



# A Ludic Appreciation of Mechner's Aesthetics

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## Abstract

We can imagine many of our emotions in our family pet: hunger, fear, anger, lust, and even the bonding that we call love. But not the appreciation of a sunset, sonnet, musical passage, or good joke. Mechner takes on the gamut of such aesthetic appreciations, removed from the urgency of the primal ones, and gives us the first thorough attempt at a behavioral explication. Because he has been so thorough and apt, my commentary can add little value to his thesis, only subtract from it. Therefore, rather than critique, I exemplify, and then simplify. By reducing his voluminous report to two lines: a theorem and an equation, I thereby encapsulate aesthetics in a sweet pill of spire. Aesthetic appreciation of this note may require a willing suspension of disbelief.

**Keywords** Aesthetics · Information · Mechner · Spire

Mechner's (2017) aesthetic vision was so thorough and, to my eyes, so correct, that I would counsel him to change nothing (except, perhaps, to be less thorough). Therefore, instead of commenting on his ideas<sup>1</sup> {b} (after all, most commentaries are but flimsy platforms for the promulgation of the authors own, superior, insights, right?), I shall attempt to get this audience to *have* aesthetic experiences by deploying the following devices of my own<sup>2</sup> design:

- {a} Combining concepts
- {b} Not realizing an expectation
- {c} Reclassifying
- {d} Distorting an attribute
- {e} Distilling
- {f} Inducing

- {g} Linking with distant concepts
- {h} Recognizing
- {i} Mirroring emotions
- {j} Emoting
- {k} Repeating
- {l} Symmetrizing
- {m} Economizing
- {n} Smiling
- {o} Involvement
- {p} Synergizing

<sup>1</sup> The brackets are linked {g} to the devices, which will explain what I am doing to you.

<sup>2</sup> Fastidious readers may suspect some correspondence {h}, a *déjà vodou*, with a list in some article that they remember having read somewhere. Fake news {c}! I came up with this myself and did not plagiarize anything. I am not a crook {d}! Crooks are bad people, very, very bad people {j, k}.

## Author Note

C-flat.

Trigger warning: Read last sentence of Abstract before unwrapping; no refunds thereafter.

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Before proceeding, however, we must deal with a grammatical gap left unbridged {b} by Mechner (2017), despite all his seeming thoroughness. My goal is, as I said {k}, that you *have* an aesthetic experience in reading this commentary (well. .. already I can see that some of you expect that you are not in fact going to realize that expectation {b}), *but*—back to the point I was making, there *is no verb* corresponding to aesthetic appreciation action/emotion/state! Why is that {b}? I can love and hate and gloat and laugh {j} but if I *aestheticize*, then I am *making* something beautiful (personally, and *fwiw*, I am better at anesthetizing)—rather than *appreciating* its beauty (at least, not until I stop beautifying and stand back to appreciate, and then I need a verb all over again {k}). The Swedes verbify nouns and adjectives by adding an *a* as a suffix (such a sensible folk, their high income-taxes and the songs of ABBA notwithstanding) (that's ABBA, not ABAI {g}, I hasten to clarify. ABBA was a successful pop music group; to ABBAa, is to act like them; ABAI is a group that doesn't do pop, dropped an *M* prefix to save ink {m}, suffixed an *I* to take it to Interesting places, and

may suffix an *a* any year now, once starts acting like something); but I digress. I sense that *estetiska* is just not going to catch on. So, please hold your breath for this discursus, which I blame on Arthur Koestler's (1966) PAO. Have you not observed that many aesthetic experiences involve breath management? (I call this a Pneumo-Aesthetic Observation, PAO, {e}{m}). (Have you ever had a good PAO {i} yourself, if that is not too personal a question?) Koestler observed that part of our aesthetic response to a great discovery is to aspirate *ah-ha!*; to great art we *aahhh!*; and to decent humor we may *ha-ha!* If this surprises you, you may *wow!* In suspense—we often hold our breath—as you have been doing (if you followed the instructions above, that is; please *do get involved!* {o}). Upon resolution of the suspense, we expire, or, if things worked out OK, just let our breath out {n}. Great art can inspire us, great science can make us aspire to create our own; bad puns make us hiss (which PA behavior only reinforces that abominable addiction; save your breath!). Even just *saying PAO* makes us expire. At the risk of neologizing (“Neologism: a new word that is coined especially by a person affected with schizophrenia {n}, and is meaningless except to the coiner, [it may be] a shortening {m} or distortion {d} of an existing word” (Merriam-Webster, 2017), I shall use the neologistic back-formation “spire” to mean “having an aesthetic experience.” (It also has a prior meaning, “to rise like a spire” which is what *spiring* (a gerundial form of our new verb, pronounced “spire-ing”) does to our spirits (if, alas {j} no longer to my body). Thus, these two routes to *spire* are harmoniously linked {g}. “Spire” can take prefixes such as *a*, *in*, *ex*, *micro* (intellectual appreciation, no paleocortical involvement {g}), *mini* (causing subtle facial expressions), *mis* (not so great after all), *mono* (along one dimension only; no synergy {p}), *re* (do it again, usually to less effect, often provoking us to question whether we misspired in first place), *tran* (do it together; which often synergize {p} the experience, but sometimes unspires), and *un* (wet-blankets). Some prefixes, such as *per*, are illegal (unless it is a *really* hot spire). Unprefixed, spire defaults to having a positive experience of slightly greater valence than a minispire, unless context dictates otherwise. So, I shall use *spire* and *spiring* to mean “having an aesthetic experience” {k}. Spire is intransitive, but off-label use permits the transitive (as in “Grok {g} that”).

Now then, having fashioned precisely the tools that I need to attack the problem, I need a problem for them to attack. Given my well known (and discreetly deplored {i}) penchant for esoteric and unreadable screeds, you will not be surprised {~b} to learn that it will be a mathematical model of spiring.

## The Aesthetic Experience Reduced to an Equation

Dawkins (2000) called this process “unweaving the rainbow,” so have your tapestry beaters handy. What do the many

contexts in which we spire have in common? The above list provides numerous clues. To tie them together requires your patience with some didactics.

### Information Theory Interlude 1

The most important concept in information theory is *uncertainty* (i.e., *entropy*), and this means randomness. If you don't know under which of two cups I have secreted a pebble, and I would only answer your questions “yes” or “no,” it would take you one guess to find out; the reduction of that much uncertainty constitutes 1 bit of information. If I hid it under one of eight cups, it could take you eight guesses to find out if you were stupid; but if you made queries such as “Among the first four?,” and so on, it would take you only three guesses.  $2^3$  happens to = 8. Coincidence? No. The information transmitted by the reduction of *n* equally likely outcomes to certainty equals the logarithm to base 2 of *n* (e.g.,  $8 = 2^3$ ;  $\log_2(8) = 3$ ). This is easily generalized to unequal probabilities, but we shall not go there. Note that there is no information in the set of eight cups, only entropy. (And maybe a pebble.) Information transmission occurs when that uncertainty is reduced.

English uses 26 symbols and a period and a space, with other punctuation less essential (or constituting cheap appeals to emotion {j}!!\*!). If these were used with equal frequency each letter in a sentence would convey between 4 and 5 bits of information (get involved, compute it! {o}). But neither are they equally likely, nor are they independent of the letters that came before them. It would come as no surprise if I told you what the last letter in the word “Americ” was. Ho-hum. But it might come as a surprise (a microspire) when you see the first letter of the next sentence (unless, like Daryl Bem, you can Feel the Future).

Finally, context is hugely important. If we are talking about trees, and you saw a three-letter word starting *el*. . . you would expect/guess the next letter would be *m*. If we are talking about animals that live amidst the trees, you would expect/guess *k*. It is easier to make the right guess if you are operating in the right context—if your conceptual search for possible words is reduced to a subset by context. We build models, and our expectation of ensuing events is contingent on both the general context and the immediately preceding stimuli. As we decode information we are always adjusting our expectations; there is little surprise, and little information added when we see the final *m* or *k* in the above scenarios. If the final letter was another *l*, however, you would be surprised, inquire, or need to rethink the sentence. That concluding *l* adds much more information than the other consonants. It would be a puzzle to be solved. (Don't tell me to go to *ell*, as it is not a place, despite rumors otherwise from the reviewers. An *ell*, fyi, is the distance from my elbow to the tip of my middle finger, which I give to those who tell me to go there. The

definition, that is.) Consider a multilingual person who walks into a foreign bar and hears people talking. (No, this is not {b} a “walks into a bar” joke!) Which lexicon does the person retrieve from memory—French, Spanish, Portuguese, Italian? It will take only a few words to eliminate codebooks with tens of thousands of possibilities once she determines that the language is actually Romanian, and then build a sense of context, and then particulars.

**Inter-Interlude: Theories, Rules, and Models** Theories are design principles for models: they tell what models are valid in that domain, what you may and may not do with them, and what kinds of facts they may be mapped onto. They set up the information space for rules and facts, what kinds of model structures may do the accounting, and what they are accountable for. Biology has different theories than chemistry, which has different theories than anthropology. The many values of a coherent theory include the reduced degrees of freedom in model construction and data evaluation. If a materials scientist sees a strange crystal formation on a surface, he does not have to study Darwinian evolution or mathematical principles of reinforcement to begin to make sense of it, nor does he have to consider a whole range of facts, such as the form of government under which the laboratory operates. Today that is.

We face a similar situation whenever we try to build satisfactory world-views. Some of their theoretical assumptions are hard to shift, even when inconsistent with facts. The evil in the world is, for instance, on the face of it inconsistent with an omniscient, omnipotent, omniloving god model, but that is spin-doctored by the literature of monotheisms to keep a coherent congregation. Submodels deployed to recover apparent consistency include: “Who are we to question?”; “Bad things only happen to bad people”; “It’s Adam’s/Eve’s/Cain’s bad seed DNA”; “It helps to pray to the proper intermediary saint”; and so on. Polytheists have it easier with a plausible “The devil made him do it”; the issue never arises for Apatheists. Behaviorists just behave. Some folks model life as a selfish zero-sum game, others as a collaborative positive sum game, others as part of a “just world.” Underneath these grand world-views are other, more mutable theories. Democracy is the best form of government. My neighbors are looking out for my yard while I’m gone. My retirement advisor is looking after my best interests. It is the custom to bring gifts to hosts. Shoes are not worn in such houses. By structuring the world and our behaviors in it, they greatly reduce the entropy of our behavior.

Spires of all sorts play with such theories and models and facts. In the prior section, the eavesdropper’s initial theory was that the speakers were speaking English; that quickly mutated until he was using the models intrinsic to the Romanian language, its “facts” (words) and models (grammar) to decode the interactions. Many of the tactics used to create a spire lead us to assume one theory, providing facts consistent with it,

until difficulties occur, and either a creative model within the theory is brought to bear to resolve it (in music, for instance, syncopation and modulation), or a wholly different theory is induced to resolve it, and also found consistent with the earlier facts, even though they now need reinterpretation (¿dissonance?). Many in the audience who paid to attend Cage’s *Four minutes, 33 s*, written for any combination of instruments, were shocked to listen to three movements of that duration during which no instruments were played. What new theory to invoke? Could silence be music? Were the ambient sounds filling the silence music? Was *4’33”* music or rather conceptual art? Were they ripped off? Many in the first audience to Stravinsky’s *The Rite of Spring* found themselves changing their theory from “musical performance” to *épater la bourgeoisie*, and appropriately rioted.

## Information Theory Interlude 2

So, how do we put this to symbols? A bit more math education, and then we can do it. When we played the cup game, the implicit theory said the pebble would be under one of the two or eight cups, and you had only to identify the correct one of them. It did not allow for the pebble being under none of them, or behind your ear, or in the belly of a nearby duck or up the sleeve of the shuffler. Players often bring models that shell-game cons exploit to their advantage. They will let them win, validating the theory of “fair game and I can outsmart it.” The con reinforces this by losing to skills. Then, he sinks the hook in the player. Mega-malspire!

We can go to auditoria and to big cities for many reasons. A subset of the first case is “to enjoy new music (not Cage)” and of the latter “to make my fortune (not lose my grubstake).” We have reduced a near-infinite set of possibilities to one embraced by simple theories. When those are challenged by the outcomes, it leads to dispire. In information theory, we deal with such restriction of ranges the following way:

**The Measure of Information Transmitted** Information transmitted from stimulus (S) to response (R),  $T(S|R)$ , is given by:

$$T(S|R) = U(S) - U(S|R)$$

Here  $U(S)$  is the total uncertainty in the set of possible stimuli. With eight stimuli (cups) there are  $8 = 2^3$  possibilities giving three bits of uncertainty (entropy) in the context of a fair game. The uncertainty changes if that context is not given.  $U(S|R)$  is the uncertainty of the stimulus given knowledge of the response; for a binary (yes/no) response that is reduced by 1 bit. The uncertainty remaining in the stimulus configuration after learning that it must be under one of the last 4 cups,  $U(S|R)$ , is reduced from  $2^3$  (for the 8 possibilities) to  $2^2 = 2$  bits for the four remaining possibilities. The first interaction therefore transmits  $T = 3 - 2 = 1$

bit of information. The game continues until all 3 bits have been transmitted, and then concludes.

Our *Prime Theorem* is: *Operations that suddenly change T, information transmitted, spire*

For an event to spire, the change in  $T$  with respect to time,  $S = dT/dt$ , must be positive.<sup>3</sup> If it is negative—for instance you learn that something you believed is not true—you will malspire or even fall into dispire. Even though information may be transmitted in discrete packets, the dawning of understanding, like that of the sun on a cloudy coast, is continuous. As its value increases, we move from un to micro to mini to macro. Above a certain personal value, we daze (treated in a later article) or boggle. (Boggles are dangerous, as they lead to cults and elections of populist leaders who oversimplify by blaming all the complexities on a single enemy. This inspires many voters, although it requires them to willingly suspend disbelief. They practice such suspension by studying tabloids and other media.) Below a certain personal value, or when negative, we unspire; and farther yet may malspire. Much of our cognition and learning involves building models of the world that are at equilibrium with it (nonspiration happens when  $S = dT/dt = 0$ ). Let us see how that works with the list of devices:

- {a} *Combining concepts*. Mechner gave an example of Picasso's bike seat and handlebars arranged to look like his favorite animal, the bull—the kind of animal that you should not sit on the face of. You look at them unassembled and you think about bikes, chores to complete, or junk. Move them around like he did, and a new theoretical landscape opens to you. The uncertainty in the stimulus changes given that rearrangement, from miscellaneous bike clutter to a cool animal. Information transmitted by that reconfiguration spires. Duchamp's *Fountain* was judged one of the 500 most influential pieces of twentieth-century art. It was a urinal. In a strange place. Making strange claims: Art! (???). Outrage! Time to retheorize. Urinals are no longer just urinals; art is not just painting; modern art sucks;  $T$  explodes, minds boggle. Found objects people ({c}verb) museums.
- {b} *Nonrealization of an expectation*. This creates surprise, and surprisal is one of the components of information. In a concert, you hear GGG; what is the next note? You might guess G, no surprise, but if you make it E *flat* you have the opening to Beethoven's majestic fifth symphony The next four are not G again, but one step down, FFF what's next?

Another flat? No, a full step down, to D. You sense a theme, are led along the descent. These phrases return throughout the symphony, deeply embellished. No new theories here, just surprised sequential dependencies. The piece reverberates with expectations set up, then nonrealized in gratifying ways—the notes played in a lower register in reverse, and many other ploys to string along, surprise, and then rediscover how the clues were always there. We find this device exploited in all artistic media, from classic forms (Lessing's law: "Every true epigram should arouse an expectation, which should then receive an emphatic resolution") to mystery stories (Wilkie Collins, author of the first great mystery novel, on his technique: "Make 'em cry, make 'em laugh {i}, make 'em wait [for resolution—suspense]"). Create uncertainty that the audience cares about, then resolve it.  $T$  will spike, you will spire.

- {c} *Reclassification*. Reclassifying whales as fish was the example, but to be honest it just doesn't spire me (to be even more honest, it unspired me). (Whatever was Francis thinking? Or is he just easily amused?) We might at least be microspired by seeing our favorite cartoon dog Pluto getting his planet stolen from him. (We not only lost some entropy in planets; more importantly we lost a friend in the sky). Reclassification is a key part of the information game: "Don't think of it as hard carbon; think of it as love. Like yours, diamonds will last forever." Buying it assures it! Our project of unweaving the rainbow of aesthetics involves reclassifying the heavenly ribbon as due to refractive optics, rather than as a path to a pot of gold, or a promise from god of no more floods (tsunamis not covered in contract). Many know less about refraction than about gods and gold, and so the unweaving unspires them. But science reweaves the rainbow, with the greater spire of understanding threading through its warp and weft.
- {d} *Distortion or exaggeration of an attribute*. "Devices that focus attention.. .." Like, "Pay special attention to the middle four cups." Unless you are being conned, this decreases the entropy in the stimulus, which transmits information and makes your search strategy more straightforward. The world is too full of entropy; distortion and exaggeration capture attention, and may elicit a model appropriate to the task. They restrict your search domain, and thus increase its efficacy. Sometimes, of course, they bias the model you choose in ways unfortunate for the individual caricatured. False news is foul, but fun for its fans. It has shock value, spiring the credulous. It gives confidence in prejudices and further biases search strategies in ways that confirm those

<sup>3</sup> Some scholars may object that information is only defined for discrete categories, and there is nothing discrete about the present article. I redirect them to Norwich (1993), who will help them reclassify {c}.

- prejudices. Such discoveries need not be valid to count as information; information is amoral.
- {e} *Distillation or summarization*. Entropy reduction. No more need be said {e}.
- {f} *Provoking induction*. “Inducing .. expansion of a class .. and identifying additional instances of the concept or applications of a relation [model] among concepts.” You already know just how I would explicate this in terms of our Prime Theorem (think entropy), and I would rather be elliptic {b} than boring (which is square {a, n}).
- {g} *Linking distantly related concepts*. “What is the link between politicians and diapers?” Mark Twain asked. “They must be changed often, and for the same reason” he answered. Spire! What is the link between information and the aesthetic response? *Spire*, its measure  $S = dT/dt$ . Maybe a minispire in that appreciation. Spire, which had one meaning before today, increases both  $U(S)$  and  $U(S|R)$ , but not equally; you see commonalities among things, increasing the playing field of conceptual responses, and you can use one word, modulated appropriately by prefix such as *mini*, to reduce that entropy. When it works well, it spires; when it is counterproductive blurring important distinctions and offering only an anodyne generic commentary,  $T$  is reduced, the joke fails, the audience yawns, and the link unspires.
- {h} *Recognition*. Finding a form with a familiar name in an ambiguous background. You “see the light.” All of a sudden it makes sense. You go from a scenario with high entropy to one where you have a model or a name.  $U$  remains high, but now the subtrahends in our fundamental aesthetic equation grow substantially, to generate a large  $T$ . If it is slow, it is pedagogy; if it is fast, it spires!
- {i} *Mirroring emotions*. Emotions orient the organism to attend to cues relevant to its situation. The potential presence of a predator stimulates the sympathetic nervous system and changes our current repertoire, setting it to scan for predators and for means of escape. You ignore for the moment the appeal of the picnic and the boyfriend nearby (.. . or .. might *he* be the predator???). Such focus reduces both the salience of many environmental cues, but even further reduces the uncertainty of our response given that focused stimulus, reducing it to two: flight or bite. (The boyfriend, being oblivious, doesn’t get it and wonders why your mood has changed). He malspires.
- {j} *Emotionalizing concepts*. *Vide supra* {~k}.
- {k} *Repetition*. Creates (or refreshes) a model, often setting up an expectation that, if not realized, creates surprise. By itself, repetition can unspire unless it comes at a time when we might not have been expecting it; then it can be a *leitmotif*, a welcome return to a theme after a variant has carried you afar, a steadying drummer’s rhythm in a jazz band. You can do the math (but remember to think in terms of the context, in which repetition may be just setting you up, like the con artist’s early string of losses before the sting, to a surprise).
- {l} *Symmetry*. When perceived, reduces the entropy of your environment. Registering the symmetry spires you. The segment is part of a circle, it is the same here as over there, the part on the left of = has the same value as the part on the right. It is the same set of notes, but now played/down rather than up/a register down/at a very different pace/is followed in a completely different direction. Life returns to balance, simplified after complexification.
- {m} *Parsimony*. Reduction of the degrees of freedom in achieving a goal. A novice may make complicated moves to achieve a goal. Describing them would take a long transcript of substantial entropy. The expert makes a few moves, easily described even if difficult to emulate. Entropy is reduced. The contrast spires, the novice aspires.
- {n} *Humor*. You will find little of that here, unfortunately, as journal articles are not the right context for frivolity; science is a serious, joyless business, in which play is considered a mark of immaturity. It wastes journal space, and may negatively impact its impact impact.
- {o} *Audience involvement*. Did you minispire just then? Good. That’s a start in involvement {o}. (Note how that paragraph required a change of model from a serious explication of humor as  $dT$  (which you sensed ended by the first comma), to a remonstrance, to a parody.) Good, you were involved, and by noting, you still are. Next task. Devise a new prefix for *spire*, or a new postfix (after checking to be sure whether or not *postfix* means the same as *suffix*; and then worrying what having two names for the same thing (if it *is* the same thing) does to  $T$ .)
- {p} *Synergistic augmentation*.  $1 + 1 = 3$ . One boy plus one girl at a picnic sometimes yields three. Unless she senses something scary, like a wolf. (N.B.: Observe that devices {a, b, g [hint: the boyfriend/wolf], k, n, and p} are synergistically deployed in these three brief sentences.) Also observe that either I miscounted the number of sentences in the note, or I deployed Device {f}, expanding the class of things sentency to include equations. (Sometimes you can aspire to synergistic augmentation, but only get a microspire out of the audience. Sigh, standup is a tough job. Just never, never, try to explain your devices, or jokes {zzzz}, as here. That increases the denominator of  $dT/dt$ , and can change what was just an misspire to a malspire. Booring.)

## Drinking the Synergetic Brew

Drinking the synergetic brew is not something we can avoid; even though a few literal souls may not like its flavor, most become easily addicted. The aesthetic response—the spire—is part of our evolutionary history. It is probably the crucial distinction between us and Neanderthals, whose stone tools barely evolved during the 250,000 years they wielded them. Those of *Homo sapiens* steadily evolved over their 100,000 years, in the last stages becoming beautiful artifacts such as the Clovis point. It is impossible not to imagine that the spire of discovering a better way of knapping flint, or of admiring a perfect arrowhead, did not mediate this evolution. Spires pervade craftsmanship; and as the craft's tools became more efficient, leisure time was left for art and storytelling, new canvases on which to extend that addiction. One of the most inspiring

stories I have found on that canvas is the one told here by Francis Mechner: It explains *so* much ( $dT \gg 0$ )!

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