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While joining the March for Science Day, which was held in New York City on May 4th, 2019, Language and Cognitive Sciences Research Institute organized an international scientific conference that covered a variety of topics in linguistics, computer sciences, social sciences, brain sciences and in related fields. The present volume of JYS reflects the papers presented at the conference.

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What are Counterfactuals? /Counterfactual Thinking

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As the name suggests, counterfactuals are sentences that describe events or situations that are counter-to-fact, hence factually false. The canonical form to express a counterfactual is a counterfactual conditional, which has a factually false antecedent (i.e. 'if' part) that is taken as suppositionally true. The antecedent 'If I had wings' expresses a non-factual affirmative state that I have wings but also implicitly conveys its negation that I do not have wings. In simple (non-conditional) counterfactuals, this feature can be described as the reversal of the polarity of the initial sentence structure. Similar to conditionals, simple counterfactuals convey a positive statement together with its negation. The utterance 'I should have called my mother' conveys the proposition of me having called my mother together with a reversed proposition of me (in fact) not having called my mother. Antecedent falsity is therefore a special case of polarity reversal. Both have the effect that the compositional suppositional proposition becomes enriched by its negation, adding up to a dual meaning.

People often ponder over the alternatives to their earlier decisions and actions, consider unrealized possibilities or engage in mere fabulous imaginations. What if I had chosen to study another subject? Would Tom have passed the test if he had studied harder? Would I be able to

fly if I had wings? These considerations are examples of counterfactual thought, and the conditional 'If then' construction is the canonical form in which such thought is expressed.

Counterfactual thought is pervasive in everyday life and has various adaptive functions. For example, counterfactual thought enables people to reason about the cause of an event and thereby plays an important role in the processing of learning from experience. It also promotes emotions such as regret and relief, and as such helps to regulate behavior and emotions in order to adequately function in a physical and social environment. Counterfactual thinking is furthermore associated with the understanding of the perspectives and beliefs of others, which might qualify it as a developmental precursor of explicit Theory of Mind abilities. Counterfactual thought is thus considered to be a highly complex cognitive capability that develops relatively late in childhood and that is often impaired along with other cognitive functions in clinical conditions like autism, depression, Parkinson and schizophrenia.

According to cognitive accounts of counterfactual thought, the reason that counterfactuals are cognitively complex is that they trigger two incompatible representations. For instance, 'If I had wings, then I would be able to fly' expresses (1) the suppositional but factually false state of the speaker having wings and being able to fly, while also expressing (2) that the speaker does not have wings and therefore relies on conventional modes of transportation. This dual meaning is the characteristic feature of counterfactuals. From a linguistic perspective, this dual meaning makes counterfactuality a fascinating phenomenon that enables people to produce utterances that are factually false yet truthful. Counterfactuals hence broaden the scope of

communication and allow meaningful conversation about topics beyond mere veridical statements.

Characteristics of Counterfactual Thinking

Three types of circumstances make counterfactual thinking likely. First, the most common trigger for counterfactual thoughts is negative emotion or a problematic situation. When people feel bad about a negative outcome, they often ruminate about how that outcome could have been avoided; thus, counterfactual thoughts are more common after defeats than victories, failures than successes, and penalties than rewards. Second, counterfactual thoughts are more likely after a "near miss" or an event that almost occurred, because when something almost happens, it seems to invite speculation about alternatives. For example, missing a plane by 2 minutes is likely to spark more thoughts on how one might have caught the plane as compared to missing a plane by a full two2 hours. Third, people also think in "If only… " terms when they are surprised by an outcome, as when an unexpected result goes against what the person had assumed would happen, thereby drawing attention and causing reflection as to why the outcome occurred.

There are good reasons why negative feelings, near misses, and unexpected outcomes trigger counterfactuals, because in these situations, counterfactuals can be useful for guiding future

behavior. When people feel bad about something, this often tells them the situation needs attention. If counterfactuals include information that makes it easier for people to tackle a problem, they might be better prepared in the future. For example, thinking "If only I had studied harder…"after a failed exam helps a person concentrate on studying so as to perform better on future exams. Similarly, focusing on near misses rather than far misses is likely to lead to success in the future because only a small change in behavior should be effective. Finally, by definition, unexpected outcomes indicate a person did not make an accurate prediction about a situation.

Counterfactual thinking appears in children at a very young age, almost as soon as they begin to speak. Developmental psychologists believe that because counterfactual thinking is so closely related to goals, children start to think about alternative courses of action as they become aware of their own wants and desires. Counterfactual thinking also seems to transcend culture. A controversy in the early 1980s centered on whether native Chinese speakers are able to reason counterfactually, given that their language lacks the specific word phrases that indicate "if only." After some false conclusions were clarified with new research, psychologists had, by the late 1980s, concluded that the ability to imagine alternatives to the past is common to all people, regardless of language or upbringing.

Counterfactuals (Would and Might)

Counterfactuals come in different varieties. Here we have two examples:

(1) If Mr. Brown read a newspaper, he would read the Morning Union.

(2) If Mr. Brown read a newspaper, he might read the Morning Union.

"1" expresses a "would" counterfactual, "2" a "might" counterfactual. Finding the right truth-conditions for counterfactual has been one of the most hotly debated questions in semantics and the philosophy of science. Most scholars agree that the truth of counterfactuals in a world depends, in some way or other, on what is the case in that world. What makes the semantics of counterfactual sentences so difficult is that not all facts have equal weight: some are important, others are all together irrelevant.

There are two approaches to this problem. Philosophers like Goodman actually took it upon themselves to at least try to say what kind of factual premises are taken into account in the evaluation of a counterfactual. The idea was that after adding those premises to the antecedent of the counterfactual, the consequent should follow logically from the resulting set. Goodman eventually reached the conclusion that the additional premises aren't specifiable in a non-circular way.

An alternative view was advanced by Stalnaker and Lewis who carefully avoided nay precise characterization of the additional premises needed for a particular piece of counterfactual reasoning. Stalnaker and Lewis both stress the vagueness of counterfactual. Their goal was to

develop a theory of counterfactuals that correctly predicts their pervasive indeterminacy and vagueness. Both Stalnaker's and Lewis's analyses are built around the inherently vague concept of similarity. For example:

Ex. If I were looking into a mirror, I would see a face with brown eyes.

According to Lewis, the counterfactual expressed by the example is true in a world "w" just in case there is a world "w", so in "w" I am looking in a mirror and see a face with brown eyes and "w" is closer to the actual world than any world where I am looking into a mirror and don't see a face with brown eyes. "Might" counterfactuals are interpreted as duals of the corresponding "would" counterfactuals. The "might" counterfactual corresponding to the sentence for example is true in a world "w" if the counterfactual expressed by the sentence is false in "w".

Optimality Theory

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1. Introduction

Optimality Theory (OT) is a linguistic model originally proposed by the linguists Alan Prince and Paul Smolensky in 1993. OT has been expanded by John J. McCarthy and Alan Prince, beginning in 1993. Although much of the interest in OT has been associated with its use in phonology (the area to which OT was first applied), the theory is also applicable to other subfields of linguistics (e.g. syntax, semantics). Optimality theory is usually considered a development of generative grammar, which shares its focus on the investigation of universal principles, linguistic typology and language acquisition.

OT is often called a connectionist theory of language, because it has its roots in neural network research, though the relationship is now largely of historical interest. It arose in part as a successor to the theory of harmonic grammar, developed in 1990 by Géraldine Legendre, Yoshiro Miyata and Paul Smolensky. Optimality Theory is, like any good and living theory, in constant flux. As different scientists add their research and interpretations of data to the

growing pool of knowledge the theory changes; and different scientists get different interpretations of what Optimality Theory is.

In Optimality Theory the GENERATOR, or GEN is what generates a list of possible outputs or candidates for some input. The input for phonology is an idealized abstract representation of a lexical word‟s appearance. The output candidates are then just what their names entail; they are candidates presented to be possible outputs. Freedom of Analysis (Kager)states that these output candidates should be as free as possible. Kager states that "Any amount of structure may be posited."

The main idea of OT is that the observed forms of language arise from the interaction between conflicting constraints. There are three basic components of the theory. GEN generates the list of possible outputs, or candidates, CON provides the criteria, violable constraints, used to decide between candidates, and EVAL chooses the optimal candidate. OT assumes that these components are universal. Differences in grammars reflect different rankings of the universal constraint set, CON. Language acquisition can be described as the process of adjusting the ranking of these constraints.

A theory of phonology is built of three parts: it is a theory of the nature of phonological representations; it is an inventory of levels of representation, and a characterization of each level; and it is a theory of phonological rules, the statements that relate representations on each level.

2. Input and GEN: the candidate set

OT supposes that there are no language-specific restrictions on the input. This is called richness of the base. Every grammar can handle every possible input. For example, a language without complex clusters must be able to deal with an input such as /flask/. Languages without complex clusters differ on how they will resolve this problem; some will epenthesize (e.g. /falasak/, or /falasaka/ if all codas are banned) and some will delete (e.g. /fas/, /fak/, /las/, /lak/). Given any input, GEN generates an infinite number of candidates, or possible realizations of that input. A language's grammar (its ranking of constraints) determines which of the infinite candidates will be assessed as optimal by EVAL.

3. CON: the constraint set

In Optimality Theory CON provides the constraints by which the possible outputs generated in GEN are measured. In Kager CON is specified to be containing “all universal constraints” .These constraints are ranked from most important to least important. The ranking gives the specifics of a language, so for multilingual speakers there would have to be more than one ranking available to the structure.In OT, every constraint is universal. CON is the same in every language. There are two basic types of constraints. Faithfulness constraints require that the observed surface form (the output) match the underlying or lexical form (the input) in some particular way; that is, these constraints require identity between input and output forms. Markedness constraints impose requirements on the structural well-formedness of the

output. Each plays a crucial role in the theory. Faithfulness constraints prevent every input from being realized as some unmarked form ([ba] for example), and markedness constraints motivate change.

The universal nature of CON makes some immediate predictions about language typology. If grammars differ only by having different rankings of CON, then the set of possible human languages is determined by the constraints that exist. OT predicts that there cannot be more grammars than there are permutations of the ranking of CON. The number of possible rankings is equal to the factorial of the total number of constraints, thus giving rise to the term Factorial Typology. However, it may not be possible to distinguish all of these potential grammars, since not every constraint is guaranteed to have an observable effect in every language. Two languages could generate the same range of input-output mappings, but differ in the relative ranking of two very lowly-ranked constraints. The EVALUATOR, or EVAL, is where the candidates generated by GEN are measured using the constraints and their ranking provided by CON. As this is the product of CON and GEN a system that has something equivalent to EVAL would necessarily have something at least structurally similar to either one or both of CON and GEN. Such a system would in all likelihood have many aspects in common with Optimality Theory. Another important part of EVAL is parallelism. The transition from input to output happens in one step without changing the input candidate. All the inputs are measured, and if found acceptable passed through to the output. A similar system of parallelism in moving from input to output would be interesting to see in other systems. In EVAL we also

find the true backbone of OT; it is an input-output correspondence system. The outputs are checked for harmony with the input. This could seem incompatible with many forms of problem-solving tasks as the input and the output could possibly have differing natures. Still, if the input and the output differ, there could be harmony between them. If the input is, say a situation, and the problem is to choose an action, that action would need to be in harmony with the realities of the situation. Thus the output must be in harmony with the input.

"At the heart of Optimality Theory lies the idea that language, and in fact every grammar, is a system of conflicting forces. These 'forces' are embodied by constraints, each of which makes a requirement about some aspect of grammatical output forms. Constraints are typically conflicting, in the sense that to satisfy one constraint implies the violation of another. Given the fact that no form can satisfy all constraints simultaneously, there must be some mechanism selecting forms that incur 'lesser' constraint violations from others that incur 'more serious' ones. This selectional mechanism involves hierarchical ranking of constraints, such that higher-ranked constraints have priority over lower-ranked ones. While constraints are universal, the rankings are not: differences in ranking are the source of cross-linguistic variation."

4. EVAL: definition of Optimality

Given two candidates, A and B, A is better than B on a constraint if A incurs fewer violations than B. Candidate A is better than B on an entire constraint hierarchy if A incurs fewer violations of the highest-ranked constraint distinguishing A and B. A is optimal in its candidate

set if it is better on the constraint hierarchy than all other candidates. For example, given constraints C1, C2, and C3, where C1 dominates C2, which dominates C3 (C1 >> C2 >> C3), A is optimal if it does better than B on the highest ranking constraint which assigns them a different number of violations. If A and B tie on C1, but A does better than B on C2, A is optimal, even if A has 100 more violations of C3 than B. This comparison is often illustrated with a tableau. The pointing finger marks the optimal candidate, and each cell displays the number of violations for a given candidate and constraint. Once a candidate does worse than another candidate on the highest ranking constraint distinguishing them, it incurs a crucial violation (marked in the tableau by an exclamation mark). Once a candidate incurs a crucial violation, there is no way for it to be optimal, even if it outperforms the other candidates on the rest of CON.

Constraints are ranked in a hierarchy of strict domination. The strictness of strict domination means that a candidate who violates only a high-ranked constraint does worse on the hierarchy than one that doesn't, even if the second candidate fared worse on every other lower-ranked constraint. This also means that constraints are violable; the winning candidate need not satisfy all constraints. Within a language, a constraint may be ranked high enough that it is always obeyed; it may be ranked low enough that it has no observable effects; or, it may have some intermediate ranking. The term the emergence of the unmarked describes situations in which a markedness constraint has an intermediate ranking, so that it is violated in some forms, but nonetheless has observable effects when higher-ranked constraints are irrelevant.

An early example proposed by McCarthy & Prince (1994) is the constraint NoCoda, which prohibits syllables from ending in consonants. In Balangao, NoCoda is not ranked high enough to be always obeyed, as witness roots like taynan (faithfulness to the input prevents deletion of the final /n/). But, in the reduplicated form ma-tayna-taynan 'repeatedly be left behind', the final /n/ is not copied. Under McCarthy & Prince's analysis, this is because faithfulness to the input does not apply to reduplicated material, and NoCoda is thus free to prefer ma-tayna-taynan over hypothetical ma-taynan-taynan (which has an additional violation of NoCoda). Constraints are also violable; the winning candidate need not satisfy all constraints, as long as for any rival candidate that does better than the winner on some constraint, there is a higher ranked constraint on which the winner does better than that rival.

Some Optimality theorists prefer the use of comparative tableaux, as described in Prince (2002). Comparative tableaux display the same information as the classic or "flyspeck" tableaux, but the information is presented in such a way that it highlights the most crucial information. For instance, the tableau above would be rendered in the following way.

For instance, in order to have a consistent ranking some W must dominate all L's. Brasoveanu and Prince (2005) describe a process known as fusion and the various ways of presenting data in a comparative tableau in order to achieve the necessary and sufficient conditions for a given argument.

5. Example

As a simplified example, consider the manifestation of the English plural:

/cat + z/ → [cats] (also smirks, hits, crepes)

/dog + z/ → [dogz] (also wugs, clubs, moms)

/fish + z/ → [fishiz] (also classes, glasses, bushes)

Also consider the following constraint set:

M: Agree(Voi) - one violation for every pair of adjacent obstruents in the output which disagree in voicing

M: *SS - one violation for every pair of adjacent sibilants in the output

F: Ident(Voi) - one violation for each segment that differs in voicing between the input and output

F: Max - one violation for each segment in the input that doesn't appear in the output (deletion)

F: Dep - one violation for each segment in the output that doesn't appear in the input (insertion)

(M: markedness, F: faithfulness)

fish + z > fishiz

fish + z

***SS**

Agree

Max

Dep

Ident

☞ fishiz

No matter how the constraints are re-ordered, the 'is' allomorph will always lose to 'iz.' For example, there is no way to rerank the constraints such that 'dogis' will win. This is called harmonic bounding. The violations incured by the candidate 'dogiz' are a subset of the violations incured by 'dogis'; specifically, if you epenthesize a vowel, changing the voicing of the morpheme is gratuitous violation of constraints. In the 'dog + z' tableau, there is a candidate 'dogz' which incurs no violations whatsoever. Within the constraint set of the problem, 'dogz' harmonically bounds all other possible candidates. This shows that a candidate does not need to be a winner in order to harmonically bound another candidate.

The tableaux from above are repeated below using the comparative tableaux format.

dog + z > dogz

dog + z

*SS

Agree

Max

De

Ident

dogz ~ dogiz

dogz ~ dogs

From the above tableau for dog + z, it can be observed that any ranking of these constraints will produce the observed output dogz. Because there are no loser-preferring comparisons, dogz wins under any ranking of these constraints; this means that no ranking can be established on the basis of this input.

cat + z > cats

cat + z

*SS

Agree

Max

Dep

Ident

cats ~ catiz

cats ~ catis

cats ~ catz

cats ~ cat

The tableau for cat + z contains rows with a single W and a single L. This shows that Agree, Max, and Dep must all dominate Ident; however, no ranking can be established between those constraints on the basis of this input. Based on this tableau, the following ranking has been established: Agree, Max,Ident.

There are two possible places to put Agree when writing out rankings linearly; neither is truly accurate. The first implies that *SS and Max must dominate Agree, and the second implies that Agree must dominate Dep. Neither of these are truthful, which is a failing of writing out rankings in a linear fashion like this. These sorts of problems are the reason why most linguists utilize a lattice graph to represent necessary and sufficient rankings, as shown below.

A diagram that represents necessary rankings of constraints in this style is often casually referred to as a **Hasse** diagram.

6. Criticism

Optimality Theory has drawn a good deal of criticism, most of which is directed at its application to phonology (rather than syntax or other fields).

Many criticisms of OT are, according to its proponents, based on fundamental misunderstanding of how it works. A well-known example of this is Chomsky's (1995) assertion that OT would predict every lexical input to be reduced to a single optimal syllable (e.g. every word is realized as [ba]). In fact, universal neutralization of this type would only be predicted if there were no faithfulness constraints (see McCarthy 1997). In a sense, the diametrically opposite kind of criticism comes from Halle (1995): "... the existence of phonology in every language shows that Faithfulness is at best an ineffective principle that might well be done without." By 'phonology', Halle clearly means disparity between inputs and outputs. OT would fail to predict this disparity only if there were no markedness

constraints (see Prince 2007). Input-output disparity is normally the result of markedness constraints being ranked over faithfulness constraints (M >> F).

Another objection to OT is the claim that it is not technically a theory, in that it does not make falsifiable predictions. The source of this issue is terminology: the term 'theory' is used differently here than in physics, chemistry, and other sciences. Specific instantiations of OT may make falsifiable predictions, in the same way that specific proposals within other linguistic frameworks can. What predictions are made, and whether they are testable, depends on the specifics of individual proposals (most commonly, this is a matter of the definitions of the constraints used in an analysis). Thus, OT as a framework is best described as a scientific paradigm.

More serious objections to OT are claims that it cannot account for phonological opacity (see Idsardi 2000, e.g.). There have been a number of proposals designed to account for opacity within OT; however, most of these proposals significantly alter OT's basic architecture, and therefore tend to be highly controversial. Frequently, such alterations add new types of constraints (which aren't Universal Faithfulness or Markedness constraints), or change the properties of GEN or EVAL. Some well-known examples of these include John J. McCarthy's Sympathy Theory and Candidate Chains theory, and there are many others.

OT is also criticized as being an impossible model of speech production/perception: computing and comparing an infinite number of possible candidates would take an infinitely long time to process. The most common rebuttal to this argument is that OT is purely representational. In

this view, OT is taken to be a model of Linguistic competence, and is not intended to explain the specifics of Linguistic performance. Further, work by Heinz, Kobele, and Riggle (forthcoming) show that in fact, OT is computationally tractable, under certain reasonable assumptions.

7. Theories within Optimality Theory

In practice, implementations of OT often assume other related theories, such as Syllable theory, Moraic theory, or Feature Geometry. Completely distinct from these, there are sub-theories which have been proposed entirely within OT, such as positional faithfulness theory, Correspondence Theory, Sympathy Theory, and a number of theories of learnability. There are also a range of theories specifically about OT. These are concerned with issues like the possible formulations of constraints, and constraint interactions other than strict domination. The EVALUATOR, or EVAL, is where the candidates generated by GEN are measured using the constraints and their ranking provided by CON. As this is the product of CON and GEN a system that has something equivalent to EVAL would necessarily have something at least structurally similar to either one or both of CON and GEN. Such a system would in all likelihood have many aspects in common with Optimality Theory. Another important part of EVAL is parallelism. The transition from input to output happens in one step without changing the input candidate. All the inputs are measured, and if found acceptable passed through to the output. A similar system of parallelism in moving from input to output would be interesting to see in other systems. In EVAL we also find the true backbone of OT; it is an

input-output correspondence system. The outputs are checked for harmony with the input. This could seem incompatible with many forms of problem-solving tasks as the input and the output could possibly have differing natures. Still, if the input and the output differ, there could be harmony between them. If the input is, say a situation, and the problem is to choose an action, that action would need to be in harmony with the realities of the situation. Thus the output must be in harmony with the input.

"At the heart of Optimality Theory lies the idea that language, and in fact every grammar, is a system of conflicting forces. These 'forces' are embodied by constraints, each of which makes a requirement about some aspect of grammatical output forms. Constraints are typically conflicting, in the sense that to satisfy one constraint implies the violation of another. Given the fact that no form can satisfy all constraints simultaneously, there must be some mechanism selecting forms that incur 'lesser' constraint violations from others that incur 'more serious' ones. This selectional mechanism involves hierarchical ranking of constraints, such that higher-ranked constraints have priority over lower-ranked ones. While constraints are universal, the rankings are not: differences in ranking are the source of cross-linguistic variation" (René Kager, Optimality Theory. Cambridge University Press, 1999).

Daniel Mattew Albro, in University of California published studies in Computational Optimality Theory where he pointed out the advantages and disadvantages of Optimality Theory.

Advantage: Optimality Theory allows the analyst to concentrate on characterizing generalizations that are true or mostly true of the surface form actually pronounced. The surface form is an appropriate form to concentrate on, as it is the level of phonological representation for which we have the most evidence. Further, within Optimality Theory there are many phonological phenomena that receive a comprehensive analysis for the first time, such as under-application and overapplication of reduplication, and "emergence of the unmarked" effects.

Disadvantage: In most phonological analyses of the sort where Occam's razor is respected, the underlying form of an utterance and its surface form tend to be quite similar, differing primarily to the extent that morphological juxtaposition of otherwise surface-possible forms creates violations of surface well-formedness conditions. In a rule-based analysis the reason for this is quite clear and built into the system itself—if no rule changes some aspect of the underlying form, then that aspect remains unchanged on the surface. This means that rule-based analysis consists essentially of noticing sound changes induced by the presence of a form in differing environments due to morphology and sentential context, and proposing a phonological rule for each type of change that takes place in a particular environment. Since this analytical process is reasonably straightforward and its correctness is fairly easy to check—rule-based generation can easily be simulated by hand—it was possible for phonologists to create complex systems of phonological rules that covered all or most of the sound changes present in the vocabulary of a human language. In Optimality Theory, on the other hand, the

analyst must propose constraints and orderings to account not only for the ways in which surface forms differ from their underlying counterparts, but also for the ways in which they do not differ from them[1]. Furthermore, once an analysis is complete, its correctness is usually still far from obvious. To justify a particular constraint ranking, the analyst must show that the ranking proposed is best satisfied by the surface forms naturally found, and that none of the infinite set of potential outputs would better satisfy it. This could be done by simulating generation on the data set to be checked, but Optimality Theoretic generation is too complex to be performed by hand. As it is, justification of a constraint ranking requires the analyst to characterize a potentially infinite set of candidates and argue that all parts of the set are less well-formed according to the constraint ranking than the actual output.

Optimality-Theoretic Syntax and Chomsky's Minimalist Program

The emergence of OT syntax seems to fit into the general tendency in syntax to blame the ungrammaticality of a sentence on the existence of a better alternative. This view on grammaticality is also found in [Noam] Chomsky's Minimalist Program (Chomsky 1995), although Chomsky takes optimization to play a much more modest role than OT syntactitians do. Whereas Chomsky's only criterion for evaluation is derivational cost, the inventory of violable constraints assumed in OT syntax is richer. As a result, the OT constraints interact and conflict with each other. This interaction is exploited by the assumption that constraints are ranked, and that parametrization can be reduced to differences in ranking between languages. Chomsky's economy conditions, on the other hand, have no such direct

parametrizing effect. In the Minimalist Program, the locus of the parametrization is the lexicon." (Introduction to Optimality Theory: Phonology, Syntax, and Acquisition, ed. by Joost Dekkers, Frank van der Leeuw, and Jeroen van de Weijer.

Language and Logic

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Introduction

One of the greatest challenges facing any philosophical system is the construction of a language that can reliably analyze reality according to logical criteria. If philosophy is to teach us any truth, it must speak in a language that we can understand, or it will remain a meaningless string of symbols. The practical need to express logical arguments in human language, however, exposes us to the danger of conflating grammatical and logical relationships. Even individual terms may distort our analysis, since many of our words were coined from casual intuition, without concern for logical or philosophical rigor. If we are to use language for logical argument, we cannot accept it as is, but must bring it into conformity with clearly intelligible logical principles.

This endeavor faces two potential modes of failure: (1) it might be impossible to bring human language fully into conformity with known logical principles, and (2) there might be fundamental aspects of logical analysis to which existing human language is blind. These linguistic problems, if intractable, could foil any attempt to construct a philosophical system that yields positive knowledge.

Taking the linguistic problems of philosophy seriously, we must avoid those common yet false solutions that would simply slice the Gordian knot. First, we cannot reduce logic to mere formalism, such as the symbolic logic of mathematics, because in order for a formalism to be intelligible, we must be able to translate its symbols into the concepts of human language. Second, we must not lapse into the fallacy of origins and try to reduce the question to pseudo-evolutionary speculation about the origin of human language. The entire point of constructing a logical language is that we are not slaves of the languages we have inherited, but can conform them to our thought and ascribe new meanings to old symbols. The history of the last two thousand years of philosophy amply demonstrates how Greek and Latin vocabulary and grammar were modified to convey ideas more precisely. Nonetheless, we must respect the possibility that there might be limits to how much we can modify language to mirror logical analysis.

If the ancient Greek philosophers did not neatly distinguish between grammatical and logical analysis, it is because they believed they were constructing a genuinely logical language. Non-dialectical language was relegated to the domain of rhetoricians and grammarians, but logic

could be seen as a linguistic domain pertaining to philosophical analysis. Thus, it is unsurprising that the Greeks should find linguistic objects to be the locus of truth and falsehood. They did not regard dialectical language as a barrier to reality, but rather as the very image of reality. As naïve as this may seem, it would be self-stultifying to tend to the other extreme and deny that language can be linked to objective reality. For one thing, it is circular reasoning to use language to generate the knowledge that language cannot generate knowledge. Secondly, ordinary men have in fact been able to teach each other many verifiable truths through colloquial common speech, so we should expect at least as good results from a more rigorously developed logical language, however imperfect it may be.

Above all, we should not suppose that the fundamentals of logic, such as the principle of contradiction, are merely accidental products of human grammar. Regardless of the anthropological origins of our grammar, those who live now may freely invent new rationales for linguistic usages, including the rationale of developing logical systems. With an understanding of the breadth of languages from the Americas to east Asia, we are much less linguistically naïve and can clearly distinguish, for example, a belief in substance and accidents from a grammatical construction of subject and predicate. Still, it would be foolhardy to suppose that we can think in "pure ideas" without language, so we must use language, yet at the same time subject it to the test of logical principles, to guarantee its coherence and to resolve ambiguities of meaning.

In the classical Western tradition, the starting point for study of the intersection of language and logic has been Aristotle's *Peri Hermaneias* or *De Interpretatione*. As mentioned, the ancient Greeks did not neatly distinguish grammar from logic, but rather we might say the latter was a special case of the former, as applicable to dialectical argument. We will rectify this confusion in our own discussion, and construct a clearer account of the basic principles of classical logic. At the same time, we will also attempt to develop a better understanding of the relationship of language to logical analysis, and show how language is often informed by our philosophical intuitions, rather than the other way around. The use of Greek and Latin in classical philosophy is less a cultural accident to be lamented than a fortuitous development, for these languages more clearly and precisely express true philosophical intuitions, and lend themselves more readily to the construction of a logical language. We will also address the question of whether modern philosophy draws too sharp a distinction between logic and grammar, so that we might regard logic as a genuinely linguistic phenomenon after all, which is not necessarily a liability.

1. Language, Thought and Reality

For Aristotle, language is primarily the spoken word, and only secondarily the written word. Spoken sounds are "symbols of affections in the soul," while written words are symbols of spoken sounds, a level of abstraction further removed from the "affections of the soul." [*De Interpretatione*, 1] This viewpoint agrees with what we commonly observe, as young children can learn complex spoken language by imitation without formal training, while learning to

read and write even simple phrases is a cumbersome, laborious process for older children and even adults. Thus it would seem that speech is the more natural, immediate expression of human thought. Even when we are experienced writers, we still articulate the words phonetically in our minds (which is why homonymous typographical errors are common). I would contend that surrogate languages for the disabled, such as sign language and braille, are more similar to written language than spoken language, as they are learned only with great effort, and are in many aspects derivative of phonetic language. Sign language, once learned, however, can become a mode of expression as familiar and direct as spoken language, though the partially deaf tend to think phonetically. Although it is by no means a metaphysical necessity that spoken language should be primary, this seems to be a genuine feature of human nature.

While it is uncontroversial that words are symbols of our thoughts or other "affections of the soul," it is far less obvious that these affections are necessarily likenesses or images of extramental things. We do not need to develop a full psychological theory of meaning in order to explore the relationship between language and logic, but we do need to clarify how language expresses thought, since logic is concerned primarily with concepts (the objects of thought), and only incidentally with language, as a means to an end. In particular, we need insight into whether and when language expresses the mind's images of reality, or if it is merely an arbitrary artifice having no necessary connection to the structure of reality.

The relationship of language to logic concerns us because we wish to know whether and how language can relate truth, which is properly the domain of logic. Logical propositions can be true or false, so the linguistic representations of these propositions, which we also call "propositions," though in an equivocal sense, have an expressive relationship to truth and falsity. For most of history, in fact, philosophers have spoken of linguistic propositions as being true or false, without making a clear distinction between the grammatical and the logical. We can see the need for such a distinction by considering the sentence, 'Socrates is alive.' This grammatical expression can correspond to different affirmations, depending on when it is uttered. If it is uttered now, it would correspond to an affirmation that is false, but if the same sentence were uttered 2400 years ago, it would correspond to a distinct affirmation that happened to be true.

Realizing that identical linguistic expressions can correspond to distinct statements, we do well to distinguish linguistic objects such as sentences from logical objects, called 'statements' in modern jargon. In classical philosophy, 'statements' were simply types of sentences that corresponded to affirmations and negations. In modern philosophy, statements are not grammatical objects at all, but concepts that can be represented by sentences, if only equivocally. To clearly distinguish between the linguistic and the logical, I will use *single quotation marks to signify a linguistic expression and double quotation marks to signify the logical concept behind an expression.*

Notwithstanding this subtle distinction, it would be rash to divorce truth and falsity altogether from linguistic objects. The facts of common experience clearly demonstrate our practical ability to relate truths and generate knowledge through language, so our sentences must correspond to logical objects in some way, and, provided the appropriate context (such as who is speaking, how the speaker uses words, and when he is speaking) they can convey logical meaning unequivocally, enabling understanding on the part of the hearer. Grammatical propositions, when understood according to the sense of the speaker, can relate truth and falsity, even if we still hesitate to ascribe truth and falsity directly to the grammatical expression. Still, we may equivocally refer to a grammatical proposition as 'true' or 'false,' provided that we do not consider the proposition abstracted from the context in which it is spoken in a given instance.

3. The Interface of Concepts and Language

We are concerned with philology only incidentally, insofar as it might help us understand the relationship between language and logic. From our review of the *Cratylus* dialogue, it appears that inquiry into the historical development of language yields little insight into this question. This is because often the original meaning or use of a term or expression varies wildly from its current meaning or use, and in any event, most people use language in near-total ignorance of etymology. Whatever means we use to relate logic to language, it is a process that is not strongly dependent on philology. This does not mean that the specific form a word takes is

irrelevant. Some names may indeed be better than others, but this judgment can be made *post hoc*, without recourse to the historical development of language.

Further, we find that the mode of analysis favored in the physical sciences, whereby a composite entity is explained in terms of its parts, is of limited utility when applied to the logic of language. In the *Cratylus* dialogue, Socrates humorously illustrates the futility of searching for the meaning of language in its phonetic or literary components. He breaks down meaning to the level of words, syllables, letters, and parts of letters, with increasingly fanciful results. With complex expressions and grammar, we do see an imperfect attempt to define terms and rules in a way that mimics logical or ontological relationships. With simpler terms, however, there is no effective imitation of an essence except in cases of onomatopoeia. We must, then, search for meaning elsewhere than in sounds or letters.

The study of natural history might be helpful incidentally, insofar as it helps us understand human psychology. Nonetheless, any attempt to explain the development of articulate speech out of the inarticulate "speech" of animals should avoid two classes of error. First, there is the error of Descartes, who famously denigrated the psyche of animals to the point of being mere automata. This is utterly contrary to the experience of those who live or work closely with animals, many of which exhibit at least rudiments of genuine cognition and volition. Modern experiments on animal behavior have amply borne out this thesis, but it is possible that current scholarship has leaned toward the opposite error of crediting too much to animals. The ability

to convey signals representing concrete objects or actions need not entail ideation of an essence.

Modern experimental scientists often have a poor philosophical conception of human intelligence, reducing this to things they can analyze, such as signal processing or behavior outcomes. These empirical data do not give us ideas or essences, but their neural or behavioral correlates. If we are concerned primarily with logic and its relationship to language, we need to deal with ideas themselves and not just their physical representations. A failure to distinguish ideas from their representations permeates the literature of neuropsychology and so-called artificial intelligence, and not a few philosophers have been infected with this malady. Since the very object of our study is the interface between ideas and their representations, we obviously cannot enjoy the luxury of ignoring this distinction.

We know from experience that ordinary human speech can convey knowledge of the essences of things-that-might-be. Language for us is more than simply assigning arbitrary symbols to objects. We must also understand the symbols as signifying some idea, and be able to manipulate the symbols in ways that correspond to perceived logical or ontological relationships among ideas or the objects to which ideas point. We take for granted this linguistically-induced immersion in ideas (which, being universals, define essences), so much so that we would be hard-pressed to translate even an ordinary sentence into a series of concrete objects or sensations. Essences, which many philosophers have found fashionable to deny, are constantly before us in a stream of mental experience, so that it is impossible for any

consistent thinker to deny at least the psychological reality of ideal essences, and thus we must admit their *a priori* conceivability.

Although ideal essences are psychologically real, the object of our study is not properly psychological, for ideas or concepts are distinct from language, which is the expression of thought. Language is a psychological phenomenon, consisting primarily of vocalizations intended to represent our thoughts. Language does more than provide a means of communicating our thoughts to others, for it may form the substance of our own inner thoughts, which we express as vocalizations in our mind's ear. Although language is an expression of thought, we should not say that language consists of ideas or concepts, for these are the objects of thought, not thought itself. It is true, nonetheless, that language attempts indirectly to express concepts or ideas (or rather, the essences they define), since it expresses thoughts that are directed toward ideal concepts.

We must take care to distinguish the conceptual (governed by logic) from the psychological (expressed by language), since the interaction between the conceptual and the psycho-linguistic is precisely the object of our study. We wish to know to what extent and in what manner language may truly relate concepts and give understanding of their logical relationships. We are not at the moment directly concerned with our ability to truly know external reality, but only our ability to construct a language that truly captures a logic of concepts, of things-that-might-be, not necessarily things-that-are.

Logic

We use the word **logic** and terms derived from that same Greek word λόγος in a variety of ways. You've probably said that someone was "being illogical" because they were too emotional or didn't agree with you. You might have thought of logic as a way of proving things or reasoning better. I plan to dig a little deeper and talk about logic as one basic way to approach our use of language. For starters, that means I'd like to distinguish between logic as a way of talking about thinking, including arguments, fallacies & truth, and logic as a way of talking about language and what goes into using language, into formulating thoughts. I don't mean to propose this division as a hard and exceptionless rule, but however you plan to use logic, as long as you're communicating with other humans, your basic starting point will be logic as a way to analyze language. Since the systems we use to communicate analysis are themselves languages, it follows that we consider logic as a language. This will introduce logic as a language. More specifically, I will present logic as a **formal language**, not because it's more polite, but because it focuses on form instead of meaning.

I threw the terms "logic" and "language" at you. I know those are abstract terms, but think about learning a new language, perhaps one spoken in some foreign country. If you reflect for a moment on the components of that language, you'll have to take on new sounds (phonology), new parts of words (morphology), the specific words used in that language (lexis), the meaning of those words (semantics), and rules for constructing phrases & sentences (syntax).

Constants & Variables

One way to simplify all this is by trying to find some core concept. We might imagine that speakers use language to convey things to listeners. For example, when I tell you about a 'house', you might picture an image of a house. So the word 'house' acts as a symbol for that image.

Here we took "words" as our core concept and said that words are symbols. It looks like words aren't just symbols, they're fixed symbols with specific definitions. When you parsed the word 'house', you related the word to a single concept. The word 'house', like other words, acts like a constant symbol or a **constant**. One key feature of these constants like house, dog and blue is that they have semantic value - they are meaningful.

These meaning-filled constants can relate to one another in a variety of ways. Two broad and basic relationships are intension and extension. **Intension** refers to what a word connotes - other words commonly associated with that word or other words that are properties of that word. The image of a red house connotes 'house', 'red' and so on. **Extension** is what a word denotes - its definition or examples. For example, 'house' extends to any image of a house.

Of course, we don't only speak in single words. We also make statements, like 'the house is red' or 'fish can swim'. Those statements are also meaningful. So we could consider those as symbols, too. So far it follows that those statements work like constants. Now we're taking on so many symbols - all kinds of words, all kinds of sentences. It would be hard to count all of them, let alone analyze them.

What if we could strip language down to the symbols? That's the aim of **symbolic logic**. We want a set of symbols that helps us evaluate structure without getting tethered in meaning and use. We may still want constants, but we'll definitely need symbols that aren't so fixed. Since their meanings wouldn't be fixed, these symbols would vary. So they're called **variables**. To make it easy on ourselves, we'll use very simple symbols like x for variables. We can use these variables for words - x can mean 'house'. However, the variable is not limited to that value. It might mean 'dog'. It might also represent an entire statement like 'the house is red', or 'I'm speaking English'.

Variable symbols will help us strip down our language and take a good look at the structure. For variables, I can use symbols like x, y and z. For statements with some truth value, it's common to use p and q. The variable p might be filled by 'fish can swim' or 'Gillsworth is a fish'. These are all conventions.

In concrete cases, you will want to use constants. It makes sense to use a constnat symbol that helps you keep track of your logic. An example is e when you're exclusively reading e as 'the English language'. In this case, you're using that symbol e as an **individual constant**, a name with a specific interpretation.

What is the relationship between language and logic?

At the practical level, if a person is to speak or think in a language other than their native one, the logic and mental flow simply feels natural for that particular language. At first, however, the new language will feel rather convoluted and awkward until some familiarity takes hold!

Each language has a particular way of categorizing mental concepts. There are data which correlate the learning of multiple languages with the stretching of our brain's plasticity. Total immersion is the best method for learning any language

The logic of our language faculty differentiates between all sorts of potential ambiguities. It also navigates by way of jagged, obtuse, and often counterintuitive mechanics which would render any computer language unusable. In rough paraphrase, that's straight from the pen of Tom Wasow and Ivan Sag of the Stanford University linguistics department, from their introductory text.

Linguists might say that there's some sort of “neural” logic driving human language, but not necessarily a “cut and dried” logic, as in a formal symbolic logic. It seems to be a fuzzy type logic. It necessarily exists, and yet it somehow must be relatively constrained as well. Otherwise, the astronomically large superset of all possible schemata would make extremely slim odds for any successful attempt at linguistic systematicity. The odds would be practically insurmountable.

This notion of a highly constrained system has caused Noam Chomsky to comment that if “Martians” ever came to earth, they would probably perceive everyone to be speaking the same language! Linguists and brain scientists are researching the problem as we speak. Among their ranks are those who work either from a formalist or a functionalist perspective (sometimes from both), as well as with rationalist and empiricist methods, including the interfaces of linguistics with neuroscience, psychology, anthropology, evolutionary biology, and bilingual education.

In my opinion, the cognitivists seem to have the most balanced, practical, moderate, middle-of-the road perspective with respect to the postulates, methodologies, and conclusions from the associated data. Regarding ideological temperament, one could liken them to the “Methodists” among linguists

What is the importance of logic for language?

The ability to easily translate. Too bad most languages are emotional-based.One can translate, to some degree, using Logic. For instance, “park transport human”. Because a park transporting humans is not a thing, the idea of “transport” would have to expand beyond “moving one object from one place to another”. By analyzing what transportation is, one can think “move” or “travel”. When pairing “move”, once again, it doesn't make [much] sense for someone to be moved by a park, nor someone to move a park. Whereas, “travel” can be used as “human travel to park” (but not “park travel to human”). (Taking into account the various priorities different cultures have in word placement, the reversals of word order can be attempted.) Now, we have “park travel human” or, better refined, “human travel[s] [to] park”. Within the English language, no one uses “human” in such a sense, and the closest match to the sentence structure and word synonym would be “person”. Given cultural perspective and priorities, a “person” can mean “self or I”. Thus, you have “I travel park”, or better translated to “there is a thought where i am at the park”. Because there's a timing ambiguity in “travel”, one cannot conclude to any degree as to when or if the person will be at the park, therefore, logically, the two can only be related (“there is a thought”), as opposed to defined.

*In text, the process is slow, but in the mind, it's much faster.

Chocolate and Brain

Dika Gogua

Nia Kemularia

Theona Chincharashvili

Nana Sheklashvili

What comes to your mind when you hear the word, chocolate?…Typically the word that comes to mind is, "where?" The world loves chocolate.

We love chocolate not just because of the way it tastes.

We love it because of the way it makes us feel.

Chocolate is that heavenly goodness that comes in different colours, flavours and forms, and everyone loves.

Chocolate is made from tropical Theobroma cacao tree seeds. Its earliest use dates back to the Olmec civilization in Mesoamerica.

After the European discovery of the Americas, chocolate became very popular in the wider world, and its demand exploded.

Chocolate has since become a popular food product that millions enjoy every day, thanks to its unique, rich, and sweet taste. Eating moderate amounts of dark chocolate benefits health in many ways. In fact, chocolate is now considered an anti-aging, anti-inflammatory "superfood" for the brain and body. Studies examining the health benefits of chocolate continue to reveal new and exciting chocolate benefits, particularly in the realms of cognitive function, mood, and heart/ blood vessel health. The right kinds of chocolate, consumed regularly, can help keep your cardiovascular system pumping, your mind sharp and alert, and your mood calm and happy. Here, we take a look at the research showing chocolate benefits, including its ability to boost brain performance and enhance mood. Surprising Cocoa Benefits Include Heart Health and Prediabetes Improvement. It's rare that something so downright delicious is also good for you, but dark chocolate is an exception to the rule. You'll find dark chocolate at the top of any brain foods list.

I bet you didn't know just how good chocolate is for you. Apparently, consuming chocolate provides a boost to your mood and your health.

1. Eating Dark Chocolate Can Make You Happy

When would you enjoy study time more? When you are happy, sad or moody?

That was a tricky question!

Of course, every 'normal' person would prefer to study when he or she is in an elevated mood. Now, did you know that the consumption of chocolate can help you attain that level of happiness you require to enjoy study time?

It has been proven that chocolate (dark chocolate especially) enhances the production of certain chemicals called endorphins. Endorphins act somewhat like a 'feel-good' chemical that makes your brain euphoric, thus making you happy. This feeling can be likened to the way footballers feel while doing what they enjoy doing best – playing football. They also reduce pain and diminish the negative effects of stress:

Chocolate also contains serotonin. Serotonin plays many roles in the body and
is involved in sleep regulation, appetite, impulse control, and mood fluctuations
When these neurotransmitters are balanced,
there is a decrease in the chance of mood swings and hunger spikes. Low levels
of serotonin in the brain have been known to be associated with both depression
and anger. When the brain is in need of serotonin, individuals are drawn towards
starchy carbohydrates, such as cake or bread. Consumption of these foods raises
levels of tryptophan, which is an essential amino acid involved in the creation of
protein. This in turn raises serotonin levels.

Dark chocolate also contains phenylethylamine, a compound called the "love drug" because it creates a brain buzz similar to being in love. Chocolate is often associated with emotional comfort. This effect seems to be linked to the capacity of carbohydrates including chocolate to

promote this type of positive feelings through the release of multiple gut and brain peptides. The intake of sweet foods, and namely dark chocolate, has been related to the release of endorphins through what is inside of chocolate. A study found that tryptophan, which promotes the release of serotonin, the antioxidant resveratrol, and phenethylamine which is linked to having an anti-depressant effect can all be found in the properties of dark chocolate.

2. Dark Chocolate Improves Blood Flow to the Brain

It's rare that something so downright delicious is also good for you, but dark chocolate is an exception to the rule.

You'll find dark chocolate at the top of any brain foods list.

Compounds in dark chocolate boost memory, attention span, reaction time, and problem-solving skills by increasing blood flow to the brain.

A Harvard Medical School study found that drinking two cups of hot chocolate increased blood flow to the brain for 2-3 hours.

This blood flow boost improved scores on a working memory speed test by 30%.

Increased cerebral flow may help prevent mental decline in seniors.

Dark Chocolate Improves Learning, Memory, and Focus

Chocolate also contains a little dosage of caffeine. Not enough to send your adrenaline pumping and keep you up through the night, but enough to help enhance your concentration, memory and most importantly, elevate your mood and give you that euphoric feeling you need to enjoy study time.

Numerous studies have suggested that high-potency cacao has significant effects on things like cognition, mood, cholesterol, insulin sensitivity, and blood vessel function. For the elderly, long-term ingestion of cocoa has a pronounced effect on attention, verbal fluency and memory. The effects are even greater for elderly people who are already experiencing cognitive decline. Scientists at Harvard Medical School have suggested that drinking two cups of hot chocolate a day could help keep the brain healthy and reduce memory decline in older people. The researchers found that hot chocolate helped improve blood flow to parts of the brain where it was needed. Farzaneh A. Sorond , said: "As different areas of the brain need more energy to complete their tasks, they also need greater blood flow. This relationship, called neurovascular coupling, may play an important role in diseases such as Alzheimer's."

Dark Chocolate Protects Your Brain for a Lifetime

There have been many exciting findings surrounding chocolate's use in treating brain-related medical conditions like strokes and dementia. The powerful antioxidants found in dark chocolate reduce the risk of dementia.

According to one study, the more chocolate seniors ate, the less likely they were to develop dementia.

Chocolate consumption makes you smarter in the long run, as continuous enhancement of brain capability can help the brain attain a level it previously couldn't without the help of a hot choco, or two bars of chocolate. This permanent enhancement of your brain will no doubt make you smarter.

To make it more believable, chocolate consumption has been proven to augment a feature that has been associated with increased intelligence – it enhances brain plasticity while also being 'neuroprotective'.

However, while chocolate consumption during study time will undoubtedly enhance your reading and assimilating abilities, how well chocolate consumption complements your studying still all boils down to you.

Risks and precautions

Weight gain chocolate can have a high calorie count due to its sugar and fat content. Anyone who is trying to slim down or maintain their weight should limit their chocolate consumption and check the label of their favorite product.

Sugar content: The high sugar content of most chocolate can also be a cause of tooth decay.

Bone health: There is some evidence that chocolate might cause poor bone structure and osteoporosis. The results of one study, found that older women who consumed chocolate every day had lower bone density and strength.

Researches has shown that there are, immediate cognitive benefits from eating chocolate. So, if you're a fan of dark chocolate, science again suggests you may carry on.

Metaphors of elements: water, fire, earth, air, storm, lightening

Mariam Berulava

Adventure Quest

In *Adventure Quest*, there are 8 elements, which are Fire, Wind, Earth, Ice, Water, Energy, Light, and Darkness, which are stated to be in a constant struggle and each ruled by a "elemental lord" with each element being able to do differing amounts of damage to a character or monster. A base guide to this would be that a being made from ice would be usually weak to fire.

Adventure Time

In the animated TV series *Adventure Time*, there are four main elements: ice, fire, candy, and slime. Firstly, introduced in the *Evergreen* episode, then more explored in the season 7 episode *Elemental* and in the *Elements* miniseries. These four elements began to exist since the beginning of the evolution in the planet, presented in special individuals from the prehistoric

age to the Land of Ooo times, where the characters; Patience St Pim; Flame Princess; Princess Bubblegum; and Slime Princess, are the actual incarnations of the ancient elementals.

The Alchemy Index

The Alchemy Index is Thrice's fifth studio recording, a four-disc concept album that was split between two releases, the first in October 2007 and the second in April 2008. The band originally planned to release four discs at once, each disc with six tracks representing one of the four classical elements: *Fire*, *Water*, *Earth*, and *Air*.

Recorded in guitarist Teppei Teranishi's house in Orange, "Alchemy" is full of experimentation. Inspired by Radiohead, Botch, Pelican and ISIS among others, Thrice has produced an effort that can be blisteringly heavy and melodically serene, as evidenced by the sludgy baritone guitar work of "Fire" and the sampled drums, synthesizers and piano on "Water." Kensrue said "Earth," recorded to sound as if the listener was in the room where it was being played, features acoustic guitars, upright bass, banjos, piano, tambourine and some horns. Air, the singer said, is the most dynamic and ties the other three records together.

The final song on each disc is written in the form of a sonnet, depicting the relationship of man with each of the particular elements. Each of these songs is in iambic pentameter, with a concluding rhyming couplet. These final couplets also contain the same vocal melody and

chord progression as each other, although they are in different keys. The Artwork for the Album was designed by Dustin Kensrue.

Angels & Demons

In Dan Brown's thriller novel *Angels & Demons*, the antagonist kidnaps four cardinals on the night of conclave and brands them with the ambigrammatic words "Earth," "Air," "Fire," and "Water." He then kills each cardinal using a method based on their respective elements; Cardinal Ebner, who was branded with the word "Earth," suffocates by having dirt shoved down his throat. Cardinal Lamasse (Air) dies from having both of his lungs punctured. Cardinal Guidera (Fire) is burned alive, and Cardinal Baggia (Water) drowns in the Fountain of the Four Rivers. Then, the Camerlengo Carlo Ventresca is branded with the Illuminati Diamond—a diamond shape made of the words for the aforementioned elements (also ambigrammatic). It is later revealed that he had done this to himself.

These brandings and murders also appear in the film adaptation of *Angels & Demons*, except Cardinal Baggia does not die; he is instead rescued from drowning and in the end becomes the new Pope. Also, the fifth brand in the film is not the elemental Illuminati Diamond, but rather the papal symbol of two crossed keys.

Avatar: The Last Airbender and *The Legend of Korra*

In the animated series *Avatar: The Last Airbender* and its sequel series, there are only four mystical martial arts, which allows certain people called "benders" to freely have control and manipulation of the four elements through real-life martial arts tradition: Waterbending, Firebending, Earthbending, and Airbending. These are more based on the elemental structure of the Western and/or the Japanese elements, without a style based around Aether/Void. However, there is some overlap of elements as Blood, Lightning, Plants, and Metal are all uniquely special sub-abilities of the other four main elements.

Airbending is a martial arts-based ability that controls and manipulates the element of Air. It is primarily based around the real martial arts of Bagua Zhang. Airbending focuses on evading and avoiding attacks.

Earthbending is a martial arts-based ability that controls and manipulates the element of Earth. It is primarily based around the real martial arts of Hung Ga, however there are exceptions like Toph who uses the Southern Praying Mantis Kung Fu. However, it is likely different due to the fact Toph has learned her Earthbending from the Badger-moles (Natural animal benders, and mentioned in the show as the first earthbenders). Unlike Airbending, Earthbending is based around withstanding attacks and holding one's ground. At least one character, Toph, can use earthbending to easily control and manipulate metal by focusing on its earthen impurities.

Firebending is a martial arts-based ability that controls and manipulates fire, flame and heat. It is primarily based on Northern Shaolin, here primarily the Northern Shaolin Style. A specialized form of Firebending can be used to control and manipulate lightning. This is done by dividing the yin from the yang of the electricity, like splitting positive and negative charges. The charge tries to merge again, much like a lightning bolt moves from one charged object to another (Like a positively charged cloud to the negatively charged ground or vice versa).

Waterbending is a martial arts-based ability that controls and manipulates the element of water. It is primarily based on T'ai chi. Firebending opposes Waterbending, as the former prefers to attack first and hard until a weakness is found while the latter waits for the opponent to attack first and then redirects their strike. Whereas the other styles appear incapable of controlling and manipulating the various forms and phase of their native element, waterbenders can alter the phase of water, controlling and manipulating water in its solid (ice, snow, hail), liquid (pure water) and gaseous forms (mist, steam, clouds, fog,and water vapor), or even take liquid water from the air, plants, animals, or even humans. Some are even capable of controlling and manipulating others (by way of the rare and sinister ability of bloodbending) under the light of a full moon, when waterbenders are at their strongest and full potential. This is done by controlling the bodily fluids inside another's living body and thus controlling them to do the waterbender's bidding like a puppet.

Each season, or book, of *Avatar: The Last Airbender* is named after one of the classical elements: water, earth, and fire respectively. The first season of the *Legend of Korra* corresponds to the final element, air.

Beast King GoLion/ Voltron

Within *Beast King GoLion* (and its American counterpart *Voltron*), the Lions are each powered by a different element of the Wu Xing:

- **the Black Lion** – Metal
- **the Red Lion** – Fire
- **the Green Lion** – Wood
- **the Blue Lion** – Water
- **the Yellow Lion** – Earth

Bionicle

A line of construction toys from Lego. In its storyline, the main characters – the Toa – are warrior-like beings (usually depicted as a team of six) who each represent and possess the ability to create, manipulate and absorb an element, namely one of the six "primary" elements: Fire, Water, Air, Earth, Ice and Stone. Toa and other beings of less common "secondary" elements are later introduced, these include Light, Shadow, Gravity, Sonics (referring to sound), Lightning, Iron, the Green (referring to plant life), Plasma, Magnetism and Psionics

(referring to mental abilities). The Toa's counterparts – the villager-like Matoran and their Turaga elders – possess innate or weaker elemental abilities, while all of them live as tribes in environments associated with their respective elements. Many other species in their universe also possess elemental powers. In a later storyline featuring a different society, the characters of the Agori villagers and Glatorian warriors do not have elemental abilities, but live in tribes associated with the elements of Fire, Water, Jungle, Ice, Rock, Sand, Iron and Earth. In a reboot of the story, the primary elements of Fire, Water, Earth, Ice and Stone are retained, however, Air has been replaced with Jungle, which now encompasses both wind and plant-based powers.

Captain Planet

Captain Planet and the Planeteers, an animated series from the early 1990s, is about five teenagers, each with a magic ring that controls an element. When their powers combine, they create a superhero named Captain Planet, who uses the power of all of the elements.

Each Planeteer's personality (and sometimes, appearance) reflects their element. The level headed, brown skinned Kwame (Earth) functions as the leader, and holds the group together. Growing up in an African village, he knows much about the land and plant life. Wheeler (Fire), who has red hair and is more temperamental and impulsive, acts as the team's fighting spirit. Linka (Wind) has a passion for bird life, while Gi (Water) is a student of marine biology and has skills in water sports. The fifth element is named as "Heart", and Ma-Ti's ring controls it. Ma-Ti, in tune with wildlife, becomes empathic with both animals and people, and can

communicate telepathically with his teammates. Whereas the other Planeteers give Captain Planet his powers, Ma-Ti's ring creates his persona.

Castle Crashers

Castle Crashers is a video game on the Xbox 360, PlayStation 3, and PC (Microsoft Windows and OS X) about knights and princesses. The four main characters each represent and use different elements.

The Red Knight represents Lightning. The Blue Knight represents Ice. The Green Knight represents Poison. The Orange Knight represents Fire.

Challengers of the Unknown

In the comic book series *Challengers of the Unknown*, each of the four original members of the team represent one of the Greek elements. Ace Morgan is a pilot (air), redheaded Red Ryan is a daredevil (fire), Prof Haley is a deep-sea explorer (water), and Rocky Davis is wrestler (earth). While the symbolic relationship between the individuals and elements can be seen, it never really played a strong role in the development of the characters' personalities, which took many twists and turns unrelated to any archetypes.

Digimon

The eponymous creatures in *Digimon* often have attacks and characteristics that relate to an element. This theme was perhaps most emphasized in the fourth season, when the Ten Legendary Warriors were based on elements of fire, light, ice, wind, thunder, earth, water, steel, wood and darkness.

The second and third seasons introduced the Digimon Sovereigns, which are based on the Wu Xing animals. For unknown reasons, Qinglongmon's element was water and Xuanwumon's was wood, whereas in Wu Xing tradition, the reverse is true.

Dungeons & Dragons

In the *Dungeons & Dragons* family of role-playing games, the idea of the Greek elements are used as the symbolic building blocks of reality; the four Elemental Planes form a metaphorical ring around the "Prime Material Plane" that contains all the "everyday" game settings (Faerun, Greyhawk, et cetera). In all editions of the game there is the addition of a Positive (Creative/Constructive) Energy Plane "above" the Elemental and Prime planes, as well as a Negative (Destructive/Necromantic) Energy Plane "below" them. In the more complex cosmos of the 2nd Edition and beyond there are other planes where the six major elemental planes adjoin each other. The Paraelemental Planes manifested where the elemental planes overlap – Fire and Earth become Magma, Earth and Water form Ooze, Water and Air are joined as Ice, and Air and Fire unite as Smoke (the opposing pairs of Fire/Water and Earth/Air do not touch). The Quasielemental Planes were formed where the Positive or Negative Planes bordered the

elemental planes; they express either the abundance or intensification of the element's nature, or its destruction or absence. The positive Quasielemental expressions of Earth, Water, Air and Fire are Minerals, Steam, Lightning and Radiance, respectively; their negative counterparts are Dust, Salt, Vacuum and Ash.

Earth, Wind & Fire

The popular R&B musical group Earth, Wind & Fire is so named because founder Maurice White's sign was Sagittarius, whose primary elemental quality is Fire (hot & dry), but whose north and south seasonal qualities are Earth (cold & dry), and Air (hot & wet);[10] (hence, the omission of water).

Elemental Assassin

In Jennifer Estep's *Elemental Assassin* series, the four "primary elements" are Air, Fire, Ice, and Stone. To be considered a true elemental, one must be able to manipulate one of these substances. Despite this,there are other, rarer elements derived from the primary four: Metal (derived from Stone), Electricity (derived from Air), Water (derived from Ice), and Acid (derived from Fire). The rarest elemental of all, however, is one who is gifted in multiple elements, like series protagonist Gin Blanco (Stone and Ice).

Encantadia

The **Brilyantes** are fictional gemstones in the Filipino fantasy television series *Encantadia* as well as its 2016 sequel. They are the elemental gems that holds the balance in Encantadia. Each gem manifests the classical elements: aether, fire, air, water, and earth. The tranquility and future of Encantadia rests on these gemstones. In both series, each Brilyante are being carefully kept by each kingdom in Encantadia. The kingdom of fairies, Lireo, in the east of Encantadia, is the keeper of *Brilyante ng Hangin* (Gemstone of Air). Adamya, the kingdom of elves in the south is the keeper of *Brilyante ng Tubig* (Gemstone of Water). Sapiro, the northern kingdom of valiant warriors and healers, kept the *Brilyante ng Lupa* (Gemstone of Earth). Hathoria, the kingdom of proud and violent blacksmiths and orcs in the west, is the keeper the *Brilyante ng Apoy* (Gemstone of Fire). But after the Hathoria attempted to seize the all the gemstones, they are turned-over to Queen Mine-a of Lireo for safekeeping. Later, the four daughters of Queen Mine-a became the keeper of these gemstones.

Fantastic Four

In the comic book series *Fantastic Four*, each of the four characters have powers that relate to the Greek elements. The two most obvious links are the Human Torch (whose fire control power is best expressed through the image of him as a burning man) and the Thing (who resembles a living being of rock and stone). Mister Fantastic, while not having water-based powers, does have a fluid form. The Invisible Woman's powers of invisibility and force fields

evoke the unseen forces of wind and air. This is especially true in Neil Gaiman's *Marvel 1602*, where the Invisible Woman is both permanently invisible and weightless.

It should also be mentioned the two obvious elemental personalities (the Human Torch and the Thing) tend to have personality traits people tend to associate with their own elements. Johnny the human Torch is extremely hot-headed and impulsive, with a brash personality, contrast this to Ben the Thing who is more sullen, dependable and strong.

Perhaps the closest character to embodying Water in the Fantastic Four is their companion (and sometimes rival) Namor the Sub-Mariner, who becomes invincible when underwater, can breathe both above and below the surface, and rules Atlantis.

Ghost

The Swedish heavy metal band Ghost assign elemental symbols to each of the masked instrumentalists, known collectively as The Nameless Ghouls. They are:

- Fire: Lead Guitar
- Water: Bass Guitar
- Air: Keyboards
- Earth: Drums
- Aether (or Quintessence): Rhythm Guitar

Harry Potter

In the *Harry Potter* series, Hogwarts School of Witchcraft and Wizardry, where most of the books' plots are set, is divided into four houses: Gryffindor, Ravenclaw, Hufflepuff, and Slytherin. Each of the four houses corresponds roughly to one of the classical Greek elements. Ravenclaw's high tower and representative symbol of the eagle correspond to the element of air. Hufflepuff, whose symbol is the badger, corresponds to earth, and their common room is located under the school. The fluid snake symbol of Slytherin corresponds to water, and their common room is located directly under the lake. The symbol of Gryffindor is the lion, exemplifying bravery, quick temper, and boldness, symbolized by fire.

Heroes of Might and Magic III

In *Heroes of Might and Magic III*, magic spells and skills were divided into schools of magic with each school corresponding to a classical element. Representative spells include

- Implosion, Meteor Shower and Slow from the school of Earth Magic
- Armageddon, Inferno and Curse from the school of Fire Magic
- Frost Ring, Clone and Heal from the school of Water Magic
- Chain Lightning, Counter Strike and Haste from the school of Air Magic

Progression in proficiency (Basic → Advanced → Expert) in magic skill increases some aspect of the spells cast in the corresponding school of magic (e.g. higher damage, increased effect, longer duration, lower mana cost etc.).

Jackie Chan Adventures

In the KidsWB series, *Jackie Chan Adventures*, eight of Jackie's enemies were Chinese demons who derived their magical abilities from eight elemental forces of nature: Wind, Water, the Moon, Sky, Mountain, Thunder, Earth, and Fire.

Keeper of the Lost Cities

In the *Keeper of the Lost Cities* series by Shannon Messenger, several abilities that the elves can have include Frosters (cryokinetics), Gusters (aerokinetics), Hydrokinetics, and Pyrokinetics. The elves that manifested any one of these abilities struggled to maintain control of these highly volatile forces of nature. Due to the uncontrollable danger of fire, Pyrokinesis was banned.

Kingdom Hearts

The original thirteen members of Organization XIII each have a designated element that they control. The first four named members to appear in the series *Kingdom Hearts Chain of Memories*: Axel, Larxene, Vexen, and Marluxia, control the series' standard four magic elements of fire, thunder, ice, and flower (in a death-attribute counterpart to the Cure spell) respectively. The range of elements used by the group is later expanded to include more traditional elements such as earth (Lexaeus), water (Demyx), and wind (Xaldin), cosmic elements like space (Xigbar) and time (Luxord), as well as more eclectic elements such as moon (Saïx) and illusion (Zexion). Even the principal forces in the series' universe are present with Roxas, the youngest member who controls light and Xemnas, the group's leader who controls nothingness. Each of these elements is represented in *Kingdom Hearts 358/2 Days* by a negative status ailment that is resisted by the element's respective member (e.g. the flower-elemental "blind" status effect, which is resisted by Marluxia).

The classical elements air, earth and water are also represented by the trio of Sora, Riku and Kairi, through the *kanji* for their names, and especially the trio of Ventus, Terra and Aqua, who represent their respective element through their names, their starting weapons and several of their special abilities.

Mastodon

Main article: Mastodon (band)

Each of the first four albums by the heavy metal band Mastodon is based on one of the classical elements: *Remission* is based on fire, *Leviathan* is based on water, *Blood Mountain* is based on earth, and *Crack the Skye* is based on aether. There is no album based on air, as the band dropped this concept with their fifth album *The Hunter*.

Magic the Gathering

In Magic the Gathering, a card game, there are 5 magic colors, based on both Western and Eastern elemental traditions; White: aether (quintessence), Blue: air and water, Black: nether, Red: earth and fire, and Green: wood.

Max Steel

In the 2013 reboot of *Max Steel*, there are four lizard-like creatures known as elementors. Each elementor is taken from one of the four classical elements and have appearances and powers based on their respective elements: The earth elementor is made of rock, has geokinesis and can repair itself, the fire elementor is made of flaming lava rock, has pyrokinesis and is faster than the others, the water elementor is liquid and has hydrokinesis and the air elementor is made of clouds and wind and is the most powerful (having flight and aerokinesis). The four of them can combine into a single, four-armed being with the combined powers of all of them.

In Season 2, a fifth, Metal elementor is added and is the strongest and smartest of the group. It has magnetic powers similar to Magneto and can liquify/solidify itself

Naruto

In the manga and anime series *Naruto*, ninjas use the ability of Chakra (mixing of mental energy and physical energy to create a supernatural force of pure life energy, manna, chakra, chi, Quintessence, Aether) to perform jutsu (ninja techniques that allow the use of superpowers or martial arts). As depicted in the series, Chakra has elemental aspects, with the five elements' comparative strengths and abilities resembling the creative/destructive cycle of the Chinese elements. The cycle goes from Air to Lightning to Earth, and Water to Fire before returning to Air/Wind again, each element much, much stronger than the one after it.

In the world of Naruto, there are certain people who can mix elemental aspect into new elemental jutsu. So far, expressions of this shown are ice, wood, lava, storm, boil, dust, heat, explosion and magnetism. The ice mixes water and wind, wood mixes water and earth, lava mixes earth and fire, storm mixes water and lightning, boil mixes fire and water, dust mixes earth, wind and fire. There are also elements unique to the anime and movie medium, among them crystal, darkness, steel and swift. This is similar to the building block idea of *Dungeons and Dragons*, which also links with ideas of primitive man that all things are made up of classical element.

Within the series, some countries are named after the elements (like the "Land of Fire" where Naruto lives). There are also five strong and powerful ninja villages who exhibit dominance

over the smaller villages, each of which is based on the five elements above. Each holds a leader ninja who is the only one to take the name of shadow (Kage).

Ninjago

In the Lego Ninjago theme the land of Ninjago was created by four elemental weapons, The Scythe of Quakes, the Nunchucks of Lightning, the Shurikens of Ice and the Sword of Fire. The main series focuses on four ninjas, each with one of the four elements in them. (and personalities mirroring them). Cole (Black ninja of Earth) has super-strength, terrakinesis and invulnerability, is portrayed as Team leader and the muscle of the group and has no fear, Kai (Red ninja of Fire) has flight and pyrokinesis and is somewhat hotheaded, violent and impulsive, but cares fiercely for his friends, Jay (Blue ninja of Lightning) has flight, teleportation, electrokinesis and is the chatty, fast-talking jokester of the group and Zane (White ninja of Ice) has cryokinesis and is intelligent, serious and calm. During the first season of the show, the main character Lloyd Garmadon joins the team (eventually becoming the new leader) as the Green Ninja (Master of all four elements and Energy) and gains the powers of the other four ninjas, along with the ability to fire green energy blasts from his hands and in season 2, he acquires Golden Power, giving him nigh omnipotence. However, in the series' third season, he is stripped of his golden power by the season's antagonist the Overlord (who represents all the evil in Ninjago) and divides what remains of it among the original four ninja to restore their own powers while Lloyd is left with his element of energy. In season four, it is revealed that the ninja are not the only ones with elemental powers and that there are other

elements: metal, gravity, nature (referencing to plants), smoke, sound, form, poison/toxicity, light, shadow, speed, mind, water and amber (the ability to absorb or replicate other elemental powers), along with the element of wind being introduced in season five. Also in season 5, it is revealed that Kai's sister Nya (the sole female member of the team) is the master of Water. Coincidentally, Nya's relationships with the original four ninjas corresponds to how water reacts with their particular elements: she is able to quench Kai's hot temper, she is Jay's girlfriend, she can erode Cole's hard exterior to reveal his soft side, and she shares interests with Zane. Later on in the seventh season, the element of Time is introduced and serves as a primary focus.

Nowhere Boys

In the teen adventure series *Nowhere Boys*, the four main characters each represent an element-—Felix with the power of fire, Andy with the power of water, Sam with the power of air and Jake with the power of earth. Felix later discovers that his younger brother, Oscar is the missing fifth element needed for them to return to their own universe. That element is spirit.

Ronin Warriors

In the anime series *Ronin Warriors*, all of the heroes and villains are representative of different concepts of virtue as well as the classical elements (in the case of the series' heroes) or seasons (in the case of the villains).

Sailor Moon

Most of the Sailor Senshi characters in the *Sailor Moon* anime metaseries have elemental powers, some being inspired by Chinese elements (the Wu Xing) and some by Roman mythology. These are derived from the Japanese names given to their planets; even in civilian form, each superheroine has a surname that reflects her planet and her tremendously powerful Sailor powers.

Four of the Sailor Senshi (Mercury, Mars, Jupiter, and Venus) have elemental abilities based directly on their planets: Mercury for water, ice, and fog, Mars for fire, flame and heat, Jupiter for lightning, rocks, and plants, and Venus for metal and light. They also take inspiration from Greek mythology, especially Jupiter (lightning) and Venus (love). The other set of four (Uranus, Neptune, Pluto, and Saturn) also have powers based on their planet names, but since the first three were not known from antiquity, their names derive from the Western names and therefore from Roman myth (resulting in "sky king," "sea king," and "land king" respectively). Sailor Uranus uses the forces of the air and wind, Sailor Neptune uses the forces of the sea and ocean, and Sailor Pluto is the Guardian of Space-Time and the Land. Sailor

Saturn's element is given as earth, which corresponds to mythological harvest symbolism and to her vastly dark powers over death and destruction, and rebirth. The main character, Sailor Moon, along with the younger Sailor Chibi Moon, use elemental powers of pure moonlight.

Slugterra

In the 2012 television series Slugterra, there are creatures described as slugs, which originated from 5 elemental slugs, representing the elements of Earth, Fire, Air, Water and Energy. The various species of slugs are classified into these elements, or even subcategories of them. Earth is categorised into Earth, Metal and Plant; Air is categorised into Air and Toxic; Water is categorised into Water and Ice and Energy is categorised into Light, Psychic and Electricity. Fire is the only element without sub-categories. Additionally, when slugs are corrupted into "ghouls" (slugs that have been mutated by the life-sucking "dark water", they are categorised into "Shadow". If any of the original elemental slugs are corrupted, it will spread to all the slugs its element originated. The only cure is to reform the ghouled elementals and fire them simultaneously.

Star Trek: The Next Generation

In the *Star Trek: The Next Generation* episode "Thine Own Self", Data is stranded on a pre-industrial planet where the inhabitants are still taught that the elements consist of sky, fire, rock, water, and lightning.

Super Sentai Power Rangers

Several teams of *Super Sentai* and *Power Rangers* have used the classical elements thematically, with each Ranger having powers related to one element.

Normally, the Red Ranger represents fire, and the Blue Ranger water. For example, the Red Turbo Ranger and the Red Lightspeed Ranger have had Zords based on fire trucks, while the Blue Aquitian Ranger had a water-based attack. *Gosei Sentai Dairanger* drew heavily from Chinese mythology, and five of the Mythical Qi Beasts correspond to the Wu Xing. In *Seijuu Sentai Gingaman* and *Power Rangers Lost Galaxy*, the five Rangers represented fire (Red), water (Blue), wind (Green), lightning (Yellow) and flora (Pink), with earth (the Black Knight/the Magna Defender) added later.

The elements in *Ninpuu Sentai Hurricanger* are air (Red), earth (Yellow), water (Blue), with Kuwaga and Kabuto both wielding the power of lightning. The last two became the Thunder Rangers in *Power Rangers Ninja Storm*, sharing the element thunder, with the Green Samurai Ranger being a non-elemental (his power was dubbed "Green Samurai Power"). The elemental theme was here used more extensively than in previous series, and the Rangers' attacks and fighting styles often reflect it. In *Mahou Sentai Magiranger* and *Power Rangers Mystic Force*, MagiRed (the Red Ranger) and Wolzard (the Wolf Warrior) share the element fire. The other Rangers have powers based on thunder (Yellow), water (Blue), air (Pink), earth (Green), ice (White), and light/the sun (MagiShine/the Solaris Knight). In Power Rangers: Samurai and its

follow up season Super Samurai, the five rangers each represent the classical elements, albeit with forest in place of aether: fire (red), water (blue), sky (pink), earth (yellow) and forest (green). The Red Ranger has also shown use of lightning. Later on when the gold ranger is added, he harnesses the element of light.

The use of elements is not restricted to the protagonists. In *Kyuukyuu Sentai GoGo-V*, the demons Zylpheeza, Drop, Cobolda and Venus (Diabolico, Impus, Loki and Vypra in *Power Rangers Lightspeed Rescue*) each represent one of the four elements. In both versions, all monsters are affiliated with one of them, and relate to the same element.

SwordQuest

Main article: Swordquest

Atari's 1982–1983 *SwordQuest* video game series were four video games with each title representing one of the four classical elements. They were released in order from least-to-most important, in life's necessities, concerning the classical elements. The fourth and final game was never released.

- *SwordQuest: EarthWorld*
- *SwordQuest: FireWorld*
- *SwordQuest: WaterWorld*
- *SwordQuest: AirWorld*

Teenage Mutant Ninja Turtles (2003–series)

In the 2003 series of *Teenage Mutant Ninja Turtles*, The Shredder has control over five mystical beings referred to as the Mystic Ninja. Each of the Mystic ninjas represent and have control over one of the basic elements: Earth, Fire, Water, Wind and Metal. The Mystic Ninja serve as guards to the Shredders throne room. They are held under the Shredders control with a mystic amulet known as the Heart of Tengu. The Mystics are later set free when they manage to have the amulet destroyed, and it is revealed that they are, in truth, heralds of and ancient Tengu demon known as the Original Shredder. The heralds are later destroyed by the Turtles and their allies.

Tenkai Knights

In episode 27 of *Tenkai Knights*, the heroes known as Bravenwolf, Tributon, Valorn and Lydendor received new forms and powers based on the elements of fire, ice, earth and lightning.

Xiaolin Showdown

In the KidsWB series, *Xiaolin Showdown*, the four main characters were monk children of the four elements: Omi (water), Raimundo (wind), Kimiko (fire), Clay (earth). In the first season, the call out their element and their fighting skill is increased dramactically. In the second season, they're able to bring their element into a physical form performing a fighting stance. For example, Omi's Tsunami Strike where he spins his entire body to allow water to fly everywhere. In the third season, the monks are promoted to Wudai Warriors. The promotion apparently unlocked their ability to bring the elements into physical form, but they can control them without any limitations.

The base of the show revolves around collecting mystical items called Shen Gong Wu on which some of them are able to conjure elements.

W.I.T.C.H

The Italian comic book series and its later cartoon series *W.I.T.C.H.* is centered on five girls who receive magical powers to fight evil in fantasy worlds parallel to their own, and each power is based on an element, with the corresponding "guardian" being able to produce said element from nothing, control and manipulate it or mentally communicate with it. The fifth element, in this story, is the Heart of Candracar, an immensely strong and powerful magical mystical crystal amulet that grants the girls their powers and greatly increases them to much greater power-levels, which is worn by Will, the leader of the group. In the second season it

is revealed that the fifth element is actually Quintessence, which is described as *"the very lifeblood substance or essence of life itself"* and is Will's own elemental ability. As such Quintessence manifests as whitish-blue lightning that contains pure life energy within to literally *"make things come alive."*

Wizard101

Wizard101 is an RPG for PC. All attacks and defenses are based on some traditional elements as well as other additional elements. The practitioner of each element has a different general play style. Fire Wizards (Pyromancers) focus on spells that deal damage over time; Storm Wizards (Diviners) have spells that have high damage, but low accuracy, while also having low health; Ice Wizards (Thaumaturges) focus on damage absorption and defense, having the highest health; Life Wizards (Theurgists) are healers, with their spells having the highest unchanged accuracy; Myth Wizards (Conjurers) mainly summon other beings to help them in battle; Death Wizards (Necromancers) have spells that not only damage enemies, but also heal themselves; Balance Wizards (Sorcerers) are unspecialized, focusing on buffing themselves or others.

Western Classical Element Theory as a Metaphor

How to Understand Western Classical Element Theory as a Metaphor

Western Classical Element Theory can be seen as a metaphor the human condition where fire is will and action, air is reason, water is the passions and spirit, and earth is the physical.[1]

TIP: Some of this theory is worked out on our page on our "Separation of Powers Metaphor" and it is related to "The Spheres of Human Understanding". See those pages as well. At some point i'll attempt to combine all this, for now, the theory spans several pages.

Understanding the Theory

These classical elements are related to a few other basic concepts including one that represents the most fundamental duality **Yin and Yang** (**or Female and Male**), where **Female (Yin)** is the passive and receptive (including Water and Earth), and **Male (Yang)** is will-or-reason-in-action (including Air and Fire).

These four elements and two related dualities can be used to describe all aspects of the human condition without exception. For example here is a theory of government encoded onto the elements (see also a theory of governmentand forms of government):

- **Power (Fire)**: The Natural law. Burke, Hobbes, Machiavelli. Force-in-action holds together the social structure, be it a strong leader of a Republic, a despot, an army, or a benevolent prince. See Realism.
- **Economy (Earth)**: The Civil law. Marx, Engles, and Smith. The idea that economy (capital, labor, means of production) forms the social structure.

- **Reason and Ethics (Air)**: The Ethical law. Aristotle, Hume, and Rousseau. The idea that law and reason can be used to understand the natural laws and then can be used to organize society around a social structure that adheres to the other elemental forces.
- **Spirituality and Morality (Water)**: The Eternal law. Aquinas and Filmer. The idea that the enteral law forms the social structure, and that a King plays the role of Hierophant (bridge between God and the people, which creates the divine law).

As you can see, the benefit of using this time-honored system is one of easy analysis and codification. It is important for the same reason a Myers-Briggs test is; it helps us understand ourselves and our collectives.

Now, if we extrapolate this concept and consider a few other classical theories, namely the symbolism of **Greek mythology** and the **Kabbalah**, we get the basics of **Tarot** and **Western Astrology**. It is from this lens that ALL the Tarot and Astrology can be understood as a metaphor for the human condition, and by which we can add necessarily complexity to theories we examine using this method.

For instance: we can consider the young, middle aged, and wise King of Fire and how they are different. Astrology calls these forces Aries, Leo, and Sagittarius; and Tarot calls them Emperor, Strength, and Temperance.

TIP: The chart below shows how the basic duality (Male, Female) can be defined by the elements, and then by astrological signs (which also relate back to Tarot and Kabbalah). If you know what Fire is, you roughly know what Yang and Aries, Leo, and Sagittarius are, and

thus, you have an easy to understand metaphor for 1/4 of the foundation of the human condition.

Polarity	Element	Symbol	Keywords	Signs (in order from beginning, Sustaining, and ending)
Yang (Male)	Fire	△	Enthusiasm; drive to express self; action	Aries; Leo; Sagittarius
	Air	⧋	Communication; socialization; conceptualization	Gemini; Libra; Aquarius
Yin (Female)	Earth	▽	Practicality; caution; material world	Taurus; Virgo; Capricorn
	Water	▽	Emotion; empathy; sensitivity; spirit	Cancer; Scorpio; Pisces

Greek Mythology God and Goddesses Documentary. Since the Greek Gods are used extensively as a metaphor in Western esotericism it helps to brush up on them.

Clarifications

Astrology, Tarot, and Classical Element Theory are academically interesting pseudosciences that are useful when discussing concepts like Jung's 12 archetypes and Campbell's mythologies, which were inspired by Jung. Each was inspired by

the classical elements, Kabbalah, and Greeks, as well as some eastern elements and myths that we don't discuss here.

Today Astrology and element theory are talked about like they were invented by the Sunday paper and are translatable only by mystics, but this isn't true. They are simply, like mythology, symbols that can be understood as a metaphor for the human condition and thus can be used for meditation and analysis. They are only magical in the way *The Collected Works of C. G. Jung* or perhaps the way Joyce's *Finnegans Wake* is. This is to say they can be insightful and spiritual, but never magical as magic isn't a real thing, but spirituality, metaphors, psychology, and myth are.

The merit of studying the old pseudosciences will become clearer as we examine their symbolism.

TIP: This page also doesn't discuss Alchemy, which is an early form of chemistry that uses the language of the classical elements. This metaphor doesn't translate well to an actual chemistry, but it does relate just fine to the classical forms: solid, liquid, gas, plasma. Thus, these forms are the ones we would equate to for a modern metaphor.

The Symbolism of the Classical Elements and the Tarot

Below is a list of each key symbol and an explanation. Consider reviewing our page on the basics of Tarot and Western Astrology before moving on.

Understanding the Male and Female Energies

The Male and Female. All energy is either Yin (female, black) or Yang (male, white), this includes the energy of each element where Fire and Air are male, and Water and Earth are female. This is the fundamental duality that describes all dualities including the first abstractions. It is only superseded by the singularity, which can be roughly be thought of as (in Eastern terms) The Tao (the Tao that can be named is not the true Tao) or in western science the big bang or big bounce (the state in which the standard model particles were unified). The idea is that as soon as you have a concept you have an abstraction, ugly creates beautify, dark creates light, etc. The Male and Female symbolically represent all dualities that arise.

In western society today we might find the symbolism of *male* and *female* sexist, but that sensitivity is not useful in understanding this philosophical construct; as in the concept of yin and yang, male and female are equal, opposite, and oscillating. They are the ultimate balance, and it is no more sexist to say "*female*" than it is to acknowledge that many biological females can carry children while biological males cannot.

The Male and Female dichotomy can be seen as a metaphor for left-right politics, idealism vs. rationalism, Hume's fork, and many other dualities.

Among other things, we can understand male-female energy by looking at the Tarot Card 0 – The Fool (and also XII – The Hanged Man, and XIX – The Sun). The Tarot, tells the story of "the Fool's Journey" or Hero's Journey. The fool is a metaphor for the human experience; it is both the male and the female and is also called the pilgrim or the initiate. Every card in the

Tarot's Major and Minor Arcana depict the fool embracing different energies present in the human condition along life's journey. Those energies are best understood by understanding the dualities and elements. Wands, swords, cups, and coins of the Tarot are the elements, and each has a duality. It is by these elements and dualities that the meanings of the cards are known.

Male is the will-or-reason-in-action, it describes outward energy. It is what we do and will to do. If we consider energy and mass, energy is the male (the one in constant motion that we can see) and mass is female (the invisible one with a sucking inward motion which is heavy). It is either tangible, in the case of fire (where one can "feel the burn"), or intangible in the case of air (as until there is will-in-action there is only thought, which is not a physical object). It is Rational and clever. I – The Magician and XXI – The World.

Female is the moral, empathetic, spiritual, sensual, and the physical. It describes inward motion and being. It is either tangible, in the case of earth, or intangible in the case of water. Think of it this way; it is everything that is not willpower, thought, or action. It is Empirical and wise. II – The High Priestess and XIV – Temperance.

The Male elements are:

Fire is the will and action and is symbolized by the **wand or scepter**. In social contract theory the will-of-the-people-in-action is symbolized by the king's scepter (it is the executive). Imagine a magic wand that shoots fire at light speed, or "carrying a big stick" or

club, this manifestation in fire of pure energy and aggression is the outward male energy. We can relate fire to gods like Apollo and Ares. IV – The Emperor or XVI – The Tower.

Air is our reason and the intellect in action (it is pure intellect, not wisdom or will). It is symbolized by the **sword**. In social contract theory, it is the ideal legislative and judicial (the law of reason and justice, not power). The sword cuts through the air, and this is the symbolism of using the mind. Thus air is the symbol of technology, learning, science, and the messenger God Mercury. XI – Justice

TIP: Lady justice holds a sword which represents reason. Lady Liberty holds a flame, which is like the guiding light of IX – The Hermit or like the illumination of the lighthouse which guides a ship. See VIII – Strength, where reason tempers will.

The Female elements are:

Water is the passions, emotions, and spirit (it is wisdom, not intellect). It is symbolized by the **cup**. It is everything sensitive, wise, and intangible (including the darkest feelings and deepest spirituality, but also including simple emotions and joy). But its nature it is elusive. In social contract theory, water represents the General Will and other wisdom. The cup represents the unending well of true knowledge, including wisdom and spirit, but it also represents the bonds of a family including the spiritual aspect of marriage. Water is the symbol of emotion and spirit. Thus, Neptune, Pluto, and Diana other elusive gods are associated with water. V – The Hierophant

Earth represents the physical realm, that which can be sensed. It is symbolized by the **coin**. It is all actual manifestations that can be known from the passions. So, everything that we can know for sure, everything we can touch and hold (including other people) is earth. In social contract theory, the earth is everything tangible, so economy, trade, housing, food, and even the body politic and state itself. Earth is the symbol of the natural pleasures and money, thus the female goddess Venus. III – The Empress, VI – The Lovers, XV – The Devil

TIP: Lady justice's scales are equitable to the symbol of a cup (although the cup is better symbolized by the V – The Hierophant or its use in XIV – Temperance XVII – The Star). There is an aspect of justice that is wise. Some complain that modern western society has forgotten some of its spiritual aspects, by our metaphor that is, of course, a recipe for disaster. We have freedom from and of religion, but it is not within human nature to be free from spirit and emotion.

Let's Tie This to Astrology:

The twelve signs of the zodiac are divided into the four elements and three types of energy: **Beginning**, **Sustaining**, and **Ending**. The following list is ordered as such.

Fire signs are Aries, Leo, and Sagittarius, **Earth** signs are Taurus, Virgo and Capricorn, **Air** signs are Gemini, Libra and Aquarius, and **Water** signs are Cancer, Scorpio, and Pisces.

So using Fire as an example, Aries is beginning fire energy, this is like a baby or a barbarian who sacks villages with club and torch in hand. It is will-in-action, the young will, young outward male energy. It is starting Fire and it is symbolized by the Greek God Ares, the god of

war and its planet is Mars and the Sun. Likewise, we can equate it to Apollo the sun god and to the Roman god of war Mars and so it will go for each element.

Similarly, middle or sustaining fire is symbolized by Leo and could be symbolized by a stage actor burning with charisma. In the Tarot the female energy tames the pure male fire energy of Leo, and in this, like the actor on the stage, the fire can sustain and not burn out. This is why the Tarot card VIII (the one with Leo on it) is called Strength (Rider-Waite) or Lust (Thoth).

Meanwhile, ending fire is symbolized by Sagittarius, the quick moving bow-wielding centaur Chiron, who mentored Achilles in archery (Achilles was a Greek hero of the Trojan War and the greatest warrior of Homer's Iliad; thus Achilles is "the Fool").

TIP: The other elements work just like this, you can look it up using the links below or using Google. Learning the whole system is akin to mastering element theory, mythology, astrology, tarot, and Kabbalah (and that is just Western mysticism! An introduction will have to suffice).

Polarity	**Element**	**Symbol**	**Keywords**	**Signs (in order from beginning, Sustaining, and ending)**
Yang (Male)	Fire	△	Enthusiasm; drive to express self; action	Aries; Leo; Sagittarius
	Air	⧋	Communication; socialization; conceptualization	Gemini; Libra; Aquarius

Yin (Female)	Earth	▽	Practicality; caution; material world	Taurus; Virgo; Capricorn
	Water	▽	Emotion; empathy; sensitivity; spirit	Cancer; Scorpio; Pisces

Now, Finally I want to introduce a few more concepts related to the Elements, Astrology, Tarot, and Kabbalah:

Putting together all the above, the "Fools Journey" is the story the Major Arcana Tarot cards tell when understood one at a time. Each card is related to an astrological sign and element and thus the fools journey is, at its core, understood using the classical elements. Here again, we get a clearly laid out metaphor for the human condition.

Astrology is also a metaphor for the human condition, and it tells the same story as the Tarot (see why astrology seems to work; its that and cold reading). Each card also relates back to the Kabbalah.

Tarot Suit	Element	Kabbalistic World
Pentacles	Earth	Assiah (Manifest World)
Swords	Air	Yetsirah (Formative World)
Cups	Water	Briah (Creative World)
Wands	Fire	Atziluth (Archetypal World)

One last concept that is key to astrology is that the astrological wheel also relates to four types of association: self, interpersonal, collective, and universal. This part is an important part of the metaphor because it explains our interaction with others.

They work roughly like this:

- Eastern Hemisphere (Houses 1, 2, 3, 10, 11, and 12): Inward Social.
- Western Hemisphere (Houses 4, 5, 6, 7, 8, and 9): Outward Social.
- Northern Hemisphere (Houses 7 – 12): Inward self.
- Southern Hemisphere (Houses 1 – 6): Outward self.

NOTE: Yes, the southern hemisphere is on the top of the chart and north is on the bottom.

- Quadrant I (Houses 1, 2, 3): Personal Identity, self (ego, id, physical self)
- Quadrant II (Houses 4, 5, 6): Personal Expression, interpersonal relationships (social)
- Quadrant III (Houses 7, 8, 9): Social Identity, groups, and communities (collective)
- Quadrant IV (Houses 10, 11, 12): Social Expression, Spirituality (emotion, mediative)

TIP: In the chart below, the house ordering starts with Aries. So Aries is the first, then we move counterclockwise and thus Taurus is the Second House, Gemini the Third, etc. So you can use that to divide the above houses.

This astrological wheel shows the basics of signs, houses, elements. (source).

Links to Important Astrological, Tarot, Mythological, and Elemental Symbols

Now that I have introduced you to the above concepts, you can use this guidepost to learn about the elements and their older brothers mythology, astrology, and tarot. By meditating and studying the symbols, you'l

Ken Ward's Astrology Pages

The Triplicities as Metaphors

A triplicity is a group of three signs, each based on the same element. For instance, the fire quadruplicity is the three signs: Aries, Leo and Sagittarius.

Fire 

Fire tends to go upwards, and can **raise** things into the clouds and beyond. The sun and the stars are fire – high in the sky! Fire cannot truly be confined, although it can be controlled. Even so, it eventually escapes into the sky. Not surprisingly, fire is associated with spirit, high ideals. Fire ideas can be very distant from the ideas of this Earth. While fire consumes, it also creates new life (forest fires remove the old and enable the new - some plants even wait for the fire to release their seeds!). Of all the elements, fire captures our attention the most. Archetypal fire goes high above the earth, is consuming, clinging and captivating and creates the new and removes the old.

Fire is raw energy.

The fire signs (triplicity) are Aries, Leo and Sagittarius.

Fiery people have ***high spirits***, great self-confidence, ***enthusiasm***, and direct ***honesty*** and ***openness***. They project a radiant, vitalising ***energy*** that glows warmly. They need a good deal of ***freedom*** to express themselves so they can insist on their own point of view. They are consumed - even entranced - by whatever they do. They are motivated by excitement, insight and intuition. That is, they get an idea which captivates them. They do not consider rational or logical thinking or practical feasibility, because the idea comes to them fully formed and full of power. While the idea may grow over a period of time, it does not grow logically but grows intuitively. For this reason, sometimes fiery people do not know **why they must do what they must do**!

Fire appears as if from nowhere, it grabs everyone's attention, and forces its way through almost everything, consuming the air, evaporating the water and chars the earth. Even the rocks are scorched or even melted (larva).

Not surprisingly, fire people are ***assertive***, ***individualistic***, ***active***, ***self-expressive*** and ***freedom*** loving. Fire sign energies can stimulate others, but they can also overpower and exhaust them. Good natured and fun-loving, they may have many friends. They are generous with their time, energy, and resources. They value having a good time above material possessions. They are generous but can be egoistic. Fiery people may believe so strongly in their own powers and abilities that they fail to notice the powers and abilities of others. This may mean that they do not give others the credit they deserve, or it may be that they underestimate their opponents. They believe that "If you want a job done well,

then do it yourself". However, they belong to a group that is the most daring and capable inspiring natural leaders. They lead from the front. In war or business, they are out in the front leading the way. They are independent and individualistic leaders, rarely consulting others before they act. In fact, they may not even think things through to themselves, because their mode of thought is intuitive – the decision comes fully formed, so they may not know why it arose. They are always "on stage" and need to be recognised and admired for their attainment and accomplishments. They consider being appreciated more important than being rich. Nothing hurts them more than being ignored. The fire sign sense of honesty is straightforward and often child-like. They believe everyone is like themselves an open book. This may lead them to be gullible and naïve, or to others exploiting their openness.

Earth 

The earth triplicity is Taurus, Virgo and Capricorn.

Of all the elements, the earth element is the most easy to confine and capture, to hold in the hand. It is rigid, fixed and stable. Anything that is ***attainable*** is "down to earth" and not "airy fairy", or "high in the sky". Archetypal earth is real, heavy, and the basis of all achievement. It is the foundation of all that is. Like the real earth, it is fixed, stable, organised and (sometimes) predictable. It is ***limited*** and ***disciplined***.

Of all the elements, it is the earth that can be ***possessed*** and ***owned***. (No one claims to own the sea, the air or fire!) It provides a solid basis for our existence (***dependable*** and***stable***), yet it can rise only so far. And the higher it rises (a bolder on a mountain), the farther it has to fall, making it unstable and less reliable, so earth people are cautious about extending too far. Unlike the other elements, it cannot easily rise and almost never disappears. Fire goes out, water trickles away, and air just disappears. If earth turns to dust, however, it can rise as high as fire, even travelling to other planets. But to do so, if must forgo its limitations (having a visible shape and organisation) and let go of its fixed nature.

Earthy people are, therefore, ***cautious***, ***premeditative***, ***conventional***, ***possessive,*** ***practical*** and ***dependable***. They live by a practical, common-sense code and seek physical wellbeing rather than spiritual enlightenment, or to rise high. The expression "down to earth" sums them up. They are responsible, methodical, and concerned with detail. Children of the earth element are therefore well suited to life on this planet. They are realistic, ***builders*** and hard workers. They are pragmatic, materialistic and reductionist - they reduce everything to what is practical, useful and observable. They particularly value skills and abilities. Earth types are successful business people in the sense that they can stably manage things. While the fiery type is an innovator, the earth type is cautious and practical, being more interested in established business activities than new innovative ones. Imagination to an earth type is of realistic representations of the five senses (or a few

of them). They think about what is, rather than what might be. In a way, they lack imagination. They can be too fixed to rules, regulations and procedures.

Air 

While air is light, it pervades everything on earth. For a long way into the sky. Even in deep caves there is air. It is everywhere!

The air triplicity is Gemini, Libra and Aquarius.

Air rises, but not as much as fire. Like fire, air is difficult to control or to capture. It is (nearly) always ***free***. Yet it links everything to everything else. Air is associated with words and language. Language and words are essentially verbal, and speech requires air. It has a serial quality. You can blow air from one position to another. For example, you can direct the breath to blow away some dust - the air moves from the mouth to the position of the dust. Language requires that words are uttered in a particular sequence, so the basis of ***logic*** is within language.

For most of human history, the air was the motive force of ***transport*** (sailing ships) and a major source of power (windmills).

Archetypal air is associated with ***language, logic, communication*** *and* ***transport***. It loves ***freedom***, and if captured, it will escape at the first opportunity. (If you capture it in a balloon, it will seep out or burst out whenever it can). Air is also associated with the interrelationships (links) between people and things.

So one keyword is "**linking**":

logic links ideas,

language links words,

transport links places, and

words link to ideas.

In order to link ideas together, we need to use abstraction or generalisation to some degree. So like fire, air can be abstract, although because it is closer to the earth, it is less likely to be "up in the sky" than fire (although it can be "up in the air", and abstract sometimes) Although air is everywhere, it remains air, although it does unite with objects and things in the world, but not as fast as fire. So the archetypal air can be objective and a bit impersonal. It is social because it is everywhere, but the associations are not as deep as those of water, or as lasting as those of earth.

Air people are concerned with ***thought***, ideas and intellect. They are detached and objective. They can be versatile and agile in communications. But they might not accomplish their promises or goals unless they are grounded in earth. They are the ***theory*** people in the "theory versus practice" debate. Nonetheless, while the air people are less practical than those of the earth, they are more practical and objective than the other two signs. However, they can become dreamers, thinking and planning, but not applying. Air people are reflective and think things through logically before they implement their ideas. They can be procrastinators, but they rarely make mistakes through

lack of thought. They tend not to be emotional, but they are fair minded and consider other's viewpoints. They are group rather than person oriented. They love humanity, but are not that close to individuals. They have varied interests and could become perpetual students.

Water 

Water, like earth, is heavy, and falls to the earth. It is less easily constrained than earth, but more easily than fire or air. Yet water can rise up into the air (although it often falls again as rain.) Unlike fire and air, it forms a flat surface, therefore, like earth, it has some form. It is therefore less **limited** than the earth, but more limited than fire and air. While fire cannot be contained, it disappears if you totally enclose it, and air expands to fill any container, water is more limited and keeps it volume, and has a level. While fire cannot destroy the earth, water can. It is the universal solvent that has the potential to make everyone one, without destroying that which it unites. Water can rise high with the help of air, but generally doesn't move upwards. Water is extremely powerful, and will always find its own level. If artificially constrained at a high level, it will eventually break free, but then it will fall. Water is **impressionable** and **reflective**. It can go deep. Archetypal water refers to the **feelings** and the **emotions**. It refers to the unconscious mind.

Normally water is cold, that is, it absorbs energy. It takes in the energy of others. Water is more sensitive than the other elements in that it can appear naturally in the three forms

of matter: solid like the earth; liquid - its normal state - and as vapour – like air. So water can mimic other elements as a solid (earth) and a vapour or gas (air).

Water people are very **sensitive** to their own feelings and to the feelings of others. They perceive life through their emotions. They are concerned with what feels right, with their hunches or impressions, rather than with what is practical or rational. They use the emotions, not the intellect, to understand and to value. Water can raise people to the heights of bliss, but can bring them down to the depths of despair.

Water rises into the air and falls as rain, nurturing the land. The earth absorbs it to become fertile. We can go for weeks without food, but only days without water. Living things need water to ***nurture*** them. With it they grow and mature. Without it they die.

Water people need close emotional relationships, and rarely have superficial affairs. They can be volatile. They are romantic, sentimental and affectionate. They can be very nurturing and very possessive with their family and spouse. They have fixed opinions. They communicate in non-verbal ways; emotionally, psychically, or through forms as art, dance, music, poetry and photography. Their beliefs are based on feelings rather than on reason, passion or practicality.

Ether

Ether refers to the exchange mechanism between the material universe and spirit. The Nodes of the Moon refer to the ether. Ether is not part of the traditional system.

See also the triplicities for more information on the elements.

The four Elements

Nature's four elements – earth, air, water, fire – resonate with many cultures and are simple, memorable, and easily understood as representations of the manner in which people interact.

We use capitals for the **metaphors**: Earth, Air Water, Fire, Elements.

Even though there are strong contrasts in environments around the globe, most people can relate to their own experience of the richness of nature. Like much of what we uncover when we take time to observe, the patterns have been there all the time. The Elements teach us much, link to our own experiences, and show us what's possible.

Using Nature as a metaphor makes it easy to start conversations and illustrate examples of effective connections, enabling personal reflection, shared discussion. This helps create a common language which is easy to remember and use.

All TetraMap workshops incorporate at least four lessons from Nature: value diversity, be sustainable, work inter-dependently and create synergy.

In our world view, all Elements are equally important and equally necessary for strength, diversity, sustainability and we use all four lenses to encourage whole brain thinking.

The Element FIRE

FIRE is the element with the highest vibrations. It is the only element with the power of transformation. All the other elements have only clearing and cleaning power. Arcangel MICHAEL is the Guardian of the Element FIRE. In the physical plain FIRE is: sun, flame and

blaze - in the spiritual plane: LIGHT. The physical fire transforms by burning material stuff, changing the material stuff into gas by raising its vibrations (=producing heat) and leaving the minerals as ashes. The spiritual LIGHT transforms by raising the vibrations of energy, thus turning dark (=light-less) and heavy energy into shining LIGHT again. The spiritual Principle FIRE is symbolized by the lion. The Principle of the Element FIRE is: LIGHT, Energy, male principle, LIFE, intuition, clearing, transformation, dynamic purposeful action, purposeful power (destructing - clearing - fertilizing). It is also symbolized by a sword (as held by MICHAEL), as a sign of renewal by revolution, by forceful change, by transformation (see also here). Another symbol of FIRE is the sun, symbol for FIRE in its highest perfection. The sun stands for: Radiating LIGHT, unconditional giving, the male principle, creative energy, warmth, material fire.