fen-om Theory

Logical-Argumentation Research

Introduction:

In the Theaetetus, Plato's Socrates provides an example of 'logical argumentation' by likening the possession of knowledge to having birds in one's private aviary. This analogy explains why, even though we may have acquired some particular knowledge, such as '5+7=12', we sometimes still make the mistake that '5+7=11', or another wrong number. It makes sense (it is logical) to liken knowledge to birds flying around in our minds, each bird standing for a piece of knowledge (little birds can be hard to catch! So, if asked what 5+7 equals, we can easily nab the wrong bird, even though the right one is somewhere 'in there').

Thus we see that 'logical argumentation' simply means "to make sense of some aspect of the cosmos in some systematically rational manner." The human mind often encounters a seemingly disparate group of factors or phenomena that it somehow senses can be interconnected into an explanatory system.

Design literature and related literatures often include works whose primary attribute is an ability to give logical order to a set of previously disparate factors. Logical conceptual systems, once framed, interconnect previously unknown or unappreciated factors in relevant ways. These works range from those that depend on mathematical rules, on one end (equations, computer programs), to those that draw their logical coherence from cultural world views (treatises; these are able to capture a culture's worldview through a summary of cultural 'logic' relative to design style; detailed logical connectors are provided in a variety of ways, to frame an overarching argument). In between these 2 poles are logical systems that share characteristics of both mathematical-formal systems and cultural-discursive ones (they may use numerical factors, equations, and rule-based propositions in their analyses, but with the view that the resulting data can shed light upon socio-cultural values).

Primary Logical Systems and Secondary Research:

We call systems that have broad explanatory power 'primary logical systems'. They not only frame a system with a very large explanatory scope, they also identify and define the internal technical terms and relationships that sustain the system. Once a primary system is in place, it has the ability to spawn secondary studies that go deeper into the mapped domain. Shape grammar, for example, is a primary system. The system proposes that both natural and human-made forms are reducible to discrete rules regulating line-to-space relationships. Together, these rules for a grammar that can describe the composition of existing works at an elementary level, or provide the basis for the design of new structures.

Traits of Logical Argumentation:

◧. Broad systemic applicability: The purpose of logical argumentation is to frame a conceptual system that has wide applicability. These systems tend to lay claim to 'universal' explanatory power on a variety of grounds (ranging from mathematical determinism, a priori reason, numerical objectivity, invariant biological considerations, etc., to rhetorical/polemical convictions that find acceptance from a large audience). Once an explanatory system is framed, it tends to become an internally self-contained conceptual system that resists further alteration or addition.

◧. Paradigmatic innovation: Disparate factors are interconnected into unique frameworks that have significant and sometimes novel explanatory power. Primary logical systems tend to be innovative. If they are successful, they provide a new way of looking at old facts. The important point here is that very few primary systems emerge 'de novo'. Most draw instead from previous ideas. What is instructive is that these various ideas, themselves unrelated, can be the roots of new knowledge. A deep reality is uncovered, that reveals surface connections.

◧. 'A priori' argumentation: Logical argumentation relies upon 'a priori' principles. This trait is what allows the principles to be applicable to any existing thing.

◧. Testability/ Validity:

- Mathematical-formal systems use quantitative tools to diagnose the overall 'logical' conditions. Computer programs are a good example of this The mathematical-formal systems that frame them are in a real sense tested with each use. We may not be conscious of each use as a 'test', but certainly the periodic upgrades manufacturers issue to a given program are based upon what is learned from extended use of previous 'releases'.
- Cultural-discursive systems use normative standards to establish validity. Good treatises find acceptance because they 'make sense' to a wide cultural audience. Thus, such systems are accepted as 'logical' only particular cultural milieus. Once upon a time, for example, Western culture accepted John Ruskin's claim that ornamentation equals design (as a response to the larger venue of the Industrial Revolution and its negative effects). Later, in the early 1900's, the same culture accepted Adolf Loos' proposition that ornament equals crime (also in response to the larger venue of the Industrial Revolution, but now focusing on its positive effects). Because treatises are indexed to cultural venues, the tendency is for their influence to wane as the culture progresses to newer ways of understanding its place in the cosmos.

Components of logical-Argumentation Systems:

◧. Definition: This is the beginning, middle, and end of logical argumentation. Almost always, primary systems will identify a menu of technical terms that make up a framework. The technical terms may be new words, but more often they are old words redefined. It is impossible to grasp the intent of a logical system without a thorough grasp of its technical terms (indeed, one difficulty with logical systems is their demand for readers to learn a new language). If there are too many technical terms, the system will be hard to comprehend. On the other hand, economy of technical terms can limit a logical system's mission to explain thoroughly. Definition typically hinges upon quantity, quality, and origin:

- Quantity: The goal is to construct a conceptual system that can explain the widest scope of the phenomenon with the least (essential) number of fundamental principles (technical terms).
- Quality: In the West, philosophically speaking, an embedded assumption has been that a determination of essential quantity is necessarily a determination of essential quality. This is accepted in some systems, where, once a quantity has been determined, the quality is necessarily determined as well. As an exception, in other systems, the argument for quality can be explicit (independent of quantity). There seems to be a human need to explain why something is 'fundamentally' good, and to accept that thing based on that explanation.
- Origin: There are 2 senses in which an argument from origin can work: the genetic sense and the enabling sense. Genetic origin means that something originated in such and such fashion (the present condition can be explained in that light). Under enabled origin, quantity enables quality.

◧. Relationship: After the technical definitions have been clarified, relational propositions must make the system logically coherent:

- Necessity: One term leads to another (different than 'contingency', where one term leads to any of several others). Necessity in formal systems is based upon the logic of mathematics and numerical relations. Necessity in cultural-discursive systems, on the other hand, is 'nomic' (based upon dependable patterns of nature's behavior). Contingent propositions are never as strong as necessary ones, but they can do more (promising explanatory power for a larger-than-observed reality).
- Deduction/induction: Deduction draws conclusions explicitly contained in a set of facts(it involves necessary connections). In contrast, induction draws generalizations from given facts beyond what is embedded (projection of a general pattern; induction involves contingency). Any logical system is a fine balance between deduced necessities and induced projections. From a finite set of observed phenomena, certain deductions are arrived upon. From these observed patterns, a general logical system is framed/ inducted.
- Syllogistic frameworks: A syllogism is constructed of a primary and a secondary premise leading to a necessary conclusion (if A=B, and C=A, then C=B).
- A priori: Logical systems are motivated by the need to identify 'a priori' (previously existing) conditions, so that those conditions can in turn be the basis for explaining particular instances of experience.
- Entailment: The implication of one component of a system for other components within the same system.

Rhetorical Tactics:

Cultural-discursive systems depend upon rhetorical tactics to convey their arguments (they also use the logic of persuasion). An audience will not come around to a particular point of view unless that point of view makes sense. In convincing an audience, a multitude of factors ultimately shape, not so much a 'truth', but an adherence to one point of view or another.

◧. Naming: An essential technique is the identifying of various elements. 'Definition' (the mere identification and explanation of technical terms) can be persuasive. The goal is to achieve a sense in the hearer that what is being defined has something to do with him/her, not only at a 'reasonable' level, but also at an emotional/ psychological level. This is why many cultural/-discursive treatises use 'larger transcendental' terms (nature, morals, history, the machine, etc.). Of course not any name is acceptable; successful naming must serve on various levels, and be general enough to be applied to various cases.

◧. Association/ disassociation: Another way to 'make sense' to an audience is by association. As an example, consider the Doric, Ionic, and Corinthian column 'types', that are associated with anthropomorphic ideas. The Doric is masculine, the Ionic matronly, and the Corinthian maidenly. These are essential factors, for their appeal and durability (what is more durable than character and human identity?). Related to association is disassociation, used to refresh outdated theories. One can always ask: "Are there factors in contemporary culture that can be used as the bases by which to mount a dissenting point of view against accepted-but-outmoded ideas?"

◧. Story: Along with association comes 'story', which is never provable, but amplifies association. Why do stories work? A story plays into our need for a workable account of beginnings. Because of this, the successful story is usually not something that is temporally or physically nearby. Rather, a story makes a connection with the faraway in such a fashion that the mythical qualities of the present object are enhanced. Finally, a workable story usually depends upon an existing tradition.

◧. Graphic images: This is a device that is all too often neglected. Consider the story of the king who sees an ox on its way to sacrifice; he orders a sheep to take its place, and later confesses that his decision was based upon having seen the ox and not having seen the sheep. The thing on which the eye dwells, that which is best or most often seen, is, by that very circumstance, overestimated. The right picture in the right context really can be powerful. In images, complex semantic realities combine with elements of feeling, psychological identity, and other factors not easy to describe in words.

◧. Appeals to personal identity: A cultural-discursive system emerges out of group experience, and it is to that group that it makes its primary appeal. It is important to introduce concrete points in the argument, that have resonance with some aspect of an audience's sense of 'me' or 'us' (national identity, professional identity, regional place/ history, etc.).

◧. Dividing: Personal identification can be encouraged by offering the audience 2 or more opposed selections. 'Making sense' is then dependent upon certain choices that the audience is asked to make (either 'x versus y', or a sequential ordering). The 'choice' can be forced upon the audience, based on a convincing argument.

◧. Authority: The authority of any logical system is primarily dependent upon the coherence of its argumentation (its explanatory power). But a system also gains authority through one of the following:

- If it is spoken by an established voice (this is why commercials link products to movie stars or famous athletes whose names have little to do with the product they are paid to endorse).
- If it is connected to a larger body of voices saying related things (this is why many texts are presented as a pack, where the whole gives a sense of logical coherence).
- If it can harness the energy of an emerging trend (a look at what is fashionable/ common amongst several 'established voices' at one particular time).

Constructing a Logical-Argumentation System:

◧. By mathematical representation: A logical system may be framed by capturing aspects of reality in mathematical terms. Once mathematical expressions are found, their power to describe multiple instances is great. Computer programs can then be developed in accordance with this premise.

◧. By analogy: A new system can be predicated upon a likeness between the attributes of its contents and the attributes of some other metasystem, usually existing in nature.

◧. By categorization and elaboration: Logical systems can be framed by categorizing reality for the purpose of identifying principles of quantity, quality, origins, etc. The key in categorizing is

to present an all-encompassing description of reality.

◧. By cross-categorization: After categorizing, it is important to 'cross-categorize', by drawing examples from various contexts, or connecting separate sets of categories.

◧. By argument from metaphilosophical traditions: A logical system can be framed by drawing from the domain of a much larger philosophical tradition. Many treatises dealing with art and architecture use this approach. As an example, consider that, from a base in 'empiricism' (experience as the source of all knowledge), John Dewey's 'Art as Experience' argued that art starts, not with the relics in museums, but rather emerges when everyday experience finds fulfillment in full expression. This has probably been the most influential metaphilosophical tradition for art/ design treatises over the last 100 years.

◧. By updating in light of new data: A logical system can be an update of an older system, now needing to be revamped in light of new developments.

Strengths and Weaknesses:

Strengths:

◧. Grasp of the principles outlined here can help frame any logical framework.

◧. Logical argumentation is very useful in connecting diverse and separate manifestations, literature, elements, etc.).

◧. Since the primary tool is 'logic', implementation can be very economical.

◧. Since they are based upon internal logical consistency, logical systems are hard to refute.

Weaknesses:

◧. Systems of logical argumentation need to be constantly evaluated as to their accuracy, by applying the proposed system to relevant venues. Internal logical consistency does not guarantee accurate explanatory power. Also, some logical systems are time dependent.

Recommended Readings:

Ch. Perelman, 'The New Rhetoric: A Treatise on Argumentation' (1971): General reference on rhetorical persuasion.