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Ideasthesia and art

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Abstract:

Ideasthesia can be defined as a phenomenon in which activation of concepts produces phenomenal experience. The present article is concerned with the relationship between ideasthesia and art. In the past, it has proven difficult to come up with a comprehensive definition of art. Equally difficult seems to be to understand which psychological processes specifically underlie the creation and consumption of art. Here, an attempt is made to explain the psychology of art, as well as define art, based on the theory of ideasthesia. According to the present theory, art happens when the intensities of the meaning produced by a certain creation and the intensities of the experiences induced by that creation, are balanced out.

The word ideasthesia comes from Ancient Greek words *idea* (for concept) and *aesthesis* (for sensation). Hence, the term ideasthesia means *sensing concepts*. The theory of ideasthesia was initially developed on the basis of research in synesthesia. Synesthetes are people who have additional sensory-like experiences to a stimulus that otherwise would not induce such experiences. For example, every letter of the alphabet may induce the experience of a certain color (letter A often happens to be red). And there are many other forms of synesthesia (Cytowic and Eagleman 2009).

Initially, it was believed that synesthetic experiences occur as a result of direct connections between corresponding parts of the brain. For example, the brain area responsible for grapheme detection would somehow (aberrantly) be connected to the brain area responsible for color perception. However, this hypothesis had to be abandoned over time as more and more evidence suggested that synesthesia was not based on direct associations, but instead that concepts mediate those associations.

For example, experiments showed that synesthetes would associate different synesthetic colors to one and the same stimulus, depending on how they interpreted that stimulus (Dixon et al. 2006). It has also been shown that new synesthetic associations could be created within minutes—simply by giving new meaning to a certain stimulus (Mroczko et al. 2009). For example, when synesthetes were exposed to an unfamiliar writing system they would associate colors to new letters as soon as they learned which of the Latin letters they corresponded to; a new “A” would get the color of the Latin A. Much other evidence also exists (Simner et al. 2006, Novich et al. 2011, Chiou and Rich 2014, Sagiv et al. 2006, Ward and Sagiv 2007, Dixon et al. 2000, Nikolić et al. 2011).

These results could not be explained by direct connections between brain areas. Ideasthesia needed to be introduced. The theory of ideasthesia states that concepts precede sensory-like experiences in synesthesia (Nikolić 2009). Thus, it is first the concept of the letter A that is activated and then, as a consequence of the activation of that concept, a synesthetic color “lights up” in the minds of synesthetes. The theory of ideasthesia emphasizes a tight relationship between concepts; i.e., our understanding of the stimuli and the experiences i.e., the way we feel about that world (Mroczko-Wasowicz and Nikolić 2014; van Leuween et al. 2015).

Importantly, a concept is something fundamentally different than a mere direct connection between brain areas. Concepts are related to our capability of engaging our full intellect to understanding the world around us, and of acquiring novel insights about that world (e.g., Fodor 1998). There is no consensus on how the brain implements concepts. One recent theory proposes that we apply concepts whenever nerve cells adapt to external stimuli; and thus, that we learn new concepts as our neurons learn how to perform such adaptations. This theory, named *practopoiesis*, presumes that the mind results from a hierarchy of adaptive mechanisms (Nikolić 2015). According to *practopoiesis*, the “idea” component of ideasthesia involves fast processes of neural adaptation.

Ideasthesia in everyday perception

Since its introduction, the theory of ideasthesia has been extended to everyday perceptual processes. Milan et al. (2014) investigated what kind of personality traits people tend to assign to two different shapes, known as Kiki and Bouba (Figure 1; Köhler, 1947). Before their research, it was well known that people consistently assign the name Kiki to the spiky star and Bouba to the round blob. However, what Milan and colleagues found was a much more extensive form of consistent associations. They discovered that subjects overwhelmingly agreed about many other properties assigned to the shapes. For example, Kiki was nervous and high-class. Bouba was lazy and easy going. They concluded that sensations produced by a “spiky shape”, a “nervous personality”, “laziness”, much like those of the sounds making the name “Kiki”, are all connected in an associative network. These types of associations are also known as cross-modal associations (e.g., Spence 2011); much like the color blue is perceived as cold and red as warm. Importantly, as Milan and colleagues noted, this network of cross-modal associations had stark similarities to the semantic associative network (e.g., “doctor” is associated with “nurse”). But these were associations among sensations, not among concepts. Therefore, they concluded that there is a strong similarity between semantics and sensations in such a way that the theory of ideasthesia would apply.

This was the first proposal for ideasthesia being used outside of the realm of synesthesia and being generalized to everyday perceptions. Since then, further proposals have been made on how ideasthesia may help us better understand consciousness (Mroczko-Wasowicz and Nikolić 2014; van Leuween et al. 2015).

Ideasthesia and art

Perhaps the most surprising consequence of introducing the concept of ideasthesia has been in its relationship to art. I have been surprised to witness many artists adopting the concept in describing or even naming their pieces of work. I have found these concepts being used in a wide range of art forms including: paintings, music, photography, interactive art, acting, installations, and even perfumes. When talking to some of those artists, I learned that they overwhelmingly felt that ideasthesia somehow described the very process by which they created art.

This adoption of ideasthesia by artists also provokes a question: Can we use ideasthesia to formulate a theory of art? Over time, I have come to believe that the answer to this question is affirmative. The relationship between the two opposing forces of ideasthesia, i.e., the *concept* and the *sensation*, can be used to formulate a hypothesis about psychological events that underlie the process of either creating an art piece or appreciating (i.e., consuming) it. I call the theory: *ideasthesia balance theory*.

The key problem here is to uniquely distinguish art from all other, somewhat related human activities. For example, we can ask the question: What precisely distinguishes one novel that is generally judged as a valuable piece of art from another novel that clearly does not get such appreciation? Or, what is the fundamental aesthetic difference between a “soap” opera as compared to a Shakespeare play? Likewise, one can ask: What is it that distinguishes insightful intellectual works that are unanimously

considered not to be art, such as e.g., a doctoral thesis, from other works that are considered a piece of art but also offer a certain intellectual value? For example, what is aesthetically different about the way Dostoyevsky depicts Russian society in the 18/19th century and how historians do so?

Many attempts have been made at defining art, though this endeavor has proved difficult (Painter 2002). The challenge is to make a distinction precisely between where the art is and where it ends. A successful definition would minimize false inclusions and false exclusions, i.e., the number of works that would be accepted as art but would not be covered by the definition and vice versa, those that the definition would cover but that would generally be rejected. A successful definition would also account for the subjectivity of art.

The definition that follows offers also a theory of art and is not made by an art historian, but by a cognitive scientist. It may well be that the art problems presented here are incomplete and somewhat naïve. In any case, an effort to bridge these distant fields—cognitive science and art theory—has been made.

The present theory is a psychological theory; it postulates what is happening within the minds of people when they experience art. Here, we try to understand what are the psychological processes that lead a person to declare some act or artifact as a piece of art. The theory should apply to both the actual act of creating art and the consumption of art.

At the heart of the present theory lies the relationship between meaning and experience as the two forces of ideasthesia. By meaning I refer here exceeds by far that type of meaning that can be expressed by language—i.e., that considered by linguistics. Here, under “extraction of meaning” from a stimulus we assume of all the changes made by our nervous system to prepare us for interaction with that stimulus (Nikolić 2015); irrespective of whether these changes can be described by words or not. In ideasthesia, meaning is much wider than what can be verbalized. This way, the theory takes into account the findings in neuroscience that motor cortex is largely involved in extraction of meaning (e.g., Kuipers et al. 2013). Similarly, the number of concepts that we have is much larger than those that can be named or expressed in words. Therefore, the meaning related to language, is only a small fraction of the total meaning machinery that our minds are equipped with.

Consequently, under meaning I refer here to the full depth of the relationship an art piece has to a person’s knowledge. Every individual has a certain amount of life experience, defining that person’s knowledge about the life and world. This knowledge can be described as an associative network of concepts or alternatively, as a hierarchy of concepts. The contents of knowledge include factual knowledge, episodic memories of events that occurred in person’s life, habits, general principles of understanding how the world works, our skills, personal values, learned emotional responses, fears, hopes, individual philosophy of life, and so on. For most part this knowledge is unconscious and hence, not easy to describe by words.

These components of our knowledge do not stand independently, but are related and connected. One meaningful aspect of any stimulus, be it art or not, is that which taps into the vast knowledge that a person comes with and uses it to interact with the world. A

stimulus that is particularly strong on meaning is one that probes our existing knowledge at a deeper level; a meaningful stimulus powerfully affects the semantic structure that we already come with. Such a stimulus not only creates new memories, but makes us re-organize the existing one. It makes us form new connections – new insights. A truly meaningful stimulus makes us see some aspect of the world more clearly; better, in a new light, in a more comprehensive way.

To be declared as meaningful, it does not really matter what the insight is about. It can be about academic content such as a mathematical theorem, but also about social life or even our basic perceptions such as colors, sounds, movements, or space. Whatever there is that we can process, memorize and understand, this same thing can also be probed by stimuli that are either more or less meaningful.

Sensation, on the other hand, as the second part of ideasthesia, is related to phenomenal experiences, also known as qualia. Sensations are about the way things feel and “are like”. It is about the redness of a red color, and the sourness of a lime. Sensations make up our inner mental life and “light it up” so that life does not happen “in the dark”.

To formulate the ideasthesia balance theory it is necessary first to establish that both meanings and sensations can vary in magnitude. Stimuli may be more or less meaningful, and may have more or less intensive sensations. For example, a light touch to someone’s skin may not be noticed, and hence a sensation might be considered weak. In contrast, a more forceful touch may produce a stronger sensation. Likewise, the same light touch may occur accidentally in a crowded street and be thus meaningless, or might indicate an important sign of affection and hence carry a lot of meaning.

In our mental life, meaning and sensation interact, and their relationship can be rich. We have discussed cases above in which meaning induces sensation. We have also seen similarities between the network of the qualities of sensations and the network of concepts underlying the extraction of meaning. But there are more relationships between the two. Firstly, extracted meaning can alter the perceived strength of sensation; everything else being equal, a meaningful stimulus is likely to induce a stronger sensation than a less meaningful one. Also, the intensity of a sensation can affect the process of learning, and can thus determine the efficiency with which we acquire new knowledge (including new concepts).

Ideasthesia balance theory states a particular relationship between the depth of meaning and the intensity of sensation. A creation that we are likely to judge as art is one in which the meaningfulness and the strength of sensation are well correlated. In an art piece, the moments (the components) that carry the most meaning are also those that induce the strongest sensations. If there is an event in a story, a sequence of notes in a melody, or a form in a sculpture that induces the strongest sensations, this same event, musical sequence and form must also be the one that carries the most meaning. These moments and components have to be the places of insight that are perfectly combined with simultaneously inducing e.g., the strongest emotions. Therefore, art needs to effectively combine an insight with feeling.

It is not that all human activities produce such a correlated induction of sensations and conceptualizations. In fact, a perfect balance is difficult to achieve and requires hard work. It is comparably easier to induce strong sensations that do not have a strong

meaning attached. Also, it is comparatively easier to express meaning in a way that is quite dull with respect to the sensations that it evokes.

The relationships between meaning and sensations with respect to the balance of ideasthesia are illustrated in Figures 2 to 5. Figure 2 shows the entire space of possible relationships between meaning and sensations. However, there is only a narrow band of relationships that can be considered as well balanced. Note that the absolute value of intensity is not considered important; it is rather the balance of the respective intensities that matters. Every art piece is comprised of multiple parts and each part will carry more or less meaning or induce more or less sensation. These intensities need to be aligned as much as possible such that their idea vs. aesthesia relations lie all along the gray diagonal in Figure 2.

A one-dimensional continuum of ideasthesia balance can be defined along the diagonal orthogonal to that of maximized balance (Figure 3). This representation can indicate the overall idea vs. aesthesia balance in a certain creation. The continuum ranges from an extreme dominance of sensations (very little meaning) to an extreme dominance of meaning (scarce sensations).

Such a one-dimensional representation can be used to sort out various types of human creations with respect to the dominance of either sensations or meaning, or their balance. For example, at one extreme point we can put entertainment, with excessive sensations and little meaning, and at the other extreme point we can put various forms of scientific and technical work that are often loaded with meaning but are lacking in sensations (Figure 4).

Importantly, art falls exactly in the middle of that continuum.

Comparison of art to entertainment: Entertainment runs on emotions, with an emphasis on emotions of positive valence. Negative emotions typically present an interlude to a resolution by positive ones (a happy ending). Fear is followed by security; tension followed by relaxation, and so on. In entertainment, this emotional rollercoaster usually does not carry significant meaning. The consumer does not learn much. There is no significant novel relation to the real world. In entertainment, it does not matter whether the events that unfold are realistic to life, whether the decisions of characters are illogical, or whether the incidents building the plot are physically impossible. The consumer of entertainment is there for the sensational ride, not for insights and logical consistency.

In contrast to entertainment, the sensations of an art piece are combined with insights. The story in a drama may help us learn something about real life. It may help us understand ourselves or our friends. Often, art helps make sense of emotions. For example, both James Bond and The Godfather movies are fictions that portray plenty of murders, explosions, fistfights, revenges, and erotic moments. However, only The Godfather tells a story of something that is realistic and from which one can learn about the real world: the fight for power, corruption, family relations, real conflicts in which individuals find themselves, and so on.

For these reasons, art does not need to rely much on happy endings. Art can also induce unpleasant emotions, but if these emotions make sense in the great scheme of things, i.e., if the events are meaningful overall, the consumer can take the insights that come with the “ugly” emotions as a valuable outcome.

How can one handle the misfortune of the main protagonist in Kafka’s *Metamorphosis*? This can be done only by finding meaning in the story – for example, by understanding it as a depiction of similar unsuccessful struggles happening to people in real life who may be suffering from a different nasty misfortune of life than turning into a giant insect; such as for example a terminal disease. The beauty in this otherwise “ugly” story is in the balance between emotions and meaning.

Because art is meaningful in addition to often giving us a good time, it provides us with a certain value that exceeds that of entertainment—a value with a longer-lasting effect. Art builds us up, elevates us, and creates new experiences integrated into the semantic structures. It also expands these semantic structures. The new knowledge it imparts is likely to be useful in our lives at some later time; it is likely to apply to events that actually occur to us. All else being equal, the person who has consumed art is likely to carry more wisdom than the one who has limited his or her experiences to mere entertainment.

Comparison to science: The ability to extract meaning and make insights is not only a characteristic of art. Science and related disciplines create new knowledge as well but in a much more explicit way. Additionally, knowledge accessed through science is often more direct, presented in a succinct form and is more objective. However, scholarly works serving the accumulation of scientific knowledge tend to grow disconnected from everyday life with their specialized terminology, abstract concepts, and “dry” data. As a result, they tend to produce less intensive sensations than art works. And when they do create sensations, these are not well balanced with the implications of the scientific work. A discovery of a new molecule that cures a certain disease is certainly very meaningful, but the way scientists describe such a molecule is by no means different from the description of any other, much less meaningful, molecule—it is just a formula. In fact, the sensory experience is broadly similar for any formula describing any kind of molecule—and these experiences are not very rich at all.

It is not that scientists don’t care about inducing sensation. They gladly hang onto any sensation-based aesthetics that can be associated with their abstract scientific work, be it simple symmetry, a nice fractal structure of data, an artificially colored visualization or anything else. However, the biggest difference from art is not primarily that science is less capable of generating such sensations (it is indeed less capable, but this is not the main difference) but that science cannot offer as good a balance between idea and aesthesia as art does. Scientific work cannot be made such that it resides in the gray diagonal of Figure 2. The story of a scientific result is not told through a set of rich sensory inputs. Instead, an abstract (i.e., “boring”) language has to be used. In science, the point of highest meaning is not the point of strongest sensations induced. It is not that an emotional equivalent of someone getting into a life-threatening situation occurs at the moment of deriving the key logical conclusion of an argument, or at the moment of finding out that a statistical test was significant.

Ideasthesia balance theory also tells us why art cannot be created by a forced combination of entertainment and scholarly work. One cannot create art by having characters in a soap opera spelling out scientific facts. This would be unbalanced, and hence the resulting creation would be positioned all over the graph in Figure 2, not in the gray diagonal. For the same reason, one cannot simply tell jokes during a scientific presentation to turn science into art.

Robert M. Pirsig (1999) argues in his book “Zen and the art of motorcycle maintenance” that quality results from a combination of two factors: *rational* and *romantic*. I postulate that he is arguing something similar to the balance of ideasthesia. The romantic component relates to being “in the moment” and defies rational analysis. In contrast, the rational component is about details and understanding the inner mechanics. Pirsig concludes that quality comes when the two aspects are combined. In relation to ideasthesia, the romantic component may correspond to aesthesis, while the rational analysis may be the idea part of ideasthesia. Therefore, to paraphrase Pirsig, high quality may be achieved when both sensations and concepts are strong; that is, when ideasthesia is maximized.

Implications

The present theory can be used to offer an explanation for the properties of art.

Abstract art. A naïve view would be that abstract art does not carry meaning, and thus that it cannot fulfill the criterion for the balance of ideasthesia. Where is the meaning in a bunch of circles and triangles on a painting? Or, where is the meaning in one sequence of musical notes? The fact is that our brain extracts meaning at a level that cannot be verbalized. Meaning does not require the ability to consciously express the contents. A stimulus is meaningful if it makes our brain work, if it attracts our attention, and if it forces us to process it in some way. An input is more meaningful if it imposes more effort for adjusting to it. A lack of meaning comes from stimuli that we ignore or do not notice. Also, when we actively suppress input e.g., filtering out one disturbing conversation in an effort to hear another, we can speak of little or no meaning being extracted from the suppressed stimulus.

Hence, abstract art can induce much meaning processed at a level difficult to express verbally. Also, abstract art can induce sensations. When these are combined well, one can achieve a balance of ideasthesia.

However, the most powerful abstract art may be that which induces meaning and sensations that transcend the modality in which the art has been created. When Malevich painted his “black square” he did not primarily produce sensory sensations by colors. Uniform black paint probably produces as little of such sensations as possible. The true sensations that he produced with that painting had to do with the social aspects. Every other artist at that time would possibly fear stating that a black square is his own artistic expression. One could easily be ridiculed. In addition, every consumer of art or gallery custodian would have to deal with similar fears. And those sensations were strong. At the same time, he offered meaning; not a verbal one though. There was

nothing much to verbalized about a black square. It was instead his actions through which he offered the idea that we can considerably broaden our definition of what art is. He offered an idea that was revolutionary at the time.

Malevich did not write an academic essay on this topic - that would be science. Instead, he painted a “black square” and he let people deal with the fear and the insight. It is also possible that he could not have known for sure how his experiment would work out in the end, and may have had to deal with the same fears himself. This combination of courage and insight makes this abstract painting a valuable piece of art.

Subjectivity of art. A judgment of whether something is or is not art is highly subjective. For any particular piece, there is no full consensus among experts. A strong subjective component exists when valuing art. This is something that is perfectly expected according to the ideasthesia balance theory. The theory tells us that the artistic value of a creation can only be judged by the ideasthesia balance evoked within an individual. Both the sensational and the meaning aspects depend on the knowledge of a given person, and each individual is different. Hence, each individual will respond somewhat differently to any stimulus. A given creation may induce a strong ideasthesia balance in some people and in others it may not. In ideasthesia balance, art is exclusively defined by how a person reacts to it. This definition itself does not allow for any other definition of art that would be objective, i.e., that would work without having to consider how people respond to it.

Timelessness of art. Art pieces do not seem to lose their effect over time. Classic paintings, classic music, classic texts; all of them continue to hold value as time goes by. In contrast, a piece of entertainment can explode in popularity for a very short period of time, and then it dies—it is forgotten as quickly as it became popular. Moreover, the pieces that become quickly popular end up not only less attractive soon afterward, but often even quite repulsive or annoying. If a hit-driven radio station were to always play just last year’s (last month’s) hit, it would quickly run out of listeners. In contrast, a classical radio station can play music 100s of years old and still keep its audience happy. Who wants to watch a single episode of a soap opera multiple times? And yet, owning a copy of Beethoven’s Fifth and listening to it repeatedly continues to evoke pleasure. How is that possible? How can ideasthesia balance explain the timelessness of art and the short-lived pleasures of entertainment?

We have to begin by noting that our brain changes with every single exposure to a stimulus. A stimulus is always perceived and processed a bit differently the second time around. And the changes are due to *learning* about the stimulus. Our brain learns to predict what will come next, and habituates to familiar inputs (Johnston et al. 1990, Johnston and Schwarting 1997). As a result, there is less and less need to process the stimulus with every new exposure. The novelty is reduced. The intensity of sensations is reduced.

The reason that art does not annoy us with repetition and entertainment does (or art annoys us much less) lies again in the ideasthesia balance. We have to ask: How would a given creation be represented in Figure 2? An entertaining piece is, on the whole, located in the green area and therefore it is not well balanced. However, what makes entertainment nevertheless temporarily attractive is that, when broken down into its

components, it will have at least one component that touches the gray area - something like the red line shown in Figure 5. It is likely that the section of a piece entering the gray zone of balance first will be the most salient one—and this may make the piece an instant hit.

This most salient part will be the one that will wear off most quickly after repetition, however. Then the saliency will move on to other parts, and these other parts lie outside the gray region and hence lack beauty. Suddenly, the piece turns “ugly” and unpleasant.

In contrast, an art piece is much more balanced across all of its components (something like the yellow line in Figure 5). For that reason art continues to provide pleasure even after learning. As one component sinks into the background of habituation another component surfaces, but also offers balance, and hence value and beauty. Repeated exposure is then desirable as it enables exploration of the art piece—every fresh encounter leading to something new being discovered. In this way, an art piece educates.

It is exactly this property of consistent balance between sensation and meaning—i.e., balanced ideasthesia—which makes us willing to preserve art pieces, to be surrounded by them, to protect them from being lost, and to encourage others to become exposed to them. Also those creations do not come easily. They require hard work. But once it is done right, they provide an incalculable value for many of us.

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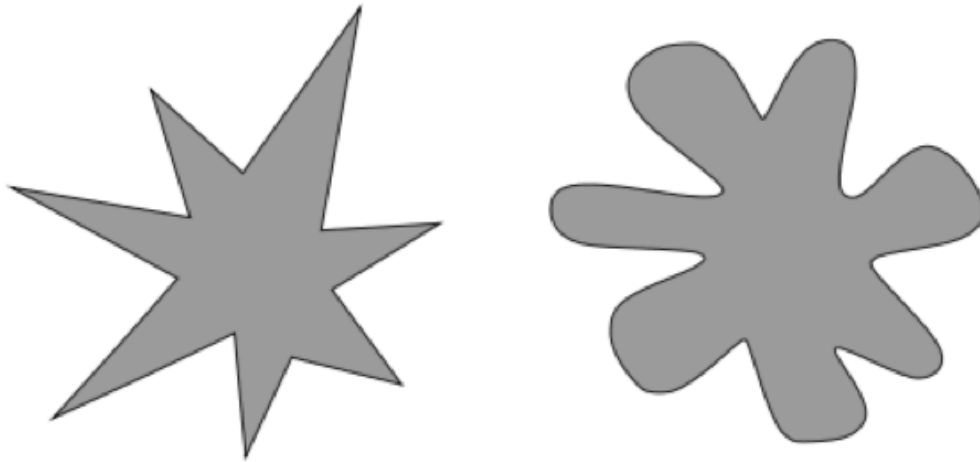


Figure 1. Which one is Kiki and which one is Bouba? People overwhelmingly agree that the spiky star is Kiki.

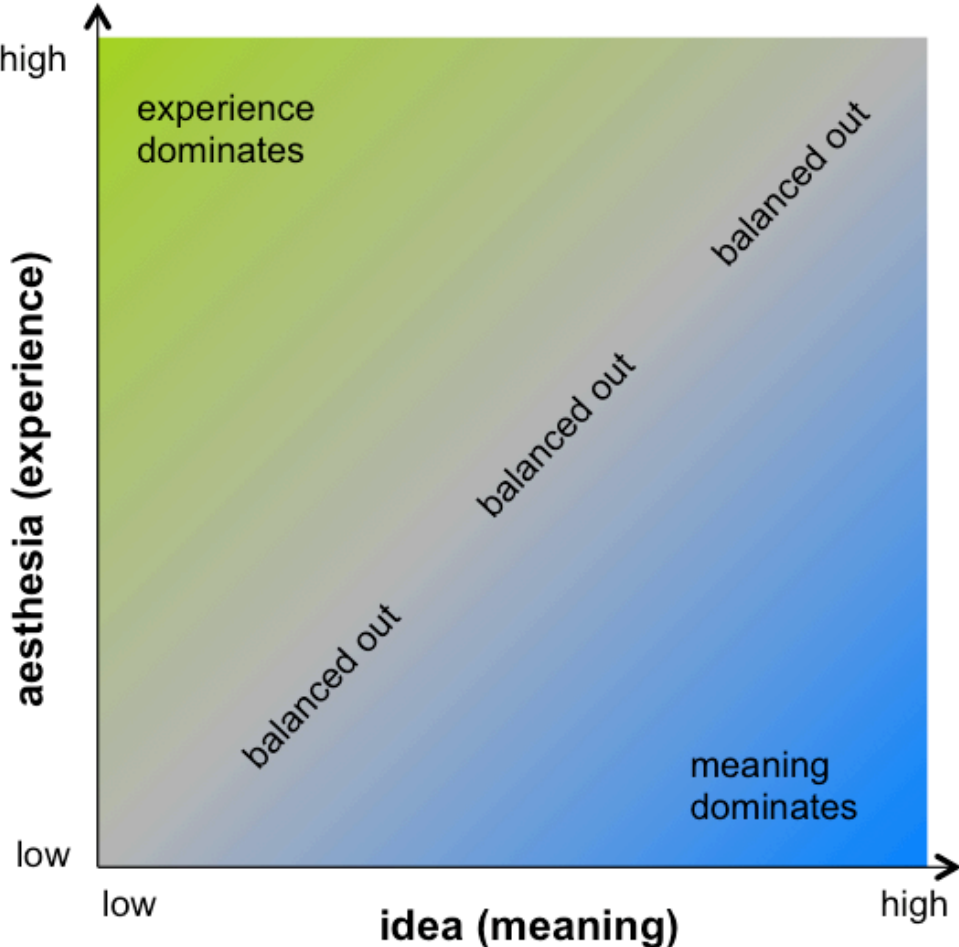


Figure 2. The space of possible relations between meaning and sensations. The contents of an art piece need to be aligned along the gray diagonal.

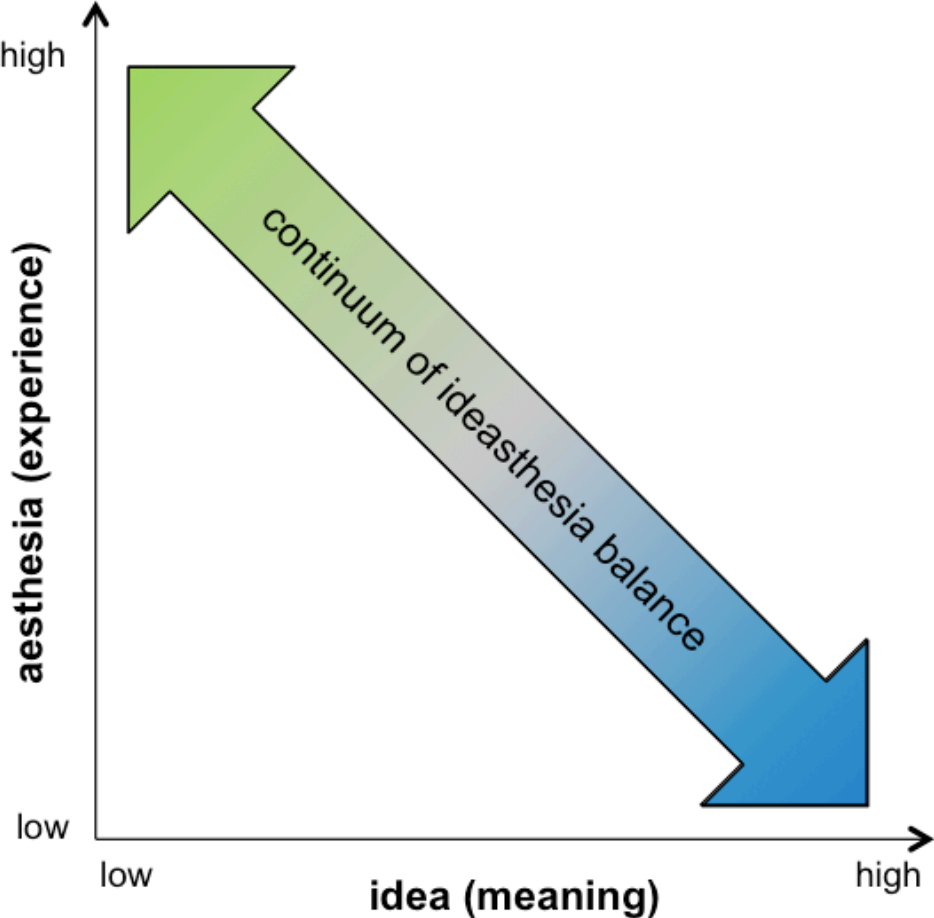


Figure 3. Definition of a one-dimensional continuum of ideasthesia balance.

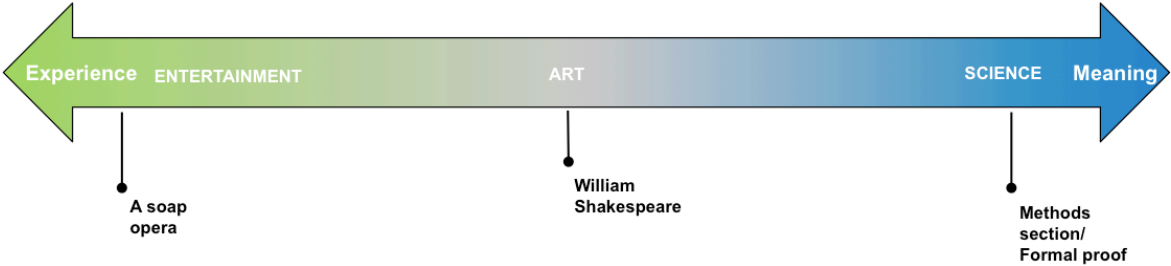


Figure 4. Entertainment, art, and science occupy different positions on the continuum of ideasthesia balance.

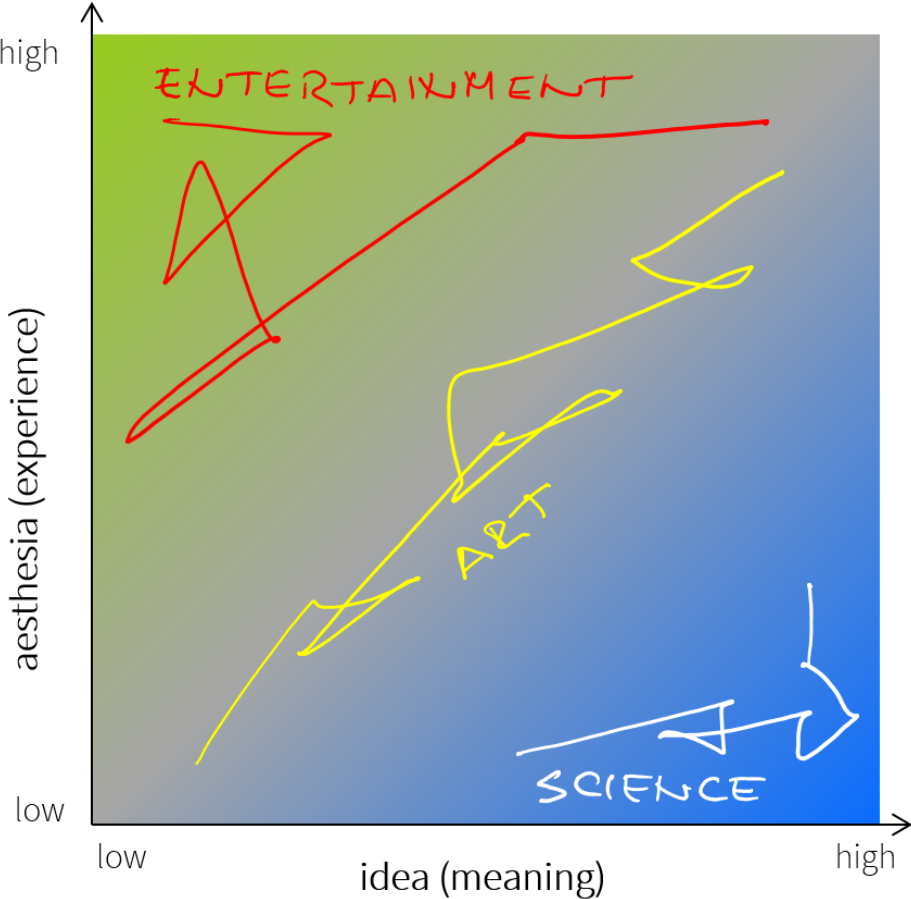


Figure 5. Sensation vs. meaning balance shown for hypothetical pieces of entertainment (red), art (yellow) and science (white), as they are broken down into their components. Only an art piece is consistently located in the gray area.