

21st Century citizens are faced with the need to remember numbers of PINs (Personal Identification Numbers) in order to do their daily business, and they often have difficulties due to human memory limitations. One way of helping them could be by providing cues during the PIN entry process. The provision of cues that would only be helpful to the PIN owner is challenging because the cue should only make sense to the legitimate user, and not to a random observer. There is some evidence from the literature that colour has a memorial effect so we decided to carry out an experiment to determine whether colour would assist users to remember their PINs.

We added colour to a PINpad to provide an implicit cue to PINpad users and launched a Web experiment where half the participants were provided with a colour-coded PINpad and the other half had a normal gray PINpad. We tested memory of the PIN after a week and then after a month. The intriguing finding was that colour actually impaired PIN retention. Four possible explanations for our findings are suggested. The first is that colour is remembered by verbally, which adds an extra level of processing rather than assisting memory implicitly. The second reason is that colour is primarily used by the visual system to demarcate objects. Colour is then associated with particular objects – and a numeral in a coloured box is not an object *per se*. In the third place, numbers are logograms, which have a complex meaning and are not simple visual objects to be associated with a particular colour. Finally, many people have pre-existing colour-number associations and these could conflict with those provided by our PINpad. Colour should therefore be avoided on PINpads as it hinders rather than assists the user.