Logic : How do we Reason?

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บทคัดย่อ

มนุษย์เป็นสัตว์โลกที่มีเหตุผล ตรรกศาสตร์เป็นวิชาที่ส่งเสริมความสามารถในการใช้เหตุผล ด้วยการฝึกฝนเราให้รู้จักใช้เหตุผลที่สมเหตุสมผลทั้งในการคิด การพูดและการเขียน วิธีใช้เหตุผลที่ศาสตร์นี้เน้นเป็นพิเศษคือ การใช้เหตุผลเชิงนิรมัยและเชิงอุปมัย การใช้เหตุผลแต่ละประเภทมีกฎเกณฑ์เฉพาะที่เราจะต้องทำตามถ้าหากต้องการให้คนเห็นด้วยกับความคิดของเราและไม่สามารถโต้แย้งในแง่ของเหตุผลได้ อย่างไรก็ตามมีข้อสังเกตว่าในเรื่องของการแสวงหาความรู้ด้วยวิธีการทางตรรก(เหตุผล) ความรู้ที่ได้มาด้วยวิธีการนี้นั้นไม่จำเป็นต้องเป็นความจริงที่มีอยู่ในโลกเสมอไป ความสัมพันธ์ระหว่างความรู้ที่ได้ด้วยวิธีการของเหตุผล เช่นความจริงทางคณิตศาสตร์ที่แทนค่าด้วยตัวเลขหรือสมการ และสภาพความเป็นจริงของโลกยังคงเป็นประเด็นที่ยังหาข้อยุติไม่ได้แน่นอน สำหรับวิธีการใช้เหตุผลเพื่อให้ชีวิตประจำวันเป็นชีวิตที่มีเหตุมีผลมากที่สุดนั้น สิ่งสำคัญที่ควรระมัดระวังคือเหตุผลที่ใช้ในการคิด การพูด และการกระทำจะต้องเป็นเหตุผลบริสุทธิ์จริงไม่มีอารมณ์ความรู้สึกอคติหรือสิ่งอื่นใดมาเจือปนแม้แต่เล็กน้อย วิชาตรรกศาสตร์เป็นวิชาที่เตรียมตัวเราให้สามารถทำตัวให้เหมาะสมกับที่เกิดมาเป็นมนุษย์ – สัตว์โลกที่มีเหตุผล

What Does It Mean to be Rational?

Through magazines, newspapers, TV, - the mass media – and through political speeches, sales promotions, the arguments of friends and family, everyday others are trying to persuade us to believe one thing or another is true, to choose this rather than that, to take this action rather than another one. How are we to know whether to believe, buy or do what is being urged upon us? What reasons exist to accept the statements and advice

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which are given? Just how compelling, that is, rationally persussive are they? How can we be sure that our own statements, judgments, arguments are as reasonable and persuasive as we can make them? To raise these questions is tɔ want to know about the rules for sound reasoning. Formulating theories about correct reasoning is called *Logic* and it consists of formal and informal rules for critical thinking. Logic is the basis of all work in philosophy.

But as already indicated, it is also very important in our everyday lives to be able to distinguish good arguments form bad ones. This is a skill which all of us need to have, bombarded as we are from every direction with impressive claims and counter claims. The study of logic then is of more than academic interest. To understand what clear reasoning is or to learn how to reason more clearly ourselves will help prevent us from making foolish mistakes – choosing, deciding or acting on the basis of merely emotional appeals, propaganda, prejudice, or ignorance. The study of logic not only informs the mind, but trains it. It is a liberal art, in that its study frees us or liberates us to think for ourselves and not to be held captive to other people's opinions, no matter how impressively given.

What Logic is.

Logic is the study of *argument* by that we do not mean two people having a quarrel -- as when we talk about Boonchu as "always getting into arguments". Philosophical argument is something different -- and I hope more peaceful. The meaning of the term "argument" here is – a *piece of reasoning in which one or more statements are offered as support for some other statement.* The statement we are trying to support is called the *conclusion* of the argument. The reasons given (supporting statements) are called *premises*.

Thus we might say, "This is so (the conclusion) *because* that and that are so (premises)." Or we might argue, "This is so and this is so, (Premises), *therefore* that is so also (conclusion)." As you can see premises can and usually are preceded by words like *because, for, since, on the ground that,* etc. Conclusions, on the other hand, can and are usually preceded by words like *therefore, hence, consequently, it follows that*…..etc.

To give some examples:

It is going to rain today (conclusion), because the weatherman has predicted it (premise) and I see black clouds forming overhead (premise).

a) Because this man is crippled (premise), therefore he needs a wheelchair (conclusion).

b) or I can turn it around and argue:

Since he is in a wheelchair (premise),

It follows that the man is crippled. (conclusion).

The rational activity of going from premises to conclusions is called *inferenće*. Inferences are not guesses, but a form of reasoning. As such they may be instances of either good or bad reasoning. Example (a) above seems to be a proper inference, but example (b) is questionable. Why? Because the man sitting in the wheelchair may be doing it just for fun or to test its strength; he may not be cripple at all.

Let us try another example.

a) Siriwan is very popular. (premise)
Popular people are asked out a great deal. (premise)
Siriwan is going out tonight. (premise)
Someone must have asked her out. (conclusion)

Did we "jump to this conclusion? Yes, we often jump to conclusions. Perhaps we did so in this case because we envy Siriwan's popularity. We were not really thinking, but led by our emotional reaction to this conclusion. Siriwan may simple be going to visit her family or to shop.

b) Siriwan is going out tonight with Prasit. (premise)
She often is asked out by friends (premise).
Popular people are those who are often asked out (premise).
Siriwan, therefore, is very popular (conclusion).
This seems to be an instance of proper inference, therefore, an example of clear reasoning.

We call the parts of an argument *statements*; each of the premises and the conclusion are kinds of statements.

The major kinds of arguments: Deductive and Inductive.

Logic is then a theory of the conditions under which any kind of reasoning is (or the arguments made) are *valid*. Believing that one or more statements are true, we may infer from them that the conclusion is true. One of the two major

kinds of arguments is *deductive artguments* which give us "conclusive inferences" or yield *necessary truths.* The conclusion of the argument is true *by necessity*, logically true; *if* the reasons given or premises (statements) *are true*, it is logically impossible for the conclusion to be false.

Example: All men are mortal (premise, true by definition)
Socrates is a man (premise, true as fact)
Therefore, Socrates is mortal (conclusion; necessarily follows).

In deductive reasoning we usually start with general statements (premises) and infer from them particular or more concrete conclusions.

Example: All stealing (or all acts of stealing) is wrong. (premise-a general statement)
Pichet stold that money. (premise-a statement of fact)
Therefore, Pichet acted wrongly. (conclusion-a particular or concrete statement)

Given the truth of the first two premises, it is certainly true to say that Pichet acted wrongly (or did a wrong act). In a deductive argument, one can see that the premises contain all the statements needed in order to reach a conclusion, thus it follows with necessity or certainty. An nothing in the conclusion refers to anything outside of the premises. The argument is formal; it is self-contained. This is the character of deductive arguments and why it is said they yield certain truth.

The second major kind of argument is *Inductive*. In inductive reasoning we begin with more concrete, particular statements and infer from them more general truth statements. Since in the conclusion of an inductive argument we go beyond the statements made in the premises, the information given, our conclusion can never be certain. It yields only degrees of *probable truth*, high or low probability of being true.

Two examples will help show this difference between *necessary* and *probable inference*.

a) *Deductive*:

All the students in that class are girls.

All these people are students from that class.
Therefore, all these students are girls.

b) *Inductive*:

All these people are students from that class.
All these students are girls.
All the students in that class are therefore girls.

You can see that the first conclusion is certainly true; it follows from the premise given. It is a necessary inference. However, this is not so about the conclusion in the second example. We are given some evidence in our premises to support the conclusion, but we would need more than is given for the inference made to be certain. The argument yields only *probable truth*. And it has a low degree of probability. All it takes is one boy to come out of the classroom to show that our conclusion is false, even though our two premises might be true. We did not have enough evidence even to support a conclusion with a *high degree of probability*. But it remains so, that even inductive arguments that yield a high degree of probability are in danger of being falsified, made false – because it takes only one genuine counter-instance, counter-evidence, to make them false.

A very classic example of an inductive argument which yields a high degree of probability, but not certain or necessary truth is this:

The sun rose yesterday.
The sun has risen every morning as long as people can remember.

Our premises state only something about the past; they contain no information about the future. Therefore, the argument is not self-contained. No matter how sure we feel, how much we hope it will be so, there is no logical necessity for the conclusion. Only a high degree of probability. An inductive argument yields only probable truth.

A medieval Chinese philosopher illustrated this lesson in logic by telling this story:

A rabbit watched as a man put down pieces of cabbage at the foot of a tree. When the man was gone the rabbit came out and ate his fill. The next day at the same time the man came again and left the cabbage, and the next day and the next, departing each time. So the rabbit reasoned, if I come everyday

to the foot of the tree at a short time after the man comes to place the cabbage, I will have a free meal without having to forage for myself. So he did. But at the end of the week, when the rabbit was happily and busily eating the cabbage, the man returned unexpectedly, reached down and wrung the rabbits' neck.

Thus is the fate of all those who mistake inductive arguments for certain truths, who argue that because things have been like this in the past, they *must* be like this in the future. It is not definitely true that the sun will rise tomorrow, only highly probable that it will do so.

Formal Logic

If one wants to have certain truth, then the way to gain it is through deductive reasoning the smallest unit of which is called a *syllogism* with its structure of two premises and a conclusion which logically following the other in a chain of reasoning.

Example: All actions that inflict needless harm on innocent people are wrong.
Killing preduces needless harm.
Babies are innocent people.
Therefore, all actions are what we mean by infanticide.
John killed the baby.
Therefore, John is guilty of infanticide.

This is an example of moral reasoning, conducting a moral deductive argument.

But syllogisms and extended arguments using them are what we call *formal logic*. From early centuries, the rules governing such were laid down and philosophers continue to use them in conducting and testing arguments.

It is *formal logic*, because we can lay out an argument to see if it is *valid*, that is, that the statements in the premises do support the *conclusion, without using words at all.*

Example: All students are human.
All humans are mortal.
Therefore, all students are mortal.

This argument can be reduced to: All M are P
All P are S
(therefore): All M are S

It is *a valid* argument.

But supposting we tried to argue that:

All Englishmen are human.
All Germans are human.
Therefore, all Germans are Englishman.

By reducing the argument to symbols we can immediately see that it is *invalid*.

All M is P
All S is P
: All S is M

What is wrong with it is that the middle term does not act as a connection between the two premises. We say there is an undistributed middle and thus the conclusion cannot follow. Or the following:

All Englishmen are human.	M --- P
No Germans are English.	No S --- M
Therefore, No Germans are human.	No S --- P

Again, this is *invalid* inference because a middle term being undistributed in the premises cannot be distributed in the conclusion. The verbal argument does not make sense to us because the formal structure of the argument is illogical. When we are thinking dearly our minds *are* logical. In the same way we can *know* that no conclusion logically follows from two negative premises, for again no connections made; that if you start off with one negative premise, the conclusive must be negative also; and that negative conclusion cannot follow from two affirmative premises or statements. You can play around with constructing syllogisms of various kinds to test your deductive reasoning.

Syllogistic arguments produce clear reasoning, but even though an argument is *valid*, it does not necessarily yield truth. We can maintain that our conclusion is *true*, only if the premises are *true* and the argument is *valid*. For example, the following argument is valid – the conclusion logically follows from the premises, but as you can see, it results only in nonsense.

Example: All moons are made out of green cheese.
This is a moon.
Therefore, it is made out of green cheese.

Since the first statement is *untrue*, the conclusion is *untrue*; nonsense yields nonsense. When *both premises* are *true* and the

logic is *valid*, then we say that the argument is *sound* and gives us truth. Philosophers engaged in critical thinking test arguments then for both their validity and soundness.

Science and Inductive Logic.

It is different with inductive reasoning and arguments which come to general conclusions from gathering a mass of particular instances. This is the form of reasoning, following the experimental method, of science. When we say there is a "law" governing falling bodies, that they all fall at the same rate, namely, 32 feet per second, we have drawn this conclusion from a mass of experimental data, of particular instances observed. But our conclusion does not follow as a logical, therefore, necessary inference, but as we have seen, as only a probable inferences. This is the case with 11 scientific theories based on experimental data. The work of all the sciences then produces only probable, not certain truth. All so-called "laws of nature" have only degrees of probability and, therefore, can be falsified. They do not produce certainity.

To use an example we have already given. Newtons "physical laws" of gravity and motion proved to be untrue for very small entities (atoms and sub-atomic particles) and very large entities (stars and galaxies). These "laws" were corrected by new "laws" of atomic physics and Einstein's theory of relativity which were developed from new questions raised (hypothese) and new experimental data. Instances were discovered which could not fit in, be covered by, the "law" formulated in Newton's theories. As with the case of the one boy walking out of the classroom or our rabbit (in our two previous examples of inductive reasoning) the future may hold surprises, new questions can produce new answers, new techniques of observation can produce new empirical findings.

This truth about scientific "laws" is recogniged by working scientists. They recognize that all scientific theories must be tentative, that they yield only probable truth – although some with a very high degree of probability. They acknowledge that theories are subject to being falsified by the accumulation of new data based on new observations. And that the observations themselves are dependent upon the hypotheses, the questions with which one starts his/her scientific work. Theories change,

are modified or rejected in the on-going work of science on this basis. The judge of whether such change is needed is the community of scientists in each field. This supports our previous assertions about scientific activity, that is historical and social in its nature.

Summary

Formal logic (deductive) does not attempt to establish truths or "facts" about our actual world and ourselves ---the truth of premises where those premises do make assertions about matters of fact or about what is believel to be true in reality. Rather deductive reasoning is concerned with the logical or rational connections made between statements, (premises and conclusions) about ourselves and our world. Thus logic is the study of arguments, not directly the study of the world.

Science, using inductive reasoning, makes statements about entities in our world, formulates theories as interpretative frameworks, general statements within which an accumulation of data can be ordered and understood, yielding probable knowledge of our world and ourselves. The task of logic in regard to the sciences is not to establish the truth of their findings, but to critically analyse the methods used, the kind and rational adequacy of the reasoning done to formulate their theories and test their data. If these are rationally inadequate, then there are rational grounds to question the findings of science, its truth-claims.

The points we have made about Formal Logic may be summed up as follows:

1. *Truth* and *falsity* pertain to statements alone.
2. *Validity* and *invalidity* refer to inference and are determined independently of the truth or falsity of the premises or conclusion of the argument.
3. If an argument is valid *and* its premises are true, the conclusion either *must* be true – if it is a deductive argument – or *will probably be* true – if it is an inductive argument.
4. If in addition to being valid an argument contains true premises, the argument must be considered *sound*. All sound arguments,

therefore, are valid but valid arguments can be either sound or unsound.

5. Although conclusions may happen to be true, we can accept them as logically true (by necessity), only when we have arrived at them by reasoning validly from true premises.

The study of logic goes beyond common sense, in formulating general principles for clear thinking. It can thus increase our ability to detect instances of bad reasoning done by ourselves and others. We are consequently armed against claims and counter-claims which appeal, not to our reason, but to emotion and prejudice, the ingredients of propaganda. Words, especially many words, can obscure and distort the truth! Logic as the principles of clear reasoning can free us from the confusion of language and help us distinqish between rational, sense and nonsense in our own thinking and that of people trying to persuade us. We can become more critical readers and listeners when we have mastered its study.

Its limitation is that it remains a tool for thinking, it is not the content of thought. Knowledge, truth, wisdom – the truth of our premises – comes from elsewhere, from Philosophy, the Sciences and Religion - also, one might add, from great art and literature. For though we are creatures of reason, as Pascal wrote, “the heart has reasons that reason does not know”.

Informal Logic

The Use and Misuse of Language. As we have noted, words – especially many words at one time – can confuse us as well as instruct us. And we use language in many ways and for many different purposes. In our reading and listening, as well as our own use of language to talk and express ourselves, it is good that we become aware of the different usages of language.

The funcamental uses of language are to *inform*, *to express* or *evoke feelings*, or *to direct*. Each is a legitimate use of language. The problem comes when they are confused with one another.

The first use of language is to give *information*. We make *descriptive statements* about ourselves or our world – statements which can be tested to see if they are true or false.

Example: It is not raining.
The walls are painted brown.
The earth is 25,000 miles in circumference.
The Buddha lived in the 6th Century, B.C.
Water is composed of hydrogen and oxogen.

The second use of language is to *express our feelings or to invokes feelings* in others. When we say, "Oh, what a horrible day!", we may not be reporting to others about the weather, even if it is raining, but expressing our own dissatisfaction with life and/or trying to evoke sympathy in our listeners. Listen carefully to political speeches to see how much is being said to really inform us and how much, through the use of vivid language, appeal to emotional-laden images and symbols, is said to invokes strong feelings in us.

The third use of language is to *direct* other people to do something that we want to be done. This can be very straight forward, as in, "Please shut the door". Or it can be more indirect but still intend the same action, as in, "It is not very private here", we say eying the open door and wanting the person to close it. Sometimes we use emotional appeals, indirectly, to get people to act in certain ways. We invoke the anger and hostility of a crowd of people hoping to incite a riot. Words can be dangerous.

All of these are legitimate usages of language; the question is whether a viven use of language is appropriate. If the primary objective is to inform, then emotionally-laden language can only confuse and one should view it with suspicion. If we are only trying to inform, then it ought to be done in a straight-forward and objective manner --- with logical reasoning.

If our primary objective is to elicit emotional responses, evoke attitudes, then the expressive use of language is appropriate --- and here poetry is better at it than prose and certainly abstract reasoning or "the plain facts" will not do it.

If the primary objective is to direct – then commands or commnding language is appropriate. "Do not cross the road agaist the lights", "Place the checkers on their own cloored square", "Halt!".

In our ordinary, everyday use of language we tend to mix together all of these usges. Confusion comes when we do

not recognize this and fail to recognize the illegitimate usages, not appropriate for their subject matter. The philosophers tell us to: "Say what we mean and mean what we say". – to become more sophistricated in recognizing the different uses of language and judging when they are appropriate. For example, to recognize that the emotional appeal of an essay or speech is irrelevant to its relational value – here we must be only concerned with the truth-claims it makes, the descriptive content of the statements and whether the argument given is a valid one. We must recognize emotional appels for what they are – they have a place in human language and a relations – but not in clear thinking.

Another problem in the use of language is that we often use words very imprecisely. Some words are *ambiguous*, that is, they have more than one distinct meaning. Some words are simply *vague*, their meaning is unclear; we have no way of knowing what the speaker or writer means unless he/she more clearly defines the term used.

For example: If I say, "What a turn he took", my statement is *ambiguous*, for the word "turn" has several distinct meanings in the English language. You would have to, if you could, decide which meaning is intended from the over-all context in which it is spoken. Depending on the context, what I said could mean:

1. He, as a race-track driver, went around the curve fast and with good control. (changing direction.

or

2. She, as a hospital patient, quickly became more ill. (change for the worse)

or

3. He, having had his chance at bat, made a home run. (having an opportunity)

When the context in which words are spoken or written remains unclear, then we are left with ambiguity. It is the task of speakers and writers to become aware of ambigious words and to provide a clear context, so that the meaning intended is also clear. Without this precision of word-use, real communication and understanding are impossible.

But some words are unclear, imprecise, regardless of their context, for their meanings are indefinite – *vague*. Their vagueness may come from their being over-used. Just what kind of day am I supposed to have when someone says, "Have a *good* day"? Or can I know exactly how a person feels if they say in answer to my question, "How are you?" – "*Fine*". How many hairs can you have left on your head an still be called, "bald".

Some words are vague in their meaning because so many meanings have been attached to them. Terms like *democracy*, *communism*, *art*, *progress*. How can we know clearly what they mean unless they are defined before they are used. One man's "democracy" is another man's "autocracy". One person's "art" is another persons "trash".

Again, philosophers ask us to, "Say what we mean, and mean what we say". Vague terms must be defined. It is the task of philosophers to clarify the language we use, the concepts, and to propose more precise definitions of terms, instead of the vagueness of language which we ordinarily rest content with. In many of our discussions we talk at great length, but past one another, not really communicating because we are not talking about the same thing. For one person "democracy" may mean each person having the right to vote, to participate in choosing all those in government. For another person, "democracy" may mean greater equality in income. When someone claims that there is more "democracy" in the Soviet Union than in the United states, we must raise our first question. What do you mean by that claim? How do you define the concept "democracy" which you are using? Philosophers say such claims are really verbal disputes or arguments, because the people are not arguing about descriptive matters, about things which are true or false in reality, but over the meaning of terms.

The word "good" is also vague because it has many meanings and indefinite usage. A good car, a good dog, a good dinner, a good husband, a good person. Does good mean the same thing in each case? "Love" is another word which confuses us as to its real meaning, because in English it is used in so many ways: the love of truth, love of country, "I love you", "I'd love to go to the movies", love of parent for children. We are not clear about what we are talking about, nor can we be

clearly communicating with others, unless we can classify more precisely the meaning of the concept of "love" is each of these used. Dictionaries report only on the common uses of words. It is a major task of philosophers to clarify the concepts and their usages with more precision, so that their definition is neither too narrow or too broad, neither ambiguous nor vague.

Informal Fallacies of Reasoning

A fallacy is an argument that is unsound, an incorrect way of reasoning. It is an attempt to persuade, or object to another's position, emotionally or psychologically, not logically. The error lies not in the form of the argument, but in its content --- its use of vague or ambiguous language, its questionable assumptions and biases. Fallacies are common errors in reasoning, so common that we all fall into them or are persuaded by them when we are careless in our thinking or careless in listening to the arguments of others.

The philosophers have identified numerous fallacies --- too many for us to discuss here. We will cover only the most common ones. You will be rather surprised to learn what are considered to be fallacies in arguments.

1) *The Genetic Fallacy*

This is an attempt to discredit or object to a position by condemning its source. How or where an idea comes from, or who holds it, is not relevant to an ideas worth or truth. It is always a fallacy, on error in argument, to object to or reject a statement simply because of its scorce.

For example, in the United States many people argue against the government regulation of businesses, because it "smacks of socialism", or is what "communism" does. Perhaps government economic regulation is practiced in socialist countues, but that in and of itself does not prove that a degree of government regulation would not be good in the United States. In party politics we find politicians arguing against a program, simply because the idea has come from an opposing party, without examining the merits of the proposal in itself. This is another example of the Genetic Fallacy.

2) *The Ad Hominem Fallacy*

This is the fallacy of attacking the person rather than the persons argument. For example, by heaping abuses on the

proposing or opposing a position, by “name-calling”, it is hoped that the audience will be swayed to reject an idea, plan or proposal without rationally examining it. Thus an energy expert might say that the people opposing the construction of a nuclear power plant “are only environmental fanatics”. Or the charges might be that anyone opposed to capital punishment is a “bleeding-heart liberal”; anyone in favor of nuclear disarmament, a “communist dupe”; anyone opposed to abortion is a “sexist”. *Ad hominem* attacks usually appear when issues are emotionally strong ones. Unless there are real grounds, solid evidence, and to question the reliability of an opponent the character of the person in relevant to the issue, then *ad hominem* attacks are only a form of verbal abuse; they have no place in rational argument.

Another form of the *ad hominem* fallacy is to attack, not the character of the person, but his/her position in life. One hears it often argued that what monks have to say about marriage can be disregarded because they are celibate and thus cannot know anything about marriage. This is certainly untrue, for a monk may have very good ideas about the social and spiritual significance of marriage. Or one hears it said that a woman’s political views can be disregarded because “she is only a housewife” or poor peoples protests can be rejected “because they are ignorant faermers”. Again, these are ways of trying to win an argument about marriage, politics or econmics, not by giving good reasons and evidence for one’s own position or for rejecting another but by attacking one’s opponent with charges not relevant to the truth of falsity of the positions themselves.

3) *Invincible Ignorance*

We are all guilty of this fallacy at one time or another. It is the fallacy of insisting on our own views without being willing to examine the issue at all, or even in the face of contradictory evidence. You can sport this fallacy when made by yourself or others quite easily. It is apparent whenever people say such things as:

> “My mind is already made up. I don’t want to hear anything about it.”
>
> “I don’t care what you say, but…..”

"No one can tell me what to think or do….."
"No matter what the experts say, no one can convince me that….."
"It doesn't matter what anyone else thinks, I believe….."
"There may be good reasons for not doing it, but I always do what I feel like….."

Such persistence or stubbornness, unwillingness to even listen to reasons or evidence or to go on to think or do what we want, despite good reasons or evidence which conflicts with our desires --- *is* invincible ignorance.

4) *The Fallacy of Hypostatization*

To hypostatize is to speak of abstract entities, things, in terms that are appropriate only when speaking of persons. It is to *personify* to speak of things as having qualities that only human beings possess. We hear this being done very often.

For example:

"The State is responsible for this problem."
"Science makes progress possible"
"nature is always right in what it does."

Since each of these three statements is only a concept, none is capable of thought or intention, and thus none is capable of the activities attributed to them. Only persons can be responsible, only scientists can make progress, and only persons are moral agents. Another very common example, is when people say, "The Budget makes it impossible", when we really mean that our own economic considerations or interests prevent us from doing something. One might say that often when we argue by speaking about abstractions as if they were people, we are trying to hide or obscure the human agents at work or trying to push aside human responsibility for what happens. It is easier "to blame the State" --- rather than the individual politicians or we, the citizens, for political failures. It is easier for scientists to try to escape from responsibility, by talking about "the progress of science". It is well to be wary of such statements, like "The Fatherland calls us", "Nature compels us" --- and look to see what concrete persons are doing the calling and compelling. It may sound less noble to say, "the present governmental rulers

call us" or "the scientist's theory gives evidence that….." but it is truer to reality.

5) *The Fallacy of Equivocation*

To commit this fallacy is to allow a key word or phrase in an argument to shift its meaning in the course of the argument.

A good example of this fallacy is:

Only man is rational.
No woman is a man.
Therefore no woman is rational.

It sounds like a valid argument if we don't notice the shift in meaning. Man in English is an ambiguous word. In the first premise it means "human", but in the second premise, it means "male".

But a more subtle example may be given one that shows how carefully one must read or listen to arguments, not to be fooled by those committing this fallacy:

> It is the clear duty of the press to publish such news as it shall be in the public interest to have published. There can be no doubt about the public interest taken in the brutal murder of the countess……..and the details of her private life……..the press would have failed in its duty if it had not published these matters.

Here the expression "the public interest" means in the first premise "the public welfare", but in the second premise it means "What the public is interested in". Thus the argument is fallacious because what the public is interested in is not the same as what is in its best interest.

6) *The Fallacies of Wholes and Parts*

Here is another common careless way of speaking, a logical error. It is to confuse the parts for the whole or the whole for its parts. For example, if we say that Bangkok has the best soccer team in the country – that may be true of the team *as a whole*, since it has won more games. But it is not true that each individual player is better than other individual players from other teams. If we tried to argue this way, it would be the error or fallacy of taking a part for a whold. Or we might say, since each of these colors is beautiful, if I put them all together I

will have a beautiful dress. No, as the old saying goes, the whole is more than the sum of the parts. The colors are individually beautiful, but when put together they might clash. Lopburi may have the worse team in the league, but its quarterback may be the best in the country. America may be the freest country in the world, taken as a whole, but may have individual parts, segments of its people who are exploited and deprived of opportunity. Wholes and parts cannot be confused.

7) *False Appeal to Authority*

Often we hear someone in an argument appealing to an expert or other authority to back up a claim to knowledge. Of course, some claims to expertise are to be respected, especially where a community of experts are in agreement about evidence or truth. But when a commercial appeals to us to buy a product because some movie star uses it, this is the fallacy of false appeal to authority. The movie star is no expert on the safety or effectiveness of the product. Or if someone argues that it must be right to kill the patient because the doctor says so --- this is a false appeal, for medical training does not make a person into an expert in morality. Even if it is argued that "the abortion law must be right because the Prime Minister approves of it" --- this is a false appeal, because in this matter he may be wrong.

An equal fallacy is to appeal to the *authouty of the crowd*, on numbers to support a claim. That everybody is doing something does not make it right; the majority may be simply morally wrong." That 50 million people have seen a movies does not make it a good movie. That one million people polled believe something to be true, does not make it true; they all may be mistaken. You can see how prevalent this fallacy is today. We tend to be taken in by statistics, swayed by appeals to be popular, "to get with it", "join the crowd". But to believe or to do anything simply *because* large numbers of people believe or do it, is a fallacy and error of thinking. It is no thinking at all.

Another version of this fallacy is the appeal to *traditional wisdom*-to rely exclusively on the past to justify something in the present. But something might have been right and true in the past which is no longer so. The fact the "this is how it always has been done", does not mean that it should be done that way today. There would be no development, no

advances, no improvements, if we relied simply upon traditional wisdom. Parents, I am afraid, fall too easily into this fallacy – judging the present and what if good for their children by their own past experience. But there is an opposite fallacy that children fall into, thinking that "the newer is always the better" when change can be not for the best but for the worst. Change by itself is neutral --- it must be evaluated to see if it is good or bad.

8) *The Fallacy of Provincialism* --- that of seeing things only through the eyes of one's own group or membership. For example, when we think something must be good because it is American, or must be right because it is the Thai way. Our bias makes us unwilling or unable to look at things with the eyes of other people or be tolerant of differences which are not morally significant, but matters of custom.

9) *The Fallacy of Two-wrongs-make-a right* is that of trying to defend a wrong action by pointing to other instances of it. For example, we say to a policeman who has stopped us for speeding, "Why stop me? That car that passed me was going faster." Or "Why condemn America for its nuclear arms race? Look at the Russians." or "I know our plant is dumping toxic wastes into the river, but so is every other factory." or "Sure, I cheat on my income tax, but everybody does". or "Politics is a dirty game, I'm just taking my share along with everyone else". You have, I am certain, all ehard versions of this fallacy, but two or more wrongs still do not make a right.

10) *The Fallacy of Either/or*

Often it is the case, that arguments are made at the extreme poles as if issues were simply black or white. The most familiar is the either "Better red, than dead" or "Better dead, then red" argument. Someone has replied to it by saying "Better pink, than extinct". But putting all such foolishness aside, there is a tendency in "hot issues" to present extreme alternajtives as if they were the only possible ones to adopt. At the same time drawing attention away from moderate, or middle ground proposals which may be more worthy of consideration, such "black or white" thinking tends usually to gross oversimplification of complicated issues. It is the appeal of

propaganda, of slogan-ghinking-of forced option. Here is a good example:

> Let me give this solemn warning. There can be only one capital Washington or Moscow. There can be one flag, the Stars and Stipes or the godless hammer and sickle. There can be but one national anthem, the "Star – Spangled Banner" or the Communist "Internationale".

It is as if there were no other capitals, flags or anthems which merited any attention. The world and their own perceptions of what is good for their peoples, then the fallacy is clear in either/or thinking. But it does not only occur in political thinking, though it is fertile ground for it. Other examples, "*Either* you believe in abortion *or* you cannot be a feminist". "We must *either* choose between inflation *or* full unemployment". "*Either* we build nuclear power plants *or* become dependent on foreign nations for their oil". In fact, some nation's economic systems have maintained both a low level of inflation and unemployment. There are althernative energy sources to both nuclear power and oil. Either/or thinking, thinking only in terms of extremes, of forced options, is contrary to clear reasoning. It is usually a vast over simplification of the facts and avoids the rigorous effort needed to come to reasonable solutions.

11) *The Fallacy of Begging the Question*

When instead of offering evidence for the conclusion of one's argument, one simply restates it using other words, it is called "begging the question". The attempt is to persuade us that something is true, merely by reaffirming it. No evidence is given, no premises are offered to support our argument. We just repeat the conclusion in another form. For example, if I ask you why there is so much unemployment, and you answer "because so many people are out of work", You have not given me any answer, any reasons, but merely repeated the question in other words. This is an easy example to understand, other instances are more difficult to spot, but are quilty of the same kind of *circular reasoning*, another name for the fallacy of "begging the question".

Example: Free trade will be good for this country. The reason is patently clear. Isn't it obvious that unrestricted commercial relations will be stow on all sections of this nation the benefits which result when there is an unimpeded flow of goods between countries?

When we unpack all this language – what is argued is "that free trade will be good for the country because free trade will be good for the country" since "benefits" means "Good" and "unrestricted commercial relations" is just another way of saying "free trade". No premises are given, no support for the conclusion; it is only restated using other words.

Example:

a) All people are selfish since they always do what they want.
How do you know that?
Well, they would't do it, if they didn't want to do it.

b) I think it is right for the taxes to be lowered.
Why do you think it is right?

Because the people would not have to pay so much money to the government.

c) Love is blind.
How do you know love is blind?
Because people marry the strangest people.

In all these examples, no real argument made to support one's opinions. When asked for a reason, the person has only reaffirmed their opinion in other words.

12) *The Fallacy of Sweeping Generalization*

Whenever a general rule is applied inappropriately to a specific case, one has committed the error of *Sweeping Generalization.* Deductive reasoning, as we saw, does argue from general premises to particular conclusions, but one has to

be careful that the case truly fits under the general principle begun with. There can be and are exceptions to general rules.

Example: Vigoious exercise is a good way to maintion health.
(We might all agree with this as a general rule.)
Prasit is in poor health.
Therefore, prasit should engage in vigorous exercise.

This is a valid argument, but not a *sound* one in the case of Prasit, because he is an exception to the rule. This particular kind of poor health is a heart condition and vigorous exercise might kill him!

Example: Free speech is the right of all free people.

In general we would agree with this statement, but not in the specific case of a person who uses his freedom of speech to lie about a colleague.

Making generalizations, formulating general rules, is necessary in all intellectual fields, especially in Science and Philosophy. But care must be taken that where there are individual exception they are recognized or where there are many reasonable exceptions they are built into the rule.

Example: Freedom of speech shall be protected as democratic right except in cases of libel, slander, incitement to riot or where it is directly harmful to others, e.q, in false advertising.
It is goof for people to help one another --- except for students taking tests.

13) *The Fallacy of Hasty Generalization*

This occurs when we make a judgment based on insufficient evidence, make a generalization not he basis of two few examples. We all do this on occasion, making our own limited experiences the grounds for maintaining a general position.

Example: That teacher gave me a D and a C. She is a hard grader.

This generalization about the teacher may not be true at all, the students grades may only indicate that the student was ill-prepared to take the tests.

Example: My husband and my friend's husband both do not help around the house – men are like that.

Now it may be generally true that men do not do their share of house-hold tasks, but the two instances given are not sufficient grounds for making this statement about "all men". There may be many men outside of the woman's experience who do help. One can see how prejudices are *rationalized*, that is, given false grounds for belief, by hasty generalization. A person encounters rudeness from two farangs and then goes around saying, "All foreigners are impolite", or knows of three politicians who are corrupted, and declares that, "Politics is a dirty business", implying that all politicians are corrupted.

14) *Rationalization* is one kind of error in hasty generalization. Rather than examine all the possible evidence that can be given for a position – to accept, reject or modify it – we select out the evidence which is in our favor, serves our own interests or supports our own biases, - and argue using that kind of evidence only.

Example: The advertiser tells you his product is cheap and easy to use. What he doesn't tell you is that his competitor's product has the same price and better quality.

The politician tells you that his party is responsible for the increase in the country's GNP and decline of inflation. What he doesn't tell you is that this was done at the cost of massive unemployment and through his policies the rich are getting richer and the poor are getting poorer.

All forms of the error of hasty generalization then occur when we fail to take into consideration all the facts that are relevant in supporting or rejecting a position taken, or a statement made.

We tend to fall into this error very often because we tend to consider only evidence which supports our case and ignore any evidence to the contrary.

Summary

We have only identified some of the most common fallacies or errors in reasoning which are encounted most frequently and which we are guilty of ourselves. The discussion of them should make us aware of how easily it is to be mislead and to mislead others – and how serious can be the consequences of such errors in reasoning. To be on guard against them is the mark of a liberally educated person: one who uses language with precision; backs up his/her opinions with evidence and sound reasoning; forgoes emotional appeals and attacks when speaking or writing; tries to be objective without the influence of bias or prejudice; looks at all sides of a question; doesn't try to give simple answers to complex problems; makes an effort to think clearly – and learns to sport these errors in what they hear and read and objects to those who are guilty of committing them. Only in this way can genuine communication and rationality be assured.