

DR ZENA O'CONNOR:

Thank you, and good morning. My talk is about improving visual literacy in the built environment. We all know what visual literacy is, but environmental visual literacy is the ability to be able to make use of those visual cues inbuilt in the built environment. These are important for people with declining visual and cognitive capacity.

Environmental visual literacy occurs at the interface between design and users, and it relies on compatibility between the two. It relies on the visual and cognitive capacity of users, and it relies on design, environmental design that support, not hinders users.

So, with visual perception, we literally construct what we see. It relies on visual cues, it relies on memory and the level of cognitive processing. So, that sentence, I'm sure that you can read it, is missing letters, and it relies on our ability, not just to read the sentence, but our capacity to read those words, read the gaps, fill in the gaps, and we do that with memory and cognitive processing.

So, visual impairment, it is problematic for large proportions of the population in New Zealand and in Australia, and around the world. Irreversible vision loss is twice as common as dementia, which is a little bit scary. In terms of people aged 65+, as we have already heard, there is a large proportion of the population and a growing proportion, thanks to the baby boomers, quite a large proportion have a disability of some sort.

Visual impairment is amongst those disabilities. It might be macular degeneration, glaucoma, cataracts and so on, but the bad news is that luminance contrast and colour sensitivity actually declined from about the mid-20s onwards. Everybody in this room is starting to experience that, obviously, at all levels, but we all suffer from contrast sensitivity loss or and colour sensitivity loss.

In terms of dementia, we are all familiar with the memory issues that people with dementia experience. But there are also a range of other sensory challenges that people with dementia experience, and they include visual and spatial perception issues.

As the illness progresses, they have difficulty perceiving foreground from backgrounds, they have trouble putting a cut down onto a table, unless there is a level of strong contrast there. They have a number of visual as well as auditory and other issues.

OK, so we have talked about that disconnect between environmental design and evidence-based research. Unfortunately, they still relatively common in health care and aged care. A lot of the focus is on aesthetics, and often, it is for the decision-makers rather than the actual users.

There tends to be, in Australia, a preoccupation with quality of care and compliance, rather than quality of life. And, unfortunately, aesthetics can't mask poor environmental design. In terms of that incompatibility between design and users, that becomes really noticeable when we are looking at poor design, for example.

On the left-hand slide, we have a garden path that is overgrown, it is in a retirement village. They had rail on the right hand of the side... It is hard to see the path, even for people with good vision.

We have a chair on carpet in a retirement village. Because of the patterns on the chair and carpet, it is hard to determine where the chair and is an carpet begins. Imagine trying to do that if you have visual issues or dementia issues.

So, in terms of functional environmental visual literacy, which is where you can literally read and make sense of those visual cues in the environment, functional environmental visual literacy dovetails really neatly with universal design, age in place initiatives, as well as design guidelines of people with dementia.

In terms of universal design outcomes, colour contrast strategies that support functional environmental visual literacy can accommodate for individual preferences. I will talk about that a bit later. They can minimise hazards and communicate information effectively about the environment, irrespective of sensory abilities.

In terms of design guidelines for a dementia-friendly environment, again, colour contrast strategies can contribute to functional environmental visual literacy, in a number of different ways, especially things like the unobtrusive inclusion of safety features in terms of visual cues for orientation and where to find them.

So, colour contrast strategies. They can support functional environmental visual literacy and also that user interface for people with declining visual capacity, people with declining cognitive capacity. They can support in orientation, they can support engagement and way-finding, as well as support in daily activities.

I will tell you why. How do they do this? Colouring contrast play key roles in visual perception. First up, we have saccades, which are the tiny movements that the eye makes. As I'm looking at you and you are looking at me, our eyes are doing these little scanning movements.

What catches the attention of a cicade? Obviously, we can have everything in an environment moving, but we could, in fact, increase contrast, and that will catch the attention of. Strong dark and colour contrast, not only attract the detection.

Colour has three attributes - hue. Hue is that category of colour, where we refer to a colour as being green, pink purple. The second attribute is total value, that is the data is a lightness. And then, there is saturation, which is the level of chroma. Colour has those three attributes. We can create contrast within all three of those three attributes.

A lack of effective colour contrast can have adverse consequences. Design details can be distinguished. Where there is a lack of perceived detail, things could become unsafe and hazardous. In terms of visual complexity, if there is too much in the way of patterning, contrast, too much colour, it hijacks the attention. Again, too many visual distractions, and an environment becomes unsafe and hazardous.

Both of those images of a retirement village environment. And they are both hugely visually complex, a lot of visual noise going on there.

Colour can definitely improve and encourage engagement. Institutional colours have very

negative connotations. Institutional colours are seen as being sterile, cold, uninviting, inhospitable and political. We can replace those with colours that can humanise the environment. Well, they make the environment more welcoming and friendly.

The use of multiple colours is preferable, because these tend to convey impressions of diversity, inclusion and acceptance of other cultures. Look at some of the multi-coloured logos that we are familiar with, like Google, it is all about making it feel welcome, included.

The idea is to use familiar, home-like colours, to allow for the colour preferences of users, irrespective of the institution or the facility, and to allow for a variety of hue, saturation and tonal variations.

Colour and contrast can also help with orientation. Colour can be used to make landmarks at certain points. Colour coding can be used to differentiate one area from another.

Here, we have got aged care facilities. On the left-hand side is the dining area, and it has a yellow feature. So, residents automatically note that the yellow wall at the end of the corridor is the dining room, and they can orientate themselves towards that.

On the right-hand side is a corridor to residents rooms, and each door has a different colour, and there are also brightly coloured landmarks orientation.

Graphics and minerals have been used here to create key landmarks at key points. Very effective, especially for people with dementia.

Here are some examples of great landmarks using colours and super graphics. Way-finding. Colours are great devices for creating pathways and roots throughout and environment.

On this side is an image of Alvar Aalto's sanatorium from 1933, and he used yellow pathways throughout that sanatorium. It is not a new idea.

On the left-hand side, we have an airport, and it has colour-coded pathways for arrivals and departures, as well as the use of large-scale icons to let you know where taxis buses and baggage claim is located.

On the right-hand side of that is an airport in Spain, which has a beautifully colour-coded interior structure, which is aesthetically pleasing, but it will also let you know where the New Zealand hub is, or the Qantas hub, etc. I don't think there is an Air Boston.

In terms of the central province of daily activities, very strong colour contrast is ideal, and it creates very clear delineation between doors and walls, doors and door handles, walls and handrails, and so on.

Here, we have got very clear delineation, in terms of handrails on a train, and also photo-luminescent paint in a fire stair, which glows at night.

Here, we have a delineation between toilet seat and toilet.

White plates on a white table are difficult for people with dementia to see. Colour camouflage. Colour could be used to divert attention as well. On the left-hand side is a doorway which has been neatly colour camouflaged to indicate that it is a no access area.

Effective colour contrast strategies, first up, they encourage engagement, they can mitigate negative response to the environment, they can attract attention and create focused, they can create very clear delineation between important details in the environment, and my recommendation is to use saturated rather than pastel colours.

It's also best to avoid equiluminance. On the side, we have Claude Monet's painting. If you reduce it to a different saturation level it is very hard to see the sun. So, you want to avoid pastel colours and you want to avoid equiluminance. It is best to use 70% plus saturation.

And there are websites that let you determine different colours and see whether you meet the criteria. Different paints, know what the LRP is, the light reflective value, so you can automatically compare and contrast the colours there. There are environmental visual literacy checklists that we have developed, so email if you would like that.

How much time have I got? No time. Alright, I will skip through this, and I would just like to say thank you very much. Thank you to Resene for sponsoring this trip and for contributing to this symposium and thank you very much for your time. (APPLAUSE)