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Empiricism and The Structure of Common Sense

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Abstract

This essay explores synesthesia as a window into how the mind actively organizes reality through associative processes. Drawing on the empiricist philosophy of David Hume, with particular focus on his three principles of association, I argue that perception, memory, and coherence are not passive reflections of the external world, but are actively shaped by mental habits. Synesthesia offers a vivid example of how perception can be structured by subjective associations and here we support this argument further with interdisciplinary insight. I suggest that what we call "common sense" arises from the cultivation of shared associative pathways, whereas "uncommon sense" reflects more unusual or novel connections, as seen in art and poetry. Synesthesia and poetic expression thus serve as tools for rethinking the foundations and limits of knowledge.

"I invented colors for the vowels! A black, E white, I red, O blue, U green. I made rules for the form and movement of every consonant, and I boasted of inventing, with rhythms from within me, a kind of poetry that all the senses, sooner or later, would recognize." (Rimbaud, 1871)

Introduction

What do we see when we look at an apple? Not a set of disparate data points gathered together, but a unified object. A set of properties such as redness, roundness, and smoothness

making up a perceptual whole. For David Hume the redness, roundness and smoothness are simple impressions that, when bundled together, form a complex impression: the apple.

But what if looking at the apple also meant hearing a G-flat? Or tasting soil? This is an example of the experience of a synesthete; someone for whom there is a unique blending of the senses. In synesthesia, experiences in one sensory modality, such as sight, will trigger a corresponding experience in another, such as sound (Cytowic & Eagleman, 2009). Thus for a synesthete, the sight of red can elicit the sound of g-flat; red, in other words, can *sound like* g-flat. The synesthete can either feel as though they hear the note physically (projectors), or in their mind (associators) (Rouw & Scholte, 2010). For some, the color must actually be seen for the sound experience to be had (lower), while for others its enough to imagine the color (higher) (Ward, 2013; van Lauween, 2013). Whichever form the individual synesthesia takes, it leads to descriptions of subjective sensory experience that deviate from the average.

This essay reframes synesthesia as an epistemological case study. Drawing from Scottish empiricist philosophy, with particular attention to the work of David Hume, I argue that synesthesia offers a magnified view of how the mind ordinarily constructs memory and a working model of reality through association. Rather than treating synesthetic experiences as deviations from normal perception, I propose they reveal the foundational logic by which all perception is shaped and support the view that perception isn't a passive reception of facts, but the active imposition of coherence. This argument unfolds in dialogue with Hume's analysis of causality as well as insights from dream theory, art, and computer science.

The Philosophy and Epistemology of Synesthesia

Epistemology, the philosophical study of knowledge and justification, often defines knowledge as *justified true belief*. Sensation allows us to collect data about the external world, and perception, the interpretation of sensation, acts as a primary source of justification for beliefs (Audi, 2010). If we perceive someone in our garden to look like our father, for instance, we are justified in believing that our father is in the garden; the belief might be false, but it will be justified by our perception. If true, it will be knowledge. Synesthesia can be a strong tool for epistemology, because it's a remarkable phenomenon of sensation and perception. It generates experiences that are consistent and involuntary much like ordinary

perception (Baron-Cohen, et al., 1987; Johnson et al., 2013), and these can serve as justification for certain beliefs about the world and the objects in it.

Historically, anomalies have helped us understand systems; we've managed to use brain damage to study brain function and symptoms of mental illness to study the architecture of the mind. Synesthesia is a unique tool for studying sensation not only because it's a perceptual anomaly; there are other conditions that significantly alter perception of the world. Studies have shown, for instance, that schizophrenia might present with fundamental differences in visual processing (Silverstein et al., 2015). However, in psychotic conditions perception and belief often fail to align in ways that are intelligible to others and visual processing differences affect functional outcome (Rassovsky et al., 2010)
Synesthesia, by contrast, deviates from shared perception in systematic and predictable ways. A grapheme-color synesthete will reliably perceive the letter "C" as yellow. The same input consistently produces the same output as in ordinary perception.

Moreover, synesthesia is not maladaptive; it might even lead to significant enhancement in memory (Ovalle-Fresa et al., 2023 & Ward et al., 2019). A synesthete struggling to recall a name might instead remember the associated color, sound, or taste. "Ava" may be citric, and the taste may serve as a cue for retrieval. This is not entirely different from how ordinary memory functions (Horner & Burgess, 2013). What distinguishes the synesthete is that more associative paths lead to the same idea. The concept of "apple" might ordinarily involve the impressions of red, round, and smooth. For a synesthete, it might also involve the sound G-flat. With more impressions converging on the same referent, there are simply more routes available for recall. This density of association may also aid in early development: some studies suggest that synesthesia helps children learn abstract concepts by linking them to concrete sensory experiences. A letter or number, not yet meaningful on its own, becomes more memorable when anchored in consistent perceptual associations (Watson et al., 2014).

In its being consistent, involuntary and adaptive synesthesia is much like ordinary perception. The potential problems associated with synesthesia, such as being bothered or distracted by certain perceptions, also occur for ordinary perception. A synesthete might not like the color scheme of their name, and an ordinary perceiver might not like how it sounds.

So far, discussions of synesthesia in philosophy have been limited. Synesthesia has come up in discussions regarding color objectivism which states that color is an inherent feature of objects in the world, as opposed to color subjectivism which takes color as a mind-dependent feature. Synesthetic experiences seem to suggest that color perception doesn't necessarily *only* reflect objective color properties but may also reflect the numerical or symbolic features of objects (Maund, 2020). Notably, the phenomenon has also been used as an argument against functionalism (Gary et al., 2002); the idea that all states, mental or physical, are constituted by their cause-effect relationship to other states. Pain as a state is functional, because it follows from harmful experiences and in turn drives us to avoid them. One argument of Gary et al is that in synesthesia, a single stimulus (e.g., sound) can produce both auditory and visual experiences. This means that the same input can lead to different qualia, yet these qualia don't serve different functions.

Though weighing the merits of this particular argument lies outside the scope of this paper, our discussion will rather imply that synesthetic experiences do have what we would think of as causes and effects. This is examplified by their aforementioned positive impact on memory and their postulated roots in early childhood where they might have served to facilitate understanding of abstract concepts by linking them to concrete experiences. It is difficult to rule out the functionality of an association, such as Tuesday = green, for a given organism without an understanding of their mental models. Even symptoms that seem harmful or chaotic (synesthetic experiences are neither) can serve a purpose for the organism which can be revealed through us in psychotherapy (Freud & Breuer, 1895); we will thus not be asserting that any association is more or less functional than any other.

Scottish Empiricism

Empiricism is the view that all knowledge comes from experience; specifically, from sense experience. It is important not to simplify empiricism by mistaking it for naive realism; the thought that the world is out there and is directly accessed by experience. While empiricists do hold that experience is our only source of knowledge, no serious strand of empiricism claims that experience gives us reality in its entirety.

David Hume, in particular, has pushed empiricism to its logical limits through a skepticism of past experience and causation. Though Hume's philosophy never posits that we should stop believing in experience, it does point out the constraints of what we can know through it. Hume argues that we can't directly observe causal connections; we can only observe a constant conjunction of events. We conclude that two events are causally connected when one regularly occurs after the other; we form an expectation that one will keep causing the other as it has in the past. The connection itself, which is the necessary force that links cause and effect evades our perception (Hume, 1748).

According to Hume, then, our expectation that the past will repeat itself, and thus our expectation of causality is a mental habit and not a feature of the external world. The broader insight underlying this thought is that the mind links impressions and ideas not through any rational necessity, but through habitual patterns of thinking formed by association (perceived connections between things in the world). In suggesting this, Hume is venturing into the realms of cognitive science and statistics; the more modern thought that we project our statistical expectations onto a potentially chaotic world in an attempt to structure it and reduce uncertainty follows naturally from this (De Ridder, 2014; Flores, 2023).

Synesthesia makes this observable. It is not just that the synesthete expects to see all A's as red; the mind imposes redness on the grapheme with the same force that ordinary perception presents it as black. The associative habit is no longer distinguishable from perception itself. Though A causally leads to red the causality is internal and reflects the structure of the mind rather than the nature of objects.

Principles of Association

For Hume, there are three principles of association. These can be thought of as connecting principles that determine how close or distant ideas are to one another within our spaces of meaning (note in this sentence the ease of association: closeness implies similarity, though there is nothing inherent to "closeness" that guarantees similarity). The three principles are contiguity, cause and effect, and resemblance (Hume, 1896, p. 12).

Contiguity refers to the association between ideas that occur near each other in time or space. The classroom might call to mind one's classmates, or the smell of coffee the cookies

one usually has with it. Cause and effect links ideas through perceived succession: if one event consistently follows another, we infer a causal relationship, even if no necessary connection is ever perceived. Causality, then, is in essence a co-occurance of contiguity, succession, and an assumed connecting principle. Finally, resemblance connects ideas that share similar features; an image of a tree might remind us of an actual tree, or a stranger might remind us of someone we know. Together, these three principles structure memory and imagination, but through them also all experience and perception. They are the rules by which the mind constructs reality.

Synesthesia is widely believed to have its roots in early childhood experiences (Witthoft & Winawer, 2006) when the organism is particularly sensitive to new information. Consider that throughout our lives, we are exposed to hundreds of thousands of events that occur in succession, appear side by side, or resemble one another in sound, shape, or texture. But we do not associate all of these experiences equally to each other; only the ones that repeat with consistency tend to make lasting impressions (Lewkowicz et al., 2009).

When we are much younger, we have seen a lot less; individual experiences have more weight. We need urgently to build world models, yet we don't yet know what information is important. However, we have a fisher-price magnet set through which we are learning the alphabet, and the 'A' magnet is always red. It is easier to form the association between A and red, because we havent seen a comparable number of blue A's or green A's, if any. This is an example from synesthesia research which has found that synesthetes born while a particular fisher price magnet set was in circulation are much more likely to have the same grapheme-color associations as the pairings seen in the set (Witthoft & Winawer, 2006). This type of associating is an example of Hume's contiguity, where A and red become associated because they occur very close together in time and space. We have seen so many white swans that we assume all swans are white; but what's more, we see black swans as white because we are so sure that whiteness is an inherent feature of swanness.

The association between things that are contiguous, causal and similar is pervasive in many of the ways in which we represent meaning and information. In computer science, particularly in natural language processing, we speak of embedding spaces. These are high-dimensional mathematical spaces in which language elements such as words and concepts are

represented as points.[1] In these spaces, words that are semantically related appear closer together. This structure mirrors how the Humean mind operates through association: ideas that resemble one another, co-occur, or serve similar functions are mentally "near" each other. In both human and machine learning these semantic relations are not predefined, but are acquired through exposure to repeated patterns in language, perception, and experience. It is not inherent to the word 'cat' that it's placed closer to physics than it is to economics. It's just that we, and the machines trained on our data, have seen more about Schrödinger's cat than Adam Smith's cat.

If the mind was indeed like an embedding space, in grapheme-color synesthesia, graphemes and colors can be thought cluster unusually closely within the associative space, creating a dense region where letter effortlessly leads to color and is inseperable from it. Though A and red are both close to each other, A leads to red and not vice versa; because the relationship between these two points is one of causality rather than mere contiguity (A → red rather than A ←→red). A is the cue, and red is the result. Studies have shown that the grapheme-color synesthete's perception of color depends on the identification of the letter. Red, for example, is only perceived after the letter has been identified as an A (Bridgeman et al., 2010). Red is then simply one of the perceived features of A.

Causality

It is difficult to prove that what we perceive does not match the external world and therefore does not follow causally from features inherent to it; we are not able to suspend the habitual ways in which we perceive reality. We also assume that others perceive it similarly, since we are able to speak about the same things easily enough. However, in the case of synesthesia, we have evidence that what we take to be the external world can be perceived differently and just as reliably.

Our shared experience of the color red does not involve the notion of a G-sharp. For the synesthete, however, the letter "A" and the color red are causally linked: the letter cannot be perceived without also perceiving the color. Even though there is nothing inherent to "A" that is red for a non-synesthete, as far as others can tell, the synesthete knows that their A is red and often doesn't know that the As of others aren't. The color is not arbitrary; it might as

[1] Technically these are vectors rather than points; I have selected the word points for ease of visualizing.

well be an inherent feature of the letter itself. It is one more impression that is added to the bundle making up the idea, and it doesn't feel less real than any others. This is a causal inference built upon exposure to patterns in data rather than a necessary connection.

This way of making causal inferences can be difficult to observe when world models, knowledge base and assumptions are very similar; when we have been socialized in very specific ways. Cross-cultural phenomena, such as the case of what has been referred to as 'cargo cults', can provide an illustration: during World War II, the US and allies built airbases on the Melanesian islands. Some islanders, after seeing that the existence of these military airstrips had reliably preceded the arrival of goods during the war, attempted to replicate the outcome by recreating the observable aspects of the airbases such as control towers and runways (Lindstrom, 2018). The goods never arrived, but what the islanders did was not irrational. In fact, it was perfectly Humean; it represented the way in which the human mind works in an uncertain world. The belief in causality emerges not from the observation of a necessary connection, but from habit and experience. Repeated conjunction forms association, followed by expectation and belief. Here we clearly see the principle of cause and effect in the thought that the existence of the base will lead to supplies even in the absence of a connection between the two. But we also see resemblance in the assumption that creating what looks like runways and airspaces will necessarily make for an airbase.

Common Sense and Uncommon Sense

All of the associative experiences discussed thus far can be thought of as what constitute our thinking and what we call a self. According to Hume, the self is nothing more than a bundle of sensations and impressions, loosely connected and strung together by habit. These impressions form and then trigger associative pathways that unfold into thought and being. Hume famously wrote, "I never can catch myself at any time without a perception, and never can observe anything but the perception." We cannot stop interpreting and narrating our sensations; we always perceive, and everything we perceive is already something; never raw or meaningless, but shaped by prior experience and expectation.

People having hypnagogic hallucinations report hearing and seeing things while transitioning from wakefulness to sleep. They can experience screams, objects falling, people speaking (Noreika et al., 2015). These are sensory experiences that follow from no immediate object in

the world; yet they can be made sense of in the moment. According to Hobson's activation synthesis theory, the brainstem generates basic sensory and emotional experience during dreaming, which the brain then transforms into coherent narratives. For them this dream-consciousness is a secondary consciousness built on top of a proto-consciousness that forms in childhood and describes the basic rules of reality (the waking consciousness is the primary consciousness) (Hobson & McCarley, 1977). This is not too far from what psychoanalysis tells us[2]; even the dreaming state isn't the made up of raw unconscious materials; the latent content is revised and made digestible in the form of manifest content. However, there is even further processing of the dream in its final stage of secondary revision (Freud, 1900). In telling or thinking of the dream, the dreamer can't help but verbally represent the dream and thus impose some coherence on it. Through the initial construction of the dream secondary revision what might have been sensations and impressions become strung together by habits of the ego. In both dreaming and waking life, the mind imposes coherence on fragments through associative processes. Hobson and Freud's models ultimately point to the possibility that meaning in the world is not discovered but imposed, habitually and creatively, by the self.

Association gives meaning to sensations and impressions based on past experience, whether we are awake or dreaming, and thus makes coherent thought possible. However, it also determines the boundaries of thought. As we form associations, we become increasingly able to think along certain lines and along similar lines to others, but we also become less able to take the associative paths less trodden. It becomes almost impossible to conceive of things that our habitual associations do not lead toward. What we often interpret as a decrease in brain plasticity with age may, in fact, be an increase in associative rigidity.

Artists, in their efforts to become seers and to think unthinkable thoughts have experimented with synesthesia. Kandinsky, likely a synesthete himself, attempted to paint music; one might notice that his works are titled as musical compositions would be. His color theory, similarly, is largely based around the correspondence between specific shapes and colours (Kandinsky, 1977). Arthur Rimbaud similarly dealt with a blending of the senses in his poetry. He famously argued that the poet becomes a seer through a systematic, rational derangement of the senses; presumably so that he may, *"arrive at the unknown!"*. The poet, he wrote, should *"die charging among unutterable things"* (Rimbaud, 1871). Rimbaud's

[2]It has also been argued that the activation synthesis theory is very far from what psychoanalysis tells us about dreaming, and it very well might be outside of this very narrow look at secondary revision.

experiment required a forgoing of human morality, habits, and comforts in order to build unusual sense associations. Paul Valery, a critic at the time, declared that "all known literature is written in the language of common sense; except Rimbaud's." (Robb, 2000). While the validity of such a statement cannot be confirmed, it still tells us something important about what Rimbaud might have thought the aim of poetry was. In a sense the artist, the poet and the revolutionary try, to the best of their ability, to associate differently. A rational derangement of the senses doesn't produce a lack of sense; it rather produces the uncommon sense.

Was an attempt to create poetry that appeals differently to the senses a scientifically viable undertaking? Since Rimbaud's time, research has indeed shown that synesthetic experiences and their neural correlates can be induced through training (Bor et al., 2014). In the end, however, Rimbaud didn't die charging into the unconscious and giving form to formless things; he abandoned poetry and largely forgot his mission as easily as one forgets other dreams.

Concluding Remarks

Perception, far from passively mirroring an external world, emerges through the active organizing of impressions by association, habit, and expectation. Synesthesia offers a striking example of perception that doesn't follow causally from its object; it instead follows from subjective past experience of the world. Hume's skepticism about causality and the synesthete's unique sensory experience converge on the insight that coherence is manufactured by the mind. Yet, a questioning of causality should not lead us into chaos, but into recognizing the significance of coherence as a creative achievement of the mind.

"Common sense", the shared organization of sensation and perception, arises when associations are shared. Yet in moments when associations shift through synesthesia, dream state, or artistic mission, we are given a glimpse into the "uncommon sense": perception that is structured, yet differently so.

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