

## Kinds of ‘thing’ that are named by colour names

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### ABSTRACT

In this paper I propose that there are at least eight different kinds of thing that are named by colour names. I am calling them: *Conventional Colour*, *Substance Colour*, *Formula Colour*, *Spectral Profile Colour*, *Psychophysical Colour*, *Inherent Colour*, *Identity Colour* and *Visual Colour*. I further propose that the means used to establish the identity of a colour determines what kind of thing it is that is being named. I will describe these different ‘kinds of colour’ and will argue that recognition of the differences can help overcome confusion and misunderstanding.

### 1. INTRODUCTION

I would like to begin by showing you a painting which I have commissioned specially for this occasion. It is the work of Niamh Doherty/Dillon Spicer\* who is the daughter/son of one of my colleagues and who is five years old. This is to be an illustration for an episode from one of Joyce Grenfell’s monologues in which she plays the role of a nursery school teacher. The scene is a period of Free Activity and the teacher has a visitor. To divert attention from some embarrassing behaviour the teacher introduces her visitor to one of the ‘good’ children (Grenfell 1977, p 33): ‘And this is my friend Caroline, and Caroline is painting such a lovely red picture, aren’t you, Caroline? I wonder what it is? Perhaps it’s a lovely red sunset, is it? Or a big red orange? It’s a picture of Mummy!’

In this story what kind of thing is it that is ‘red’? ‘A lovely red picture’. As an adjective, agreeing with the noun ‘picture’, ‘red’ seems to be referring to an objective property of the picture. But there is nothing in objective redness that can be ‘lovely’. Caroline’s picture can only be lovely when someone looks at it, has a subjective experience of redness, and enjoys that experience. So ‘red’ here seems to mean two different kinds of thing: an objective property and a subjective experience.

Philosophers cannot agree about the nature of colour. The various positions in the debate are described by Alex Byrne and David Hilbert (1997). Rather than argue in favour of one position or another it is more useful to accept Barry Maund’s idea of a pluralist framework for colour (Maund 2001). Colour names are used in general and in specialist conversation to mean more than one different kind of thing. A pluralist framework can accommodate these different kinds of thing. But what is a ‘thing’? A ‘thing’, in English, can be an entity, an action, an idea, an event, a quality, a circumstance, an object, even a person (Thompson 1995). It is an imprecise but versatile word.

In this paper I propose that there are at least eight different kinds of thing that are named by colour names. I am calling them: *Conventional Colour*, *Substance Colour*, *Formula Colour*, *Spectral Profile Colour*, *Psychophysical Colour*, *Inherent Colour*, *Identity Colour* and *Visual Colour*. I further propose that the means used to establish the identity of a colour determine what kind of thing it is that is being named. I will allow myself considerable latitude in what should count as a ‘colour name’ for the purposes of identifying a colour. ‘Red’ is clearly a colour name, but I also include numbers as ‘names’ and letter/number notations such as 1090 R and 5R 5/14. Recognition that there are different kinds of thing that are named by colour names can help overcome confusions and misunderstandings.

### 2. DIFFERENT KINDS OF COLOUR

Before I started I distributed some colour chips. You should each have a colour sample from the *Dulux Colour Specifier* range of paints produced by Dulux Australia (Dulux 2000). You will see that

it is identified by the name *Cuddlepote*<sup>\*\*</sup>. I bought a small pot of this paint and painted a panel. Here it is. Look at the sample in your hand and look at the panel. Are they the same colour? You know you have a sample of *Cuddlepote* in your hand because you can read the name, but how could you know that this panel is also '*Cuddlepote*'? And what would 'being the same colour' mean?

## 2.1 Conventional Colour

The teacher knew that Caroline's painting was red simply by looking at it; she had an idea of what 'red' should look like. Someone familiar with Dulux Australia's colours might have an idea of what *Cuddlepote* should look like. This is my first kind of colour; I am calling it *conventional colour*. The commonly held concept of colour conflates the physical with the visual. Red is the name for the paint that Caroline is using as well as being the name for the visual experience that the teacher has when she looks at the painting. In the same way we could say that *Cuddlepote* is the name for the paint as a physical substance as well as being the name for the appearance of the paint. The identity of some thing as a *conventional colour* is established when someone uses a name like *Cuddlepote* to mean a physical property which can be recognized by looking at it.

## 2.2 Substance Colour and Formula Colour

A physical substance is not the same kind of thing as its appearance. Peter McGinley (2001) has described the process of research and development which led to the creation of the *Dulux Colour Specifier*. When I asked him what it is that a name like *Cuddlepote* names, McGinley's first response (2001, pers. comm.) was that it is a name for the paint formula – a particular combination of base and tinters; it is the name for the paint as a physical substance. If that is the kind of thing that is named as *Cuddlepote*, and if the make-up of the substance is determined by chemical analysis, *Cuddlepote* is the name for a *substance colour*.

Closely related to *substance colour* is *formula colour*. Chemical analysis might not be needed. If the paint formula is known as a particular combination of base and tinters, and the identity of the paint is established in terms of this formula, *Cuddlepote* is the name for a *formula colour*. The output of the glowing phosphors on a computer screen would also count as *formula colours* where a colour's identity would be established by the relative output of the red, green and blue phosphors. When people refer to RGB values on the computer screen, or to CMYK values in printing, they are also referring to *formula colours*.

*Cuddlepote* is supposedly the name for something precise, if not unique. Although the name appears on the sample in your hand, as well as on the pot of paint, as *substance colours* and *formula colours* they are not the same. A nitrocellulose lacquer is used to produce the sample card, while the paint is produced by adding measured amounts of tinting pigment to a base of titanium dioxide in a latex binder (McGinley 2005, pers. comm.). Chemical analysis would show that the substance on the sample card is not the same as that on the painted panel and the formulae are correspondingly different.

According to McGinley, *Cuddlepote*, as a unique 'colour', is established in the original paint formula. In a more recent conversation, McGinley (2003 pers. comm.) told me that definitive samples of *Cuddlepote*, and all the other new colours, are kept in storage for purposes of future reference. If new improved tinters were to become available it would be possible to measure that definitive sample and derive a new formula for a paint to match the sample, but this newly formulated paint would not have the same *substance colour* or *formula colour* as the original definitive *Cuddlepote*.

## 2.3 Spectral Profile Colour

The sample card in your hand and the painted panels would each absorb and reflect the different wavelengths of light in a distinctive way. This could be measured with a spectrophotometer and represented in a graph. Such a graph could be seen as a spectral reflectance 'profile'. Because they can be used to identify colours I include spectral reflectance graphs as 'colour names'. Instruments can also be used to derive other kinds of spectral profiles: radiation profiles for light sources and transmission profiles for transparent or translucent materials. In each case we are dealing with *spectral profile colour*.

## 2.4 Psychophysical Colour

Since they have different *substance colours*, the sample card and painted panels would almost certainly have different *spectral profile colours*. Nevertheless, we might look at them all side by side and see no difference; they might look the same. Where the spectral profiles are different but the appearance is the same we are dealing with colours that are metamerics, colours that look the same under certain circumstances but which may no longer look the same under different lighting conditions or when viewed by someone else.

Use of a colorimeter establishes chromaticity co-ordinates which pin-point a position on the chromaticity diagram. If the sample card and painted panels were measured by a colorimeter, and given the same chromaticity co-ordinates, it would mean that the colours would be judged a match when seen under the specified light source by a 'standard observer'. Since chromaticity co-ordinates serve the purpose of identification I include them, also, as 'colour names'. With colorimetry we are in the domain of psychophysics which links the physical world with phenomenal experience. If the identity of *Cuddlepot* is to be established with a colorimeter the name will refer to a *psychophysical colour*. *Substance colours* may be different, but *psychophysical colours* may be the same.

## 2.5 Inherent Colour

If colours are understood to be visual experiences rather than physical properties, their identification must depend on the people who have the experiences. Two surfaces with the same *psychophysical colour* can be expected to look the same when they are placed side by side. A *Cuddlepot* colour chip can now be used to establish the identity of other surfaces. If you are satisfied that the *Cuddlepot* sample looks to be the same colour as my painted panel when I place the sample on the panel the two surfaces have the same *inherent colour*, a term used by Karin Fridell Anter (2000). The difference between *psychophysical colour* and *inherent colour* is that *psychophysical colour* is established by using a measuring instrument and *inherent colour* is established by visual comparison of surfaces when they are placed in direct juxtaposition.

## 2.6 Perceived Colour

Surfaces may have the same *inherent colour* but still they may not look the same. A wall that has been painted with *Cuddlepot*, when seen from across the road, and my painted panel, when seen from across the room, may not look the same as a *Cuddlepot* paint sample held in the hand. Faced with this fact, Fridell Anter makes a distinction between *inherent colour* and what she calls *perceived colour*.

The phenomenon of simultaneous contrast offers the simplest way of making the distinction between *inherent colour* and *perceived colour*. I have cut windows in this piece of card which is half yellow and half violet. If I place the card in front of my painted panel so that you see two square areas of colour, one against a yellow background and the other against violet, the two squares no longer look the same – the *perceived colours* are different. But direct comparison with a colour sample would show that they still have the same *inherent colour*. We could say that this is due to an illusion, but we could also say that we are dealing with two different kinds of thing.

## 2.7 Identity Colour and Visual Colour

In the case of Fridell Anter's *perceived colour*, Monica Billger (1999) makes a further distinction between the overall colour impression and local variations. Billger calls the overall colour impression the *identity colour*. The local variations I have chosen to call, simply, *visual colours*. Because of the potential for confusion, I prefer not to use the term *perceived colour*. I have painted all the surfaces of this cube with *Cuddlepot*. If it looks as though the cube has been painted with the same paint all over we would say that the cube has one *identity colour*. However, each visible plane clearly looks different; each plane has a separate *visual colour*.

Individuals may not agree over what name or number should be given to an *identity colour* or a *visual colour*. People might be content to describe this cube simply as 'brown', but if they wanted to be more precise, and they were familiar with Dulux Australia's new colours, they might argue over whether it

is *Cuddlepote* or *Coyote*, *New Penny* or *Nomad*. It would require a majority opinion to establish the 'correct' name. The *Natural Colour System* (NCS) is unique as a colour order system for *visual colours*. While it is true that NCS colour samples can also be used to establish the *inherent colours* of surfaces, the samples themselves are to be understood only as a means of illustrating the system; the original notation reflects the consensus judgements of a very large number of people viewing the samples against a white background under a standard light source (Hård & Sivik 1981, p 137).

### 3. CONCLUSION

In the built environment, as in the natural world, we derive information from colours. Our interpretation begins with the visual experiences and the exact experiences we have depends variously on the work of artists, designers, scientists and technologists. As colour problems are tackled, by people working alone or in collaboration, it is helpful to recognize that colour is not one single kind of thing. The different kinds of thing, that concern different kinds of people, and which are identified by colour names, may be closely related but they are, nevertheless, distinct.

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\*\* *Cuddlepote* and *Snugglepote* are both names of colours in Dulux Australia's new range. They are derived from the names of the gumnut babies Snugglepote and Cuddlepote, two characters in a children's book by the Australian author May Gibbs. The colours are both browns – 'gumnut colours'.

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