

Differentiation between
and preference for colours
and
colour combinations
of hard gelatin capsules
by the elderly

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Differentiation between and preference for colours and colour combinations of hard gelatin capsules by the elderly^(1,2)

Papers summarised by
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Drug safety is strongly related to correct use of a pharmaceutical product. Although other factors also play a part, correct use is heavily dependent upon whether the patient can identify the product, and how he perceives the likely therapeutic benefits.

Elderly patients on polymedication (several different drugs to be taken every day) and whose vision is impaired can find it difficult to differentiate between drugs. Poor differentiation leads to uncertainty, which may in turn reduce patient compliance and so diminish the potential for treatment benefit.

As it is well known that the right colour or colour combination can contribute positively to patients' identification of a pharmaceutical product and their expectation of beneficial treatment effects, it was decided to carry out a study of colour perception in elderly subjects.

Since the importance of identifying the most appropriate colours or colour combinations for use in different therapeutic indications is likely to increase with advancing age, only people of 65 or over were included in the trial.

The study involved 50 subjects (34 women and 16 men aged 65-92; mean age, 74 years) who were taking at least two drugs a day without assistance (typically, 2-6 drugs per day) and who were suffering age-related visual impairment.

Ten different colours were chosen for the study (white, yellow, orange, red, pink, light blue, dark blue, green, brown, purple), and applied to capsules either as a single colour (monochromatic) or as a combination of two (bichromatic).

The studies performed included the effect of low light intensity (40W/60W) and surface colour (white/brown) on colour recognition; the role of gen-

der and personal colour preference in colour selection; subjective expectation of the physiological and emotional effects of colour on organ functioning, motor function and mood (treatment effects). Another aim of the study was to investigate if colour selection is influenced by previous experience of treatment for a (chronic) disease. For example, will a patient being treated for diabetes select a different colour/colour combination from that chosen by a healthy (untreated) subject?

The results showed that being able to differentiate between monochromatic colours depends on the intensity of the available light and the surface colour used. In particular, subjects found it difficult to differentiate between the colours brown, orange, purple and pink in conditions of low light intensity (40W) or when a dark surface colour (brown) was used.

From 45 colour combinations the subjects were asked to choose 10 that they found easy to distinguish and 10 that were difficult for them. Over 50% of the subjects selected white/red, yellow/red and white/light blue as easily distinguishable, while more than 50% found brown/purple, green/brown, dark blue/purple, white/pink, yellow/pink and dark blue/brown difficult to distinguish (*Table 1*).

With monochromatic colours no gender-related difference was observed. However, with colour combinations (bichromatic capsules) men were significantly more likely than women to rate those that included pink as more difficult to distinguish; this may, however, be an artefact of social and cultural factors.

Personal colour preference didn't appear to play a part in colour differentiation and selection.

Easy to distinguish	%	Difficult to distinguish	%
White/red	60	Brown/purple	84
Yellow/red	54	Green/brown	76
White/light blue	52	Dark blue/purple	74
Red/dark blue	44	White/pink	58
White/green ; red/green	42	Yellow/pink	56
Red/light blue	38	Dark blue/brown	54
Yellow/light blue	34	Dark blue/green ; green/purple	38
White/dark blue	28	White/yellow	34
White/purple	26	Light blue/green	28
White/yellow ; white/orange ; red/purple	24	Orange/pink	24
Yellow/green ; pink/light blue ; light blue/purple	22	Orange/brown	22
Yellow/dark blue ; red/brown ; light blue/dark blue	20	Yellow/orange ; red/brown	20
Yellow/brown ; orange/red	18	Light blue/brown	16
Pink/purple	16	Pink/brown	12
White/brown ; yellow/purple ; orange/dark blue ; orange/green ; pink/green	14	Yellow/brown ; orange/green ; red/dark blue ; light blue/dark blue	10

Table 1: Easy and difficult to distinguish colour combinations by percentage of the selection (1)

To assess patient expectation of the likely treatment effects of monochromatic colours on organs, motor function and mood, participants were first shown the colours and then asked to rate their subjective reactions (compared with their preconceptions) according to three categories: less, no difference and greater.

Over 80% stated that white, yellow, pink and light blue helped to ease their breathing and were appealing to look at; pink was also perceived as having a calming effect on heart rate. Another colour identified as appealing was green. Red was seen as a stimulus on motor function and mood, causing blood pressure and heart rate to rise. More than 80% of subjects found that brown had the effect of slowing down motor function, and calming heart rate and mood. No clear effects (80%) could be identified for the colours orange, dark blue and purple.

In two of three conditions investigated – cardiac-related disease, sleep disorders and arthritic joint conditions – it appeared that patients may be influenced in their colour selection by the experience of previous medication.

Although subjects suffering from cardiac-related disease showed no preferences for particular colours or colour combinations, subjects previously treated for sleep disorders preferentially selected monochromatic light blue capsules (p 0.039*). Similarly, subjects who had been treated for arthritic joint conditions chose the colour combinations white/green (p 0.008*) and red/light blue (p 0.0035*) as the most suitable. Interestingly, there were no statistical differences between subject groups in terms of the colours/colour combinations they considered unsuitable.

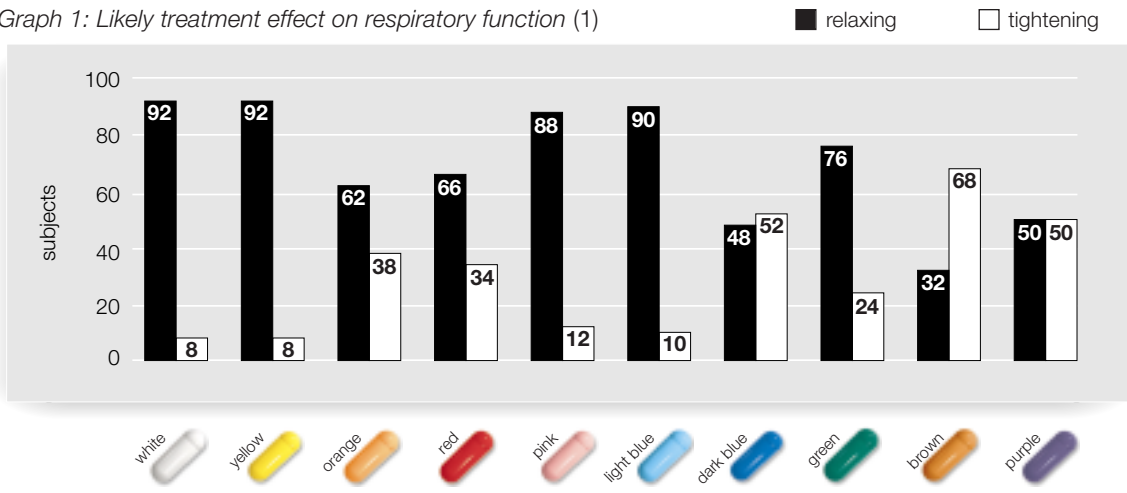
In summary, it appears that white and to some extent yellow, used with colours such as light blue, red, green, dark blue and orange are the most suitable colour combinations. Dark colours such as brown, dark blue and purple, used with another dark colour, cannot be recommended as suitable colour combinations.

* Since the investigated groups were very small, a chance effect cannot be ruled out.

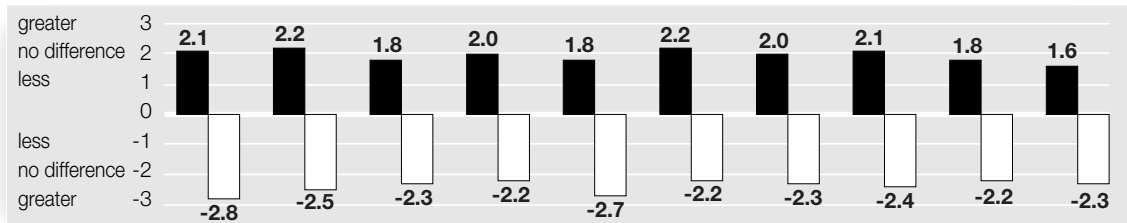
(1) Hersberger, J. : Differenzierbarkeit und Präferenz von Kapsel-farben bei älteren Menschen. Lizentiatsarbeit Universität Basel, Institut für Psychologie, November 1997

(2) Hatebur, S. ; Erfassung von geeigneten und ungeeigneten. Farbkombinationen von Medikamentenkapseln für ältere Menschen. Lizentiatsarbeit Universität Basel, Institut für Psychologie, November 1997.

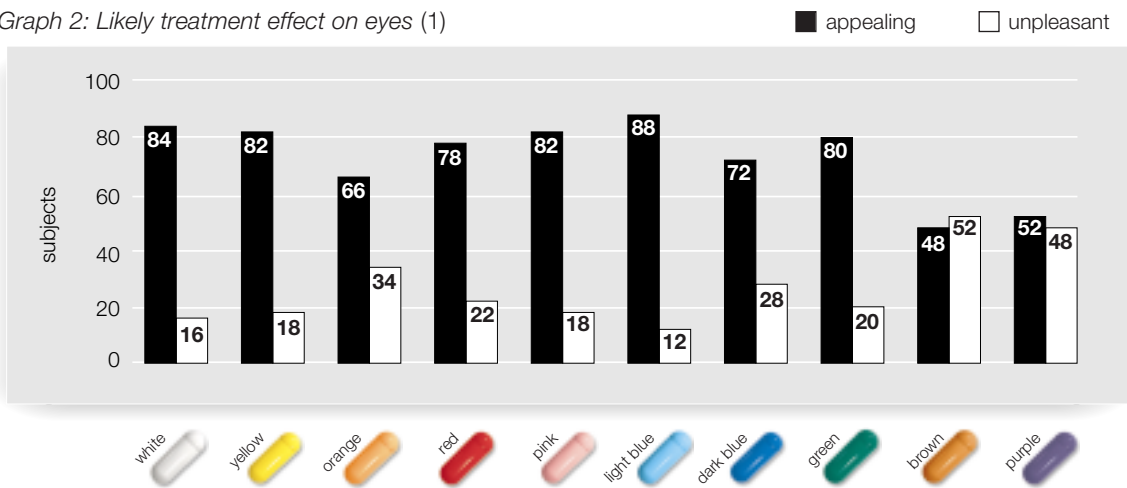
Graph 1: Likely treatment effect on respiratory function (1)



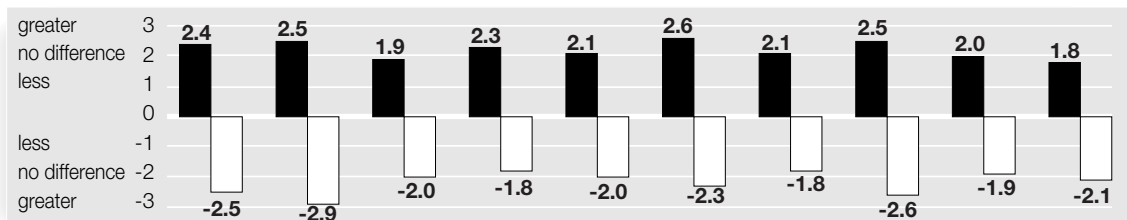
Average subjective value pre- and post-exposure:



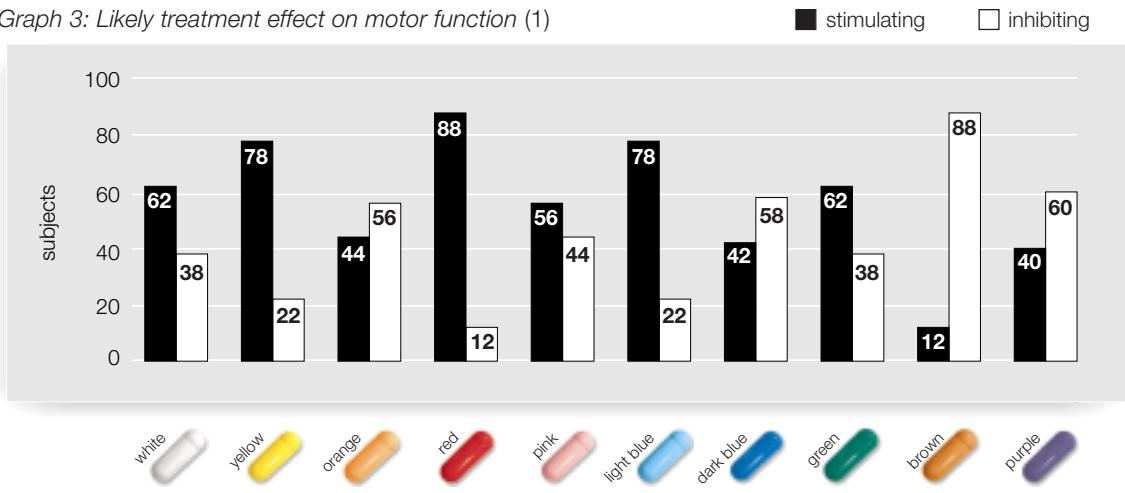
Graph 2: Likely treatment effect on eyes (1)



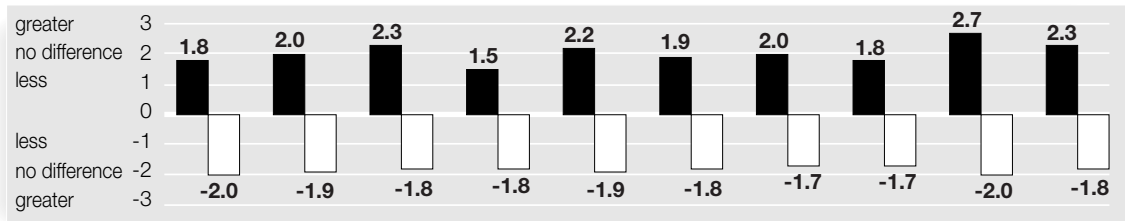
Average subjective value pre- and post-exposure:



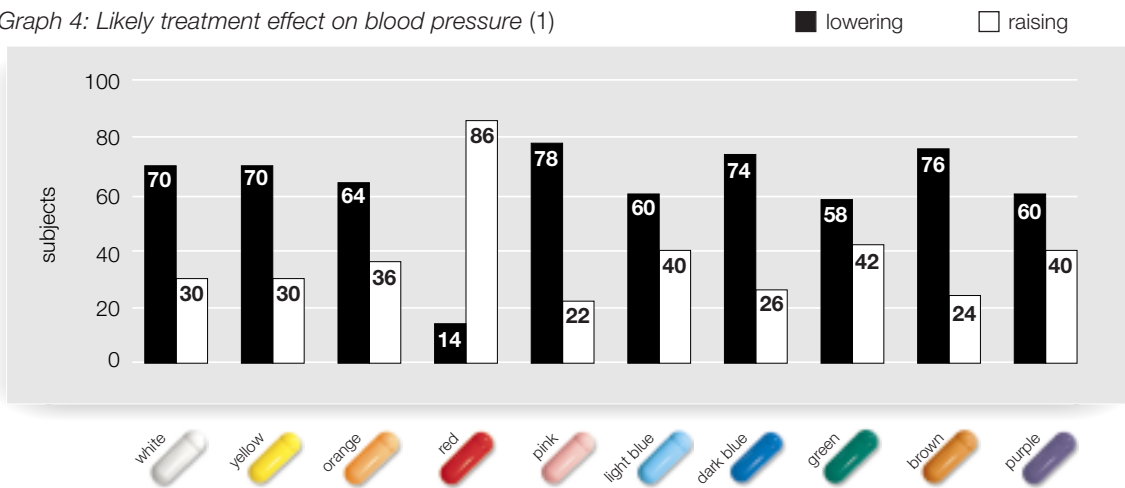
Graph 3: Likely treatment effect on motor function (1)



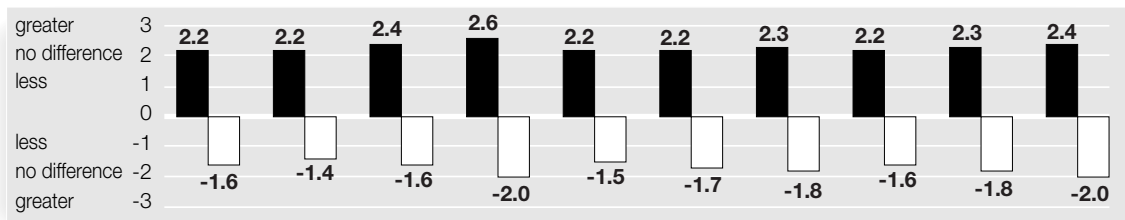
Average subjective value pre- and post-exposure:



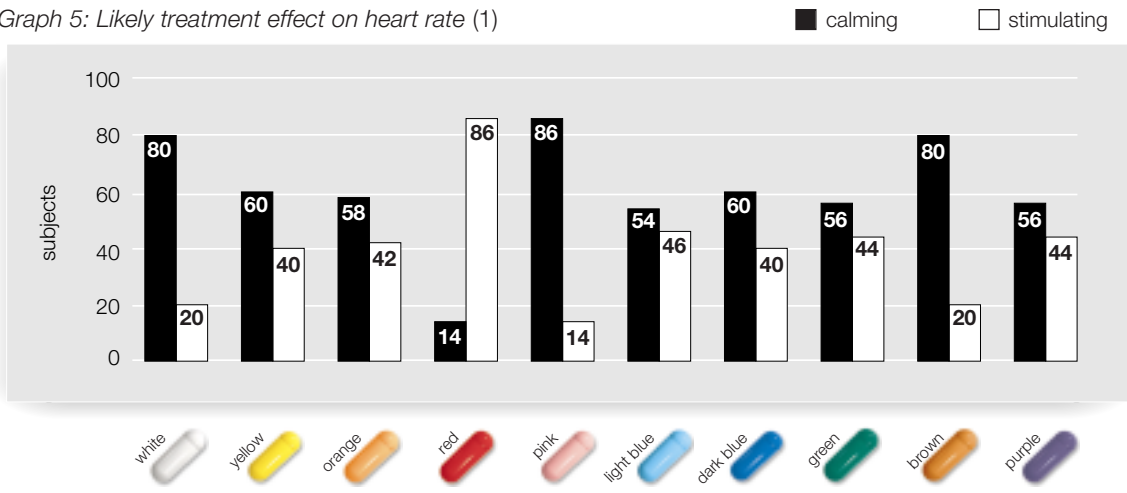
Graph 4: Likely treatment effect on blood pressure (1)



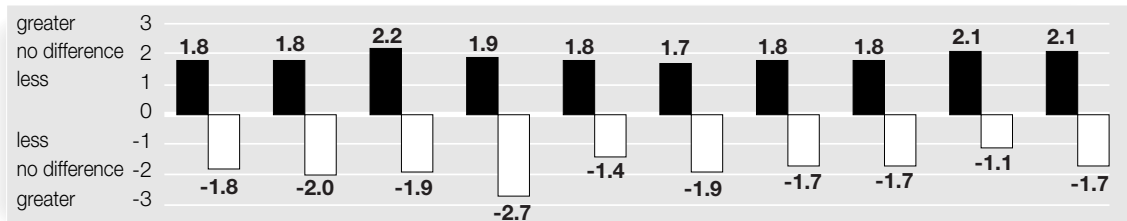
Average subjective value pre- and post-exposure:



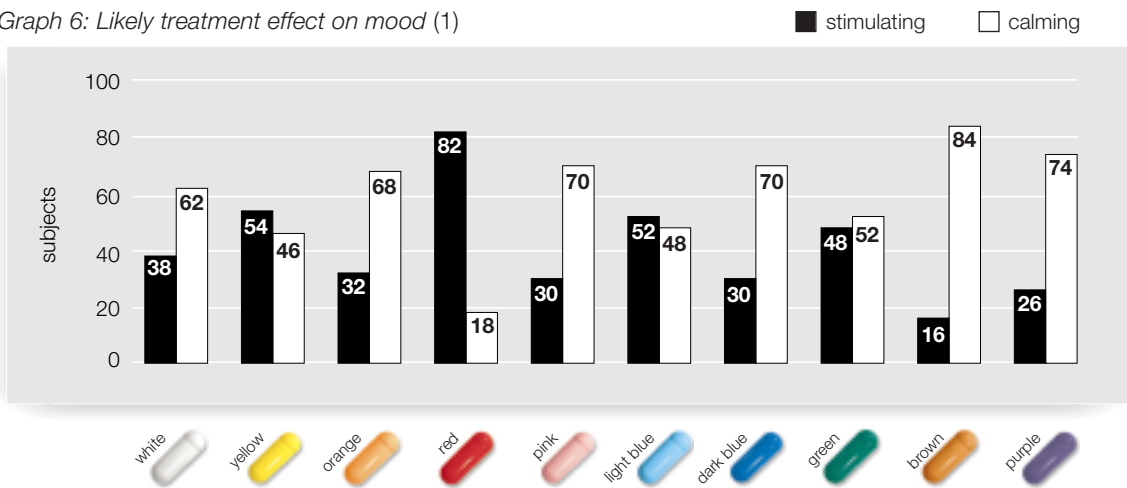
Graph 5: Likely treatment effect on heart rate (1)



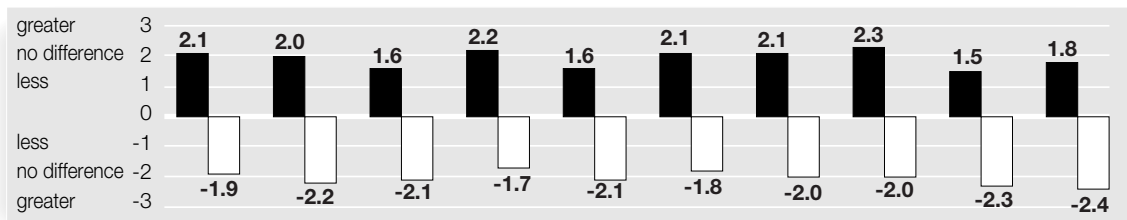
Average subjective value pre- and post-exposure:



Graph 6: Likely treatment effect on mood (1)



Average subjective value pre- and post-exposure:



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