency that should be avoided. One is *logical inconsistency*, which involves saying or believing inconsistent things (i.e., things that cannot both or all be true) about a particular matter. The other is *practical inconsistency*, which involves saying one thing and doing another. Sometimes people are fully aware that their words conflict with their deeds; in short people sometime are hypocrites. From a critical thinking point of view, such personality is not especially interesting. As a rule, they involve failures of character to a greater degree than they do failures of critical reasoning.

More interesting from a critical thinking standpoint are cases in which people are not fully aware that their words conflict with their deeds. Such cases highlight an important lesson of critical thinking: human beings often display a remarkable capacity for self-deception. Author Harold Kushner, in this respect, writes as:

[a]sk the average person which is more important to him, making money or being devoted to his family, and virtually everyone will answer family without hesitation. But watch how the average person actually lives out his life. See where he really invests his time and energy, and he will give away the fact that he really does not live by what he says he believes. He has let himself be persuaded that if he leaves for work earlier in the morning and comes home more tired at night, he is proving how devoted he is to his family by expending himself to provide them with all the things they have seen advertised.

Critical thinking helps us become aware of such unconscious practical inconsistencies, allowing us to deal with them on a conscious and rational basis. It is also common, of course, for people to hold unknowingly inconsistent beliefs about a particular subject. In fact, as Socrates pointed out long ago, such unconscious logical inconsistency is far more common than most people suspect. For example, many today claim that morality is relative, while holding a variety of views that imply that it is not relative. Critical thinking helps us to recognize such logical inconsistencies or, still better, avoid them altogether. A critical thinker should be consistent logically and practically.

6) Logical Correctness

To think logically is to reason correctly; that is, to draw well-founded conclusions from the beliefs held. To think critically, we need accurate and well supported beliefs. But, just as important, we need to be able to reason from those beliefs to conclusions that logically follow from them. Unfortunately, illogical thinking is all too common in human affairs. When we think, we bring a variety of thoughts together into some order. When the combinations of thoughts are mutually supporting and make sense in combination, the thinking is logical. When the combination is not mutually supporting, is contradictory in some sense, or does not make sense the combination, is not logical.

7) Completeness

In most contexts, we rightly prefer deep and complete thinking to shallow and superficial thinking. Of course, there are times when it is impossible or inappropriate to discuss an issue in depth; no one would

expect, for example, a thorough and wide-ranging discussion of the ethics of the right to self- determination in a short newspaper editorial. However, thinking is better when it is deep rather than shallow, thorough rather than superficial.

8) Fairness

Critical thinking demands that our thinking be fair - that is, open minded, impartial, and free of distorting biases and preconceptions. That can be very difficult to achieve. Even the most superficial acquaintance with history and the social sciences tells us that people are often strongly disposed to resist unfamiliar ideas, to prejudge issues, to stereotype outsiders, and to identify truth with their own self-interest or the interests of their nation or group.

It is probably unrealistic to suppose that our thinking could ever be completely free of biases and preconceptions; to some extent, we all perceive reality in ways that are powerfully shaped by our individual life experiences and cultural backgrounds. But as difficult as it may be to achieve, basic fair-mindedness is clearly an essential attribute of a critical thinker.

We naturally think from our own perspective, from a point of view, which tends to privilege our position. Fairness implies the treating of all relevant viewpoints alike without reference to one‘s own feelings or interests. Because we tend to be biased in favor of our own viewpoint, it is important to keep the standard of fairness at the forefront of our thinking. This is especially important when the situation may call on us to see things we do not want to see, or give something up that we want to hold onto.

4.3. Codes of Intellectual Conduct for Effective Discussion

We have learned in chapter two that a good argument is constituted by two or more explicit and/or implicit claims, one or more of which supports or provides evidence for the truth or merit of another claim, the conclusion. We have also seen in the previous lesson that critical thinking‘ is a disciplined thinking that provide a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims; and governed by clear intellectual standards that can be used to identify a critical thinking from the uncritical. But the question is that how can we measure the goodness or badness of an argument?, and how is that some thinking are critical, and some are not. In this lesson, we will discuss the basic codes of intellectual conduct, especially the common principles of a good argument as well as that of a critical thinking.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Recognize the important principles of good arguments.
- Appreciate the basic principles of a critical thinking.

4.3.1. Principles of Good Argument

Activity # 3: *Dear learners, how do you distinguish a good argument from a bad one?*

A discussion may involve two or more participants or it may simply be an internal discussion with oneself. In either case, one who wishes to construct the strongest possible arguments for his or her views, and to do one's part in resolving conflicts concerning issues that matter, should make each of the following principles a part of his or her intellectual style:

1) The Structural Principle

The structural principle of a good argument requires that one who argues for or against a position should use an argument that meets the fundamental structural requirements of a well-formed argument. Such an argument does not use reasons that contradict each other, that contradict the conclusion, or that explicitly or implicitly assume the truth of the conclusion. Neither does it draw any invalid deductive inferences.

The first criterion used in determining whether an argument is a good one is the requirement that it be structurally sound. An argument must look and works like an argument. In other words, it should be formed in such a way that the conclusion either follows necessarily from its premises, in the case of deductive arguments, or follows probably from its premises, in the case of inductive arguments. A good argument should also provide us with reasons to believe that the conclusion deserves our acceptance. Since most discussions about controversial issues are initiated because the argument's conclusion has not yet been accepted by all participants, the arguer will use premises that are more likely to be accepted than the conclusion. If those premises are accepted and they lead to the conclusion, it is more likely that the conclusion will also be accepted.

Another structural feature of an argument that could render it fatally flawed would be one whose premises are incompatible with one another. An argument that has such premises is one from which any conclusion, no matter how outrageous, can be drawn. The fact that an argument with incompatible premises may yield an absurd result demonstrates that it cannot even function as an argument— let alone a good one. It certainly cannot help us decide what to do or believe. The same is true of an argument with a conclusion that contradicts one of the premises. A conclusion that contradicts another claim in the same argument violates the law of non-contradiction.

2) The Relevance Principle

This is the second principle of a good argument that requires that one who presents an argument for or against a position should set forth only reasons whose truth provides some evidence for the truth of the conclusion.

The premises of a good argument must be relevant to the truth or merit of the conclusion. There is no reason to waste time assessing the truth or acceptability of a premise if it is not even relevant to the truth of the

conclusion. A premise is relevant if its acceptance provides some reason to believe, counts in favor of, or has some bearing on the truth or merit of the conclusion. A premise is irrelevant if its acceptance has no bearing on, provides no evidence for, or has no connection to the truth or merit of the conclusion.

One may want to ask two questions in an effort to determine whether a particular premise or reason is relevant. First, would the premise‘s being true in any way make one more likely to believe that the conclusion is true? If the answer is yes, the premise is probably relevant. If the answer is no, the premise is probably not relevant. Second, even if the premise is true, should it be a consideration in the determination of whether or not the conclusion of the argument is true? For example, does the fact that an idea that is widely accepted by most people can be considered as a sign that the idea itself is good. ? If the answer is no, then a premise that asserts that claim is irrelevant. If the answer is yes, which is unlikely in this case, then the premise should be regarded as relevant.

3) The Acceptability Principle

The third principle of a good argument is the acceptability principle. This principle requires that one who presents an argument for or against a position should provide reasons that are likely to be accepted by a mature, rational person and that meet standard criteria of acceptability. The reasons set forth in support of a conclusion must be acceptable. A reason is acceptable if it is the kind of claim that a rational person would accept in the face of all the relevant evidence available. Some people believe that the acceptability principle should be replaced by the truth principle to connote the idea that premises should be true to be acceptable. However, the term ―acceptable‖ is preferable to the more traditional term ―true‖ for several reasons.

First, the notion of acceptability stems from the very nature of argumentative interchange. In most argumentative situations, the key to achieving agreement on the conclusion is achieving acceptance of the premises. The arguer typically starts with premises that the sceptic is likely to accept or that a rational person ought to accept. Upon acceptance of the premises, assuming that other criteria of a good argument are satisfied, the opponent is logically led to the acceptance of the conclusion.

Second, since it is notoriously difficult to establish the absolute truth of any statement, it would be an impractical requirement of a good argument that its premises must be true in any absolute sense. Indeed, if such a condition were enforced, there would be very few good arguments. The most that we can legitimately expect is what a reasonable person would accept as true.

Third, an analysis of our language suggests that in many ordinary contexts, what we typically mean by the word -true would be more appropriately expressed by the phrase -accepted as true. Consider, for example, the contradictory testimony from courtroom witnesses, each of whom is allegedly telling the truth. A better way to describe what is happening there is that each witness is presumably telling what he or she honestly accepts as true. Fourth, even if a premise were true in the absolute sense, it may be unacceptable to a particular audience because that audience may not be in a position to determine its truth. For example, the evidence for a premise may be inaccessible to them in that it is too technical for them to understand. The

truth of the premise would therefore not add anything to the practical force of the argument. An argument can be a good one only if the premises are accepted or recognized as true.

4) The Sufficiency Principle

The four principle of a good argument is the sufficiency principle, which requires that one who presents an argument for or against a position should attempt to provide relevant and acceptable reasons of the right kind, that together are sufficient in number and weight to justify the acceptance of the conclusion.

The feature of the sufficiency principle that is most difficult to apply is the assignment of weight to each piece of supporting evidence. Indeed, disagreement over this issue probably causes most of the problems in informal discussions. What one participant regards as the most important piece of evidence, another may regard as trivial by comparison with other possible evidence. It is not likely that we will come to closure in a dispute until we come to some kind of agreement about the relative weight to give to the kinds of relevant and acceptable evidence used in support of a conclusion.

One should ask several questions when applying the sufficiency test to a particular argument. First, are the reasons that are given, even if they are relevant and acceptable, enough to drive one to the arguer‘s proposed conclusion? Second, is the evidence presented flawed by some kind of faulty causal analysis? Finally, is some key or crucial evidence simply missing from the argument that must be included as one of the premises in order for one to accept the argument‘s conclusion? Answer to these questions will tell us if the premises are sufficient.

5) The Rebuttal Principle

The last principle of a good argument is the rebuttal principle. This principle requires that one who presents an argument for or against a position should include in the argument an effective rebuttal to all anticipated serious criticisms of the argument that may be brought against it or against the position it supports.

Since an argument is usually presented against the background that there is another side to the issue, a good argument must meet that other side directly. An argument cannot be a good one if it does not anticipate and effectively refute or blunt the force of the most serious criticisms against it and the position that it supports.

A complete argument might even refute the arguments mustered in behalf of alternate positions on the issue in question. One must ask and answer several questions in applying the rebuttal principle to an argument. First, what are the strongest arguments against the position being defended? Second, does the argument address the counterarguments effectively? Third, what potentially serious weaknesses in the argument for the position might be recognized by an opponent? Fourth, does the argument itself recognize and address those possible weaknesses? Finally, does the argument show why arguments for alternative positions on the issue are flawed or unsuccessful?

Arguments can fail to meet the rebuttal principle in several ways and those wishing to avoid the responsibility of rebuttal commonly use several diversionary tactics. For example, arguments that misrepresent the criticism bring up trivial objections or a side issue, or resort to humor or ridicule are using

devices that clearly fail to make effective responses. The same can be said of those arguments that ignore or deny the counterevidence against the position defended. Finally, some arguers try to avoid responding to a criticism by attacking the critic instead of the criticism. All of these approaches are clear violations of our obligation to respond honestly to the arguments of our opponents.

4.3.2. Principles of Critical Thinking

Activity # 4: *Dear learners, how do you distinguish a critical thinking from the an uncritical one?*

Having discussed the major principles of a good argument, let us now see the principles of a critical thinking as parts of the codes of intellectual conduct.

1) The Fallibility Principle

The first principle of a critical thinking is the fallibility principle. This principle requires that each participant in a discussion of a disputed issue should be willing to accept the fact that he or she is fallible, which means that one must acknowledge that one's own initial view may not be the most defensible position on the question.

To employ the fallibility principle in a discussion is consciously to accept the fact that you are fallible, that is, that your present view may be wrong or not the most defensible view on the matter in dispute. If you refuse to accept your own fallibility, you are, in effect, saying that you are not willing to change your mind, even if you hear a better argument. This is pretty strong evidence that you do not intend to play fairly, and there is no real point in continuing the discussion. An admission of fallibility, however, is a positive sign that you are genuinely interested in the kind of honest inquiry that may lead to a fair resolution of the issue. Given the great number of issues that divide us and the large number of different positions on each of those issues, it is more likely that a person would turn out to be wrong on more issues than right.

2) The Truth Seeking Principle

The second principle of a critical thinking is the truth seeking principle. This principle requires that each participant should be committed to the task of earnestly searching for the truth or at least the most defensible position on the issue at stake. Therefore, one should be willing to examine alternative positions seriously, look for insights in the positions of others, and allow other participants to present arguments for or raise objections to any position held on an issue.

The search for truth is lifelong endeavor, which principally takes the form of discussion, wherein we systematically entertain the ideas and arguments of fellow seekers after truth, while at the same time thoughtfully considering criticisms of our own views. If we really are interested in finding the truth, it is imperative not only that we assume that we may not now have the truth, but that we listen to the arguments for alternative positions and encourage criticism of our own arguments.

We probably all want to hold only those opinions that really are true, but the satisfaction of that interest comes at a price - a willingness to look at all available options and the arguments in support of them. Otherwise, we might miss the truth completely. The problem, of course, is that most of us want the truth to be what we now hold to be the truth.

3) The Clarity Principle

The clarity principle is the third principle of a critical thinking. It requires that the formulations of all positions, defences, and attacks should be free of any kind of linguistic confusion and clearly separated from other positions and issues. Any successful discussion of an issue must be carried on in language that all the parties involved can understand. Even if what we have to say is perfectly clear to ourselves, others may not be able to understand us. A position or a criticism of it that is expressed in confusing, vague, ambiguous, or contradictory language will not reach those toward whom it is directed, and it will contribute little to resolving the issue at hand.

4) The Burden of Proof Principle

The fourth principle of a critical thinking is the burden of proof principle. This principle requires that the burden of proof for any position usually rests on the participant who sets forth the position. If, and when, an opponent asks, the proponent should provide an argument for that position.

Just as a person is generally held accountable for his or her own actions, one who makes a positive or negative claim about something has what is called the burden of proof. In many cases, of course, one does not have to supply such proof, for we are not always challenged to defend our claims. But if the claimant is asked ―Why? or ―How do you know that is true?‖ he or she is logically obligated to produce reasons on behalf of the claim. An exception to this rule is a situation in which the claim in question is well established or uncontroversial. In such a case, the burden of proof might rest on the one who wishes to challenge that claim. One has the responsibility to provide evidence for one‘s conclusion and for any questionable premise, if asked to do so.

To ask others to accept your claim without any support, or to shift the burden of proof to them by suggesting that your position is true unless they can prove otherwise, is to commit the fallacy of arguing from ignorance, for you are, in this way, making a claim based on no evidence at all.

5) The Principle of Charity

This is the fifth principle of a critical thinking that requires that if a participant‘s argument is reformulated by an opponent, it should be carefully expressed in its strongest possible version that is consistent with what is believed to be the original intention of the arguer. If there is any question about that intention or about any implicit part of the argument, the arguer should be given the benefit of any doubt in the reformulation and/or, when possible, given the opportunity to amend it.

Good discussion in general and argumentation in particular impose an ethical requirement on their participants. But there is also a practical reason for being fair with one another‘s arguments. If we

deliberately create and then attack a weak version of the original argument, we will probably fail to achieve the very goals that discussion is designed to serve. If we are really interested in the truth or the best answer to a problem, then we will want to evaluate the best version of any argument set forth in support of one of the options. Hence, if we don‘t deal with the best version now, we will eventually have to do so, once an uncharitable version has been corrected by the arguer or others. We would do well, then, to be fair about it in the first place by letting our opponents amend any portion of our reconstruction of their arguments.

6) The Suspension of Judgment Principle

The sixth principle of a critical thinking is the suspension of judgment principle. This principle requires that if no position is defended by a good argument, or if two or more positions seem to be defended with equal strength, one should, in most cases, suspend judgment about the issue. If practical considerations seem to require a more immediate decision, one should weigh the relative benefits or harm connected with the consequences of suspending judgment and decides the issue on those grounds.

If suitable evidence is so lacking that one has no good basis for making a decision either way, it may be quite appropriate to suspend judgment on the matter and wait until there is more of a basis for decision. This alternative should not, however, be seen as a clever way to avoid the psychological fright of making a difficult decision or of moving into unfamiliar territory.

7) The Resolution Principle

The last principle of a critical thinking is the resolution principle. This principle requires that an issue should be considered resolved if the argument for one of the alternative positions is a structurally sound, one that uses relevant and acceptable reasons that together provide sufficient grounds to justify the conclusion and that also include an effective rebuttal to all serious criticisms of the argument and/or the position it supports. Unless one can demonstrate that the argument has not met these conditions more successfully than any argument presented for alternative positions, one is obligated to accept its conclusion and consider the issue to be settled. If the argument is subsequently found by any participant to be flawed in a way that raises new doubts about the merit of the position it supports, one is obligated to reopen the issue for further consideration and resolution.

If the purpose of rational discussion is ultimately to decide what to do or believe, then coming to closure should happen more often than it does. There are many good arguments out there, and if good arguments resolve issues, why are not more issues resolved? How much more discussion is needed, just because some refuse to recognize the force of a good argument? Unfortunately, very few controversial issues ever come to rational resolution. If you have doubts about this, then ask yourself when the last time was that you allowed the force of argument to change your mind about an important issue - even though changing one‘s mind in the face of a good argument should not be a difficult thing to do for a genuine truth-seeker. So why does it not happen? Why are issues not resolved? There are probably a number of reasons. It could be that one of the parties to the dispute has a blind spot; that is, he or she simply cannot be objective about the particular issue

at hand. Or maybe he or she has been rationally but not psychologically convinced by the discussion. Another possible explanation is that one or more of the parties in the dispute have been rationally careless or at least guilty of not thinking as clearly as they should. It is even possible that one of the parties has a hidden agenda - an issue to defend other than the stated one. Or maybe the parties involved are simply not being honest with themselves, for they may want to win the argument more than they want to find a solution to the problem. Finally, perhaps the parties are in what might be called deep disagreement. In other words, they are divided on the issue because of fundamental underlying assumptions that have yet to be explored.

No argument, however, being regarded as permanently successful. There is always the possibility that new evidence will come to light that will raise new doubts about a position hold on what were thought to be good grounds. Under these conditions, further examination is always appropriate. Pride in holding a position defended by a good argument in the past should not become an obstacle to reopening the issue in the present if conditions warrant it. The new doubts, however, should not be the same old doubts in new clothing. Reopening the issue should come only as a consequence of uncovering new or reinterpreted evidence not considered in the earlier treatment of the issue.

4.4. Characteristics of Critical Thinking

So far, in this chapter, we have discussed the meaning and nature of critical thinking; standards of critical thinking, codes of intellectual conduct: the principles of good arguments and critical thinking. With this as background, we are now in a position to offer general characteristics of critical thinking.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- Appreciate the general characteristics of critical thinking.
- Understand the characteristics of a critical and uncritical thinker.

Activity # 1: *Dear learners, what do you think of the specific characteristics that best distinguishes critical individuals from those uncritical ones?*

Dear learners, we have defined critical thinking generally as a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims. What then distinguishes a critical thinker from the uncritical one? Let us discuss some characteristics of Critical and Uncritical Thinkers.

4.4.1 Basic Traits of Critical Thinkers

A critical thinker simply is a person who exhibit some feature of critical thinking. There are some dispositions and attitudes, skills and abilities, habits and values that every critical person should manifest. In this section, we will see some of the key intellectual traits of critical thinkers.

Critical thinkers:

- Are honest with themselves, acknowledging what they don't know, recognizing their limitations, and being watchful of their own errors.
- Regard problems and controversial issues as exciting challenges.
- Strive for understanding, keep curiosity alive, remain patient with complexity, and are ready to invest time to overcome confusion.
- Base judgments on evidence rather than personal preferences, deferring judgment whenever evidence is insufficient. They revise judgments when new evidence reveals error.
- Are interested in other people's ideas and so are willing to read and listen attentively, even when they tend to disagree with the other person.
- Recognize that extreme views (whether conservative or liberal) are seldom correct, so they avoid them, practice fair-mindedness, and seek a balance view.
- Practice restraint, controlling their feelings rather than being controlled by them, and thinking before acting.

4.4.2 Basic Traits of Uncritical Thinkers

We have in the previous section that every critical person manifests some dispositions and attitudes, skills and abilities, habits and values. What about the uncritical thinker? In this section, we will see some traits of uncritical thinkers.

Uncritical thinkers:

- Pretend they know more than they do, ignore their limitations, and assume their views are error-free.
- Regard problems and controversial issues as nuisances or threats to their ego.
- Are inpatient with complexity and thus would rather remain confused than make the effort to understand.
- Base judgments on first impressions and gut reactions. They are unconcerned about the amount or quality of evidence and cling to their views steadfastly.
- Are preoccupied with themselves and their own opinions, and so are unwilling to pay attention to others' views. At the first sign of disagreement, they tend to think, "How can I refute this?"
- Ignore the need for balance and give preference to views that support their established views.
- Tend to follow their feelings and act impulsively.

Let us now compare and contrasts the key intellectual traits of critical thinkers with the relevant traits of uncritical thinkers:

First, critical thinkers have a passionate drive for clarity, precision, accuracy, and other critical thinking standards while uncritical thinkers often think in ways that are unclear, imprecise, and inaccurate. In addition to this, critical thinkers are sensitive to ways in which critical thinking can be skewed by egocentrism, socio-

centrism, wishful thinking, and other impediments, while uncritical thinkers often fall prey to egocentrism, socio-centrism, relativistic thinking, unwarranted assumptions, and wishful thinking.

Second, critical thinkers are skilled at understanding, analyzing, and evaluating arguments and viewpoints whereas uncritical thinkers often misunderstand or evaluate unfairly arguments and viewpoints. Moreover, critical thinkers reason logically, draw appropriate conclusions from evidence and data, while uncritical thinkers are illogical, and draw unsupported conclusions from these sources.

Third, critical thinkers are intellectually honest with themselves, acknowledging what they do not know and recognizing their limitations while uncritical thinkers pretend they know more than they do and ignore their limitations. Furthermore, critical thinkers listen open-mindedly to opposing points of view, welcome criticisms of beliefs and assumptions, whereas uncritical thinkers are closed-minded, and resist criticisms of beliefs and assumptions.

Fourth, critical thinkers base their beliefs on facts and evidence rather than on personal preferences or self-interests, while uncritical thinkers often base beliefs on mere personal preferences or self-interests. Again, critical thinkers are aware of the biases and preconceptions that shape the way they perceive the world, whereas uncritical thinkers lack awareness of their own biases and preconceptions.

Fifth, critical thinkers think independently and are not afraid to disagree with group opinion whereas uncritical thinkers tend to engage in ―groupthink‖ uncritically following the beliefs and values of the crowd. Moreover, critical thinkers have the intellectual courage to face and assess fairly ideas that challenge even their most basic beliefs whereas uncritical thinkers fear and resist ideas that challenge their basic beliefs.

Finally yet importantly, critical thinkers pursue truth, are curious about a wide range of issues and have the intellectual perseverance to pursue insights or truths despite obstacles or difficulties whereas uncritical thinkers are often relatively indifferent to truth and lack curiosity, tend not to persevere when they encounter intellectual obstacles or difficulties.

4.5. Barriers to Critical Thinking

It is said that critical thinking‘ is a disciplined thinking that provide a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims; and governed by clear intellectual standards that can be used to identify a critical thinking from the uncritical. But if critical thinking is so important, why is it that uncritical thinking is so common? Why is it that so many people, including many highly educated and intelligent people, find critical thinking so difficult? The reasons are quite complex. In this lesson, we will discuss some of the problems that impede critical thinking. But we will limit our discussion to four of them: egocentrism, socio-centrism, unwarranted assumptions and stereotype and relativistic thinking. These are not exhaustive lists. There are many factors that impede critical thinking.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- ✓ Identify and define the major barriers to critical thinking.

Activity # 1: *Dear learners, what do you think impede critical thinking?*

Dear learners, there are a number of factors that impede a critical thinking. Some of the most common barriers to critical thinking are: Lack of relevant background information, poor reading skills, bias, prejudice, superstition, egocentrism (self-centered thinking), socio-centrism (group-centered thinking), peer pressure, conformism, provincialism (narrow, unsophisticated thinking), narrow-mindedness, closed-mindedness, distrust in reason, relativistic thinking, stereotyping, unwarranted assumptions, scapegoating (blaming the innocent), rationalization (inventing excuses to avoid facing our real motives).

Let us examine in detail five of these impediments that play an especially powerful role in hindering critical thinking: egocentrism, socio-centrism, unwarranted assumptions, relativistic thinking, and wishful thinking.

1) Egocentrism

One of the most powerful barriers to critical thinking is egocentrism. Even highly educated and intelligent people are prey to egocentrism. Egocentrism is the tendency to see reality as centered on oneself. Egocentrics are selfish, self-absorbed people who view their interests, ideas, and values as superior to everyone else‘s. All of us are affected to some degree by egocentric biases. Egocentrism can manifest itself in a variety of ways. Two common forms this are *self-interested thinking* and *the superiority bias*.

Self-interested thinking is the tendency to accept and defend beliefs that harmonize with one‘s self-interest. Almost no one is immune to self-interested thinking. There are a number of facts, which supported this idea. For example, most doctors support legislation making it more difficult for them to be sued for malpractice because they do not want to punish for mistakes committed in the workplace. Most university professors strongly support tenure, paid sabbaticals, low teaching loads, and a strong faculty voice in university governance because these will promote their interest. Most factory workers support laws requiring advance notice of plant closings; most factory owners do not. Of course, some of these beliefs may be supported by good reasons. From a psychological standpoint, however, it is likely that self-interest plays at least some role in shaping the respective attitudes and beliefs.

Self-interested thinking, however understandable it may seem, is a major obstacle to critical thinking. Everyone finds it tempting at times to reason that this benefits me, therefore it must be good‖; but from a critical thinking standpoint, such reasoning‖ is a sham. Implicit in such thinking is the assumption that what is most important is what *I* want and need.‖ But why should I, or anyone else, accept such an arbitrary and obviously self-serving assumption? What makes your wants and needs more important than everyone else‘s? Critical thinking condemns such special pleading. It demands that we weigh evidence and arguments objectively and impartially. Ultimately, it demands that we revere truth - even superiority bias (also known as illusory superiority or the better-than average effect) is the tendency to overrate oneself - to see oneself as

better in some respect than one actually is. If you are like most people, you probably think of yourself as being an unusually self-aware person who is largely immune from any such self-deception. If so, then you too are probably suffering from superiority bias - when it hurts.

2) Socio-centrism

The second powerful barrier that paralyze the critical thinking ability of most people including intellectuals is socio-centrism. It is group-centered thinking. Just as egocentrism can hinder rational thinking by focusing excessively on the self, so socio-centrism can hinder rational thinking by focusing excessively on the group. Socio-centrism can distort critical thinking in many ways. Two of the most important are group bias and conformism.

Group bias is the tendency to see one‘s own group (nation, tribe, sect, peer group, and the like) as being inherently better than others. Social scientists tell us that such thinking is extremely common throughout human history and across cultures. Just as we seem naturally inclined to hold inflated views of ourselves, so we find it easy to hold inflated views of our family, our community, or our nation. Conversely, we find it easy to look with suspicion or disfavor on those we regard as outsiders. Most people absorb group bias unconsciously, usually from early childhood. It is common, for example, for people to grow up thinking that their society‘s beliefs, institutions, and values are better than those of other societies. Although most people outgrow nationalistic biases to some extent, few of us manage to outgrow them completely. Clearly, this kind of mine-is-better thinking lies at the root of a great deal of human conflict, intolerance, and oppression.

Conformism refers to our tendency to follow the crowd - that is, to conform (often unthinkingly) to authority or to group standards of conduct and belief. The desire to belong, to be part of the in-group, can be among the most powerful of human motivations. This desire can seriously cripple our powers of critical reasoning and decision-making.

Authority moves us. We are impressed, influenced, and intimidated by authority, so much so that, under the right conditions, we abandon our own values, beliefs, and judgments, even doubt our own immediate experience. As critical thinkers, we need to be aware of the seductive power of peer pressure and reliance on authority and develop habits of independent thinking to combat them.

3) Unwarranted Assumptions and Stereotypes

The third factor that impedes critical thinking is unwarranted assumptions and stereotype. An assumption is something we take for granted - something we believe to be true without any proof or conclusive evidence. Almost everything we think and do is based on assumptions. If the weather report calls for rain, we take an umbrella because we assume that the meteorologist is not lying, that the report is based on a scientific analysis of weather patterns, that the instruments are accurate, and so forth. There may be no proof that any of this is true, but we realize that it is wiser to take the umbrella than to insist that the weather bureau provide exhaustive evidence to justify its prediction.

Although we often hear the injunction ―Don‘t assume,‖ it would be impossible to get through a day without making assumptions; in fact, many of our daily actions are based on assumptions we have drawn from the patterns in our experience. You go to class at the scheduled time because you assume that class is being held at its normal hour and in its same place. You don‘t call the professor each day to ask if class is being held; you just assume that it is. Such assumptions are warranted, which means that we have good reason to hold them. When you see a driver coming toward you with the turn signal on, you have good reason to believe that the driver intends to turn. You may be incorrect, and it might be safer to withhold action until you are certain, but your assumption is not unreasonable. Unwarranted assumptions, however, are unreasonable. An unwarranted assumption is something taken for granted without good reason. Such assumptions often prevent our seeing things clearly.

One of the most common types of unwarranted assumptions is a stereotype. The word stereotype comes from the printing press era, when plates, or stereotypes, were used to produce identical copies of one page. Similarly, when we stereotype, as the word is now used, we assume that individual people have all been stamped from one plate, so all politicians are alike, members of ethnic groups, professors, women, teachers, and so forth. When we form an opinion of someone that is based not on his or her individual qualities but, rather, on his or her membership in a particular group, we are assuming that all or virtually all members of that group are alike. Because people are not identical, no matter what race or other similarities they share, stereotypical conceptions will often be false or misleading.

Typically, stereotypes are arrived at through a process known as hasty generalization, in which one draws a conclusion about a large class of things(in this case, people) from a small sample. If we meet one South African who talk a lot, we might jump to the conclusion that all South Africans talk a lot. Or we might generalize from what we have heard from a few friends or reading a single news story. Often the media advertisements, the news, movies, and so forth encourage stereotyping by the way they portray groups of people.

The assumptions we need to become most conscious of are not the ones that lead to our routine behaviors, such as carrying an umbrella or going to class, but the ones on which we base our more important attitudes, actions, and decisions. If we are conscious of our tendency to stereotype, we can take measures to end it.

4) Relativistic Thinking

One of the strongest challenges to critical thinking is relativistic thinking. Relativism is the view that truth is a matter of opinion. There are two popular forms of relativism: *subjectivism* and *cultural relativism*. Subjectivism is the view that truth is a matter of individual opinion. According to subjectivism, whatever an individual believes is true, *is* true for that person, and there is no such thing as -objective or -absolute‖ truth, i.e., truth that exists independent of what anyone believes. For example, suppose Abdella believes that abortion is wrong and Obang believes that abortion is not always wrong. According to subjectivism, abortion

is always wrong for Abdella and not always wrong for Obang. Both beliefs are true - *for* them. And truth for one individual or another is the only kind of truth there is.

The other common form of relativism is cultural relativism. This is the view that truth is a matter of social or cultural opinion. In other words, cultural relativism is the view that what is true for person A is what person A‘s culture or society believes is true. Drinking wine, for example, is widely considered to be wrong in Iran but is not generally considered to be wrong in France. According to cultural relativism, therefore, drinking wine is immoral in Iran but

is morally permissible in France. Thus, for the cultural relativist, just as for the subjectivist, there is no objective or absolute standard of truth. What is true is whatever most people in a society or culture believe to be true.

Relatively few people endorse subjectivism or cultural relativism in the pure, unqualified forms in which we have stated them. Almost everybody would admit, for example, that 1 + 1 = 2 is true, no matter who might be ignorant or deluded enough to deny it. What relativists usually claim, therefore, is not that all truth is relative, but that truth is relative in some important domain(s).

By far the most common form of relativism is *moral relativism.* Like relativism generally, moral relativism comes in two major forms: *moral subjectivism* and *cultural moral relativism*. Moral subjectivism is the view that what is morally right and good for an individual, A, is whatever A believes is morally right and good. Thus, if G/Meskel believes that premarital sex is always wrong, and Eden believes that it is not always wrong; according to moral subjectivism, premarital sex is always wrong for G/Meskel and is not always wrong for Eden.

The other major form of moral relativism is cultural moral relativism, the view that what is morally right and good for an individual, A, is whatever A‘s society or culture believes is morally right and good. Thus, according to cultural moral relativism, if culture A believes that polygamy is wrong, and culture B believes that polygamy is right, then polygamy is wrong for culture A and right for culture B. Cultural moral relativism is a very popular view. There are two major reasons people seem to find it so attractive. One has to do with the nature of moral disagreement and the other concerns the value of tolerance.

Ethics, obviously, is very different from mathematics or science. In mathematics and science, there are arguments and disagreements, but not nearly to the extent there are in ethics. In ethics there is widespread disagreement, the disagreements often go very deep, and there seems to be no rational way to resolve many of them. What this shows, some people conclude, is that there is no objective truth in ethics; morality is just a matter of individual or societal opinion.

Another reason people find cultural moral relativism attractive is that it seems to support the value of tolerance. Throughout history, terrible wars, persecutions, and acts of religious and cultural imperialism have been perpetrated by people who firmly believed in the absolute righteousness of their moral beliefs and practices. Cultural moral relativism seems to imply that we must be tolerant of other cultures‘ moral beliefs

and values. If culture A believes that polygamy is wrong, and culture B believes that it is right, then culture A must agree that polygamy is right for culture B, no matter how offensive the practice may be to culture A.

Despite these apparent attractions, however, there are deep problems with cultural moral relativism. First, does the fact that there is deep disagreement in ethics show that there is no objective moral truth - that ethics is just a matter of opinion? Think about another area in which there is deep, pervasive, and seemingly irresolvable disagreement: religion. People disagree vehemently over whether God exists, whether there is an afterlife, and so forth; yet we do not conclude from this that there is no objective truth about these matters. It may be difficult to know whether God exists. But whether he exists is not simply a matter of opinion. Thus, deep disagreement about an issue does not show that there is no objective truth about that issue.

Second, cultural moral relativism does not necessarily support the value of tolerance. Relativism tells us that we should accept the customs and values of our society. Thus, if you live in an intolerant society, relativism implies that you too should be intolerant. Does this mean that cultural moral relativism has nothing at all to teach us? No. The fact that people disagree so much about ethics does not show that moral truth is simply a matter of opinion, but it should make us cautious and open-minded regarding our own ethical beliefs. If millions of obviously decent, intelligent people disagree with you, how can you be sure that your values are the correct ones?

In this way, relativism can teach us an important lesson about the value of intellectual humility. But we do not need relativism - which is a false and confused theory - to teach us this lesson. We can learn it just by opening our hearts and minds and thinking critically about the challenges of living an ethical life.

5) Wishful Thinking

Wishful thinking refers to a state of believing something not because you had good evidence for it but simply because you wished it were true. Have you ever been guilty of wishful thinking? If so, you are not alone. Throughout human history, reason has done battle with wishful thinking and has usually come out the loser. People fear the unknown and invent comforting myths to render the universe less hostile and more predictable. They fear death and listen credulously to stories of healing crystals, quack cures, and communication with the dead. They fantasize about possessing extraordinary personal powers and accept uncritically accounts of psychic prediction and levitation,

4.6. Benefits of Critical Thinking

Being a critical person in general and critical thinking in particular has many benefits. In this lesson, we will discuss some benefits of critical thinking.

Lesson Objectives:

After the accomplishment of this lesson, you will be able to:

- ✓ Identify the major benefits of critical thinking.

Activity # 1: *Dear learners, what benefits of critical thinking do you think of?*

Critical Thinking: Skills and Dispositions

Critical thinking teaches you how to raise and identify fundamental questions and problems in the community. It will teach you to reformulate these problems clearly and precisely. It will teach you how to gather and assess relevant information, develop reasoned conclusions and solutions, testing them against relevant criterion and standards. It teaches you how to be open minded to alternative system of thought, recognize and assess your own assumptions, implications and practical consequences, how to communicate effectively with others in figuring out solutions to complex problems.

Critical thinking is what university is all about. University is not only about teaching students with facts. It's about teaching students to think- think critically. This chapter will introduce you the skills and dispositions you need to become an independent, self-directed thinker and learner. But you'll only get out of this course what you put into it. Becoming a critical thinker is hard work. Becoming a master thinker means toning up your mental muscles and acquiring habits of careful, disciplined thinking. This requires effort, and practice. Critical thinking is an adventure. Becoming mentally fit is hard work. But in the end you'll be a smarter, stronger, more confident thinker. Let us consider, more specifically, what you can expect to gain from a course in critical thinking.

Critical Thinking in the Classroom

When they first enter university, students are sometimes surprised to discover that university education seem less interested in how beliefs are acquired than they are in whether those beliefs can withstand critical scrutiny. The question is not much about what you know, but how you acquire what you know and whether your ideas stands critical examination.

In university, the focus is on higher-order thinking: the active, intelligent evaluation of ideas and information. For this reason critical thinking plays a vital role in universities. In a critical thinking chapter, students learn a variety of skills that can greatly improve their classroom performance.

These skills include:

- ✓ Understanding the arguments and beliefs of others
- ✓ Critically evaluating those arguments and beliefs
- ✓ Developing and defending one's own well-supported arguments and beliefs

Let us look briefly at each of these three skills:

To succeed in university, you must, of course, be able to understand the material you are studying. A course in critical thinking cannot make inherently difficult material easy to grasp, but critical thinking does teach a variety of skills that, with practice, can significantly improve your ability to understand the arguments and issues discussed in your college textbooks and classes.

In addition, critical thinking can help you critically evaluate what you are learning in class. During your university career, your instructors will often ask you to discuss -critically some argument or idea introduced

in class. Critical thinking teaches a wide range of strategies and skills that can greatly improve your ability to engage in such critical evaluation.

You will also be asked to develop your own arguments on particular topics or issues. In moral and civic education class, for example, you might be asked to write a paper addressing the issue of whether ethnic federalism is good or bad. To write such a paper successfully, you must do more than simply find and assess relevant arguments and information. You must also be able to marshal arguments and evidence in a way that convincingly supports your view. The systematic training provided in a course in critical thinking can greatly improve that skill as well.

Critical thinking is a transferable thinking skill. These skills will be taught in ways that expressly aim to facilitate their transfer to other subjects and contexts. If you learn how to structure argument, judge the credibility of sources or make a reasonable decision by the methods of critical thinking for instance, it will not be difficult to see how to do these things in many other contexts such as in class rooms and personal life; this is the sense in which the skills we teach in this text are transferable.

Critical Thinking in Life

Critical thinking is valuable in many contexts outside the classroom. Let us look briefly at three ways in which this is the case. First, critical thinking can help us avoid making foolish personal decisions. All of us have at one time or another made decisions about what profession to choose, what relationships to enter into, what personal behavior to develop, and the like that we later realized were seriously misguided or irrational. Critical thinking can help us avoid such mistakes by teaching us to think about important life decisions more carefully, clearly, and logically.

Second, critical thinking plays a vital role in promoting democratic processes. In democracy, it is the people who have the ultimate say over who governs and for what purposes. Citizens should vote, should evaluate different public policies, and collectively determine their fate and et cetera. It is vital, therefore, that citizens‘ decisions be as informed and as rational as possible. Many of today‘s most serious societal problems - environmental destruction, poverty, ethnic conflicts, decaying the morality of societies, high level of corruption , violating basic human rights, displacement, to mention just a few - have largely been caused by poor critical thinking.

Third, critical thinking is worth studying for its own sake, simply for the personal enrichment it can bring to our lives. One of the most basic truths of the human condition is that most people, most of the time, believe what they are told. Throughout most of recorded history, people accepted without question that the earth was the centre of the universe, that demons cause disease that slavery was just, and that women are inferior to men. Critical thinking, honestly and courageously pursued can help free us from the unexamined assumptions and biases of our upbringing and our society. It lets us step back from the prevailing customs and ideologies of our culture and ask, This is what I‘ve been taught, but is it true? In short, critical thinking

allows us to lead self-directed, -examined lives. Such personal liberation is, as the word itself implies, the ultimate goal of education. Whatever other benefits it brings, education can have no greater reward.

Chapter Summary

Critical also means, involving or exercising skilled judgment or observation. In this sense, critical thinking means thinking clearly and intelligently. More precisely, critical thinking is the general term given to a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims; to discover and overcome personal preconceptions and biases; to formulate and present convincing reasons in support of conclusions; and to make reasonable, intelligent decisions about what to believe and what to do.

It does not automatically follow that being intelligent means the student can think critically or reason about information in a useful, effective and efficient manner. Critical thinking is a process. It is, also, a journey that helps us to arrive at the most useful, helpful, and most likely destinations when evaluating claims for scientific truth. Critical thinking, thus, is thinking clearly, thinking fairly, thinking rationally, thinking objectively, and thinking independently. It is a process that hopefully leads to an impartial investigation of the data and facts that remains not swayed by irrelevant emotions. As part and parcel of logic, critical thinking, also, teaches us what logical principles we, as rational beings, should following in right reasoning. It is also important to recall that, in this chapter, characteristics of critical and uncritical persons, criteria for critical thinking, what it meant for a good argument and other related issues were addressed.

Self-Check Exercise

1. Define critical thinking.

_____

2. Discuss the major standards of critical thinking.

_____

3. Explain the principles of good argument and critical thinking.

_____

4. Compare and contrast critical and uncritical thinkers.

_____

5. Explain the common barriers of critical thinking.

_____

6. Discuss briefly the major benefits of critical thinking.

References

Bowell, Tracy. and Kemp, Gary, *Critical Thinking. A Concise Guide*. 2015. Rutledge, USA.

Damer, Edward, *Attacking Faulty Reasoning*. 2009. Wadsworth Cengage, USA.

Fisher, Alec. *Critical Thinking: An Introduction*. 2011. Short Run, UK. 2ed.

Gregory, Bassham, et al, *Critical Thinking: A Student"s Introduction.* 2013. Mac- Grew Hill. USA. 5th ed.

Rawls, John, *A Theory of Justice.* 1971. Belknap, USA. 2nd ed.

Moon, J., *Critical Thinking: An Exploration of Theory and Practice*. 2008. Routledge, USA.

Paul, Richard, et al, *The Miniature Guide to Critical Thinking*. 2008. Berkeley University, USA.

Sharon, Bailing, et al, *Conceptualizing Critical thinking*. 2013. Journal of Curriculum Studies.

CHAPTER FIVE

INFORMAL FALLACIES

Introduction

The unit introduces you with the nature of informal fallacies. A **fallacy** is a defect in an argument that consists in something other than merely false premises. As we will see, fallacies can be committed in many ways, but usually they involve either a mistake in reasoning or the creation of some illusion that makes a bad argument appear good (or both). Both deductive and inductive arguments may contain fallacies; if they do, they are either unsound or uncogent, depending on the kind of argument. Conversely, if an argument is unsound or uncogent, it has one or more false premises or it contains a fallacy (or both). Fallacies are usually divided into two groups: formal and informal. A **formal fallacy** is one that may be identified through mere inspection of the form or structure of an argument. Fallacies of this kind are found only in deductive arguments that have identifiable forms. **Informal fallacies** are those that can be detected only through analysis of the content of the argument.

Objective

upon the accomplishment of this unit, you will be able to;

-identify some of the common errors in reasoning

-distinguish between formal and informal fallacies

-identify the major types of informal fallacies

5.1. FALLACIES IN GENERAL

Session Objective

-introducing the nature of fallacy

-distinguishing between formal and informal fallacies

-identifying the nature of fallacies of relevance

Brainstorming ? Dear learner. What do you think are the effects of using emotional grounds to establish an argument?(use the next space to give your answer)

_____

_____.

A **fallacy** is a defect in an argument that consists in something other than merely false premises. As we will see, fallacies can be committed in many ways, but usually they involve either a mistake in reasoning or the creation of some illusion that makes a bad argument appear good (or both). Both deductive and inductive arguments may contain fallacies; if they do, they are either unsound or uncogent, depending on the kind of argument. Conversely, if an argument is unsound or uncogent, it has one or more false premises or it contains a fallacy (or both).

Fallacies are usually divided into two groups: formal and informal. A **formal fallacy** is one that may be identified through mere inspection of the form or structure of an argument. Fallacies of this kind are found only in deductive arguments that have identifiable forms. The following categorical syllogism contains a formal fallacy:

All bullfights are grotesque rituals.
All executions are grotesque rituals.
Therefore, all bullfights are executions.

This argument has the following form:
All *A* are *B.*
All *C* are *B.*
All *A* are *C.*

Through mere inspection of this form, one can see that the argument is invalid. The fact that *A, B,* and *C* stand respectively for ‘‘bullfights,’’ ‘‘grotesque rituals,’’ and ‘‘executions’’ is irrelevant in detecting the fallacy. The problem may be traced to the second premise. If the letters *C* and *B* are interchanged, the form becomes valid, and the original argument, with the same change introduced, also becomes valid (but unsound).

Informal fallacies are those that can be detected only through analysis of the content of the argument. Consider the following example:

All factories are plants.
All plants are things that contain chlorophyll.
Therefore, all factories are things that contain chlorophyll.

A cursory inspection of this argument might lead one to think that it has the following

form:

All *A* are *B*.

All *B* are *C*.

All *A* are *C*.

Since this form is valid, one might conclude that the argument itself is valid. Yet the argument is clearly invalid because it has true premises and a false conclusion. An analysis of the content—that is, the meaning of the words—reveals the source of the trouble. The word ‘‘plants’’ is used in two different senses. In the first premise it means a building where something is manufactured, and in the second it means a life form.

Thus, the argument really has the following invalid form:

All *A* are *B*.

All *C* are *D*.

All *A* are *D*.

The various informal fallacies accomplish their purpose in so many different ways that no single umbrella theory covers them all. Some fallacies work by getting the reader or listener to feel various emotions, such as fear, pity, or camaraderie, and then attaching a certain conclusion to those emotions. Others attempt to discredit an opposing argument by associating it with certain pejorative features of its author. And then there are those that appeal to various dispositions on the part of the reader or listener, such as superstition or mental laziness, to get him or her to accept a conclusion.

By studying the typical ways in which arguers apply these techniques, one is less likely to be fooled by the fallacious arguments posed by others and is less likely to stumble blindly into fallacies when constructing arguments for one’s own use. The presentation that follows divides twenty-two informal fallacies into five groups: fallacies of relevance, fallacies of weak induction, fallacies of presumption, fallacies of ambiguity, and fallacies of grammatical analogy. The final section of the chapter considers the related topics of detecting and avoiding fallacies in the context of ordinary language.

5.2 Fallacies of Relevance

The **fallacies of relevance** share the common characteristic that the arguments in which they occur have premises that are *logically* irrelevant to the conclusion. Yet the premises are relevant *psychologically*, so the conclusion may *seem* to follow from the premises, even though it does not follow logically. In a good argument the premises provide genuine evidence in support of the conclusion. In an argument that commits a fallacy of relevance, on the other hand, the connection between premises and conclusion is emotional. To

identify a fallacy of relevance, therefore, one must be able to distinguish genuine evidence from various forms of emotional appeal.

1. Appeal to Force (*Argumentum ad Baculum*: Appeal to the ‘‘Stick’’)

The fallacy of **appeal to force** occurs whenever an arguer poses a conclusion to another person and tells that person either implicitly or explicitly that some harm will come to him or her if he or she does not accept the conclusion. The fallacy always involves a threat by the arguer to the physical or psychological well-being of the listener or reader, who may be either a single person or a group of persons. Obviously, such a threat is logically irrelevant to the subject matter of the conclusion, so any argument based on such a procedure is fallacious. The *ad baculum* fallacy often occurs when children argue with one another:
Child to playmate: ‘‘you need to admit that arsenal is better than Manchester united or else I am going to kick you in the back.’’

But it occurs among adults as well:

Secretary to boss: I deserve a raise in salary for the coming year. After all, you know how friendly I am with your wife, and I’m sure you wouldn’t want her to find out what’s been going on between you and that sexpot client of yours.

The first example involves a physical threat, the second a psychological threat. While neither threat provides any genuine evidence that the conclusion is true, both provide evidence that someone might be injured. If the two types of evidence are confused with each other, both arguer and listener may be deluded into thinking that the conclusion is supported by evidence, when in fact it is not. The appeal to force fallacy usually accomplishes its purpose by psychologically impeding the reader or listener from acknowledging a missing premise that, if acknowledged, would be seen to be false or at least questionable. The two examples just given can be interpreted as concealing the following premises, both of which are most likely false:

If my brother forces you to admit that ‘‘Teletubbies’’ is the best show on TV, then
‘‘Teletubbies’’ is in fact the best show.

If I succeed in threatening you, then I deserve a raise in salary. The conclusion of the first argument is that ‘‘Teletubbies’’ is the best show on TV. But just because someone is forced into saying that it is does not mean that such is the case. Similarly, the conclusion of the second argument is that the secretary deserves a raise in salary. But if the boss is threatened into raising the secretary’s salary, this does not mean that the

secretary deserves a raise. Many of the other informal fallacies can be interpreted as accomplishing their purpose in this way.

2. Appeal to Pity

(*Argumentum ad Misericordiam*)

The **appeal to pity** fallacy occurs when an arguer attempts to support a conclusion by merely evoking pity from the reader or listener. This pity may be directed toward the arguer or toward some third party.

Example: *Taxpayer to judge:* Your Honor, I admit that I declared thirteen children as dependents on my tax return, even though I have only two. But if you find me guilty of tax evasion, my reputation will be ruined. I'll probably lose my job, my poor wife will not be able to have the operation that she desperately needs, and my kids will starve. Surely I am not guilty.

The conclusion of this argument is ''Surely I am not guilty.'' Obviously, the conclusion is not *logically* relevant to the arguer's set of pathetic circumstances, although it is *psychologically* relevant. If the arguer succeeds in evoking pity from the listener or reader, the latter is likely to exercise his or her desire to help the arguer by accepting the argument. In this way the reader or listener may be fooled into accepting a conclusion that is not supported by any evidence. The appeal to pity is quite common and is often used by students on their instructors at exam time and by lawyers on behalf of their clients before judges and juries.

3. Appeal to the People (*Argumentum ad Populum*)

Nearly everyone wants to be loved, esteemed, admired, valued, recognized, and accepted by others. The **appeal to the people** uses these desires to get the reader or listener to accept a conclusion. Two approaches are involved, one of them direct, the other indirect. The *direct approach* occurs when an arguer, addressing a large group of people, excites the emotions and enthusiasm of the crowd to win acceptance for his or her conclusion. The objective is to arouse a kind of mob mentality. This is the strategy used by nearly every propagandist and demagogue. Adolf Hitler was a master of the technique, but it is also used with some measure of success by speechmakers at Democratic and Republican national conventions. Waving flags and blaring music add to the overall effect. Because the individuals in the audience want to share in the camaraderie, the euphoria, and the excitement, they find themselves accepting any number of conclusions with ever-increasing fervor. example; by a politician to a group of people;

we are proud people. We are unique and deserve to rule other parts of the world. Our skin color and eye color makes us unique. Elect me and I will restore our pride.

The direct approach is not limited to oral argumentation, of course; a similar effect can be accomplished in writing. By using such emotionally charged phraseology as ''fighter of communism,'' ''champion of the free

enterprise system,'' and ''defender of the working man,'' polemicists can awaken the same kind of mob mentality as they would if they were speaking.

In the *indirect approach* the arguer aims his or her appeal not at the crowd as a whole but at one or more individuals separately, focusing on some aspect of their relationship to the crowd. The indirect approach includes such specific forms as the bandwagon argument, the appeal to vanity, and the appeal to snobbery. All are standard techniques of the advertising industry.

Here is an example of the **bandwagon argument:**
Use BIC pens, everyone is using them.
The idea is that you will be left behind or left out of the group if you do not use the product.

The **appeal to vanity** often associates the product with someone who is admired, pursued, or imitated, the idea being that you, too, will be admired and pursued if you use it. The current television and billboard ads for the U.S. Marine Corps provide an example. The ads show a strong, handsome man in uniform holding a gleaming sword, and the caption reads:

The Few, the Proud, the Marines.
The message is that if you join the Marines, then you, too, will be admired and respected,
just like the handsome man in the uniform.

The **appeal to snobbery** depends on a similar kind of association.
A Rolls Royce is not for everyone. If you qualify as one of the select few, this
distinguished classic may be seen and driven at British Motor Cars, Ltd.
(By appointment only, please.)

Needless to say, the indirect approach is used by others besides advertisers *Mother to child:* You want to grow up and be just like Wonder Woman, don't
you? Then eat your liver and carrots.
Both the direct and indirect approaches of the *ad populum* fallacy have the same basic structure:
You want to be accepted/included-in-the-group/loved/ esteemed. . . . Therefore, you should accept XYZ as true.

In the direct approach the arousal of a mob mentality produces an immediate feeling of belonging for each person in the crowd. Each person feels united with the crowd, which evokes a sense of strength and security.

When the crowd roars its approval of the conclusions that are then offered, anyone who does not accept them automatically cuts himself or herself off from the crowd and risks the loss of his or her security, strength, and acceptance. The same thing happens in the indirect approach, but the context and technique are somewhat subtler.

4. Argument Against the Person

(*Argumentum ad Hominem*)

This fallacy always involves two arguers. One of them advances (either directly or implicitly) a certain argument, and the other then responds by directing his or her attention not to the first person's argument but to the first person *himself*. When this occurs, the second person is said to commit an **argument against the person.**

The argument against the person occurs in three forms: the *ad hominem* abusive, the *ad hominem* circumstantial, and the *tu quoque*. In the ***ad hominem* abusive,** the second person responds to the first person's argument by verbally abusing the first person.

Example: Before he died, poet Allen Ginsberg argued in favor of legalizing pornography. But Ginsberg's arguments are nothing but trash. Ginsberg was a marijuana-smoking homosexual and a thoroughgoing advocate of the drug culture.

Because Ginsberg's being a marijuana-smoking homosexual and advocate of the drug culture is irrelevant to whether the premises of his argument support the conclusion, this argument is fallacious. Not all cases of the *ad hominem* abusive are as blunt as this one, but they are just
as fallacious. Example:
William Buckley has argued in favor of legalizing drugs such as cocaine and heroin.
But Buckley is just another one of those upper-crust intellectuals who is out of
touch with real America. No sensible person should listen to his pseudosolutions.

Again, whether Buckley is an upper-crust intellectual has nothing to do with whether
his premises support his conclusion.

The ***ad hominem* circumstantial** begins the same way as the *ad hominem* abusive, but instead of heaping verbal abuse on his or her opponent, the respondent attempts to discredit the opponent's argument by alluding to certain circumstances that affect the opponent. By doing so the respondent hopes to show that the

opponent is predisposed to argue the way he or she does and should therefore not be taken seriously. Here is an example:

The Dalai Lama argues that China has no business in Tibet and that the West should do something about it. But the Dalai Lama just wants the Chinese to leave so he can return as leader. Naturally he argues this way. Therefore, we should reject his arguments. The author of this argument ignores the substance of the Dalai Lama's argument and attempts to discredit it by calling attention to certain circumstances that affect the Dalai Lama—namely, that he wants to return to Tibet as its leader. But the fact that the Dalai Lama happens to be affected by these circumstances is irrelevant to whether his premises support a conclusion. The *ad hominem* circumstantial is easy to recognize because it always takes this form: ''Of course Mr. X argues this way; just look at the circumstances that affect him.''

The ***tu quoque*** (''you too'') fallacy begins the same way as the other two varieties of the *ad hominem* argument, except that the second arguer attempts to make the first appear to be hypocritical or arguing in bad faith. The second arguer usually accomplishes this by citing features in the life or behavior of the first arguer that conflict with the latter's conclusion. In effect, the second arguer says, ''How dare you argue that I should stop doing *X*; why, you do (or have done) *X* yourself.'' Example:
Child to parent: Your argument that I should stop stealing candy from the corner store is no good. You told me yourself just a week ago that you, too, stole candy when you were a kid. Obviously, whether the parent stole candy is irrelevant to whether the parent's premises support the conclusion that the child should not steal candy.

It is important to keep in mind that the purpose of an *ad hominem* argument is to discredit another person's argument by placing its author in a bad light. Thus, for the fallacy to be committed, there must always be two arguers (at least implicitly). If it should turn out that the person being attacked is not an arguer, then the personal comments made by the attacker may well be relevant to the conclusion that is drawn.

In general, personal observations are relevant to conclusions about what kind of person someone is (good, bad, stingy, trustworthy, and so forth) and whether a person has done something. Example:

International terrorist Osama bin Laden planned the bombing of the U.S. embassies in Kenya and Tanzania, killing over two hundred innocent people, and he supports terrorist causes all over the world. Bin Laden is therefore a wicked and irresponsible person.

The conclusion is not that Bin Laden's argument is bad but that Bin Laden himself is bad. Because the premises give relevant support to this conclusion, the argument commits no fallacy.

5. Accident

The fallacy of **accident** is committed when a general rule is applied to a specific case it was not intended to cover. Typically, the general rule is cited (either directly or implicitly) in the premises and then wrongly applied to the specific case mentioned in the conclusion. Two examples:

Freedom of speech is a constitutionally guaranteed right. Therefore, John Q. Radical should not be arrested for his speech that incited the riot last week.

Property should be returned to its rightful owner. That drunken sailor who is starting a fight with his opponents at the pool table lent you his .45-caliber pistol, and now he wants it back. Therefore, you should return it to him now.

In the first example, the general rule is that freedom of speech is normally guaranteed, and the specific case is the speech made by John Q. Radical. Because the speech incited a riot, the rule does not apply. In the second example, the general rule is that property should be returned to its rightful owner, and the specific case is the sailor who wants his gun returned. The rule does not apply because the return of the property might result in serious injury or death. The fallacy of accident gets its name from the fact that the specific case exhibits some attribute, or ''accident,'' that prevents the general rule from applying. In the first example the accident is that the speech incited a riot; in the second example, the accidents are that the sailor is drunk, that he is starting a fight, and that the property in question is dangerous.

6. Straw Man

The **straw man** fallacy is committed when an arguer distorts an opponent's argument for the purpose of more easily attacking it, demolishes the distorted argument, and then concludes that the opponent's real argument has been demolished. By so doing, the arguer is said to have set up a straw man and knocked it down, only to conclude that the real man (opposing argument) has been knocked down as well. Example:

Mr. Goldberg has argued against prayer in the public schools. Obviously Mr. Goldberg advocates atheism. But atheism is what they used to have in Russia. Atheism leads to the suppression of all religions and the replacement of God by an omnipotent state. Is that what we want for this country? I hardly think so. Clearly Mr. Goldberg's argument is nonsense.

Like the argument against the person fallacy, the straw man fallacy involves two arguers. Mr. Goldberg, who is the first arguer, has presented an argument against prayer in the public schools. The second arguer then attacks Goldberg's argument by equating it with an argument for atheism. He then attacks atheism and concludes that Goldberg's argument is nonsense. Since Goldberg's argument had nothing to do with atheism, the second argument commits the straw man fallacy. As this example illustrates, the kind of distortion the second arguer resorts to is often an attempt to exaggerate the first person's argument or make it look more extreme than it really is. Here is an example:

The student status committee has presented us with an argument favoring alcohol privileges on campus. What do the students want? Is it their intention to stay boozed up from the day they enter as freshmen till the day they graduate? Do they expect us to open a bar for them? Or maybe a chain of bars all over campus? Such a proposal is ridiculous!

The arguer distorts the request for alcohol privileges to mean a chain of bars all over campus. Such an idea is so patently outlandish that no further argument is necessary.

7. Missing the Point (*Ignoratio Elenchi*)

All the fallacies we have discussed thus far have been instances of cases where the premises of an argument are irrelevant to the conclusion. **Missing the point** illustrates a special form of irrelevance. This fallacy occurs when the premises of an argument support one particular conclusion, but then a different conclusion, often vaguely related to the correct conclusion, is drawn. Whenever one suspects that such a fallacy is being committed, he or she should be able to identify the *correct* conclusion, the conclusion that the premises *logically* imply. This conclusion must be significantly different from the conclusion that is actually drawn.

Example;

Students are violating some of the rules and regulations of wollega university. Therefore , the university must be closed.

Ignoratio elenchi means ‘‘ignorance of the proof.’’ The arguer is ignorant of the logical implications of his or her own premises and, as a result, draws a conclusion that misses the point entirely. The fallacy has a distinct structure all its own, but in some ways it serves as a catchall for arguments that are not clear instances of one or more of the other fallacies. An argument should not be identified as a case of missing the point, however, if one of the other fallacies fits.

8. Red Herring

This fallacy is closely associated with missing the point (*ignoratio elenchi*). The **red herring** fallacy is committed when the arguer diverts the attention of the reader or listener by changing the subject to a

different but sometimes subtly related one. He or she then finishes by either drawing a conclusion about this different issue or by merely presuming that some conclusion has been established. By so doing, the arguer purports to have won the argument. The fallacy gets its name from a procedure used to train hunting dogs to follow a scent. A red herring (or bag of them) is dragged across the trail with the aim of leading the dogs astray. Since red herrings have an especially potent scent (caused in part by the smoking process used to preserve them), only the
best dogs will follow the original scent. To use the red herring fallacy effectively, the arguer must change the original subject of the argument without the reader or listener noticing it. One way of doing this is to change the subject to one that is subtly related to the original subject. Here are two examples of this technique:

Environmentalists are continually harping about the dangers of nuclear power. Unfortunately,
electricity is dangerous no matter where it comes from. Every year hundreds of people are electrocuted by accident. Since most of these accidents are caused by carelessness, they could be avoided if people would just exercise greater caution.

There is a good deal of talk these days about the need to eliminate pesticides from our fruits and vegetables. But many of these foods are essential to our health. Carrots are an excellent source of vitamin A, broccoli is rich in iron, and oranges and grapefruits have lots of vitamin C.

Both arguments commit the red herring fallacy. In the first, the original issue is whether nuclear power is dangerous. The arguer changes this subject to the danger of electrocution and proceeds to draw a conclusion about that. The new subject is clearly different from the possibility of nuclear explosion or meltdown, but the fact that both are related to electricity facilitates the arguer's goal of leading someone off the track.
In the second argument, the original issue is pesticides, and the arguer changes it to the value of fruits and vegetables in one's diet. Again, the fact that the second topic is related to the first assists the arguer in committing the fallacy. In neither case does the arguer draw a conclusion about the original topic, but by merely diverting the attention of the reader or listener, the arguer creates the presumption of having won the argument.

A second way of using the red herring effectively is to change the subject to some flashy, eye-catching topic that is virtually guaranteed to distract the listener's attention. Topics of this sort include sex, crime, scandal, immorality, death, and any other topic that might serve as the subject of gossip. Here is an example of this technique:

Professor Conway complains of inadequate parking on our campus. But did you know that last year Conway carried on a torrid love affair with a member of the English Department? The two used to meet every day for clandestine sex in the copier room. Apparently they didn't realize how much you can see through that fogged glass window. Even the students got an eyeful. Enough said about Conway.

The red herring fallacy can be confused with the straw man fallacy because both have the effect of drawing the reader/listener off the track. This confusion can usually be avoided by remembering the unique ways in which they accomplish this purpose. In the straw man, the arguer begins by distorting an opponent's argument and concludes by knocking down the distorted argument. In the red herring, on the other hand, the arguer ignores the opponent's argument (if there is one) and subtly changes the subject. Thus, to distinguish the two fallacies, one should attempt to determine whether the arguer has knocked down a distorted argument or simply changed the subject. Also keep in mind that straw man always involves two arguers, at least implicitly, whereas a red herring often does not.

Both the red herring and straw man fallacies are susceptible of being confused with missing the point, because all three involve a similar kind of irrelevancy. To avoid this confusion, one should note that both red herring and straw man proceed by generating a new set of premises, whereas missing the point does not. Straw man draws a conclusion from new premises that are obtained by distorting an earlier argument, and red herring, if it draws any conclusion at all, draws one from new premises obtained by changing the subject. Missing the point, however, draws a conclusion
from the original premises. Also, in the red herring and straw man, the conclusion, if there is one, is *relevant* to the premises from which it is drawn; but in missing the point, the conclusion is *irrelevant* to the premises from which it is drawn. Finally, remember that missing the point serves in part as a kind of catchall fallacy, and a fallacious argument should not be identified as a case of missing the point if one of the other fallacies clearly fits.

Brainstorming? Dear learner, what do you think is the nature of a fallacy?(use the next space to give your answer)

_____

_____.

Summary

Fallacies are types of arguments that display errors in reasoning of a certain kind. Specifically fallacies of relevance try to appeal to emotional grounds as a way of establishing the truth of the argument. Thus in such fallacies the relation between the premises and the conclusion is not rationally justifiable.

Self-check exercise 5.1

Identify the fallacies of relevance committed by the following arguments, giving a brief explanation for your answer. If no fallacy is committed, write ‘‘no fallacy.’’

1. The school board argues that our schools are in desperate need of repair. But the real reason our students are falling behind is that they spend too much time with their computers. Becoming educated means a lot more than learning how to point and click. The school board should send a letter to the parents urging them to monitor their kids’ computer time.

2. You should read Irving Stone’s latest novel right away. It’s sold over a million copies, and practically everyone in the Manhattan cocktail circuit is talking about it.

3. Friedrich Nietzsche’s philosophy is not worth the paper it’s printed on. Nietzsche was an immoral reprobate who went completely insane from syphilis before he died.

5.3 Fallacies Of Weak Induction

Session Objective

-introducing the nature of fallacies of weak induction

-distinguishing between the major types of fallacies of weak induction

Brainstorming? dear student, how do you think the strength of the inferential relation between the premises and conclusion affect the strength of an argument? (use the next space to give your answer)

_____

_____.

The **fallacies of weak induction** occur not because the premises are logically irrelevant to the conclusion, as is the case with the eight fallacies of relevance, but because the connection between premises and conclusion is not strong enough to support the conclusion. In each of the following fallacies, the premises provide at least a shred of evidence in support of the conclusion, but the evidence is not nearly good enough to cause a reasonable person to believe the conclusion. Like the fallacies of relevance, however, the fallacies of weak induction often involve emotional grounds for believing the conclusion.

9. Appeal to Unqualified Authority (*Argumentum ad Verecundiam*)

The **appeal to unqualified authority** fallacy is a variety of the argument from authority and occurs when the cited authority or witness is not trustworthy. There are several reasons why an authority or witness might

not be trustworthy. The person might lack the requisite expertise, might be biased or prejudiced, might have a motive to lie or disseminate ‘‘misinformation,’’ or might lack the requisite ability to perceive or recall. The following examples illustrate these reasons:

The famous athlete Derartu Tulu argued that the Ethiopian economy should shift its focus from agriculture to science and technology. Thus, we must conclude that this is true.

This conclusion deals with economics, and the authority is an athlete. Because it is unlikely that an athlete would be an expert in economics, the argument commits an appeal to unqualified authority.
Benito Mussolini argued that Ethiopians are backward people who practice cannibalism. Therefore, we should accept Mussolini’s arguments.
As an authority, Mussolini is clearly biased, so his statements cannot be trusted.

James W. Johnston, Chairman of R. J. Reynolds Tobacco Company, testified before Congress that tobacco is not an addictive substance and that smoking cigarettes does not produce any addiction. Therefore, we should believe him and conclude that smoking does not in fact lead to any addiction.

If Mr. Johnston had admitted that tobacco is addictive, it would have opened the door to government regulation, which could put his company out of business. Thus, because Johnston had a clear motive to lie, we should not believe his statements.

Old Mrs. Furguson (who is practically blind) has testified that she saw the defendant stab the victim with a bayonet while she was standing in the twilight shadows 100 yards from the incident. Therefore, members of the jury, you must find the defendant guilty.

Here the witness lacks the ability to perceive what she has testified to, so her testimony is untrustworthy.

In deciding whether a person is a qualified authority, one should keep two important points in mind. First, the person might be an authority in more than one field. For example, a chemist might also be an authority in biology, or an economist might also be an authority in law. The second point is that there are some areas in which practically no one can be considered an authority. Such areas include politics, morals, and religion.

10. Appeal to Ignorance (*Argumentum ad Ignorantiam*)

When the premises of an argument state that nothing has been proved one way or the other about something, and the conclusion then makes a definite assertion about that thing, the argument commits an **appeal to**

ignorance. The issue usually involves something that is incapable of being proved or something that has not yet been proved. Example:

People have been trying for centuries to provide conclusive evidence for the claims of astrology, and no one has ever succeeded. Therefore, we must conclude that astrology is a lot of nonsense.

Conversely, the following argument commits the same fallacy.

People have been trying for centuries to disprove the claims of astrology, and no one has ever succeeded. Therefore, we must conclude that the claims of astrology are true.

The premises of an argument are supposed to provide positive evidence for the conclusion. The premises of these arguments, however, tell us nothing about astrology; rather, they tell us about what certain unnamed and unidentified people have tried unsuccessfully to do. This evidence may provide some slight reason for believing the conclusion, but certainly not sufficient reason. These examples do, however, lead us to the first of two important exceptions to the appeal to ignorance. The first stems from the fact that if qualified researchers investigate a certain phenomenon within their range of expertise and fail to turn up any evidence that the phenomenon exists, this fruitless search by itself constitutes positive evidence about the question. Consider, for example, the following argument:

Teams of scientists attempted over a number of decades to detect the existence of the luminiferous aether, and all failed to do so. Therefore, the luminiferous aether does not exist.

The premises of this argument are true. Given the circumstances, it is likely that the scientists in question would have detected the aether if in fact it did exist. Since they did not detect it, it probably does not exist. Thus, we can say that the above argument is inductively strong (but not deductively valid).

As for the two arguments about astrology, if the attempts to prove or disprove the astrological claims had been done in a systematic way by qualified experts, it is more likely that the arguments would be good. Exactly what is required to qualify someone to investigate astrological claims is, of course, difficult to say. But as these arguments stand, the premises state nothing about the qualifications of the investigators, and so the arguments remain fallacious. It is not *always* necessary, however, that the investigators have *special* qualifications. The kinds of qualifications needed depend on the situation. Sometimes the mere ability to see and report what one sees is sufficient. Example:

No one has ever seen Mr. Abdi drink a glass of wine, beer, or any other alcoholic beverage. Probably Mr. Abdi is a nondrinker.

Because it is highly probable that if Mr. Abdi were a drinker, somebody would have seen him drinking, this argument is inductively strong. No special qualifications are needed to be able to see someone take a drink. The second exception to the appeal to ignorance relates to courtroom procedure. In the United States and Canada, among other countries, a person is presumed innocent until proven guilty. If the prosecutor in a criminal trial fails to prove the guilt of the defendant beyond reasonable doubt, counsel for the defense may justifiably argue that his or her client is not guilty.

Example:

Members of the jury, you have heard the prosecution present its case against the
defendant. Nothing, however, has been proved beyond a reasonable doubt.
Therefore, under the law, the defendant is not guilty.

This argument commits no fallacy because ‘‘not guilty’’ means, in the legal sense, that guilt beyond a reasonable doubt has not been proved. The defendant may indeed have committed the crime of which he or she is accused, but if the prosecutor fails to prove guilt beyond a reasonable doubt, the defendant is considered ‘‘not guilty.’’

11. Hasty Generalization (Converse Accident)

Hasty generalization is a fallacy that affects inductive generalizations. The fallacy occurs when there is a reasonable likelihood that the sample is not representative of the group. Such a likelihood may arise if the sample is either too small or not randomly selected. Here are two examples:

One student of natural science scored below average in the course logic and critical thinking. Therefore, natural science students these days are not academically sufficient.

Six Arab fundamentalists were convicted of bombing the World Trade Center in New York City. The message is clear: Arabs are nothing but a pack of religious fanatics prone to violence.

In these arguments a conclusion about a whole group is drawn from premises that mention only two instances. Because such small, a typical samples are not sufficient to support a general conclusion, each argument commits a hasty generalization. The second example indicates how hasty generalization plays a role in racial (and religious) prejudice.

The mere fact that a sample may be small, however, does not necessarily mean that it is atypical. On the other hand, the mere fact that a sample may be large does not guarantee that it is typical. In the case of small samples, various factors may intervene that render such a sample typical of the larger group. Examples:

Ten milligrams of substance Z was fed to four mice, and within two minutes all four went into shock and died. Probably substance Z, in this amount, is fatal to the average mouse.

On three separate occasions I drank a bottle of Amber beer and found it flat and bitter. Probably I would find every bottle of Amber beer flat and bitter.

Neither of these arguments commits the fallacy of hasty generalization because in neither case is there any likelihood that the sample is atypical of the group. In the first argument the fact that the mice died in only two minutes suggests the existence of a causal connection between eating substance Z and death. If there is such a connection, it would hold for other mice as well. In the second example the fact that the taste of beer typically remains constant from bottle to bottle causes the argument to be strong, even though only three bottles were sampled. In the case of large samples, if the sample is not random, it may not be typical of the larger group. Example:

One hundred thousand voters from Orange County, California, were surveyed on their choice for governor, and 68 percent said they intend to vote for the Republican candidate. Clearly the Republican candidate will be elected.

Even though the sample cited in this argument is large, the argument commits a hasty generalization. The problem is that Orange County is overwhelmingly Republican, so the mere fact that 68 percent intend to vote for the Republican candidate is no indication of how others in the state intend to vote. In other words, the survey was not conducted randomly, and for this reason the argument is fatally flawed.

Hasty generalization is otherwise called ‘‘converse accident’’ because it proceeds in a direction opposite to that of accident. Whereas accident proceeds from the general to the particular, converse accident moves from the particular to the general. The premises cite some characteristic affecting one or more atypical instances of a certain class, and the conclusion then applies that characteristic to all members of the class.

12. False Cause

The fallacy of **false cause** occurs whenever the link between premises and conclusion depends on some imagined causal connection that probably does not exist. Whenever an argument is suspected of committing the false cause fallacy, the reader or listener should be able to say that the conclusion depends on the supposition that *X* causes *Y*, whereas *X* probably does not cause *Y* at all. Examples:

During the past two months, every time that the cheerleaders have worn blue ribbons in their hair, the basketball team has been defeated. Therefore, to prevent defeats in the future, the cheerleaders should get rid of those blue ribbons.

Successful business executives are paid salaries in excess of $50,000. Therefore, the best way to ensure that Ferguson will become a successful executive is to raise his salary to at least $50,000.

There are more laws on the books today than ever before, and more crimes are being committed than ever before. Therefore, to reduce crime we must eliminate the laws.

The first argument depends on the supposition that the blue ribbons caused the defeats, the second on the supposition that a high salary causes success, and the third on the supposition that laws cause crime. In no case is it likely that any causal connection exists. The first argument illustrates a variety of the false cause fallacy called *post hoc ergo propter hoc* (‘‘after this, therefore on account of this’’). This variety of the fallacy presupposes that just because one event precedes another event the first event causes the second. Obviously, mere temporal succession is not sufficient to establish a causal connection. Nevertheless, this kind of reasoning is quite common and lies behind most forms of superstition. (Example: ‘‘A black cat crossed my path and later I tripped and sprained my ankle. It must be that black cats really are bad luck.’’)

The second and third arguments illustrate a variety of the false cause fallacy called *non causa pro causa* (‘‘not the cause for the cause’’). This variety is committed when what is taken to be the cause of something is not really the cause at all and the mistake is based on something other than mere temporal succession. In reference to the second argument, success as an executive causes increases in salary—not the other way around—so the argument mistakes the cause for the effect. In reference to the third argument, the increase in crime is, for the most part, only coincidental with the increase in the number of laws. Obviously, the mere fact that one event is coincidental with another is not sufficient reason to think that one caused the other.

A third variety of the false cause fallacy, and one that is probably committed more often than either of the others in their pure form, is *oversimplified cause*. This variety occurs when a multitude of causes is responsible for a certain effect but the arguer selects just one of these causes and represents it as if it were the sole cause. Here are some examples:

The quality of education in our grade schools and high schools has been declining for years. Clearly, our teachers just aren’t doing their job these days.

Today, all of us can look forward to a longer life span than our parents and grandparents.

Obviously, we owe our thanks to the millions of dedicated doctors who expend every effort to ensure our health.

In the first argument, the decline in the quality of education is caused by many factors, including lack of discipline in the home, parental uninvolvement, too much television, and drug use by students. Poor teacher performance is only one of these factors and probably a minor one at that. In the second argument, the efforts of doctors are only one among many factors responsible for our longer life span. Other, more important factors include a better diet, more exercise, reduced smoking, safer highways, and more stringent occupational safety standards.

13. Slippery Slope

The fallacy of **slippery slope** is a variety of the false cause fallacy. It occurs when the conclusion of an argument rests upon an alleged chain reaction and there is not sufficient reason to think that the chain reaction will actually take place. Here is an example:

Immediate measures should be taken against students who miss classes in wollega university. If students miss classes the instructors will be discouraged. Furthermore, other rules of the university like not cheating on exams and drinking on school property will be violated. Finally, chaos and violence will prevail in the university.

Because there is no good reason to think that the mere failure to prevent students from missing classes will result in all these negative consequences, this argument is fallacious.

14. Weak Analogy

This fallacy affects inductive arguments from analogy. The fallacy of **weak analogy** is committed when the analogy is not strong enough to support the conclusion that is drawn.

Example:

Solan's new car is bright blue, has leather upholstery, and gets excellent gas mileage.

Tolasa's new car is also bright blue and has leather upholstery. Therefore, it probably gets excellent gas mileage, too.

Because the color of a car and the choice of upholstery have nothing to do with gasoline consumption, this argument is fallacious. The basic structure of an argument from analogy is as follows: Entity A has attributes *a, b, c,* and *z*. Entity B has attributes *a, b, c*. Therefore, entity B probably has attribute *z* also.

Evaluating an argument having this form requires a two-step procedure: (1) Identify the attributes *a, b, c, . . .* that the two entities A and B share in common, and (2) determine how the attribute *z*, mentioned in the conclusion, relates to the attributes *a, b, c, . . .* If some causal or systematic relation exists between *z* and *a, b,* or *c,* the argument is strong; otherwise it is weak. In the argument above, the two entities share the attributes of being cars; the attributes entailed by being a car, such as having four wheels; and the attributes of color and upholstery material. Because none of these attributes is systematically or causally related to good gas mileage, the argument is fallacious. As an illustration of when the requisite systematic or causal relation does and does not exist, consider the following arguments:

The flow of electricity through a wire is similar to the flow of water through a pipe.
Obviously a large-diameter pipe will carry a greater flow of water than a pipe of small diameter. Therefore, a large-diameter wire should carry a greater flow of electricity than a small-diameter wire.

The flow of electricity through a wire is similar to the flow of water through a pipe.
When water runs downhill through a pipe, the pressure at the bottom of the hill is greater than it is at the top. Thus, when electricity flows downhill through a wire, the voltage should be greater at the bottom of the hill than at the top.
The first argument is good and the second is fallacious. Both arguments depend on the similarity between water molecules flowing through a pipe and electrons flowing through a wire. In both cases there is a systematic relation between the diameter of the pipe/wire and the amount of flow. In the first argument this systematic relation provides a strong link between premises and conclusion, and so the argument is a good one. But in the second argument a causal connection exists between difference in elevation and increase in pressure that holds for water but not for electricity. Water molecules flowing through a pipe are affected by gravity, but electrons flowing through a wire are not. Thus, the second argument is fallacious.

Brainstorming ?Dear learner, what do you think is the nature of the fallacies of weak induction?(use the next space to give your answer)

_____

_____.

Summary

Fallacies of weak induction try to present a genuine evidence in support of the conclusion. Still the inferential relation is not strong enough to strictly establish the truth of the conclusion.

Self-check questions 5.3

Identify the fallacies of weak induction committed by the following arguments, giving a brief explanation for your answer. If no fallacy is committed, write ‘‘no fallacy.’’

1. If a car breaks down on the freeway, a passing mechanic is not obligated to render emergency road service. For similar reasons, if a person suffers a heart attack on the street, a passing physician is not obligated to render emergency medical assistance.

2. A few minutes after Governor Harrison finished his speech on television, a devastating earthquake struck southern Alaska. For the safety of the people up there, it is imperative that Governor Harrison make no more speeches.

3. Lester Brown, universally respected author of the yearly *State of the World* report, has said that the destruction of tropical rain forests is one of the ten most serious worldwide problems. Thus, it must be the case that this is indeed a very serious problem.

5.4 Fallacies Of Presumption

Session Objective

-identifying the nature of fallacies of presumption

-distinguishing between the major types of fallacies of presumption

Brainstorming? Dear learner, what do you think is the difference between presuming an idea and establishing it?(use the next space to give your answer)

_____

_____.

The **fallacies of presumption** include begging the question, complex question, false dichotomy, and suppressed evidence. These fallacies arise not because the premises are irrelevant to the conclusion or provide insufficient reason for believing the conclusion but because the premises presume what they purport to prove. *Begging the question* presumes that the premises provide adequate support for the conclusion when in fact they do not, and *complex question* presumes that a question can be answered by a simple ‘‘yes,’’ ‘‘no,’’ or other brief answer when a more sophisticated answer is needed. *False dichotomy* presumes that an

‘‘either . . . or . . .’’ statement presents mutually exhaustive alternatives when in fact it does not, and *suppressed evidence* presumes that no important evidence has been overlooked by the premises when in fact it has.

15. Begging the Question (*Petitio Principii*)

The fallacy of **begging the question** is committed whenever the arguer creates the illusion that inadequate premises provide adequate support for the conclusion by leaving out a key premise, by restating the conclusion as a premise, or by reasoning in a circle. The Latin name for this fallacy, *petitio principii,* means ‘‘request for the source.’’ The actual source of support for the conclusion is not apparent, and so the argument is said to beg the question. After reading or hearing the argument, the observer is inclined to ask, ‘‘But how do you know *X*?’’ where *X* is the needed support. The first, and most common, way of committing this fallacy is by leaving a key premise out of the argument while creating the illusion that nothing more is needed to establish the conclusion.

Examples:

Murder is morally wrong. This being the case, it follows that abortion is morally wrong.

Of course humans and apes evolved from common ancestors. Just look how similar they are.

It’s obvious that the poor in this country should be given handouts from the government. After all, these people earn less than the average citizen.

Clearly, terminally ill patients have a right to doctor assisted suicide. After all, many of these people are unable to commit suicide by themselves.

The first of these arguments begs the question ‘‘How do you know that abortion is a form of murder?’’ The second begs the question ‘‘Does the mere fact that humans and apes look similar imply that they evolved from common ancestors?’’ And the third and fourth beg the questions ‘‘Just because the poor earn less than the average citizen, does this imply that the government should give them handouts?’’ and ‘‘Just because terminally ill patients cannot commit suicide by themselves, why does it follow that they have a right to a doctor’s assistance?’’

These questions indicate that something has been left out of the original arguments. Thus, the first argument is missing the premise, ‘‘Abortion is a form of murder’’; the second is missing the premise, ‘‘The fact that humans and apes look similar implies that they have common ancestors’’; and so on. These premises are crucial for the soundness of the arguments. If the arguer is unable to establish the truth of these premises, then the arguments prove nothing. The second form of *petitio principii* occurs when the premise of an argument merely restates the conclusion in slightly different language.

Examples:

Capital punishment is justified for the crimes of murder and kidnapping because it is quite legitimate and appropriate that someone be put to death for having committed such hateful and inhuman acts.

Anyone who preaches revolution has a vision of the future for the simple reason that if a person has no vision of the future he could not possibly preach revolution.

In the first argument, saying that capital punishment is ‘‘justified’’ means the same thing as saying that it is ‘‘legitimate and appropriate,’’ and in the second argument the premise and the conclusion say exactly the same thing. However, by repeating the same thing in slightly different language, the arguer creates the illusion that independent evidence is being presented in support of the conclusion, when in fact it is not. Both arguments contain rhetorical phraseology (‘‘hateful and inhuman,’’ ‘‘*simple* reason,’’ and ‘‘could not possibly’’) that help effect the illusion. The first argument begs the question, ‘‘How do you know that capital punishment really is legitimate and appropriate?’’ and the second begs the question, ‘‘How do you know that people who preach revolution really do have a vision of the future?’’

The third form of *petitio principii* involves circular reasoning in a chain of inferences. Here is an example:

Ford Motor Company clearly produces the finest cars in the United States. We know they produce the finest cars because they have the best design engineers.
This is true because they can afford to pay them more than other manufacturers.
Obviously they can afford to pay them more because they produce the finest cars in the United States.

Upon encountering this argument, the attentive reader is inclined to ask, ‘‘Where does this reasoning begin? What is its source?’’ Since the argument goes in a circle, it has no beginning or source, and as a result it proves nothing. Of course, in this example the circularity is rather apparent, so the argument is not likely to convince anyone. Cases in which circular reasoning may convince involve long and complex arguments having premises that depend on one another in subtle ways and a key premise that depends on the conclusion. In all cases of begging the question, the arguer uses some linguistic device to create the illusion that inadequate premises provide adequate support for a conclusion. Without such an illusion, the fallacy is not committed.

16. Complex Question

The fallacy of **complex question** is committed when a single question that is really two (or more) questions is asked and a single answer is then applied to both questions. Every complex question presumes the

existence of a certain condition. When the respondent's answer is added to the complex question, an argument emerges that establishes the presumed condition. Thus, although not an argument as such, a complex question involves an implicit argument. This argument is usually intended to trap the respondent into acknowledging something that he or she might otherwise not want to acknowledge. Examples:

Have you stopped cheating on exams?
Where did you hide the cookies you stole?
Let us suppose the respondent answers ''yes'' to the first question and ''under the bed''
to the second. The following arguments emerge:

You were asked whether you have stopped cheating on exams. You answered
''yes.'' Therefore, it follows that you have cheated in the past.
You were asked where you hid the cookies you stole. You replied ''under the bed.''
It follows that you did in fact steal the cookies.

On the other hand, let us suppose that the respondent answers ''no'' to the first question and ''nowhere'' to the second. We then have the following arguments: You were asked whether you have stopped cheating on exams. You answered ''no.'' Therefore, you continue to cheat. You were asked where you hid the cookies you stole. You answered ''nowhere.'' It follows that you must have stolen them and eaten them. Obviously, each of the questions is really two questions: Did you cheat on exams in the past? If you did cheat in the past, have you stopped now?
Did you steal the cookies? If you did steal them, where did you hide them?
If respondents are not sophisticated enough to identify a complex question when one is put to them, they may answer quite innocently and be trapped by a conclusion that is supported by no evidence at all; or, they may be tricked into providing the evidence themselves. The correct response lies in resolving the complex question into its component questions and answering each separately.

The fallacy of complex question should be distinguished from another kind of question known in law as a leading question. A *leading question* is one in which the answer is in some way suggested in the question. Whether or not a question is a leading one is important in the direct examination of a witness by counsel. Example:

Tell us, on April 9, did you see the defendant shoot the deceased? (leading question)
Tell us, what did you see on April 9? (straight question)

Leading questions differ from complex questions in that they involve no logical fallacies; that is, they do not attempt to trick the respondent into admitting something he or she does not want to admit. To distinguish the two, however, it is sometimes necessary to know whether prior questions have been asked.

17. False Dichotomy

The fallacy of **false dichotomy** (otherwise called ‘‘false bifurcation’’ and the ‘‘either or fallacy’’) is committed when one premise of an argument is an ‘‘either . . . or . . .’’ (disjunctive) statement that presents two alternatives as if they were jointly exhaustive (as if no third alternative were possible). One of these alternatives is usually preferred by the arguer. When the arguer then proceeds to eliminate the undesirable alternative, the desirable one is left as the conclusion. Such an argument is clearly valid; but since the disjunctive premise is usually false, the argument is almost always unsound. Of course, not all unsound arguments are fallacious. The fallacious nature of false dichotomy lies in the attempt by the arguer to delude the reader or listener into thinking that the disjunctive premise presents jointly exhaustive alternatives and is therefore true by necessity. The fallacy is commonly committed by children and adolescents when arguing with their parents, by advertisers, and by adults generally. Here are some examples:

Either you study philosophy or sociology in university or you are simply wasting your time.

Either you use Ultra Guard deodorant or you risk the chance of perspiration odor.
Surely you don’t want to risk the chance of perspiration odor. Therefore, you will want to use Ultra Guard deodorant.

Either you buy only American-made products or you don’t deserve to be called a loyal American. Yesterday you bought a new Toyota. It’s therefore clear that you don’t deserve to be called a loyal American.

None of the disjunctive premises in these arguments presents alternatives that are jointly exhaustive. Yet in each case the arguer wants to make it appear that it does. The soundness of the argument depends on the presumption that the two alternatives presented are the only ones that exist. If they are not the only ones that exist, the ‘‘either . . . or . . .’’ statement is false, and the argument is unsound. Most instances of false dichotomy are not presented as complete arguments.

18. Suppressed Evidence

If an inductive argument does indeed ignore evidence, then the argument commits the fallacy of **suppressed evidence.** Consider, for example, the following argument:

Most dogs are friendly and pose no threat to people who pet them. Therefore, it would be safe to pet the little dog that is approaching us now.

If the arguer ignores the fact that the little dog is excited and foaming at the mouth (which suggests rabies), then the argument commits a suppressed evidence fallacy. This fallacy is classified as a fallacy of presumption because it works by creating the presumption that the premises are both true and complete when in fact they are not. Perhaps the most common occurrence of the suppressed evidence fallacy appears in inferences based on advertisements. Nearly every ad neglects to mention certain negative features of the product advertised. As a result, an observer who sees or hears an advertisement and then draws a conclusion from it may commit the fallacy of suppressed evidence. Example:

The new RCA Digital Satellite System delivers sharp TV reception from an 18-inch dish antenna, and it costs only $199. Therefore, if we buy it, we can enjoy all the channels for a relatively small one-time investment.

The ads for the Digital Satellite System fail to mention that the user must also pay a substantial monthly fee to the satellite company and that none of the local channels are carried by the system. Thus, if the observer takes the ads at face value and uses them as the basis for such an argument, the argument will be fallacious. Another way that an arguer can commit the suppressed evidence fallacy is by ignoring important events that have occurred with the passage of time that render an inductive conclusion improbable. Here is an example:
During the past fifty years, Poland has enjoyed a rather low standard of living.
Therefore, Poland will probably have a low standard of living for the next fifty years.

This argument ignores the fact that Poland was part of the Soviet bloc during most of the past fifty years, and this fact accounts for its rather low standard of living. However, following the collapse of the Soviet Union, Poland became an independent nation, and its economy is expected to improve steadily during the next fifty years. Yet another form of suppressed evidence is committed by arguers who quote passages out of context from sources such as the Bible, the Constitution, and the Bill of Rights to support a conclusion that the passage was not intended to support. The suppressed evidence fallacy is similar to the form of begging the question in which the arguer leaves a key premise out of the argument. The difference is that suppressed evidence leaves out a premise that requires a *different* conclusion, while that form of begging the question leaves out a premise that is needed to support the *stated* conclusion. However, because both fallacies proceed by leaving a premise out of the argument, there are cases where the two fallacies overlap.

Brainstorming? Dear learner, what do you think is the nature of fallacies of presumption?

(use the next space to give your answer)

Summary

In the fallacies of presumption the reasoning process of the argument is presumed rather than established through the relation between the premises and conclusion.

Self-check exercise 5.4

Identify the fallacies of presumption committed by the following arguments. If no fallacy is committed, write ‘‘no fallacy.’’

1.Why is it so difficult for you to reach a decision?

2. Either human beings evolved from more primitive life forms or they were created in their current state. But human beings were not created in their current state. Therefore, human beings evolved from more primitive life forms.

3. Why did you lie on the witness stand?

5.5 FALLACIES OF AMBIGUITY

Session Objective

-identifying the nature of fallacies of ambiguity

-distinguishing between the major types of fallacies of ambiguity

Brainstorming ?Dear learner, what do you understand by ambiguity and how does it affect the inferential process?(use the next space to give your answer)

---.

The **fallacies of ambiguity** include *equivocation* and *amphiboly*. These fallacies arise from the occurrence of some form of ambiguity in either the premises or the conclusion (or both). An expression is ambiguous if it is susceptible to different interpretations in a given context. The words ‘‘light’’ and ‘‘bank’’ are ambiguous, as is the statement ‘‘Tuna are biting off the Washington coast.’’ When the conclusion of an argument depends on a shift in meaning of an ambiguous word or phrase or on the wrong interpretation of an ambiguous statement, the argument commits a fallacy of ambiguity.

19. Equivocation

The fallacy of **equivocation** occurs when the conclusion of an argument depends on the fact that a word or phrase is used, either explicitly or implicitly, in two different senses in the argument. Such arguments are either invalid or have a false premise, and in either case they are unsound.

Examples:

Some triangles are obtuse. Whatever is obtuse is ignorant. Therefore, some triangles are ignorant.

Any law can be repealed by the legislative authority. But the law of gravity is a law.
Therefore, the law of gravity can be repealed by the legislative authority.

We have a duty to do what is right. We have a right to speak out in defense of the innocent. Therefore, we have a duty to speak out in defense of the innocent.
A mouse is an animal. Therefore, a large mouse is a large animal.

In the first argument ‘‘obtuse’’ is used in two different senses. In the first premise it describes a certain kind of angle, while in the second it means dull or stupid. The second argument equivocates on the word ‘‘law.’’ In the first premise it means statutory law, and in the second it means law of nature. The third argument uses ‘‘right’’ in two senses. In the first premise ‘‘right’’ means morally correct, but in the second it means a just claim or power. The fourth argument illustrates the ambiguous use of a relative term. The word ‘‘large’’ means different things depending on the context. Other relative terms that are susceptible to this same kind of ambiguity include ‘‘small,’’ ‘‘good,’’ ‘‘bad,’’ ‘‘light,’’ ‘‘heavy,’’ ‘‘difficult,’’ ‘‘easy,’’ ‘‘tall,’’ ‘‘short,’’ and so on.

To be convincing, an argument that commits an equivocation must use the equivocal word in ways that are subtly related.

20. Amphiboly

The fallacy of **amphiboly** occurs when the arguer misinterprets a statement that is syntactically ambiguous and proceeds to draw a conclusion based on this faulty interpretation. The original statement is usually asserted by someone other than the arguer, and the syntactical ambiguity usually arises from a mistake in grammar or punctuation-a missing comma, a dangling modifier, an ambiguous antecedent of a pronoun, or some other careless arrangement of words. Because of this ambiguity, the statement may be understood in two clearly distinguishable ways. The arguer typically selects the unintended interpretation and proceeds to draw a conclusion based upon it. Here are some examples:

The tour guide said that standing in Greenwich Village, the Empire State Building could easily be seen. It follows that the Empire State Building is in Greenwich Village.

John told Henry that he had made a mistake. It follows that John has at least the courage to admit his own mistakes.

Professor Johnson said that he will give a lecture about heart failure in the biology lecture hall. It must be the case that a number of heart failures have occurred there recently.

The premise of the first argument contains a dangling modifier. Is it the observer or the Empire State Building that is supposed to be standing in Greenwich Village? The correct interpretation is the former. In the second argument the pronoun ‘‘he’’ has an ambiguous antecedent; it can refer either to John or to Henry. Perhaps John told Henry that *Henry* had made a mistake. In the third argument the ambiguity concerns what takes place in the biology lecture hall; is it the lecture or the heart failures? The correct interpretation is probably the former. The ambiguity can be eliminated by inserting commas (‘‘Professor Johnson said that he will give a lecture, about heart failure, in the biology lecture hall’’) or by moving the ambiguous modifier (‘‘Professor Johnson said that he will give a lecture in the biology lecture hall about heart failure’’). Two areas where cases of amphiboly cause serious problems involve contracts and wills. The drafters of these documents often express their intentions in terms of ambiguous statements, and alternate interpretations of these statements then lead to different conclusions. Examples:
Mrs. Hart stated in her will, ‘‘I leave my 500-carat diamond necklace and my pet chinchilla to Alice and Theresa.’’ Therefore, we conclude that Alice gets the necklace and Theresa gets the chinchilla.

Mr. James signed a contract that reads, ‘‘In exchange for painting my house, I promise to pay David $5000 and give him my new Cadillac only if he finishes the job by May 1.’’ Therefore, since David did not finish until May 10, it follows that he gets neither the $5000 nor the Cadillac.

In the first example, the conclusion obviously favors Alice. Theresa is almost certain to argue that the gift of the necklace and chinchilla should be shared equally by her and Alice. Mrs. Hart could have avoided the dispute by adding either ‘‘respectively’’ or ‘‘collectively’’ to the end of the sentence. In the second example, the conclusion favors Mr. James. David will argue that the condition that he finish by May 1 affected only the Cadillac and that he therefore is entitled to the $5000. The dispute could have been avoided by properly inserting a comma in the language of the promise.

Amphiboly differs from equivocation in two important ways. First, equivocation is always traced to an ambiguity in the meaning of a *word* or *phrase*, whereas amphiboly involves a syntactical ambiguity in a *statement*. The second difference is that amphiboly usually involves a mistake made by the arguer in interpreting an ambiguous statement made by someone else, whereas the ambiguity in equivocation is typically the arguer's own creation. If these distinctions are kept in mind, it is usually easy to distinguish amphiboly from equivocation.

Brainstorming

?Dear learner. What do you think is the nature of fallacies of ambiguity?(use the next space to give your answer)

_____

_____.

Summary

In the fallacies of ambiguity, an error in reasoning occurs due to the fact that the argument could be interpreted in one or more ways. Sometimes the ambiguity is caused by syntactical defects, while in others due to the usage of words that could yield diverse interpretations.

Self-check exercise 5.4

Identify the fallacies of ambiguity committed by the following arguments, giving a brief explanation for your answer. If no fallacy is committed, write ''no fallacy.''

1.An athlete is a human being. Therefore, a good athlete is a good human being.

2. This letter from the National Gift Distribution Center says that we have definitely won a free gift, and to claim it we need to call the phone number given in the letter. Apparently if we call that number, they will send the gift right away.

5.6 Fallacies Of Grammatical Analogy

Session Objective

-identifying the nature of fallacies of grammatical analogy

-identifying the major types of fallacies of grammatical analogy

Brainstorming ? Dear learner, what do you think is the effect of the transference of attributes from one part to the other on the inference of an argument?(use the next space to give your answer)

_____

_____.

The **fallacies of grammatical analogy** include *composition* and *division.* Arguments that commit these fallacies are grammatically analogous to other arguments that are good in every respect. Because of this similarity in linguistic structure, such fallacious arguments may appear good yet be bad.

21. Composition

The fallacy of **composition** is committed when the conclusion of an argument depends on the erroneous transference of an attribute from the parts of something onto the whole. In other words, the fallacy occurs when it is argued that because the parts have a certain attribute, it follows that the whole has that attribute too and the situation is such that the attribute in question cannot be legitimately transferred from parts to whole. Examples:

Maria likes anchovies. She also likes chocolate ice cream. Therefore, it is certain that she would like a chocolate sundae topped with anchovies.

Each player on this basketball team is an excellent athlete. Therefore, the team as a whole is excellent.

Each atom in this piece of chalk is invisible. Therefore, the chalk is invisible.
Sodium and chlorine, the atomic components of salt, are both deadly poisons.
Therefore, salt is a deadly poison.

In these arguments the attributes that are transferred from the parts onto the whole are designated by the words ‘‘Maria likes,’’ ‘‘excellent,’’ ‘‘invisible,’’ and ‘‘deadly poison,’’ respectively. In each case the transference is illegitimate, and so the argument is fallacious. Not every such transference is illegitimate, however. Consider the following arguments:

Every atom in this piece of chalk has mass. Therefore, the piece of chalk has mass.
Every component in this picket fence is white. Therefore, the whole fence is white.

In each case an attribute (having mass, being white) is transferred from the parts onto the whole, but these transferences are quite legitimate. Indeed, the fact that the atoms have mass is the very reason *why* the chalk has mass. The same reasoning extends to the fence. Thus, the acceptability of these arguments is attributable,

at least in part, to the *legitimate* transference of an attribute from parts onto the whole. These examples illustrate the fact that the fallacy of composition is indeed an informal fallacy. It cannot be discovered by a mere inspection of the form of an argument— that is, by the mere observation that an attribute is being transferred from parts onto the whole. In addition, detecting this fallacy requires a general knowledge of the situation and of the nature of the attribute being transferred. The critic must be certain that, given the situation, the transference of this particular attribute is not allowed.

Further caution is required by the fact that composition is sometimes confused with hasty generalization. Because it is sometimes easy to mistake a statement about a class for a general statement, composition can be mistaken for hasty generalization. Such a mistake can be avoided if one is careful to keep in mind the distinction between these two kinds of statements. This distinction falls back on the difference between the **collective** and the **distributive** predication of an attribute. Consider the following statements:

Fleas are small.
Fleas are numerous.
The first statement is a general statement. The attribute of being small is predicated distributively; that is, it is assigned (or distributed) to each and every flea in the class. Each and every flea in the class is said to be small. The second statement, on the other hand, is a statement about a class as a whole, or what we will call a ‘‘class statement.’’ The attribute of being numerous is predicated collectively; in other words, it is assigned not to the individual fleas but to the *class* of fleas. The meaning of the statement is not that each and every flea is numerous but that the class of fleas is large.

22. Division

The fallacy of **division** is the exact reverse of composition. As composition goes from parts to whole, division goes from whole to parts. The fallacy is committed when the conclusion of an argument depends on the erroneous transference of an attribute from a whole (or a class) onto its parts (or members). Examples:

Salt is a nonpoisonous compound. Therefore, its component elements, sodium and chlorine, are nonpoisonous.

This jigsaw puzzle, when assembled, is circular in shape. Therefore, each piece is circular in shape.
The Royal Society is over 300 years old. Professor Thompson is a member of the Royal Society. Therefore, Professor Thompson is over 300 years old.

In each case the attribute, designated respectively by the terms ‘‘nonpoisonous,’’ ‘‘circular in shape,’’ and ‘‘over 300 years old,’’ is illegitimately transferred from the whole or class onto the parts or members. As with the fallacy of composition, however, this kind of transference is not always illegitimate. The following arguments contain no fallacy:

This piece of chalk has mass. Therefore, the atoms that compose this piece of chalk have mass.
This field of poppies is uniformly orange in color. Therefore, the individual poppies are orange in color.

Obviously, one must be acquainted with the situation and the nature of the attribute being transferred to decide whether the fallacy of division is actually committed. Just as composition is sometimes prone to being confused with hasty generalization (converse accident), division is sometimes prone to being confused with accident. As with composition, this confusion can occur only when the ‘‘whole’’ is a class. In such a case, division proceeds from the class to the members, while accident proceeds from the general to the specific. Thus, if a class statement is mistaken for a general statement, division may be mistaken for accident. To avoid such a mistake, one should analyze the premises of the argument. If the premises contain a general statement, the fallacy committed is accident; but if they contain a class statement, the fallacy is division.
Example:

Stanley Steamers have almost disappeared.
This car is a Stanley Steamer.
Therefore, this car has almost disappeared.
The first premise is not a general statement but a class statement. The attribute of having almost disappeared is predicated collectively. Accordingly, the fallacy committed is division, not accident.
This example also illustrates how cases of division that involve class statements can include a subtle form of equivocation. In the conclusion, the word ‘‘disappeared’’ means fading from vision, as when the lights are turned down; but in the first premise it means rarely seen. The equivocation is a kind of secondary fallacy that results from the primary fallacy, which is division.

Brainstorming

?Dear learner. what do you think is the nature of fallacies of grammatical analogy?(use the next space to give your answer)

_____

_____.

Summary

The fallacies of grammatical analogy are caused by the illegitimate transference of attributes from one parts of an argument to the whole. In some occasions attributes are transferred from parts to the whole, and in the other from the whole to the parts.

Self-check exercise 5.6

Identify the fallacies of grammatical analogy committed by the following arguments, giving a brief explanation for your answer. If no fallacy is committed, write ‘‘no fallacy.’’

1. Every sentence in this paragraph is well written. Therefore, the paragraph is well written.

2. Each and every cell in this carrot is 90 percent water. Therefore, the entire carrot is 90 percent water.

Chapter Summary

Fallacies of Relevance

Appeal to force: Arguer threatens reader/listener.

Appeal to pity: Arguer elicits pity from reader/listener.

Appeal to the people (direct): Arguer arouses mob mentality.

Appeal to the people (indirect): Arguer appeals to reader/listener’s desire for security, love, respect, etc.

Argument against the person (abusive): Arguer verbally abuses other arguer.

Argument against the person (circumstantial): Arguer presents other arguer as predisposed to argue this way.

Argument against the person (*tu quoque*): Arguer presents other arguer as hypocrite.

Accident: General rule is applied to a specific case it was not intended to cover.

Straw man: Arguer distorts opponent’s argument and then attacks the distorted argument.

Missing the point: Arguer draws conclusion different from that supported by premises.

Red herring: Arguer leads reader/listener off track.

Fallacies of Weak Induction

Appeal to unqualified authority: Arguer cites untrustworthy authority.

Appeal to ignorance: Premises report that nothing is known or proved, and then a conclusion is drawn.

Hasty generalization: Conclusion is drawn from atypical sample.

False cause: Conclusion depends on nonexistent or minor causal connection.

Slippery slope: Conclusion depends on unlikely chain reaction.

Weak analogy: Conclusion depends on defective analogy.

Fallacies of Presumption

Begging the question: Arguer creates the illusion that inadequate premises are adequate by leaving out a key premise, by restating the conclusion as a premise, or by reasoning in a circle.

Complex question: Multiple questions are concealed in a single question. False dichotomy: ‘‘Either . . . or . . .’’ statement hides additional alternatives.

Suppressed evidence: Arguer ignores important evidence that requires a different conclusion.

Fallacies of Ambiguity

Equivocation: Conclusion depends on a shift in meaning of a word or phrase.

Amphiboly: Conclusion depends on the wrong interpretation of a syntactically ambiguous statement.

Fallacies of Grammatical Analogy

Composition: Attribute is wrongly transferred from parts to whole.

Division: Attribute is wrongly transferred from whole to parts.

Self-check exercise 5.7

Out of the 22 major kinds of informal fallacies, Identify which fallacy is committed in the following passages.

1. Something is seriously wrong with high school education these days. After ten years of decline, S.A.T scores are still extremely low and high school graduates are practically incapable of reading and writing. The obvious conclusion is that we should close the schools.
2. Ladies and gentlemen, today the lines of battle have been drawn. When the dims of clashing armor have s finally died away, the Republican Party will emerge victorious. We are the true party of the American people; we embody the values that Americans hold sacred. We cherish and protect the

fathers that gave birth to the constitution. In the coming election, victory will be hours, so help us God.

3. Surely architect Norris is not responsible for the collapse of the central ban tower. Norris has nothing but trouble lately. His son committed suicide, and his alcoholic wife recently left for Las Vegas with his money.
4. The first amendment to the constitution prevents the government from interfering with the exercise of religion. The liturgical practice of the religion of internal enlightenment involves human sacrifice. Therefore, it should be wrong for the government to interfere with this religious practice.
5. Professor Pearson's arguments in favor of the theory of evolution should be discounted. Pearson is cocaine snorting sex pervert and according to some reports, a member of the communist party.

References

Hurley, Patrick. A Concise Introduction to Logic. 2006. Routledge, USA. 9th ed.

Howord, Snyder, et al, The Power of Logic, MacGrewHill, USA.

Gensler, Harry, Introduction to Logic. Routledge, USA. 2ND ed.

Walton, Douglas. Fundamentals of Critical Argumentation. 2006. Cambridge University, USA.

CHAPTER SIX

CATEGORICAL PROPOSITIONS

Introduction

Dear students, in the fifth chapter of this course, we have seen Logical Reasoning and Fallacies. However, this chapter emphasizes the standard forms of categorical statements and their immediate inferences, difference between the modern and traditional squares of opposition what otherwise are called Boolean and Aristotelian Square of Oppositions, evaluating immediate inferences: Venn Diagrams and Square of Oppositions and Logical Operations: Conversion, Obversion, and Contraposition.

Chapter Objectives:

Having studied this lesson, you will be able to:

- Define what a categorical proposition is
- Explain the four standard categorical Propositions
- Explain the attributes of a categorical proposition in terms of quality and quantity
- Understand the immediate inferences based on the rules of conversion, obversion and contraposition
- Describe the logical oppositions between the four propositions based on their square of relations.

Lesson 1: General Introduction

Lesson overview:

Dear students, it is clear that the discussions so far, in the previous chapters, provide you clue insights to what it means, in logic, *categorical* and *proposition*. A proposition that relates two classes, or categories, is called a categorical proposition. The classes in question are denoted respectively by the subject term and the predicate term, and the proposition asserts that either all or part of the class denoted by the subject term is included in or excluded from the class denoted by the predicate term. To put the same ideas in different words, a categorical proposition is a statement that relates two sets, classes, groups or categories which are presented in their subject or predicate positions that could be connected based on inclusion (partial/whole) or exclusion (partial/whole) relations.

Lesson objectives:

At the end of this lesson, students will be able to:

- Understand what it categorical proposition mean.
- Recognize the various components of a standard forms of categorical proposition
- Distinguish the feasible difference between traditional and modern squares of opposition

What is Categorical Propositions?

A proposition that relates two classes, or categories, is called a categorical proposition. The classes in question are denoted respectively by the subject term and the predicate term, and the proposition asserts that either all or part of the class denoted by the subject term is included in or excluded from the class denoted by the predicate term. To put the same ideas in different words, a categorical proposition is a statement that relates two sets, classes, groups or categories which are presented in their subject or predicate positions that could be connected based on inclusion (partial/whole) or exclusion (partial/whole) relations. Here are some examples of categorical propositions:

- *Every human being is mortal*
- *Nothing that is a human which is eternal*
- *There exists a fish that is a shark.*
- *There are plants which are not edible.*

All the above statements are categorical propositions. This is due to the fact that in each statement two sets of things are related either in the form of inclusion or exclusion. In the first example, two set of things are given: human being (which is the subject of the statement) and mortal (the predicate of the statement).

In all the above cases, there are certain difficulties. The amount of the set of things is not clearly stated based on fixed quantifiers. It is very difficult to determine the type of relation of the two classes in the form of inclusion or exclusion. It is ambiguous to decide the attribute (nature) of statements either negatively or positively and to determine their logical relation with other statements. These and other related problems urge us to study categorical propositions based on fixed logical standard-forms. Since any categorical proposition asserts that either all or part of the class denoted by the subject term is included in or excluded from the class denoted by the predicate term, it follows that there are exactly four types of categorical propositions:

- *Those that assert that the whole subject class is included in the predicate class*
- *Those that assert that part of the subject class is included in the predicate class*
- *Those that assert that the whole subject class is excluded from the predicate class*
- *Those that assert that part of the subject class is excluded from the predicate class.*

6.1 Standard-Forms of Categorical Proposition

Dear learners, to determine the validity and invalidity of the immediate inferences of categorical statements and to identify the formal fallacies committed in invalid arguments based on the criteria of logical rules, *categorical propositions should be stated in standard form*. A categorical proposition that expresses these relations with complete clarity is called a *standard-form categorical proposition.*

Consider the below Examples:

All men are mortal.

No men are eternal.

Some politicians are liars.

Some Ethiopians are not friendly.

6.1.1 The Components of Categorical Propositions

A proposition or statement is a sentence that is either true or false. This being the case, categorical proposition is defined as a proposition that relates two classes, or categories. The classes in question are denoted respectively by the subject term and the predicate term. Accordingly, we have four propositions and each of these propositions has quantifier, subject term, sentential connective and predicate term. These are, in general, known as the components of a categorical proposition. Study the following points.

Quantifier = 'All', 'No' and 'Some' indicate the quantity or amount of the subject class.

Subject term = any term (word) or phrase that consists of set of things.

Copula = 'Are' and are 'not'. The Latin copula is a sentential connective that relates the subject and predicate terms.

Predicate term – A term consisting set of things, which has some kind of relation with the subject term.

The four components of standard form can

be summarized as follow:

1) *Those that assert that the whole subject class is included in the predicate class*
2) *Those that assert that part of the subject class is included in the predicate class,*
3) *Those that assert that the whole subject class is excluded from the predicate class,*
4) *Those that assert that part of the subject class is excluded from the predicate* class

The following is, therefore, the correct order of the standard form of a categorical proposition.

=Quantifier + subject term + copula + predicate term.

Consider the following **example**:

All members of the Ethiopian Medical Association are people holding degrees from recognized academic institutions. This standard-form categorical proposition is analyzed as follows:

Quantifier: *all*

Subject term: *members of the Ethiopian Medical Association*

Copula: *are*

Predicate term: *people holding degrees from recognized academic institutions*

A categorical proposition is in standard form if and only if it is a substitution instance of one of the following four forms:

- ✓ *All S are P.*

- ✓ *No S are P.*
- ✓ *Some S are P.*
- ✓ *Some S are not P.*

Given the subject an predicate terms and its four components, categorical propositions could be stated in standard form symbolically -as follows.

All S are P = All members of S is in P class.

No S are P = No members of S is in P class.

Some S are P = At least one member of S is in P class.

Some S are not P = At least one member of S is not in P class.

6.2 Attributes of Categorical Propositions

Quality and quantity are attributes of categorical propositions. Here, it is useful to rephrase the meaning of categorical propositions in class terminology:

Proposition	**Meaning in class notation**
All *S* are *P*.	Every member of the *S* class is a member of the *P* class; that is, the *S* class is included in the *P* class.
No *S* are *P*.	No member of the *S* class is a member of the *P* class; that is, the *S* class is excluded from the *P* class.
Some *S* are *P*.	At least one member of the *S* class is a member of the *P* class.
Some *S* are not *P*.	At least one member of the *S* class is not a member of the *P* class.

These are the three fundamental concepts that would help us to deal with the properties of the four standard forms of categorical statement.

A. Quality:

It refers to those set of things stated in the subject term that are included or excluded from those set of things stated in the predicate term. If the subject term refers to those classes of things, which are included (partially/entirely) in the predicate term, the proposition is said to be affirmative, while if the subject term refers to those classes of things that are excluded (partially/entirely) the proposition is said to be negative. Study the following table.

Standard form	*Quality*
All S are P	*Affirmative*
No S are P	*Negative*
Some S are P	*Affirmative*
Some S are not P	*Negative*

B. Quantity

The quantity of a categorical proposition is determined by the amount or quantity of those set of things stated in the subject term. Accordingly, if the subject term refers entirely, the quantity of the proposition is said to be universal, whereas, if the amount of the subject class is stated partially, the quantity of the proposition is said to be particular. Study the following table.

Standard form	*Quantity*
All S are P	*Universal*
No S are P	*Universal*
Some S are P	*Particular*
Some S are not P	*Particular*

Accordingly, the four letter names: A, E, I and O are devised to represent the four standard forms of categorical propositions and it is summarized as follows.

Standard form	*Letter Name*
All S are P	*A*
No S are P	*E*
Some S are P	*I*
Some S are not P	*O*

C. Distribution

The concept of distribution emphasizes the terms (the subject & predicate terms) and not the proposition as such. If a term refers unambiguously the set of things stated in it entirely the term is said to be distributed. It implies that attribute of the class is distributed to each & every member of the class and we know clearly that the attribute is shared similarly by every member of the class. If a term does not state the class of things in this way, the term is said to be undistributed. Study the following table:

Standard form	*A term distributed*	*A term undistributed*
All S are P	*S*	*P*
No S are P	*S and P*	*None*
Some S are P	*None*	*S and P*

Some S are not P	*P*	*S*

Dear learners, please consider that all the above discussions are summarized as follows.

Letter Name	***Standard form***	***Quality***	***Quantity***	***Distribution***
A	*All S are P*	*Affirmative*	*Universal*	*S*
E	*No S are P*	*Negative*	*Universal*	*S & P*
I	*Some S are P*	*Affirmative*	*Particular*	*None*
O	*Some S are not P*	*Negative*	*Particular*	*P*

6.3 Venn Diagrams & Modern Square of Opposition

Lesson Objectives:

At the end of this lesson, you will be able to:

• Understand what Venn diagram, in its broader sense, mean

• How to represent propositions/arguments in in diagram

• Distinguish the difference between modern and traditional square of opposition**.**

Activity #1:-

- ✓ *What do you think of to represent arguments/categorical propositions in a diagram?*
- ✓ *Make a group of five and discuss the feasible difference and similarities, if any, between modern and traditional squares of opposition.*

The primary goal of our inquiry into categorical propositions is to disclose the role that such propositions play in the formation of arguments. Accordingly, in such interpretations, an argument might be valid or invalid. The standard forms of categorical statements can be represented in diagrams. The first known diagram of categorical propositions is called Euler diagram, after the 18^{th} mathematician L. Euler. Later on, however, Euler diagram was found to be ineffective in identifying valid & invalid categorical syllogistic arguments and thereby new diagram for categorical propositions become indispensable.

6.3.1 Representing Categorical Propositions in Diagrams

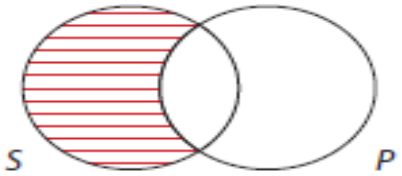
Adopting this interpretation of categorical propositions, the nineteenth-century logician John Venn developed a system of diagrams to represent the information they express. These diagrams have come to be known as **Venn diagrams.** Venn diagram is an arrangement of overlapping circles in which each circle represents the class denoted by a term in a categorical proposition. Because every categorical proposition has exactly two terms, the Venn diagram for a single categorical proposition consists of two overlapping circles.

Each circle is labeled so that it represents one of the terms in the proposition. Unless otherwise required, we adopt the convention that the left-hand circle represents the subject term, and the right-hand circle of the predicate term. In such a diagram:

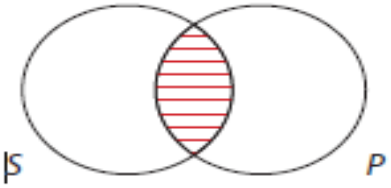
- The two categories (set of things) stated in the subject and predicate terms are represented by two overlapping circles.
- The shading part of the diagram depicts that there no member of the class exists; that is it is null or empty.
- The "*" or simply "X" shows that there is at least one member of the class exists.

Study the following Venn diagrams.

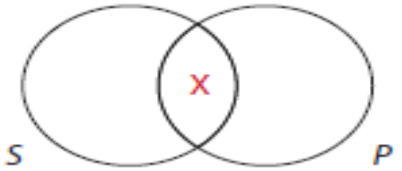
Proposition A= All S are P



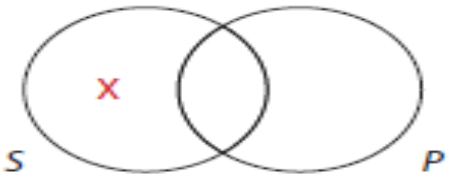
Proposition E = No S are P



Proposition I = Some S are P



Proposition O = Some S are not P



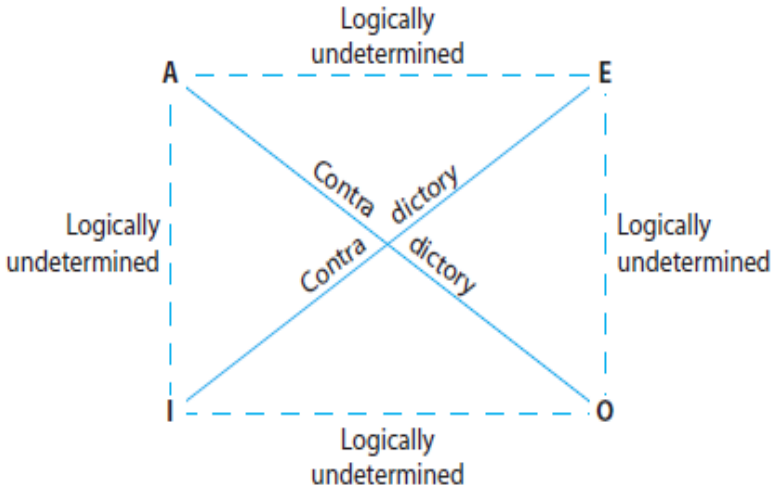
✦ The **A** proposition asserts that no members of *S* are outside '*P'*. This is represented by shading the part of the '*S'* circle that lies outside the *P* circle.

- The **E** proposition asserts that no members of *S* are inside '*P'*. This is represented by shading the part of the *S* circle that lies inside the *P* circle.
- The I proposition asserts that at least one *S* exists and that *S* is also a *P*. This is represented by placing an X in the area where the *S* and *P* circles overlap. This X represents an existing thing that is both an *S* and a *P*.
- The **O** proposition asserts that at least one *S* exists, and that *S* is not a *P*. This is represented by placing an X in the part of the *S* circle that lies outside the *P* circle. **Please note** that 'X' represents an existing thing that is an *S* but not a *P*.

6.3.2 Squares of Opposition: Traditional & Modern Squares of Opposition

To understand the modern and traditional square of opposition; let us compare the diagram for **A** proposition with the diagram for the **O** proposition. The diagram for the **A** proposition asserts that the left -hand part of the *S* circle is empty, whereas the diagram for the **O** proposition asserts that this same area is not empty. These two diagrams make assertions that are the exact opposite of each other. As a result, their corresponding statements are said to contradict each other.

In a similar fashion, the diagram for the **E** proposition asserts that the area where the two circles overlap is empty, whereas the diagram for **I** proposition asserts that the area where the two circles overlap is not empty. Accordingly, their corresponding propositions are also said to contradict each other. This relationship of mutually contradictory pairs of propositions is represented in a diagram called the **modern square of opposition.** This diagram arises from the modern (or **Boolean) interpretation of categorical propositions**. It is represented as follows:



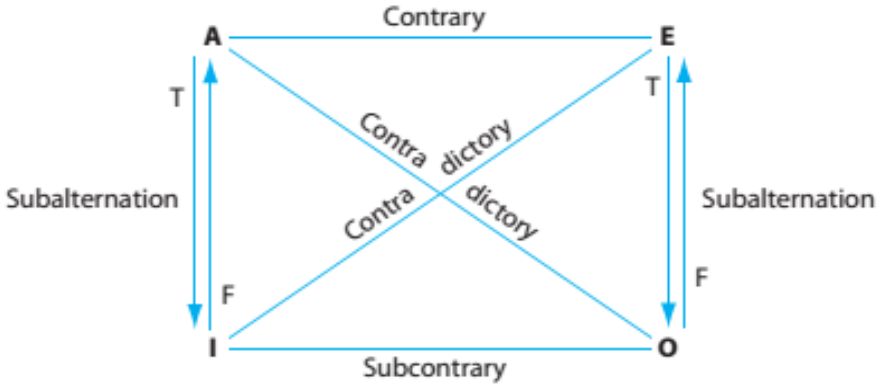
If two propositions are related by the **contradictory relation,** they necessarily have opposite truth value. Thus, if a certain '**A'** proposition is given as true, the corresponding '**O'** proposition must be false. Similarly, if certain '**I'** proposition is given as false, the corresponding '**E'** proposition must be true. But no other inferences are possible. In particular, given the truth value of an '**A** or **O'** proposition, nothing can be determined about the truth value of the corresponding **E** or **I** propositions. These propositions are said to

have **logically undetermined truth value**. Like all propositions, they do have a truth value, but logic alone cannot determine what it is. Similarly, given the truth value of an **E** or **I** proposition, nothing can be determined about the truth value of the corresponding **A** or **O** propositions. They, too, are said to have logically undetermined truth value.

6.3.3 The Traditional Square of Opposition

In the previous lessons, we have adopted the Boolean standpoint, and we saw how the modern square of opposition applies regardless of whether the propositions refer to actually existing things. In this lesson, we adopt the Aristotelian standpoint, which recognizes that universal propositions about existing things have existential import. For such propositions, the traditional square of opposition becomes applicable. Like the modern square, the traditional square of opposition is an arrangement of lines that illustrates logically necessary relations among the four kinds of categorical propositions. However, because the Aristotelian standpoint recognizes the additional factor of existential import, the traditional square supports more inferences than does the modern square.

It is represented as follows:



The **four (4)** relations in the traditional square of opposition may be characterized as follows:

- ✦ Contradictory = opposite truth value
- ✦ Contrary = at least one is false (not both true)
- ✦ Sub-contrary = at least one is true (not both false)
- ✦ Sub-alternation = truth flows downward, falsity flows upward

Explanations on the 4 Relations in the Traditional Square of Opposition

1) The **contradictory relation** is the same as that found in the modern square. Thus, if a certain **A** proposition is given as **true**, the corresponding **O** proposition is **false**, and vice versa, and if a certain **A** proposition is given as **false**, the corresponding **O** proposition is **true**, and vice versa. The same relation

holds between the **E** and **I** propositions. The *contradictory* relation thus expresses *complete opposition* between propositions.

2) The **contrary relation** differs from the contradictory in that it expresses only *partial opposition*. Thus, if a certain **A** proposition is given as **true**, the corresponding **E** proposition is **false** (because at least one must be false), and if an **E** proposition is given as **true**, the corresponding **A** proposition is **false**. But if an **A** proposition is given as **false**, the corresponding **E** proposition could be **either true or false** without violating the "*at least one is false*" rule. In this case, the **E** proposition has **logically undetermined truth value**. Similarly, if an **E** proposition is given as **false**, the corresponding **A** proposition has **logically undetermined truth value**. These results are borne out in ordinary language. Thus, if we are given the actually true A proposition "All cats are animals," the corresponding E proposition "No cats are animals" is false, and if we are given the actually true E proposition "No cats are dogs" the corresponding A proposition "All cats are dogs" is false. Thus, the A and E propositions cannot both be true. However, they can both be false. "All animals are cats" and "No animals are cats" are both false.

3) The **sub-contrary relation** also expresses a kind of *partial opposition*. If a certain **I** proposition is given as **false**, the corresponding **O** proposition is **true** (because at least one must be true), and if an O proposition is given as false, the corresponding I proposition is true. But if either an **I** or an **O** proposition is given as **true**, then the corresponding proposition could be **either true or false** without violating the "at least one is true" rule. Thus, in this case the corresponding proposition would have logically undetermined truth value. If we are given the actually false I proposition "Some cats are dogs," the corresponding O proposition "Some cats are not dogs" is true, and if we are given the actually false O proposition "Some cats are not animals," the corresponding I proposition "Some cats are animals" is true. Thus, the I and O propositions cannot both be false, but they can both be true. "Some animals are cats" and "Some animals are not cats" are both true.

The **sub-alternation relation** is represented by **two arrows**: a **downward arrow** marked with the letter **T (true)**, and an **upward arrow** marked with an **F (false)**. These arrows can be thought of as **pipelines** through which truth value "flow." The downward arrow "transmits" only truth, and the upward arrow only falsity. Thus, if an **A** proposition is given as **true**, the corresponding **I** proposition is **true** also, and if an **I** proposition is given as **false**, the corresponding **A** proposition is **false**. On the other hand, if an **A** proposition is given as **false**, this truth value cannot be transmitted downward, so the corresponding **I** proposition will have **logically undetermined truth value**. Conversely, if an **I** proposition is given as **true**, this truth value cannot be transmitted upward, so the corresponding **A** proposition will have **logically undetermined truth value**. Analogous reasoning prevails for the sub alternation relation between the **E** and **O** propositions. To remember the direction of the arrows for sub alternation, imagine that truth "**trickles down**" and falsity "**floats" up**.

6.4 Evaluating Immediate Inferences: Using Venn Diagrams and Square of Oppositions

Lesson Overview:

Dear learners, Since the modern square of opposition provides logically necessary results, we can use it to test certain arguments for validity. We begin by assuming the premise is true, and we enter the pertinent truth value in the square. We then use the square to compute the truth value of the conclusion. If the square indicates that the conclusion is true, the argument is **valid**; if not, the argument is **invalid**.

Arguments of this sort are called **immediate inferences** because they have only one premise. Instead of reasoning from one premise to the next, and then to the conclusion, we proceed immediately to the conclusion.

Lesson objectives:

At the end of this lesson, student will be able to:

- Understand different logical inferences and represent them on appropriate diagram
- Test the validity and invalid of different arguments in different diagrams
- Perform the operations of conversion, obversion, and contraposition as indicated

Activities # 1 *please study following argument and attempt to evaluate it by using Venn Diagrams and Square of Oppositions:*

Some trade spies are not masters at bribery.

Therefore, it is false that all trade spies are masters at bribery.

Dear learners, in order to have better understanding on to evaluate inferences or to test argument for validity, let‘s reconsider ,once again the above example that:

Some trade spies are not masters at bribery.

Therefore, it is false that all trade spies are masters at bribery.

To evaluate this argument, we begin by assuming that the premise, which is an **O** proposition, is true, and we enter this truth value in the square of opposition. We then use the square to compute the truth value of the corresponding **A** proposition. By the contradictory relation, the **A** proposition is false. Since the conclusion claims that the **A** proposition is false, the conclusion is true, and therefore the argument is valid. Arguments that are valid from the Boolean standpoint are said to be **unconditionally valid** because they are valid regardless of whether their terms refer to existing things.

Note that the conclusion of this argument has the form ―It is false that all *S* are *P*.‖ Technically, statements of this type are not standard-form propositions because, among other things, they do not begin with a quantifier. To remedy this difficulty we adopt the convention that statements having this form are equivalent to ― All *S* are *P*‘ is false.‖ Analogous remarks apply to the negations of the **E**, **I**, and **O** statements. We begin by assuming that the premise is true. Since the premise claims that an **A** proposition is false, we enter

—false into the square of opposition. We then use the square to compute the truth value of the corresponding **E** proposition. Since there is no relation that links the **A** and **E** propositions, the **E** proposition has undetermined truth value. Thus, the conclusion of the argument has undetermined truth value, and the argument is **invalid.**

We can also use Venn diagrams to test immediate inferences for validity. However, using this technique often requires that we diagram statements beginning with the phrase ―It is false that. Let us begin by showing how to diagram such statements. Here are two examples:

It is false that all A are B.

It is false that some A are B.

The first statement claims that ―All *A* are *B*‖ is false. Thus, to diagram it, we do the exact opposite of what we would do to diagram ―All *A* are *B*.‖ To diagram ―All *A* are *B*,‖ we shade the left -hand part of the *A* circle:

To diagram ―It is false that all *A* are *B*,‖ we enter an X in the left-hand part of the *A* circle. Entering an X in an area is the opposite of shading an area: Any statement that is diagrammed by entering an X in an area is a particular proposition. Thus, as the diagram shows, ―It is false that all *A* are *B*‖ is actually a particular proposition. By similar reasoning, ―It is false that no *A* are *B*‖ is also a particular proposition. To diagram ―It is false that some *A* are *B*,‖ we do the exact opposite of what we would do to diagram ―Some *A* are *B*.‖ For ―Some *A* are *B*,‖ we would enter an X in the overlap area. Thus, to diagram ―It is false that some *A* are *B*,‖ we shade the overlap area:

If the information expressed by the conclusion diagram is contained in the premise diagram, the argument is **valid;** if not, it is **invalid**. Here is the symbolized form of the trade spies inference that we tested earlier.

Some T are not M.

Therefore, it is false that all T are M.

The next step is to draw two Venn diagrams, one for the premise and the other for the conclusion. For the premise we enter an X in the left -hand part of the *T* circle, and for the conclusion, as we have just seen, we enter an X in the left -hand part of the *T* circle: To evaluate the inference, we look to see whether the information expressed by the conclusion diagram is also expressed by the premise diagram. The conclusion diagram asserts that something exists in the left -hand part of the *T* circle. Since this information is also expressed by the premise diagram, the inference is **valid**. In this case, the diagram for the conclusion is identical to the diagram for the premise, so it is clear that premise and conclusion assert exactly the same thing.

Here is the symbolized version of the second inference evaluated earlier:

It is false that all M are C.

Therefore, no M are C.

To diagram the premise, we enter an X in the left -hand part of the *M* circle, and for the conclusion we shade the overlap area: Here, the conclusion diagram asserts that the overlap area is empty. Since this information is not contained in the premise diagram, the inference is **invalid**. We conclude with a special kind of inference that: the information of the conclusion diagram is not contained in the premise diagram, so the inference is **invalid**. However, if the premise were interpreted as having existential import, then the *C* circle in the premise diagram would not be empty. Specifically, there would be members in the overlap area. This would make the inference valid.

Arguments of this sort are said to commit the existential fallacy. From the Boolean standpoint, the **existential fallacy** is a formal fallacy that occurs whenever an argument is invalid merely because the premise lacks existential import. Such arguments always have a universal premise and a particular conclusion. The fallacy consists in attempting to derive a conclusion having existential import from a premise that lacks it.

The existential fallacy is easy to detect. Just look for a pair of diagrams in which the premise diagram contains shading and the conclusion diagram contains an X. If the X in the conclusion diagram is in the same part of the left -hand circle that is unshaded in the premise diagram, then the inference commits the existential fallacy. In the example we just considered, the premise diagram contains shading, and the conclusion diagram contains an X. Also, the X in the conclusion diagram is in the overlap area, and this area is unshaded in the premise diagram. Thus, the inference commits the **existential fallacy.** All of these forms proceed from a universal premise to a particular conclusion.

Existential fallacy:

All A are B.

Therefore, some A are B.

It is false that some A are not B.

Therefore, it is false that no A are B.

No A are B.

Therefore, it is false that all A are B.

It is false that some A are B.

Therefore, some A are not B.

Finally, while all of these forms proceed from a universal premise to a particular conclusion, it is important to see that not every inference having a universal premise and a particular conclusion commits the existential fallacy. For example, the inference ―All *A* are *B*; therefore, some *A* are not *B*‖ does not commit this fallacy. This inference is invalid because the conclusion contradicts the premise. Thus, to detect the existential fallacy, one must ensure that the invalidity results merely from the fact that the premise lacks existential import. This can easily be done by constructing a Venn diagram.

6.5 Logical Operations: Conversion, Obversion & Contraposition

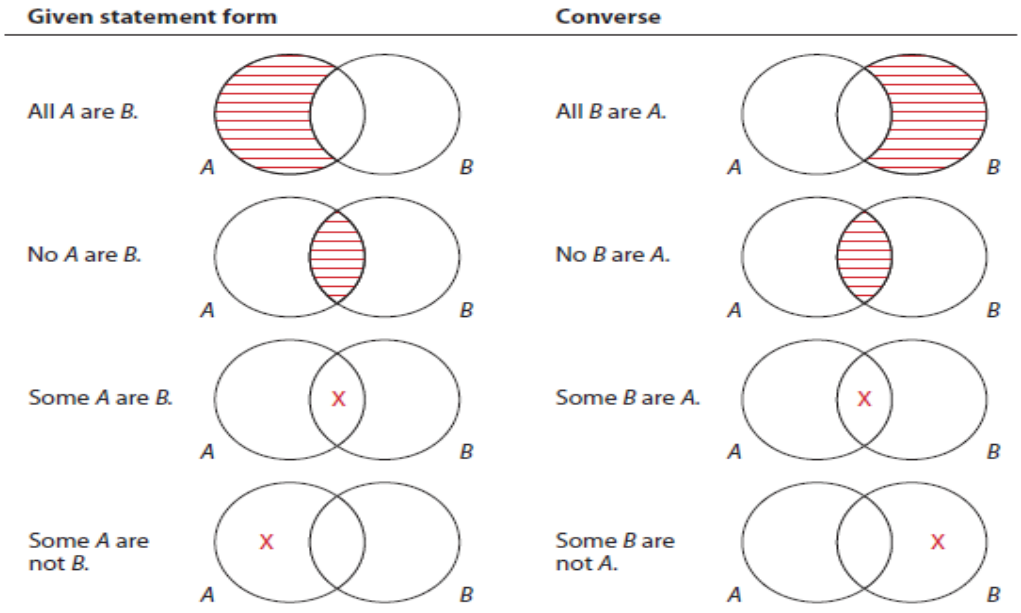
Dear Learners, Conversion, Obversion, and Contraposition are operations that can be performed on a categorical proposition, resulting in a new statement that may or may not have the same meaning and truth value as the original statement. Venn diagrams are used to determine how the two statements relate to each other.

1) Conversion

Conversion-the rule of conversion emphasizes the change of the position of the subject to the predicate and vice versa. Accordingly, by conversion the four propositions look like the following. Study the following table.

Letter Name	*Given Proposition*	*New statement by conversion*
A	*All S are P*	*All P are S*
E	*No S are P*	*No P are S*
I	*Some S are P*	*Some P are S*
O	*Some S are not P*	*Some P are not S*

The simplest of the three operations is **conversion,** and it consists in switching the subject term with the predicate term. For example, if the statement "No foxes are hedgehogs" is converted, the resulting statement is "No hedgehogs are foxes." This new statement is called the *converse* of the given statement. To see how the four types of categorical propositions relate to their converse, compare the following sets of Venn diagrams:



According to the rule of **conversion**:

Propositions E and I always gives the same truth-value. Hence, we can form a valid conversion from the two propositions, taking the given proposition as premise and the converted one as conclusion. If the given proposition is true, then the new converted proposition will be again true. If the premise is false, then the conclusion will be false too. Symbolically:

No S are P = No P are S

Some S are P = Some P are S

Both propositions are equivalent and give us the same truth-value.

Example 1:

No birds are featherless (T) = given. No featherless are birds (T) = New (converted)

Based on the given and converted true statements we can form valid immediate inference. Immediate inference is an argument consisting of only one premise and one conclusion.

Accordingly, the above propositions form a valid argument:

- Since no birds are featherless, therefore no featherless are birds.
- In other words, we can state this assumption by saying that

No birds are featherless, it implies that no featherless are birds.

The same is true for proposition I .

Some businesses are profitable = True (given)

Some profitables are businesses = True (converted)

However, proposition A and O would not give us the same truth-value always as in the case of proposition E and I. The truth-value of the converted statements of A and O are undetermined, that is, sometimes it gives us the same truth-value as the truth-value of the given proposition, in another occasion they can give us a different truth-value than a given proposition.

Example 1: In proposition 'A'

A. All men are mortal - True

All mortals are men = False which is different in truth value from the given proposition.

B. All Muslims are Christians = False

All Christians are Muslims = False – which is the same truth value as the given proposition.

2. In Proposition (I)

A. Some athletes are not drug users = True

Some drug users are not athletes = True, same

B. Some Ethiopians are not Africans = False

Some Africans are not Ethiopians = True , different

These examples clearly show that we cannot form valid arguments form propositions A and O

Activity # 2 Dear students, do you remember how a deductive argument is evaluated as valid or invalid?

We have the confidence in you that, you did not forget the two basic factors for an argument to be invalid:

1. When the premise is true and the conclusion is false

2. When the premise become unsupportive and irrelevant to the claims of the conclusion:

Based upon these two requirements the immediate fallacies of propositions A and O in conversion:

- Would give us inconsistent truth values
- The information content of the premise is unsupportive and not harmonious to the conclusion

Dear learners,

Do you know about fallacies? You have to know that fallacies are mistakes committed in arguments which deludes us into thinking that the mistaken argument as correct one. They are classified as formal and informal fallacies. Informal fallacies can be detected by examining the logical problem in the argument, while formal fallacies can be known simply by their logically incorrect forms that are by the position of terms, quantifiers and statements. The diagram for the **A** statement is clearly not identical to the diagram for its converse, and the diagram for the **O** statement is not identical to the diagram for its converse. Also, these pairs of diagrams are not the exact opposite of each other, as is the case with contradictory statements. This means that an **A** statement and its converse are logically unrelated as to truth value, and an **O** statement and its converse are logically unrelated as to truth value. In other words, converting an '**A'** or '**O'** statement gives a new statement whose truth value is logically undetermined in relation to the given statement. The converse of an **A** or **O** statement does have a truth value, of course, but logic alone cannot tell us what it is. Because conversion yields necessarily determined results for **E** and **I** statements, it can be used as the basis for immediate inferences having these types of statements as premises. The following inference forms are valid:

No A are B.

Therefore, no B are A.

Some A are B.

Therefore, some B are A.

Since the conclusion of each inference form necessarily has the same truth value as the premise, if the premise is assumed true, it follows necessarily that the conclusion is true. On the other hand, the next two inference forms are invalid. Each commits the fallacy of **illicit conversion:**

All A are B.

Therefore, all B are A.

Some A are not B.

Therefore, some B are not A.

Here are two examples of inferences that commit the fallacy of illicit conversion:

All cats are animals. (True)

Therefore, all animals are cats. (False)

Some animals are not dogs. (True)

Therefore, some dogs are not animals. (False)

Accordingly, the immediate inferences of proposition A and O in the case of conversion are invalid and the formal fallacy committed in the invalid arguments of these propositions is called **illicit conversion**. It is a logically incorrect conversion; hence, it is named as illicit conversion.

2) Obversion The logical rule of obversion has two steps:

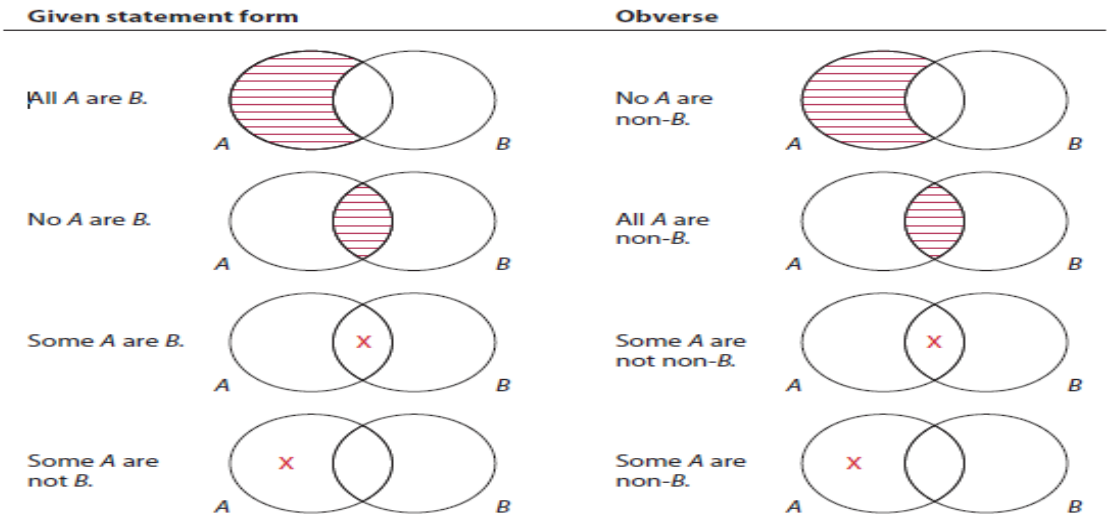
a. Change the quality without changing its quantity

b. Change the predicate by its term complement. A term which has opposite meaning against the meaning of a given term is called term complement. A term complement for black is white, and for the term Ethiopians is non-Ethiopians or those that are not Ethiopians.

Study the following tabular demonstration:

Letter Name	*Given Proposition*	*New Statement By Obversion*
A	*All S are P*	*No S are non-P*
E	*No S are P*	*All S are non-P*
I	*Some S are P*	*Some S are not non-P*
O	*Some S are not P*	*Some S are non –P*

We now have everything we need to form the *obverse* of categorical propositions. First, we change the quality (without changing the quantity), and then we replace the predicate term with its term complement. For example, if we are given the statement "All horses are animals," then the obverse is "No horses are non-animals"; and if we are given the statement "Some trees are maples," then the obverse is "Some trees are not non-maples." To see how the four types of categorical propositions relate to their obverse, compare the following sets of Venn diagrams:



Do you understand how the standard forms of the four propositions are obverted? To make the first rule of obversion, change the quality without changing its quantity. The affirmative quantifier "all "has to be replaced by the negative quantifier "no." This is to change the affirmative quality of the proposition into negative quality. And again the quantity of these propositions are universal, that is the propositions that begins by "All S are "and "No S are" are both universal in quantity.

3. The affirmative proposition "some S are "should be replaced as "some S are not" for the purpose of changing its quality. Besides, the predicate should be replaced by its opposite term, which has different meaning than a given term, symbolically represented as "non-P". According to the rule of obversion, all the four propositions would give us the same truth-value as it is in the given proposition. This is to mean that if the given proposition is true, like for example, all S are P is true, then the new obverted statement, No S are non-P, is also be true. If the given proposition is false, the new obverted statement will be false too. It is the same for all propositions. Example: I = Some student are clever. (True)

Some students are not lazy. (True) by obversion.

E= No leaders are liars (False

All leaders are honest. (False)

Since the truth value of the given and obverted statement have the same truth-value and the information content of the two propositions are the same, if we consider the given proposition as premise and the obverted statement as conclusion, the immediate inference is always valid, hence commits **no formal fallacy**. The following inference forms are valid:

All A are B. *Some A are B.*

Therefore, no A are non-B. *Therefore, some A are not non-B.*

No A are B. *Some A are not B.*

Therefore, all A are non-B. *Therefore, some A are non-B.*

Because the conclusion of each inference form necessarily has the same truth value as its premise, if the premise is assumed true, it follows necessarily that the conclusion is true.

Contraposition

According to the rule of contraposition, we have to change the position of the subject to the predicate and vice versa; and, we should to replace the predicates and the subject terms by their term complements.

Study the following table.

Latter Name	*Given Proposition*	*New statement by Contraposition*
A	*All S are P*	*All non-P are non-S*
E	*No S are P*	*No non- P are non-S*
I	*Some S are P*	*Some non- P are non –S*
O	*Some S are not P*	*Some non P are not non S*

According to the rule of contraposition, proposition 'A' and 'O' would give us the same truth value, while proposition E and I do not. This is just the opposite of what we have observed in the case of conversion. Please the following contrapositions.

A = All worshipers are believers = True

All non- believers are non- worshipers = True

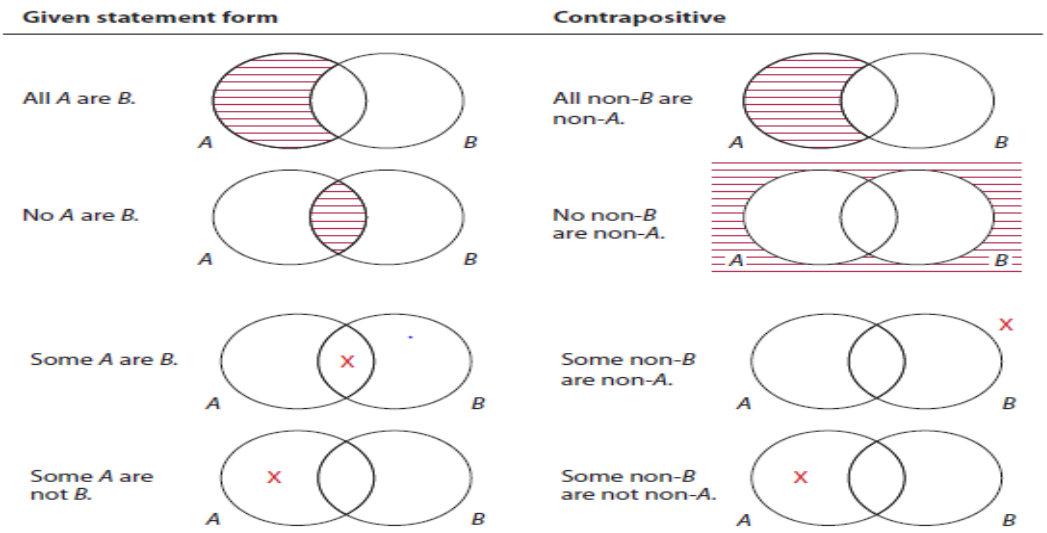
When it is correctly phrased:-

All atheists are un worshipers

O = Some delicious foods are not good for health = True

Some that are bad for health are bad foods = True

Like obversion, contraposition requires two steps: (1) switching the subject and predicate terms and (2) replacing the subject and predicate terms with their term complements. For example, if the statement "All goats are animals" is contraposed, the resulting statement is "All non-animals are non-goats." This new statement is called the contrapositive of the given statement. To see how all four types of categorical propositions relate to their contrapositive, compare the following sets of diagrams:



As with Conversion and Obversion, Contraposition may provide the link between the premise and the conclusion of an immediate inference. The following inference forms are valid:

All A are B.

Therefore, all non-B are non-A.

Some A are not B.

Therefore, some non-B are not non-A.

On the other hand, the following inference forms are invalid. Each commits the fallacy of illicit contraposition:

Some A are B.

Therefore, some non-B are non-A.

No A are B.

Therefore, no non-B are non-A.

Here are two examples of inferences that commit the fallacy of illicit contraposition:

No dogs are cats. (True)

Therefore, no non-cats are non-dogs. (False)

Some animals are non-cats. (True)

Therefore, some cats are non-animals. (False)

Note that both illicit conversion and illicit contraposition are formal fallacies: They can be detected through mere examination of the form of an argument.

Chapter Summary

A proposition that relates two classes, or categories, is called a categorical proposition. The classes in question are denoted respectively by the subject term and the predicate term, and the proposition asserts that either all or part of the class denoted by the subject term is included in or excluded from the class denoted by

the predicate term. To put the same ideas in different words, a categorical proposition is a statement that relates two sets, classes, groups or categories which are presented in their subject or predicate positions that could be connected based on inclusion (partial/whole) or exclusion (partial/whole) relations. In this chapter, you have, also, learnt the different components of categorical proposition, the difference between modern and traditional square of opposition and how to evaluate arguments/inferences using different propositional representation.

Self-Check Exercises

Dear learners, please attempt the following Questions.

1. What is the significance of determining categorical propositions in standard form?

_____

_____

2. What problems would occur if categorical propositions are not settled in standard form?

_____

3. Write a categorical proposition in which its quantifier is No.

_____

4. Write a categorical proposition in which its quantifier is some, its subject term soldier and predicate term cowards and its copula are not

_____

5. If a categorical proposition states that there is at least one X and that X is in Y, its symbolic representation will be

_____

6. The standard form of All S are not P is not a correct standard form. Why?_____

7. Write a categorical statement in which its subject class is entirely included in the predicate class.

_____

I. Draw Venn diagrams for the following propositions.

1. Some rock-music lovers are not fans of Madonna.

2. Some housing developments are complex that exclude children.

II. Use the modern square of opposition to determine whether the following immediate inferences are valid or invalid from the Boolean standpoint.

1. Some country doctors are altruistic healers.

Therefore, some country doctors are not altruistic healers.

2. It is false that all weddings are light-hearted celebrations. Therefore, some weddings are not light-hearted celebrations.

III. Convert the following propositions and state whether the converse is logically equivalent or not logically equivalent to the given proposition.

a. All hurricanes are storms intensified by global warming.

b. No sex-change operations are completely successful procedures

V. **Obvert the following propositions and state whether the obverse is logically equivalent or not logically equivalent to the given proposition.**

a. All radically egalitarian societies are societies that do not preserve individual liberties.

b. No cult leaders are people who fail to brainwash their followers.

References

Textbooks

Hurley, Patrick J. (2014) A Concise Introduction to Logic, 12th Edition, Wadsworth, Cengage Learning.

Hurley, Patrick J. (2012) A Concise Introduction to Logic, 11th Edition, Wadsworth, Cengage Learning.

Reference Books

Copi, Irving M.and Carl Cohen, (1990) Introduction to Logic, New York: Macmillan Publishing Company.

Damer, Edward. (2005). Attacking faulty reasoning. A practical guide to fallacy free argument. Wadsworth Cengage learning, USA.

Fogelin, Robert, J, (1987) Understanding Arguments: An Introduction to Informal Logic, New York: Harcourt Brace Jvanovich Publisher.

Guttenplan, Samuel: (1991) The Language of Logic. Oxford: Blackwell Publishers

Simico, N.D and G.G James. (1983) Elementary Logic, Belmont, Ca: Wadsworth Publishing Company.

Stephen, C. (200) The Power of Logic. London and Toronto: Mayfield Publishing Company.

Walelign, Emuru, (2009) Freshman Logic, Addis Ababa.

Wollega University

College of Social Science & Humanities

Department of Civics and Ethical Studies

Logic and Critical Thinking (LoCT 1011) Assignment.

Total Weight: 40%

Name: _____Id.No._____ Department. _____Center.__

I. Determine whether the following arguments are inductive or deductive.

1. Since Gimbi is west of Nekemte and east of Nejo, it follows that Nejo is west of Nekemte.

2. The Sidama referendum happened in either 2018 or 2019. It did not happen in 2018. Therefore, it happened in 2019.

3. Gemechu will never be able to solve that difficult problem in advanced calculus in the limited time allowed. He has never studied anything beyond algebra, and in that he earned only a C.

4. Fifteen percent of the students at Adama University are from Hararghe. Jemal is a student at Adama University. Therefore, Jemal is from Hararghe.

II. Determine whether the following definitions are stipulative, lexical, precising, theoretical, or persuasive

5. ‘‘Football’’ means a sport in which modern-day gladiators brutalize one another while trying to move a ridiculously shaped ‘‘ball’’ from one end of the playing field to the other

6. ‘‘Magnetism’’ means a property of certain substances such as iron, cobalt, and nickel that arises from the spin of the electrons in the unfilled inner shell of the atoms that compose the substance.

III. Out of the major kinds of informal fallacies, identify which fallacy is committed in the following passages.

7. Professor Gemechu, who is a respected physician in this country, argued this morning that all building found in Nekemte have less quality. It implies that, all buildings of Nekemte have less quality.

8. Doctor: “smoking is very unhealthy and leads to all sorts of problems.” So take my advice and never start.

Patient: “well, I guess smoking cannot be that bad; after all you too are smoking.”

9. Either the government imposes price controls on the cost of vegetable oil, or the merchants will continue to store huge profits. Therefore, price controls must be imposed, because we cannot tolerate these huge profits any longer.

10. Professor Merera, surely I deserve B in logic. I know that I have gotten F's on all the tests; but if you give me an F for my final grade, I will be put on probation. That will force me to drop out of University, and my poor, aged parents, who yearn to see me graduate, will be grief-stricken for the rest of their lives.

IV. In the following categorical propositions identify the quantifier, subject term, copula, and predicate term.

11. Some artificial hearts are mechanisms that are prone to failure.

12. No persons who live near airports are persons who appreciate the noise of jets.

13. All trials in which a coerced confession is read to the jury are trials in which a guilty verdict can be reversed.

14. Some universities that emphasize research are not institutions that neglect undergraduate education.

V. Draw Venn diagrams for the following proposition.

Some political campaigns are mere attempts to discredit opponents.