The Role of Geometrical Representations – Wittgenstein’s Colour Octahedron and Kuki’s Rectangular Prism of Taste

In his writings Philosophical Remarks, the Austrian-British Philosopher Ludwig Wittgenstein (1989-1951) draws an octahedron with the words of pure colours such as ‘white’, ‘red’ and ‘blue’ at the corner and argues: “The colour octahedron is grammar, since it says that you can speak of a reddish blue but not of a reddish green, etc” (Wittgenstein, L. 1980, §39). He uses the word “grammar” in such a specific way that the grammar or grammatical rules describe the meanings of words/expressions, in other words, how we use them in our language. Accordingly, the colour octahedron can also be taken to represent grammatical rules about how we apply words of colour, e.g., that we can call a certain colour “reddish-blue”, but not “reddish-green”. In a different context, the Japanese philosopher Shūzō Kuki (1988-1941) explores in his work The Structure of Iki what the Japanese word “iki” means. This word is often translated as “chic” or “stylistic” in English, but Kuki holds that it is an aesthetic Japanese concept that cannot be translated one-to-one, but encompasses three aspects: ‘coquetry’, ‘pride and honour’ and ‘resignation’. To explain the meanings of the word “iki” and other related words all of which Kuki calls “tastes”, he introduces a rectangular prism as a geometrical representation similar to Wittgenstein’s colour octahedron. In this paper, I argue that the rectangular prism does not solely explain how the modes of Japanese tastes are related to each other, but has a grammatical character. On this score, I suggest that one can also regard this rectangular prism as a description of the grammatical rules of the Japanese language. By appeal to the arguments of both philosophers and in comparison with them, I will not only clarify what they claim by geometrical representations but also examine what role this kind of representation plays as an explanation of the grammar of our language.

Keywords: grammar, colour octahedron, rectangular prism, Shūzō Kuki, Wittgenstein

Introduction

We have several colour systems. The most common one is the so-called Natural Colour Model, which has three pairs of elementary colours (white-black, green-red and yellow-blue). Not only do different languages have different words which are supposed to refer to the same colour – e.g. “blue” in English, “blau” in German, “bleu” in French, “青” (“ao”) in Japanese. For several purposes like colour printing or the sensing display of images in electronic systems, we also employ different colour systems such as the CMY Colour Model consisting of cyan, magenta and yellow as its primary colours and the RGB Colour Model based on red, green and blue. Apart from these models, some ethnic groups employ their own colour systems that conform to
their forms of life: The Eskimos use six different words referring to the word
“grey” in the Natural Colour Model; the indigenous people of lowland
Bolivia, the Tsimané, have fewer terms for colours than Bolivian-Spanish and
English speakers. All these systems have different ways of applying colour
words.

As is the case in colour systems, we can also imagine that there are
different systems in different languages that describe how the character, the
value, the taste of the people is. Such descriptions can also be taken to
correspond to their forms of life.

Ludwig Wittgenstein and Shūzō Kuki are the philosophers who lived in
the same period – in 1989-1951 and 1988-1941 respectively – in different
countries and conduct their investigations on how we use words in our
languages. Wittgenstein deals with our colour system whereas Kuki is
concerned with the system of the Japanese “tastes”, which is to be seen in the
following discussion. In an attempt to clarify our use of words, both
philosophers bring geometrical representations into play. To what extent can
they, however, serve to make our use of words clear?

Goal and Method

This paper aims at shedding light upon what role geometrical
representations play to show how our language system operates. For this
purpose, I consider the investigations of Wittgenstein and Kuki and compare
their explanations on geometrical representations. Interestingly enough, both
explanations have certain commonalities as well as the same kind of
shortcomings although there seems to have been neither correspondence nor
link between both philosophers.

This paper has the following structure. In the first part of the discussion,
I enter into what Wittgenstein says of the use of colour words in our colour
system and the colour octahedron, which he introduces as a geometrical
representation of it. His explanation also embraces some controversial
remarks. I will have a short glance at some interpretations in the secondary
literature although it is here not my intention to solve the problem and offer a
new satisfactory interpretation. In the second part, I consider the rectangular
prism, which Kuki also introduces as a geometrical representation of how one
uses words standing for the “tastes” characteristic of the Japanese. Finally, I
compare the explanations of both philosophers to point out the similarities of
them and clarify to what extent geometrical representations can serve to show
how we use words in our language systems.
Discussion

Wittgenstein

What is the colour octahedron?

Especially in his so-called middle period, Wittgenstein discusses the colour octahedron at several places. According to Tina Wilde and Josef G.F. Rothhaup, “Wittgenstein adapts the model of the colour-octahedron from Höfler” (Wilde, T. 2002, p.284). The person in question is the Austrian philosopher and educationalist, Alois Höfler, and he attempts to explain coloured sight in relation to the psychological effect of colours. It is to note that although Wilde refers to the picture drawn in Wittgenstein’s Philosophical Remarks, it is actually not what he means by “colour octahedron”. Now I give its three examples, which can be found in his other works:

![Wittgenstein's handwriting](image1)

![Wittgenstein, L. 2016, p.16](image2)

![Wittgenstein, L. 1980, p.8](image3)

Pictures of the Colour Octahedron

As the editors of Wittgenstein’s Cambridge lectures from 1930-33, where the second picture stands, point it out and one can clearly see it from the third picture, what Wittgenstein means by “the colour octahedron” can be described as follows:

The colour octahedron has one of the ‘pure colours’ (red, blue, green, yellow, white, and black) at each corner, with white at the top and black at the bottom. [Wittgenstein, L. 2016, p.16, fn.13]

Hence, this colour octahedron can be said to represent a certain kind of relationship between some colour words shown in a geometrical figure. One
can, e.g., say that the mixed colour ‘orange’ stands between the pure colours red and yellow. What does Wittgenstein, however, aim at by this colour octahedron?

The Colour Octahedron as a representation of the Nature of Colour

Let’s see the following passages about Wittgenstein’s notion of the colour octahedron. He writes:

This [= the colour octahedron] is really a part of grammar, not of psychology. ‘People under these circumstances have red after-images’ is psychology. [Wittgenstein, L. 2016, pp.16f.; cf. Wittgenstein, L. 1980, p.8.]

An octahedron with the pure colours at the corner-points e.g. provides a rough representation of colour-space, and this is a grammatical representation, not a psychological one. On the other hand, to say that in such and such circumstances you can see a red after-image (say) is a matter of psychology. (This may, or may not, be the case—the other is a priori; we can establish the one by experiment but not the other.). [Wittgenstein, L. 1975, §1; Wittgenstein, L. 2005, p.322]

Unlike Höfler, Wittgenstein argues that the representation of colour-space is not only rough but also not a psychological one. Although he hints at what a matter of psychology concerning colour words is like, I here focus on the point especially relevant for the present discussion: The representation via the colour octahedron meant by Wittgenstein has an a priori character. In other words, one has not discovered this representation by a posteriori, empirical investigations. Wittgenstein’s colour octahedron is not a result of some psychological experiments, e.g., of colour images people can have under certain circumstances.

Wittgenstein then refers to the investigations of Johann Wolfgang von Goethe about colour concepts to discuss differences between results of experimental investigations and “the nature of colour”. In Remarks of Colour, he argues:

Someone who agrees with Goethe believes that Goethe correctly recognized the nature of colour. And nature here is not what results from experiments, but it lies in the concept of colour. [Wittgenstein, L. 1969, I, §71]

And here ‘nature’ does not mean a sum of experiences with respect to colours, but it is to be found in the concept of colour. [ibid., III, §125]
Thereby Wittgenstein also points out that the nature of colour is neither results through some experiments nor a sum of experiences, but therefore has an a priori character. In this respect, it seems natural to think that Wittgenstein’s colour octahedron is related to this “nature of colour”. To put it simply, when it comes to the representation of the colour octahedron, he does not have experimental investigations in mind. Rather, it is exactly “grammatical” investigations that he conducts as Goethe as well as William James do according to him (cf. ibid., I, §70; ibid., III, §125).

Octahedron and Grammar

As we see it in the passages quoted above, Wittgenstein stresses at several places that the colour octahedron has a “grammatical” character. In the following passage, he gives a reason for regarding it as “grammar”:

The colour-octahedron is grammar because it tells us that we can talk about a reddish blue, but not about a reddish green, etc. [Wittgenstein, L. 2005, p.322; cf. Wittgenstein, L. 1975, §39; Wittgenstein, L. 1980, p.8; Wittgenstein, L. 2016, pp.16f.]

Wittgenstein uses the words “grammatical”, “grammar” in a somewhat specific manner in his later period. He describes what he has in mind by the word “grammar” in the following way:

Grammar explains the meaning of words to the extent that it can be explained. [Wittgenstein, L. 2005, p.32; cf. Glock, H.-J. 1996, p.152]

Wittgenstein also utilises the expression “the meaning of words” in his particular sense. It derives from the central idea in his later period:

In most cases, the meaning of a word is its use in the language. [Wittgenstein, L. 1999, §43].

When Wittgenstein says that the colour octahedron is grammar, it is obviously one of these – most – cases where he also bears the notion of ‘meaning’ as ‘use’ in mind. Consequently, the colour octahedron as “grammar” is supposed to make clear how to use colour words in the system of our language. It is possible in our language, e.g., to talk about a reddish-blue, but not about a reddish-green. To repeat it again, however, this is not a result of experimental investigations, but rather a matter of how we use our language.

One can also see from Wittgenstein’s explanations in what sense propositions about colour words are not empirical. He also regards the
proposition about colour words “The white cannot be darker than the blue or
the red.” (Wittgenstein, L. 1969, III, §2) as grammatical and then even as
mathematical by saying “Here we have a sort of mathematics of colour”
(ibid., §3) or “We have a colour system as we have a number system”
(Wittgenstein, L. 1967, §357). Our colour system has internal relations
between colour words as our mathematical system has internal relations
between numbers, formulas, etc. Wittgenstein takes these relations of colours
in our language to be analogous to the calculation of mathematics whereas
the octahedron shows (a part of) such internal relations of colour words. In
this sense, grammatical propositions about colour words can be considered as
little empirical as mathematical ones.

Different Grammars in different Colour Systems

As there are different language systems, Wittgenstein also brings other
colour systems than ours into play. He says:

Imagine a tribe of colour-blind people, and there could easily be one.
They would not have the same colour concepts as we do. For even
assuming they speak, e.g. English, and thus have all the English colour
words, they would still use them differently than we do and would learn
their use differently.
Or if they have a foreign language, it would be difficult for us to translate
their colour words into ours. [Wittgenstein, L. 1969, I, §13; cf. ibid., III,
§128]

This tribe would have another colour system than ours and we could
possibly not understand what they mean by their words. What Wittgenstein
thereby emphasises again is the difference in the use of language. Our
grammar would then be also different from theirs. Thus, the colour
octahedron he takes as a geographical representation of our grammar could
not explain their grammar but would have to adopt a different geometrical
form unless their grammar could not have any appropriate geometrical
representation.

The “Surveyability” of the Octahedron

How does the colour octahedron serve as a representation of grammar?
Wittgenstein holds that it can make our grammar “übersichtlich”. Misfortunately, one can find different translations of this German word in his
different works. Above all, Peter Hacker levels criticism at this point: “The
terms Übersicht, Übersichtlichkeit, and the related verb übersehen have given
Wittgenstein’s translators much trouble. They have chosen to translate it non-
systematically in conformity with the demands of English style, thereby partially obscuring the significance and pervasiveness of the concept in Wittgenstein’s work” (Hacker, P.M.S. 2007, p.151, fn.6). Then Hacker raises examples of expressions containing the translation of the term in question: ‘command a clear view’, ‘perspicuous representation’ ‘synoptic account’, ‘Survey’, ‘synoptic view’, ‘perspicuity’, ‘capable of being taken in’, which records unsystematic and problematic translations.

Without discussing all these passages containing the word “übersichtlich” or the like, I address Wittgenstein’s following explanation about the relation between the colour octahedron and its “Übersichtlichkeit”: 

The representation via the octahedron is a surveyable [übersichtliche] representation of the grammatical rules. [Wittgenstein, L. 2005, p.322]

Using the octahedron as a representation gives us a bird’s-eye view [Übersichtlichkeit] of the grammatical rules.

The chief trouble with our grammar is that we don’t have a bird’s-eye view [Übersichtlichkeit] of it. [Wittgenstein, L. 1975, §1]

Just for the sake of convenience, I take over the word “surveyable” as the translation of “übersichtlich” as Häcker construes it. This term is often discussed as fundamentally significant for Wittgenstein’s philosophy in his later period especially in the context of §122 in the Philosophical Investigations, where this term also appears. However, instead of entering into interpretations of this §122, I will rather concentrate on the necessity of the surveyability of the grammar, which is pointed out in the citations above, and also draw attention to the following aspect of the colour octahedron, which Wittgenstein formulates in another place:

In fact, grammar can indeed sometimes be given through geometrical bodies, e.g., in the case of the colour octahedron. This is a perspicuous [übersichtlich] representation of rules of grammar, but it does not do away with the need for the rules. It only simplifies the rules and makes them more perspicuous [übersichtlicher]. [Wittgenstein, L. 2003, p.135; cf. ibid. p.141]

To encapsulate the ideas in all these passages including this quote, one can say that geometrical representations such as the colour octahedron can make the grammar of words in our language system more surveyable, but they are not sufficient for the thorough clarification of our grammar. Beyond such a geometrical representation, it is necessary to adequately grasp how the grammatical rules operate.

In Wittgenstein’s other discussions, it is clearer to see this point, i.e., that the colour octahedron cannot explain enough how the grammatical rules of
our colour words look even if it can simplify them. In *Remarks of Colour* part I §§16-33, he argues that white is not a transparent colour and in this sense unique and different from other colours such as green. Frederik Gieringer then interprets him by referring to some remarks (cf. Wittgenstein, L. 1951, III, §197) in the way that he, later on, got unsatisfied with the idea of the colour octahedron as the representation of our grammar. If and to what extent he is not satisfied seems to me still discussable, but I at least agree that the colour octahedron alone – without further details – does not explicate that one cannot talk about “transparent white” in the system Wittgenstein bears in mind, therefore, not fully explain how to use the word “white” in this language system.

**Does the Octahedron belong to Grammar?**

In the secondary literature, it is even controversial whether the colour octahedron after all serves as a representation of our grammar. Gordon Baker has a negative attitude:

In consequence, no verbal formulations of grammatical rules (and no assemblage of grammatical rules) can properly be called ‘a perspicuous representation of grammatical rules’, and conversely the colour-octahedron cannot properly be viewed as a mere compendium of the combinatorial rules for colour words. [Baker, G. 2004, p.24].

According to Hacker, Baker claims that the colour octahedron is no more than a subordinate and supplementary representation:

Baker held that the colour-octahedron is meant to be a second-order representation of the grammar of colour-words, i.e. not an expression of the rules for the use of colour words at all. Accordingly, the colour octahedron does not itself belong to grammar [...].” [Hacker, P.M.S. 2007, p.119, fn.23]

Hacker criticizes Baker’s interpretation by appeal to Wittgenstein’s remark quoted above: “The colour octahedron is grammar”. Here it is not my aim to examine whether it really belongs to grammar. Instead, I just notice that such geometrical representations as the colour octahedron might embrace this controversial point.

**Shūzō Kuki**

Now I proceed to what Kuki says about his example of geometrical representations. Of course, he neither deals with ways of applying colour
words nor uses Wittgenstein’s terms such as “grammar”, but rather examines certain words describing the Japanese character. Yet, I think Kuki’s consideration shares considerable commonalities with Wittgenstein’s one and is worth calling attention to for the clarification of what role geometrical representations play in the system of language.

Kuki’s Analysis of *iki* as a “Phenomenon of Consciousness”

Kuki’s investigations aim at clarifying the structure of *iki*, which is characteristic of the Japanese. Similarly to Wittgenstein’s contention, he also points out differences in the meanings of words in different languages. Kuki thereby explains how specific the meaning of the word "iki" is. He says:

If words describing natural phenomena already differ in this way [e.g., in the case of “sky” in English, “*ciel*” in French, “*Himmel*” in German] among languages, we cannot hope to find precise counterparts in one language for words describing specific social phenomena in other languages [Nara, H. 2004, p.14].

These specific social phenomena include the phenomenon the word “*iki*” describes and can also have difficulties of translation into other languages. Then Kuki continues:

For a word to have a consistent meaning and value to a people, a linguistic path must be always open there. The fact that the West has no word corresponding to *iki* is itself evidence that the phenomenon of consciousness that is *iki* has no place in Western culture as a certain meaning in its ethnic being. [ibid., p.59]

Kuki stresses the importance of “a linguistic path” where words have consistent meanings and value to a people. I understand this expression in such a relation to language that the meanings of words and expressions can be clear only inside of the language to which they belong. In my opinion, the word “meaning” in Kuki’s sense is also concerned with our use of words or expressions, as Wittgenstein holds.

What do Kuki’s philosophical investigations on the notion of “*iki*” in his linguistic sense look like? He claims it is necessary first to make clear two kinds of the features of *iki* as a “phenomenon of consciousness”. He writes:

To comprehend *iki*, which manifests itself as meaning as a phenomenon of consciousness, we must first recognize the **intensional features** constituting the meaning of *iki* and clarify their semantic content. We will then explicate **extensionally** the distinction between the meaning of *iki*
and the meaning of related words in order to differentiate the meaning of *iki*. [ibid., p.18; emphases in original]

Kuki calls what will get clear from the explications of these two kinds of features a “phenomenon of consciousness” and these explications are needed for the “comprehension” of *iki*. The word “comprehend” has a specific meaning generally in Kuki’s writings according to the editor of his book *The Structure of iki*, Hiroshi Nara:

This usage [of “comprehend”] is based on the fact that, in other published writings, Kuki was quite strict about the distinction between ordinary understanding, including the sort of knowledge possible in the natural sciences, and the sort of comprehension that makes it possible to understand historical and cultural phenomena, including ideas, intentions, and feelings. [ibid., p.62, fn.14]

Accordingly, the comprehension in Kuki’s sense is different from the sort of knowledge possible in natural sciences and cannot thus, as I understand, be reached through some experimental nor empirical investigations. Rather, Kuki’s analysis is directed towards the other kind of comprehension in the quote. This is what amounts to the historical and cultural analysis of how several words including “*iki*” are used by Japanese people in many phrases in some Japanese novels, some Japanese theatres, their ordinary lives, etc. In this regard, I think his investigations are actually so little experimental and empirical and so much grammatical as Wittgenstein’s ones.

Kuki takes it to be necessary to comprehend *iki* as a “phenomenon of consciousness” and its “objective expressions”, claiming that the understanding of the former is a prerequisite for that of the latter. For this reason, I first enter into the examination of *iki* as a “phenomenon of consciousness”.

**Intensional features of *iki***

Let’s look into the intensional features constituting the meaning of *iki*. Kuki explains its “semantic content”, as he calls it (ibid., p.18), briefly and succinctly:

*Iki* stands in an inseparable internal relationship to the idealism of *bushido* [‘the way of the samurai’] and the unrealism of Buddhism. *Iki* means that *bitai* ‘coquetry’ that has acquired *akirame* ‘resignation’ lives in the freedom of *ikiji* ‘pride and honor’. [ibid., p.60]
One might well say that the Japanese character of *eki* lies exactly in its properties of Buddhism as well as bushido representing the Japanese culture. Then, one can also see a difference between *eki* and the colours Wittgenstein addresses: *eki* is not a pure property unlike pure colours such as ‘red’, ‘white’, but has three distinguishing features ‘coquetry’, ‘resignation’ and ‘pride and honour’ and is a kind of composite.

**External Features and the Rectangular Prism of Taste**

Now we consider the external features of *eki*. These features concern the internal relation of different words. Then Kuki says “[…] we will clarify the extensional meaning of *eki* by examining and distinguishing other terms related to it” (ibid., p.24). He calls *eki* and these other related terms “tastes”, but I think this naming is also used in a somewhat specific way, i.e., in the sense of “aesthetic judgments” as Immanuel Kant uses this word “tastes” in the *Critique of Judgment*. To explain the internal relation, Kuki introduces a rectangular prism as a geometrical representation of the meanings of the words of tastes:

![Figure. The rectangular prism of taste](ibid, p.32)

Furthermore, Kuki goes into the details:

[…] the two squares at the top and the bottom, corresponding to the determinants for the various modes of taste […] represent the two domains of the public. [ibid., p.32]

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1In the original, Kuki uses the Japanese word “趣味” (*shumi*) and Nara translates it as “taste”. Note that the German word “Geschmack” in the *Critique of Judgment* is not uncommonly translated as “taste” and “趣味” and it is also the case in the time Kuki lived in.
In the text, Kuki explains explicitly what each of the two different domains is like, but it is important in the present context just to note that tastes belonging to two different domains can’t stand together. It is also in the same domain that the words of taste connected by diagonal lines in the figure oppose each other: One cannot have jōhin and gehin at the same time and in this sense one can formulate: jōhin ↔ gehin; hade ↔ jimi; iki ↔ yabo. Yet, he adds that only shibumi does not have an obvious opposite (cf. ibid., p.24.).

Through the rectangular prism, Kuki describes the character of the use of the words concerning iki as follows:

It is thought that jōhin belongs to the domain of the public of general human being and, as such, does not interact with coquetry. [ibid., p.25]

[...] since iki encompasses aspects of ikiji ‘pride and honor’ and akirame ‘resignation’, iki is understood as a superior form of taste. When we look into the relation between iki and jōhin, we find they have superior taste and positive value in common, even as they differ with respect to coquetry. [ibid., p.26]

Consequently, Kuki doesn’t simply claim that iki by itself is incompatible with jōhin (‘elegant’), jimi (‘quiet’) and hade (‘flashy’), but iki encompasses three different aspects, which are incompatible with these three tastes. Due to such internal relations of words of tastes the rectangular prism represents, I think one can also say of the taste system as “mathematics of taste” as Wittgenstein does in the case of the colour system.

The “Objective Expressions” of iki and its Relation to the Grammar

Now I turn to the analysis of objective expressions of iki. As already seen, Kuki places importance and priority on the analysis of iki as a phenomenon of consciousness and even says that one has to fail to grasp the ethnic specificity of iki in the area of objective expression if one only focuses on them apart from the viewpoint of the phenomenon of consciousness (ibid., p.18). However, the analysis of the objective expressions is undoubtedly concerned with the use of the word “iki”. I think this analysis is also inevitable for the clarification of its grammar and sheds more light upon it.

At this stage, Kuki explains objects in our daily lives in which iki is expressed, e.g., in certain ways of talking, posture, gesture, certain design – e.g. parallel lines –, in certain colours – grey, brown and blue – (cf. ibid., pp.35, 41 and 47). This aspect also characterises the use of the word “iki”. In my opinion, it is doubtful if the rectangular prism of taste alone represents these objective expressions, therefore, fully represents how to apply the word “iki”.

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Besides, I hold that the same kind of controversy between Baker and Hacker applies to the rectangular prism of taste. In other words, one can ask if this geometrical representation really belongs to grammar or it is nothing but a subordinate one. For it is not a more verbal formulation than the colour octahedron and thus can’t be viewed as a “surveyable representation” according to Baker.

**Conclusion**

In summary, one can state the four following points. Firstly, it can be said from Wittgenstein’s point of view that, like Goethe and James, Kuki also does grammatical investigations of the words of taste including “iki” and he uses the rectangular prism for his analysis similarly to Wittgenstein’s colour octahedron. Secondly, one can conduct grammatical investigations in the system of colour as well as other systems such as the system of taste. Thirdly, different cultures can have different systems of taste and different geometrical representations depicting them, as is the case with the system of colour.

The fourth point is the most essential in this paper. Indeed, geometrical representations such as Wittgenstein’s octahedron and Kuki’s rectangular prism can make the grammar of a given language more surveyable and simplify it. Nevertheless, it is still questionable if it itself belongs to the grammar. In this regard, I state that a geometrical representation is no more than “a rough representation” [Wittgenstein, L. 1975, §1; Wittgenstein, L. 2005, p.322]. In other words, our grammatical rules in our language system are much more manifold than they can be geometrically represented regardless of the discussion as to whether geometrical representations belong to the grammar or not.

**References**


