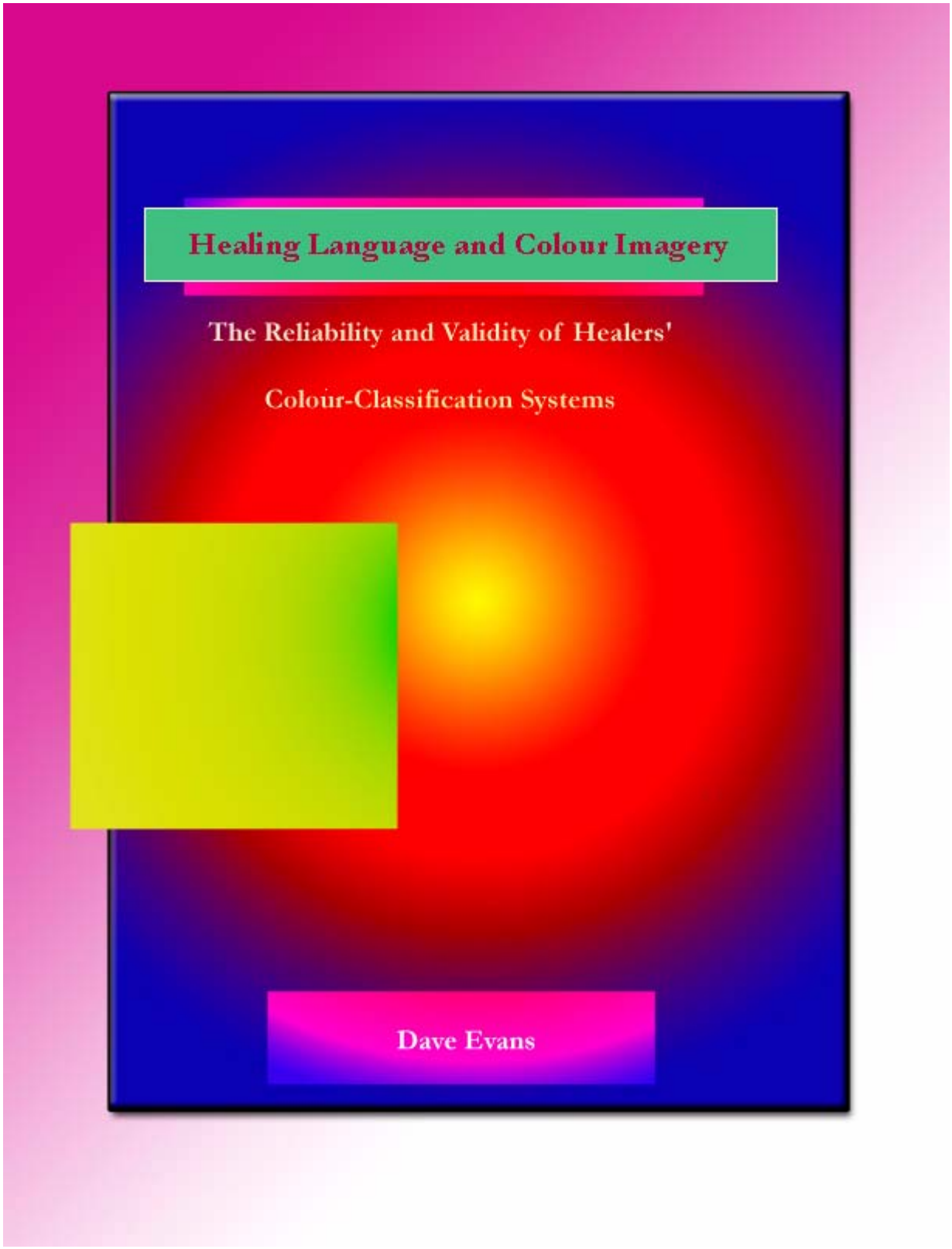
Healing Language and Colour Imagery
The Reliability and Validity of Healers'
Colour-Classification Systems
Dave Evans

Foreword to this new PDF Version

It is with strange, mixed feelings that I come back to a part of my life that now seems far longer ago than 4 years. I am now working in a different academic discipline and hardly, if at all, draw on this material anymore. However an HTML version of this piece on the internet in 2000 gained some encouraging interest and when the site holding that version 'died' (through no fault of the content) that only seemed to increase the demand, which I satisfied by emailing individual copies out to people, who were encouraged by the cachet of a 'rare' or at least hard to obtain item, perhaps.

So, after a little reorganisation of the layout to suit the new file format and the removal of some redundant information it is with mixed pleasure and trepidation that I present the report again. I welcome any feedback, to achad13@hotmail.com but close questioning on the intricacies of the statistics (particularly) might be beyond me now, as I am not working with those concepts every day anymore.

I have also written a more brief summary article of this research to allow non-statisticians to engage with the subject, see elsewhere on www.occultebooks.com

For serious psychology researchers who are working in the field who might perhaps need material for a meta-study I can happily supply about 10mb of the raw numerical data, in the form of Excel spreadsheets, if this will help with your work.

Dave Evans,
Devon, 1st February 2003

Other e-publication:

My MA Thesis: "Aleister Crowley and the 20th Century Synthesis of Magick" can be found on **www.occultebooks.com** (this is a pay-for-download file, £3 UK- approx $5 US). I also write a regular free column for the same site

Acknowledgements

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This study could not have been contemplated, let alone completed without the long-range support and encouragement of K, and A, and the financial support of both an educational grant from Buckinghamshire LEA and the kindness and philanthropy of my Uncle, R.

The Reliability and Validity of Healers' Colour-Classification Systems

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Abstract

This field study assessed reliability and validity of healers" (n =5) professional schemes of reference for colours, related to clients' physical/emotional states and treatment needs. Healers are believed to base therapy on coherent systems that associate alleged "aura" colours with disease states, and colour visualisations with treatment.

Whether healing actually *works* is beyond the scope of this study. Hypotheses sought coherence within-subjects over time and/or coherence between-subjects; measured by non-parametric (Spearman's) correlations. Since healing terms such as aura cannot be easily operationally defined, standardised colour and word stimuli elicited verbal responses in the context of a therapeutic framework.

Overall, significant, positive but non-reliable correlations were found between-subjects. Within-subjects correlations were also significant, with partial reliability. Many colour and word components within the overall analysis showed highly reliable correlations.

Problems of empirically investigating 'non-scientific' areas and further study areas are discussed.

KEYWORDS: HEALERS, ALTERNATIVE MEDICINE, COLOUR, WORD-ASSOCIATIONS, RELIABILITY, VALIDITY.

Introduction

This study assessed the reliability and validity of healers' schemes of reference for colours, related to clients' physical/emotional states and treatment needs. To aid the reader with unfamiliar concepts, a glossary of healing-related terms [1] appears as Appendix A.

A General Practitioner (GP, or personal physician in the USA) should have a coherent system over time of diagnosis based on examination, e.g., to consistently differentiate influenza from skull fracture, and treat them accordingly. It was expected that healers basing diagnoses [2] and/or treatments on colour have their own similarly coherent criteria; although these are less formal and global; not the standardised diagnostic manuals used in medicine, psychology or psychiatry.

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[1] The first mention in the text of words included the glossary is followed by Θ i.e., Witches Θ.

[2] 'Diagnosis' in this respect is not an ideal term. Many healers do not align themselves to any medical model; often having spiritual or other frames of reference, so the term is used reluctantly here. As is 'Spiritual', reflecting that the meaning of the term has not been defined fully by science.

Defining the terms

There are myriad definitions of healer (e.g., Aldridge, 1993a, 1993b, 1996; Aldridge, Brandt & Wohler, 1990, Brennan, 1988). Healing, in this context, means practices loosely under the umbrella terms of spiritual or "alternative" medicine.

Alternative medicine is diverse. The British Medical Association (BMA, 1986) described 116 kinds; divided, in Table 1, into four classes:

Table 1: A classification method for alternative medicine; with examples (from Pietroni, 1986)

Class	Examples
'Psychological' therapies	Self-help, meditation Θ, breathing exercises [3]
Specific therapies	i.e., massage, aromatherapy Θ, spirit healing Θ
Purely diagnostic systems that then refer clients to relevant therapies.	i.e., iridology Θ
Complete systems of therapy	i.e., acupuncture Θ, homeopathy Θ; herbalism Θ

Healing in this study falls under class 2; 'spirit healing' although participants also work in other areas (i.e., herbalism and massage). Labelling can mislead, much as 'psychotherapists' may be Freudian, Jungian, Gestalt, cognitive-behavioural or an eclectic mixture; the latter varying over time and client need. 'Healer**S'** is therefore generic; thus potentially confounding studies of different healing types.

What is Healing?

Physical healing is modelled on wounds forming scar tissue, etc. The dominant model of spiritual healing is that illness originates on unbalanced mental-emotional-spiritual levels; affecting the physical body (Brennan, 1988; Regardie, 1987). While surgery and/or pharmacology may relieve *physical* symptoms, these may re-present if underlying imbalances remain. This is similar to psychosomatic theories (Sapolsky, 1994), and has parallels with Humanist psychology (Gross, 1995). Healing diverges from Humanism by restoring this balance via 'universal energy' Θ (Breakspear, 1995; Regardie, 1987; Crowley, 1912/1973).

Healing terminology is conceptual, often mystical. A central notion is the aura Θ; an allegedly visible 'bioenergy' Θ field surrounding living organisms (Montandon, 1977; Stevens, 1984). The aura is damaged and/or discoloured in illness and repaired by healing.

"Kirlian photography" Θ (Kirlian & Kirlian, 1974) purports to record auras (Benoir, 1984). It has been widely employed in acupuncture (Wei, 1975) and veterinary medicine (Milin & Molinier, 1982). In agriculture it reliably differentiates dead from viable seeds (McGinty, Pomeranz & Rousser, 1975; Rud & Sukach, 1977). Kenneth (1932) found objective chemical and electrical elements in auras, while others supported the validity of aura photography (Pace & Drumm, 1992; Gruenner, 1978: Lerner, 1977; Murstein & Hadjolian, 1977). However, many claim mundane explanations for this 'anomaly' (Borgdorff, 1978; Dobervich, 1974; Marks, 1986; Stanwick, 1996; Greyson, 1989; Dale, Anderson & Wyman, 1978). Schwartz (1976) occupies the middle ground, calling it a valid, but purely electrical phenomena, i.e., based on neural impulses.

The aura has subcomponents; localised energy centres called "chakras" Θ that are variously coloured

[3] This seems contentious: breathing exercises have physiological effects too (Sapolsky, 1994).

according to health. Aura and chakra colours are thus a 'diagnostic' aid, but colour changes as health is dynamic (Brennan, 1988). There are operational matters influencing treatment: a colour in one chakra may differ in meaning if in another chakra.

Exactly what, if anything, healers *do* is highly contentious. The following is an amalgam from several healing sources (Brennan, 1988; Regardie, 1986,1987; R.A. Wilson, 1977). Once 'diagnosis' is made, treatment involves purported highly subtle 'energy transmissions' Θ; i.e., the universal energy mentioned above; which healers 'tap in to,' control and direct to a site (such as a wound). This can be done via direct contact; the stereotypical 'healing hands' approach; or via a purely mental method of 'willing' the energy to a site. Similarly to this there are associated applications of colour *visualisations* (see Table 2; below); which can be from the healer alone or with the client also visualising the same colour(s). These energies and visualisations are purported to heal. There is little or no scientific support for these views, and (even if one accepts the existence of this energy) numerous unanswered questions. This includes the matter of how can healers *control* the energy. All belief systems seem to contain absurdities to 'outsiders.'

Table 2: Colour visualisation functions in healing practice (edited from Brennan, 1988)

Visualised colour	Healing Function(s)
Red	Charging energy field, burning out cancer, warming cold areas.
Orange	Charging energy field, increasing sexual potency, increasing immunity
Yellow	Charging energy field, clearing a foggy head
Green	Charging overall field
Blue	Cooling, calming, restructuring etheric level Θ, shielding Θ
Purple	Connecting to spirit
Indigo	Opening an energy channel Θ, clearing head
White	Charging field, bringing peace and comfort, removing pain
Gold	Restructuring seventh layer Θ, strengthening field, charging field
Velvet Black	Bringing patient into state of grace, silence and peace with 'God'
Purple Blue	Taking away pain when doing deep tissue and bone work

Assuming healers can control these energies, they can be used ambivalently (Regardie, 1987; Collins, 1988). The subjectively *malevolent* uses, i.e., 'cursing' are hard to study, this being generally via retrospective qualitative studies (Davis, 1985). A further problem is different healing approaches sub-divide the aura differently by both functional areas and number of associated chakras (King & Skinner, 1977). This could result in no similar systems *between* subjects. This was supported by an

ad-hoc survey via World-Wide-web newsgroups [4].

Several self-rated healers from the UK and USA gave comment; six providing useful data; displayed in Table 3, below. Major differences arise over a small sample. Comparing Table 2 (below) to Table 3 shows striking commonalities (i.e., red) and differences (i.e., orange). The literature also indicates diverse healing properties for the two visually similar colours of purple and violet, and disagreement over the therapeutic relevance of black.

Table 3: Internet Survey (Spring 1998): Aura colour-to-diagnosis/healing attributions across a variety of self-reported healing sub-types in the UK and USA compared to versions in the literature of Occultism (NA = no attribution)

Aura colour	Bardic Θ Witch, USA 3/98	UK Healer (unspec'd) 3/98	Energy Healer, USA, 3/98	American ''spiritual'' Healer 3/98	''Energetic'' Healer; USA, 3/98	Crowley's Magick	Healing type withheld; UK, 3/98	Qabalah
Red:	anger, desire	power, anger	high energy	excitement	Angry, "fired up,"	force and fire	vitality, egotism	severity
Blue:	loyalty, cleansing depression, trust	truth, powerful healing energy	restructuring, renewal	peace	cool, linear	mellow; meditation	innate wisdom	mercy
Green:	growth, balance	"never seen it"	disease	NA	healing, balance	growth	stagnation	harmony and love
White:	purity, cleansing	clear aura after meditation	detached, celestial	NA	spiritual, insulating (from pain, etc.,)	perfection of higher self	immature egotism	"spiritual" illumination
Grey:	confusion, passage towards death	"never seen it"	disease, lack of vitality	beginning a blockage	fearful, depressed, sad	transition from perfection to oblivion and back	Physical-emotional illness, fear.	confusion
Black:	negation, evil	"never seen it"	void	a big problem	ill, hateful, very suppressed	"spiritual" oblivion $	Severe physical illness	evil
Pink:	passivity, amity	love and integration	healing love	love	love, sweetness	mediation,	arousal, love.	NA
Orange:	physical vitality, attraction	very sexual	building immunity	NA	physical vitality, sexuality	animalistic aspects of soul	Egoic, intellectual, aggressively "scientific."	communication
Yellow:	creativity, mental energy	infection or stagnation	self-esteem	fear	thinking, mental	solar energy; growth;	Intelligence, unless cloud-like, where there is insufficient application.	joy

$: The semantics of 'Oblivion' need to be defined here: it was not a *negative* state in Crowley's system, which emphasised destruction of "ego" to find true selfhood.

Official attitudes to healing often seemed inherently xenophobic, focusing more on 'witch-hunts', such as the fate of Reich Θ (Reich, 1989: Hyatt, 1988), rather than objective empiricism. It seems that healing, lumped under 'parapsychology' is regarded as unscientific; however Bem and Honorton (1994) detail parapsychological methods with better controls, standardisation, higher statistical power (often using $\alpha = .01$ *a priori* significance levels) and more stringency than many other sciences achieve.

While there have certainly been charlatans in healing (Washington, 1993) some forms of healing *do*

[4] The e-mail survey text is included in Appendix Y.

cure (R.A. Wilson, 1977) possibly through placebo or expectancy effects [5]. Whether healing actually works *via the means claimed* is central to the psychology-psi debate Θ , and beyond the ethical, temporal and financial scope of this study.

So why study healing at all?

The problems of defining and researching anything to do with healing and perhaps the often-abusive label of 'parapsychologist' (or worse) sometimes attached to those who try may have held back scientific research. However this attitude has not affected the size of the client group. The social phenomenon is that uptake of different alternative therapies is large, and increasing. Fully ten percent of *all* health consultations in the UK are with an alternative practitioner (Fulder & Munro, 1985). This uptake rate alone should be justification for research. Since NHS treatment is free and healing is usually on a fee basis why do so many people pay for treatment? It seems that it is for something the NHS cannot provide, or to treat chronic states that orthodox medicine had not helped (Finnigan, 1991). Thirty-five percent of patients using alternative therapies had ceased to call first on their GP. This was often modelled on experiences with previous illnesses (Thomas, Carr, Westlake & Williams, 1991). There is also the suggestion that healers provide 'maintenance' treatment for healthy clients, similar to the way that GPs might give dietary and exercise advice to a patient in otherwise good health.

The large client group for alternative medicine, and the numbers keeping their GP 'in reserve' imply this area *must* be researched. This is either to prevent harm if alternative therapies do not work, or to maximise the use and effectiveness if they do. Vincent *et al.,* (1997) identify a four-fold area for research into alternative medicine to aid and inform several different groups, summarised as table 4, below.

Over 40 years ago Bardon (1956) vehemently encouraged healers and the medical profession to become allies. There is a 10% referral-rate each way between both camps (Fulder & Munro, 1985), however GPs' knowledge is often insufficient to accurately refer; for which they are legally liable if the patient is harmed. Beyond personal beliefs, anecdotes from colleagues or limited experience there is little aid for GPs making referrals. Goldstein, Sutherland, Jaffe and Wilson (1988) surveyed the American Holistic Medical Association [6] members (AHMA) finding 53% viewed spiritual healing [7] as of great value for medical practice. Twenty percent of non-holistic MDs also expressed support for spiritual healing. Few could explain why, other than single-case anecdotes of 'miraculous' cures after orthodox medicine had 'failed.' In the UK nearly 50% of GPs saw spiritual healing as useful (Wharton & Lewith, 1986).

Table 4: The four-fold **r**esearch requirements from alternative medicine of different interest groups

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5 If the patient feels that somebody is paying them attention they may improve 'spontaneously'; similarly to psychotherapy waiting-list patients who may start to recover *before* treatment, while those not on a list often remain ill (Robinson, Berman & Neimeyer, 1990).

6 The AHMA comprises qualified MDs practicing alternative therapies in concert with orthodox medicine

7 To ground this; 84% said the same about psychotherapy; and 90% for physical exercise.

(derived from Vincent *et al.*, 1997)

Group(s)	**Information needed**	**Reason**
General public, Clinicians and Government	Is therapy 'X' safe?	Risk assessment balanced against therapeutic benefit
Alternative practitioners	Is therapy 'X' safe?	Clinical safety and Insurance reasons
General public	Is therapy 'X' clinically effective?	Likelihood of it being personally useful; to prevent wasting money.
Clinicians	Is therapy 'X' clinically effective?	To inform GPs and allow reasoned choices on referrals to alternative practitioners.
Government	Is therapy 'X' clinically effective?	To maximise use of NHS funds by avoiding ineffectual, thus financially wasteful therapies
Alternative practitioners	Is therapy 'X' clinically effective?	To justify their own practice with scientific support and to perform clinical audits

Are healers deluded?

A further area to address is the possible psychopathology of practitioners of alternative medicine. Many beliefs (i.e., auras) denied by science may appear delusory under standard psychological guidelines, i.e., DSM IV (APA, 1996). This is important, given that healers are in a position of trust working often with vulnerable people. So are other groups who may seem equally bizarre to the *truly* objective observer:

> **"Every week, every day, up and down the country, people accept food from a man who, before feeding them, intones: 'Take and eat, this is My body . . ."**
>
> (Stafford, 1992, p 43).

However, empirical studies in progress (Priem, 1996-present) support the view that very strongly held spiritual beliefs *can* be benign, or indeed beneficial (Claridge, 1997). Thus healers, much like any minority 'religious group,' are *statistically,* rather than clinically, abnormal. Recent American Psychological Association guidelines on avoidance of pejorative language and discriminatory procedures (APA, 1997) also require that research (and reporting language) should be non-discriminatory. These guidelines would be contravened by any *a priori* assumption of mental illness based merely on experimenter prejudice or ignorance.

Within these guidelines it can be stated that three participants in this study self-labelled as Witches Θ, with healing being taught as an integral part of their craft. However, not all healers express adherence to any particular belief system.

Science should ideally progress via falsification (Popper, 1935), and demonstration of a coherent and stable system of associations (i.e., this study) would be one small step in support for the non-delusory view.

As Shaw said **"all great discoveries start as heresies"** (Bloomsbury, 1990). In any case, science scarcely supports Freudian psychoanalysis (Thornton, 1983) or physics, which relies upon both of two contradictory hypotheses (Feynman, 1985). Also, homeopathy (with no scientific basis) is *already* used on the NHS (Vincent *et al.*, 1997). There are combined Psychology and Complementary Medicine post-graduate courses (Exeter University, 1999).

Areas of alternative medicine needing research

Many questions highlighted by Vincent *et al.,* (1997) rely on outcome studies. Unfortunately there are dichotomies between perspectives; not least in different 'diagnostic' systems. Just as 'damaged solar plexus chakra' may be meaningless to a GP; 'nephritis [8]' might confuse healers; but they could be 'diagnoses' of one state; simply couched differently. Thus a prerequisite for study is a common language. Since there is no sign of this, operationalising the terms and each branch of alternative therapy has not been achieved.

As a step towards operationalisation, Vincent *et al.,* (1997) emphasise 'process' questions: such as the reliability and validity of named diagnosis and treatment schemas; i.e., this study. By testing individuals across time, the degree to which practitioners had a stable system was measured. Cross-comparison of *several* healers indicated any commonalities. There are operational problems in measuring subtle energies Θ, visualisations, proving existence of the aura, standardising and then colouring it. To circumvent these; *physical* colour stimuli and names of human states (independent of chakra locations) were visually presented in 'real space' in the context of a healing session. Participants rated the colour or word relative to orally presented names of healing properties, human states and names of colours.

There follows a short background of general research into colour and colour-associations [9] relevant to this study.

Psychological Perspectives on Colour

Any 'normal' adult [10] has associations between colours and words. Colour is an important controlling stimulus; i.e., red traffic signals make drivers stop (Baum, 1994). Stimuli also *modulate* behaviour, eliciting one reaction from many possible ones; depending upon context; as illustrated by Neuro-Linguistic Programming (O'Connor & Seymour, 1990). Many words have high imagery associations (Valdez & Mehrabian, 1994; Seymour, 1980; Paivio, Yuille & Madigan, 1968); but not *the same* ones in everyone.

Neurobiology

Colour vision relies on a functional retina and visual cortex. Often people are unaware of congenital or chronic deficits. Hemispherical dominance (thus handedness) seems important in semantic imagery processing (Gazzaniga, 1994), as does dyslexia (Besner, 1981) and colour processing (Dyer, 1973). Both artistic and psi- abilities Θ may reside in the right hemisphere (Bem *et al.*, 1994).

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8 Inflammation of the kidneys (Blacks, 1979).

9 Before examining this, the difficulties of proving that any two people are seeing anything, let alone the 'same colour' must be briefly mentioned. This has been extensively highlighted by philosophers (i.e. Hume, 1777/1992; Russell, 1912/1980; Ingram, 1996), and extended by Dennett (1978, 1991). For the sake of this study; and brevity, it is assumed that participants **were** perceiving, and similarly enough for this not to be a confound.

10 In this context: meaning of reading age, sighted and without severe cognitive impairments

One participant (hereafter pseudonymously called "FK") had possible visual neglect following stroke. Further discussion of this, and action taken, occurs in the methods section and Appendices B and C.

Also relevant is colour-opponency. If red is viewed for a time and gaze is transferred to a white surface, the opponent colour; in this case green, will be perceived. The green temporarily 'exists' *only* as neural impulses within the visual pathways (Dennett, 1991; Coren *et al.*, 1994). In another psychological sense 'colour' can exist without light. In complete darkness, by putting gentle pressure on the eyes, coloured spots called "phosphenes" appear. These have also been produced by electrical brain stimulation (Gazzaniga, 1994).

Cognitive and Attentional Perspectives:

Paivio (1986) highlights representational systems as developing both from environmental events (via Piagetian development and behaviourism) and heredity (partly from Chomsky's innate language theories). Colour also influences shape perception (Bonaiuto, Giannini, Biasi, Romano & Bonaiuto, 1997). Interaction of modalities is important, but visual perception awakening cognitive imagery seems predominant (Ellis, 1991).

Sacks, (1995) tells of a painter who lost *colour* vision overnight, simultaneously losing the ability to *dream* and *visualise* in colour; with colour descriptions only arising from verbal memory. This loss was in tandem with devastating cognitive-associative effects; food appeared black; thus he could scarcely eat.

Evolution

Colours in nature have vitally important contexts; e.g., a yellow ***banana*** with a few black lines on it is healthy, ripe and unlikely to kill you. A yellow ***snake*** with black stripes on the other hand..... (Ridley, 1994; Dawkins, 1976). Successful discrimination of edible-safe from poisonous-hostile, especially in the same location (e.g., when encountering snakes in banana plantations) has survival benefits; across *all* animals (Alcock, 1984). This becomes inherited behaviour, and/or transmitted by cultural memes. Colouring in nature can indicate less proximal threats; the green leaves of plants turning brown heralds the dangerous cold of winter that may still be weeks away (Dawkins, 1991; E.O. Wilson, 1978).

Ageing

Since colour perception varies with age due to corneal yellowing (Coren, Ward & Enns, 1994) and associations increase with experience, they differ between age groups (Marmor, 1978; Hemphill, 1996; Boyatsis & Varghese, 1994).

There may be history effects. Emotive associations of red for danger/communism in US citizens who were adult in the late 1950s are lessened in those who are now becoming adults (Thompson, 1990).

Culture, Religion and Geography

In many faiths, colours represent concepts. White symbolises death for Taoists, while in Christian countries, white equates with purity. Blue is associated with the Virgin Mary in Catholicism, and Krishna in Hinduism (Crowley, 1912/1973).

There are memetic (Dawkins, 1991) and inherited variations in colour perception. These include yellowing of the cornea to accommodate for increased ultraviolet light nearer the equator, (Coren *at al*, 1994). Sahlins (1976, p 3) saw colour meanings as semiotic codes, used to **"communicate significant differences of culture." [11]**

Languages evolve different colour terms (Berlin & Kay, 1969; Zollinger, 1979, 1984; Zimmer, 1984), highlighting how the same wavelength of light is variously named, and thus often reacted to differently. This makes cross-cultural comparisons difficult (Te Linde & Paivio, 1979). Bilinguals may have contrasting colour terms, possibly altering meaning (Zollinger, 1984).

There is a cultural divide in TV and cinema. Rule (1998) highlights differences in colour film between Technicolor (emphasis on reds) used primarily by American film-makers and Agfacolour (emphasis on grey-greens) used in Europe and the former USSR. This is best seen by comparing the American production of 'The Wizard of Oz' with the European 'Film Noir' genre (Solomons, 1998). These colour-meaning associations are largely a moving recapitulation of earlier schools of static art (Waldo-Schwartz, 1977).

Colours are carefully chosen for corporate logos. The purple for EuroDisney, is:

> **"half way between red and blue, because it sings like a Mozart flute concerto."**

However Blomsky (Sudjic, 1992, p 26) countered:

> **"Purple doesn't sing, it groans like the dying Christ. In the old country, purple is the colour of the crucifixion."**

The same colour, with two disparate interpretations. Colour symbolism has been covered extensively (e.g., Levy, 1980; Kaplan, 1975; Jung, 1964). Jungian therapy derives from metaphor, symbolism and colour (Jung, 1964), and colour/semantic associations vary with affect (Nolan, Dai & Stanley, 1995; Hemphill, 1996).

Since much of the symbolism of occultism and Jungian psychology is identical there is considerable resonance between the participants and Jungian theories. Lüscher (1969) developed cue-sorting tests to both diagnose pathological states and define personality; on the basis that:

> **"Preference for one colour and a dislike for another means something definite and reflects an existing state of mind, of glandular balance or both"** (Lüscher, 1969, p 15).

This relationship is purportedly universal, but Lüscher (1969) cites no one to support this. However his colour meanings survive analysis. Evolutionary ideas (Ridley, 1994) and autonomic nervous system studies (Becker, 1953) link the retina to both cortex and 'primitive' areas of the brain including the pituitary gland. Thus colours could bring about *both* instinctive-hormonal *and* cognitive reactions. Dark colours (black, midnight blue) indicate passivity; symbolising night when our ancestors retired to their caves. In contrast, light colours (white, yellow) are active and thus

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11 *emphasis added*

'daytime.' Lüscher (1969) considered red, green, blue and yellow 'psychologically primary' colours, also using violet, brown, grey (a 'psychological neutral') and black. His protracted main associations are summarised in Table 5, below:

Table 5: Lüscher's (1969) psychological colour meanings (a greatly simplified version).

Visual Colour	Psychological Meaning
Blue	Passivity
Green	Defensiveness
Red	Excitability
Yellow	Expansivity
Grey	Insularity
Violet	Mysticality
Brown	Retractivity
Black	Renunciation

Colour in Medicine

There are cognitive elements in medication design. The *colour* of placebos can apparently increase their effectiveness:

> **"Red works really well; yellow lacks magic"** (Illman, 1994, p 12).

As mentioned, light affects psychological and physiological states. Long exposure to red accelerates pulse and respiration. Blue has the reverse effect. Coloured light therapy originated in ancient China and came to Europe in the 19th century (Washington, 1993). More recently, attentional deficit disorder (ADD) in children (Zentall, Falkenberg & Smith, 1985) and Seasonal Affective Disorder , (SAD), (Oren, Brainard, Johnston, Joseph-Vanderpool, Sorek & Rosenthal, 1991) have been successfully treated. This gives credence to health reactions to actual photons; perhaps colour *visualisations*, as used in healing, could be similarly effective? No study has yet been published (Psychlit, 1999).

'But what if your Red is my Orange....?'

Except for Lüscher (1969), none of the above systems involve standardised colours. Many specifications exist for visual colours; including the Munsell system, Optical Society of America Uniform Colour Scales, Ostwald System, Pantone Matching System and the *Commission Internationale de l'Eclairage* (CIE)[12] (Berns, 1998). Munsell colours are heavily used in perceptual research (Falk, 1986; Kulikowski, Routledge, Jordan, & Laycock, 1997). However a Munsell set was unavailable for this study due to cost and because it rapidly degrades in daylight [13] (Jordan, 1998) and this was a field trial, so would have destroyed the colour set. Pantone colours (a printing industry standard) were used instead [14].

The Universality of Colour-Meanings?

Considering the matters above, it seems that despite a universal visual colour spectrum (regardless of

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[12] French: translates roughly as International Commission on Illumination.

[13] Since this was a field study the chances of exposure to daylight were high.

[14] Software to convert Pantone codes to Munsell codes is available (Colour Science Web, 1999).

relative linguistic labelling of particular wavelengths), universal colour-*meanings* are unlikely. However, within certain groups and individuals there may be continuity. Many specialists use systems of colour-word associations; including advertisers, paint makers, artists and healers.

Concise Aims of the Study

This study attempted to measure the reliability (consistency) of colour schemas across time within individual healers, and between-healers in the group studied.

Hypotheses:

There were no 'null' and 'experimental' hypotheses as such; failure to reject Ha2 and/or Hb2 (below) would be closest to supporting the null view, that there is no consistency among and/or within healers.

Within-Subject Hypotheses:

Ha1 the colour classification systems of individual healers would not significantly differ over time, (i.e., will be consistent).

Ha2 the colour classification systems of individual healers would significantly differ over time, (i.e., will be inconsistent).

Between-Subject Hypotheses:

Hb1 the colour classification systems between healers would not differ significantly, (i.e., will be consistent).

Hb2 the colour classification systems between healers would differ significantly, (i.e., will be inconsistent)

Subsidiary Hypotheses

Six subsidiary analyses were planned *a priori:* line-bisections, colour favouritism, visual violet *Vs* purple, mirror-comparisons of parallel-form stimuli, and participants' reactions to two distractor stimuli (black and healthy):

Line-bisections

To support experimental validity, line-bisection ability could not significantly differ from other participants or a perfect 50% bisection score, both pre- and post-test [15].

Colour favourites

Hc1: Participants would not give responses that simply reflected their personal favourite colours (which were found via the pre-test questionnaire).

Visual Violet versus Visual Purple

The literature indicates substantially different healing properties for the two visually similar colours of purple and violet: Hypotheses were:
Hv1: the results for purple and violet would be significantly different.

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15 See Appendix C for details

Hv2: the findings for purple and violet would not differ significantly.

Mirror-Comparisons
From Solso (1971; above) verbal and visual forms of the 'same stimuli' give different results. Hypotheses were:

Hz1: Visual stimuli will give higher correlations than verbal forms of the same stimuli.
Hz2: Verbal stimuli will give higher correlations than visual forms of the same stimuli.

Distractor Stimuli
Black: As mentioned above; opinions differ on healing functions or relevance of black. Hypothesis was: **Hw1:** healer's uses of black would be minimal since this colour appears mainly negative in the literature

Healthy: Healers would either be confused by 'healthy' since it is not a disease state, or would give maintenance therapy. Hypotheses were:
Hwa1: healer's responses to healthy would indicate a pre-existing maintenance rationale in their therapy.
Hwa2: healer's responses to healthy would not indicate a pre-existing maintenance rationale in their therapy

Descriptive Statistics
Some of the data analysed under this heading has no hypotheses, since it was for purely exploratory purposes.

Distribution of response type
Likert scale response types were monitored to highlight any unusual patterns such as skewed data.

Consistency of responses
Also performed were standard analyses of the variance of mean and standard deviation among the four stages of the trials (as described in methods section) to monitor the internal consistency of the study. Hypotheses were:

Hds1: the overall mean and SD of each stage of the trials will not differ significantly.
Hds2: the overall mean and SD of each stage of the trials will differ significantly.

Stratification
The data was stratified by age, gender and any known belief system.

Method [16]

Participants

[16] This is an outline method. Lengthy, replication-level detail appears as Appendix B.

Participants (n = 5) were 2 male, 3 female (age range 26-60 years, mean = 38.2 yrs, median = 35 yrs, SD = 13.10), unpaid volunteers. They were residents of Anglesey, North Wales during August-November 1998; and either working [17] vocationally as, or spending considerable time being spiritual healers. Their healing experience and qualifications appear in the results section. An opportunity sample was chosen, based on *pre-informed willingness* to participate.

Design

This is a mixed design; within- and between- subjects, repeated measures. Within-subject measures were the same set of trials repeated 3 times over 8 weeks. The between-subject measure was cross-subject comparison of category responses, disregarding time of trial.

Due to a possible visual neglect confound, perceptual ability measurement (line-bisection task) within and between-subjects was performed (see Appendices B and C). No control group was used. Interpretation of a pilot study (Appendix D) suggested healers were a special population; thus invalidating 'normal' controls. Justification of this action appears as Appendix E.

Procedure in Brief

Figure 1, below, shows the basic layout and procedure. Each trial comprised four stages:

1. Participants were sequentially presented with 10 coloured visual stimuli, via a lightbox. They were instructed to rate healing associations or effectiveness to each colour in response to a verbally presented list of 10 words (human states). See the flowchart in figure 2. Verbal words were read aloud by the experimenters. Ratings of effectiveness or association were made as one from five forced-choice verbal responses. These were scored by the experimenters, as in Table 6, below, producing ordinal data. This scoring method was used throughout.

2. The 10 colours were then sequentially re-presented, accompanied by another verbal list of 10 words (healing properties) using the same always-to-never rating scale categories.

3. Next, participants were next consecutively presented with 10 visual word stimuli (names of human states). They rated healing associations between that word to each of 10 verbally presented words (healing properties).

4. The 10 visual word stimuli were then repeated accompanied by another verbal list of 10 words (colour names). Participants rated these as in stage 1, above.

Three trials were run at 4-week intervals.

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17 'Working' here means not necessarily for payment or reward; healing practitioners vary in that some have fixed charges, others work for voluntary donations or free of charge; this was not monitored for the study. Past and present occupations other than healing included Nursing and Social Services-type work with Special Needs clients.

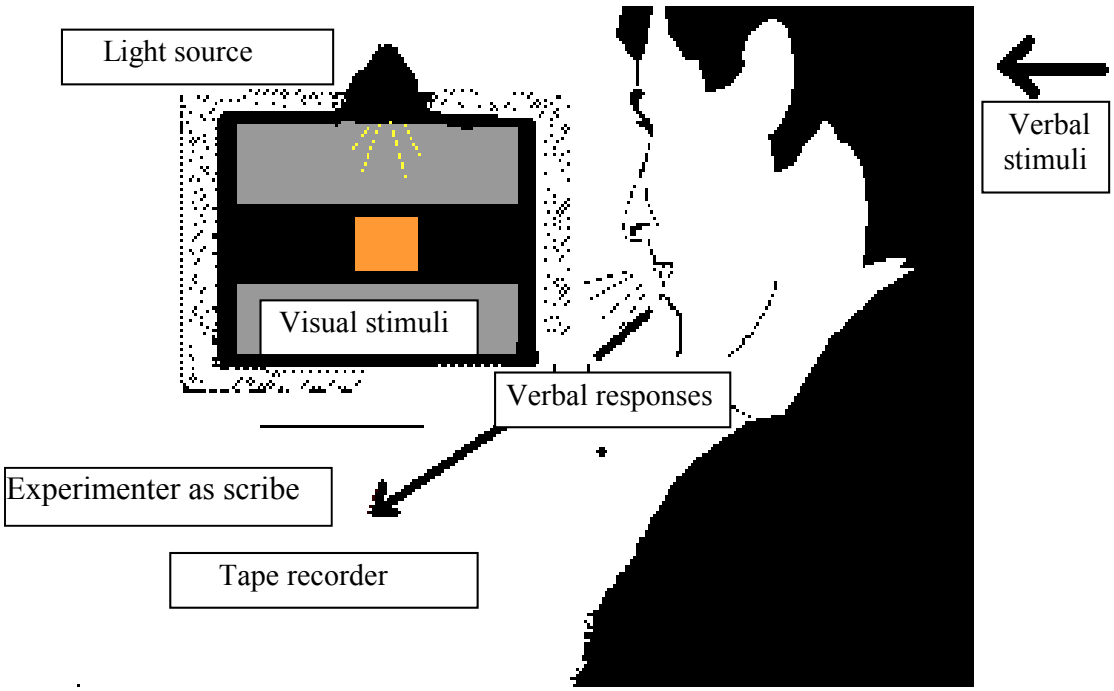

Figure 1: Experimental schematic; showing layout of apparatus and general procedure.

Table 6: Likert-scoring rationale for participant responses

Participant Response	Likert score
Always	1
Often	2
Occasionally	3
Rarely	4
Never	5

The standardised experimenters' script is included as Appendix F.

Variables

The Dependent Variable was verbal responses to stimuli. The Independent Variables were visual and verbal stimuli presented and time (for repeated measures testing).

For line bisection the Dependent Variable was marking the line and Independent Variables were line length, line orientation and time (i.e., pre- or post-test).

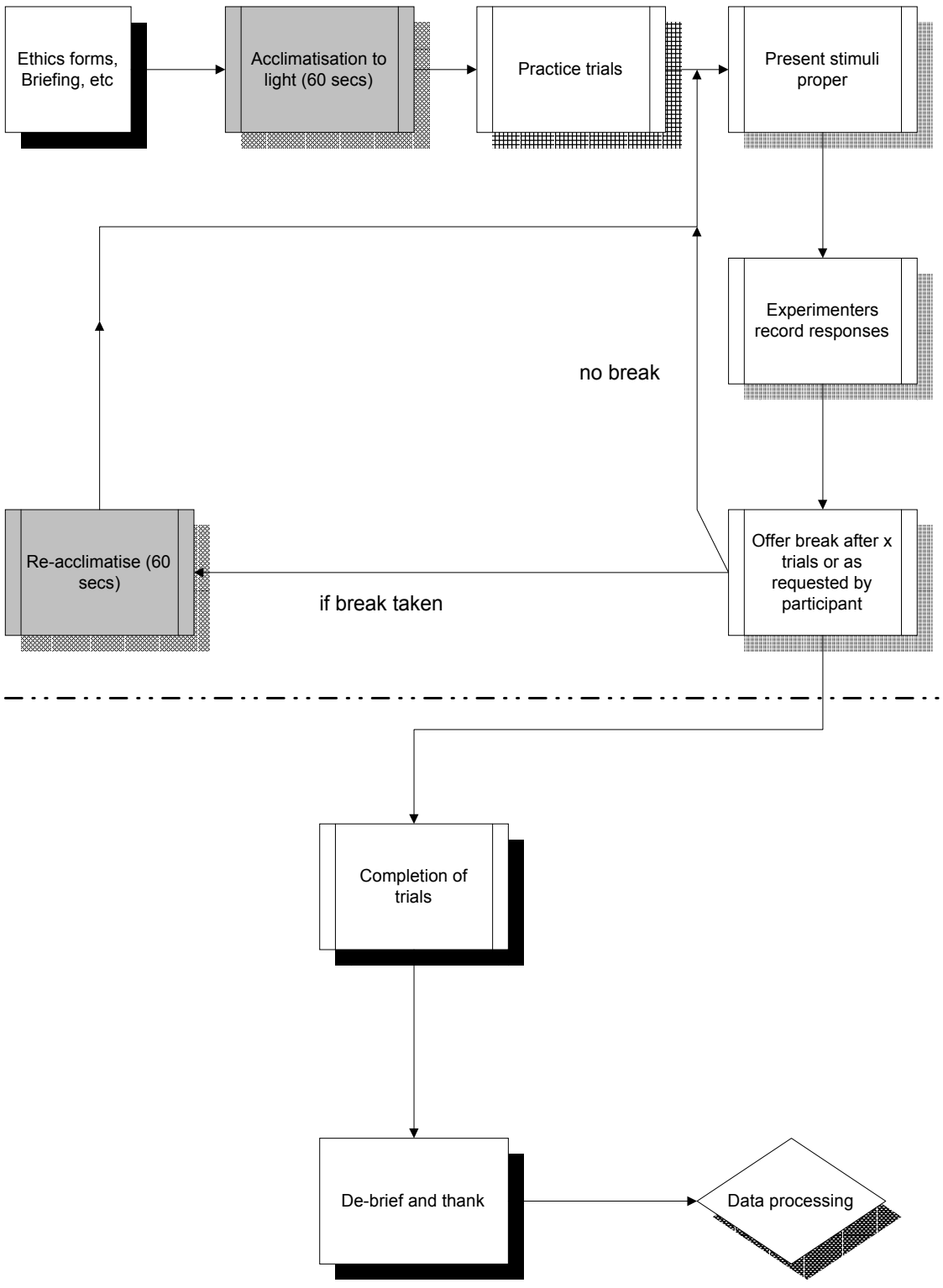

Figure 2: Flowchart of step-by-step experimental procedure

Standardisation of Stimuli

Visual Words

Words were lower-case in a clear and familiar font; Times New Roman 72 point bold, printed at 180 dots per inch; i.e., this size:

example

The dichotomy between terminologies precluded strictly medical-psychological language. All words (visual or verbal) used came from a healing text (Brennan, 1988). Words were compared to several standardised word corpora (MRC, 1998) to ensure that

(a) All participants should be familiar with the words; i.e., they would be components of a normal adult vocabulary, and yet
(b) Words would be unlikely to elicit healing-based responses; or inspire associations to other stimulus words, *in a normal population;*

thus preventing systematic confounds from the words used. Full method and comprehensive results of these comparisons appear as Appendix G. The words used appear in Table 7:

Table 7: Visual stimulus words presented in the lightbox

Headache	**Infection**	**Confusion**	**Sprain**	**Hyperactivity**
Healthy	**Depression**	**Stress**	**Fracture**	**Fatigue**

The verbal cue words for the word condition are in table 8:

Table 8: Verbal Stimulus words presented orally for Visual Words in the lightbox

Healing Properties	Colour Names
cleansing	red
energising	green
calming	blue
cooling	yellow
immunising	white
strengthening	pink
loving	black
restructuring	violet
clearing	purple
balancing	orange

The verbal cue words for the colour condition appear in table 9, below:

Table 9: Verbal Stimulus words presented orally for Visual Colour in the lightbox

Healing Properties	Human States
cleansing	headache
energising	sprain
calming	fatigue
cooling	depression
immunising	fracture
strengthening	infection
loving	confusion
restructuring	hyperactivity
clearing	stress
balancing	healthy

Visual Colours

Colours were chosen to be representative both of the ranges of the visual spectrum and those used in healing; including black and white, as in table 10; below. As can be seen from tables, 7, 8, 9 and 10:

- The human states presented orally in the visual colour condition were the same states used as visual stimuli in the word condition.

- The verbal colour names used in the visual word condition were the same physical colours used as visual stimuli in the colour condition.

- The healing properties were the same verbal stimuli words in both conditions.

This allowed for mirror-comparisons of responses to verbal and visual forms of the same stimulus, after Solso (1971) as mentioned above.

Both violet and purple were chosen to investigate different healing properties purported for these colours in the literature; despite their visual similarity.

Visual word and colour stimuli were mounted in the same location and orientation on identically sized black cards, as in figure 3, below.

Randomised ordering of stimuli by trial appears in Appendix H.

Figure 3: Examples of each type of visual stimulus layout (word or colour) used in the lightbox

Line-Bisection

Line-bisection sheet standardisation was achieved by printing them all at the same time using the same printer, ink and paper (see Appendix I).

Apparatus

Stimulus presentation was via a purpose-built lightbox (see Appendix J).

Tape recordings captured responses (as a back-up to written sheets) and anecdotal or qualitative detail that arose during and immediately after trials*; but only when participants actively consented to the tape still running*.

This was a paper-intensive study; using several documents:
The line bisection task sheets comprised an array of nine lines, 1 mm thick, as in table 11, below (Caramazza & Hillis, 1990; Cowey, Small & Ellis, 1994; Bisiach, 1993). Full details and results appear as Appendix J.

Table 11: Line-Bisection task: test sheet line lengths and orientation in relation to participants.

Horizontal Lines	Vertical Lines
24 cm	16 cm
20 cm	12 cm
15 cm	5 cm
10 cm	3 cm
5 cm	

Consent Forms (Appendix K) specific to this study were devised in accordance with Departmental ethical requirements (see Appendix L). Participants completed an initial questionnaire (Appendix M) and supplementary monitoring questionnaires before trials 2 and 3 (Appendix N). Briefing sheets (Appendix O) were given before trial 1 and debriefing sheets (Appendix P) were given after trial 3.

A printed debriefing and interim results letter was sent by terrestrial mail to each participant approximately five weeks after their final trial (Appendix Q).

Analysis of responses

The conventional coefficient of determination of reliability, r^2 was used for all correlations; i.e. r_s must be greater than or equal to 0.7 to be considered reliable.

Within subjects:

Individuals' Likert scores were compared to other trial responses as below; by non-parametric correlations (Spearman's r), using the $\alpha = .05$ significance level:

Trial 1 compared to Trial 2
Trial 1 compared to Trial 3
Trial 2 compared to Trial 3.

Between-subjects:

Likert scores were compared across stimuli; discounting time of trial, by non-parametric correlations (Spearman's r) using $\alpha = .05$ significance level.

Subsidiary Analyses

Line-Bisections

This produced data that was given an analysis of variance (See Appendix R), using the $\alpha = .05$ significance level.

Colour Favourites

Ratings of 'always' or 'often' for favourite colours were compared to ratings for other colours by Chi-square analysis, using the $\alpha = .05$ significance level.

Visual Violet versus Visual Purple

Within-subject correlations for each colour were compared for relative significance and reliability.

Mirror-Comparisons

Frequency of responses for 'the same' verbal versus visual stimuli were compared by t-test, using the $\alpha = .05$ significance level.

Descriptive Statistics

Other measures taken were mean and standard deviation of Likert responses over all trials and participants. Distribution means and standard deviations over each of the four stages of each trial were also calculated. Overall correlation data was stratified by age, gender and belief system.

Results

Between-Subjects

Data from all trials was grouped by stimulus to give five participant columns each holding 1200 responses (three trials totalling 400 responses per trial; this being 10 verbal responses multiplied by 40 visual stimuli). Spearman's correlation analysis of this data gave highly significant positive correlations between colour and word associations, r_s = ranging between + .17 to + .60, n =1200, all of which are $p < .01$, one tail. This data is summarised in table 12 below. Thus hypothesis Hb2 is comprehensively rejected; the colour classification systems between healers do not differ significantly. However none of these values exceed the $r_s > .7$ threshold for reliability.

Table 12: Between-subjects correlations overall by participant.

Spearman's rank correlation coefficient (r_s)					
	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Participant 1		0.3688	0.3100	0.2811	0.1729
Participant 2	0.3688		0.6198	0.5778	0.4734
Participant 3	0.3100	0.6198		0.6053	0.4513
Participant 4	0.2811	0.5778	0.6053		0.5368
Participant 5	0.1729	0.4734	0.4513	0.5368	

Within-Subjects

Data for each of the five participants over each of three trials was grouped by each of the 40 visual stimuli. This, multiplied by 10 verbal responses to each, produced fifteen participant columns of 400 responses. Spearman's correlation analysis of this data appears in table 13, below:

All cells show highly significant positive correlations (r_s ranging from + .5295 to + .8673, n = 400, all of this range being $p < .01$, one tail. Of the fifteen correlation cells, eight were above the $r_s > .7$ reliability threshold, these appear in bold type:

Hypothesis Ha2 is rejected for all participants, since they showed no significant difference over time. Participants 2 and 4 also show reliable scores ($r_s > .7$) over all comparisons, with participants 1 and 3 achieving this on one of the three comparisons. Participant 5 did not show reliability on any comparison, but narrowly missed reliability on time 2 to time 3; as did participant one on time 1 to time 2.

Subsidiary Analyses

Line-Bisections

These results are given and discussed in Appendix R and C; since they are supplemental to the main aims of the study.

Table 13: Within-Subjects overall correlations compared by time of trial

Spearman's rank correlation coefficient (r_s)			
	Trial Comparison:		
	time 1 to time 2	time 1 to time 3	time 2 to time 3
Participant 1	0.6940	0.6152	**0.7252**
Participant 2	**0.7505**	**0.7050**	**0.7587**
Participant 3	0.6422	0.5295	**0.7668**
Participant 4	**0.7985**	**0.7709**	**0.8673**
Participant 5	0.6169	0.5641	0.6968

Colour Favourites

Table 14 shows participants' colour favourites. This data was collected via questionnaires prior to trial one and compared to responses to colours in all trials.

Table 14: Healers' personal favourite colours, and reasons given for that choice (quoted *verbatim*):

Response
"It changes daily; I love **all colours**"
"**Purple**, it just is!"
"**Primrose yellow**; it reminds me that spring follows winter"
"**Purple**; I love vibrations of purple; it brings depth of richness, sensuality and spirituality."
"**Purpley-blue**; I like the way it looks and it makes me calm and relaxed, and I feel it has a feeling of strength and solidity"

Chi-square analyses were performed on frequency of response by colour, with no significant differences found for any participant between responses to favourite colour against their other colour responses, χ^2 (9, n = 5) = 50.9, p > .05). This result includes participant 4, who although they expressed no preference had their responses examined to highlight any colour *apparently* favoured. Using the frequency data, individual participants' ratings for colours compared to their previously expressed personal favourite colour is displayed in figures 4-8, below. For clarity's sake, participant's favourite colour is printed in that colour and curves for all other colours are printed in grey. Participant 4, who expressed no preference, has their two apparently least-favoured healing colours (black and red) from the Likert responses printed in those colours. NB/ The Likert scale of responses appears as a *ratio axis* for purposes of clarity only.

From these results Hypothesis Hc1 is rejected; participants' responses to colour stimuli did not seem biased to their personal favourite colours.

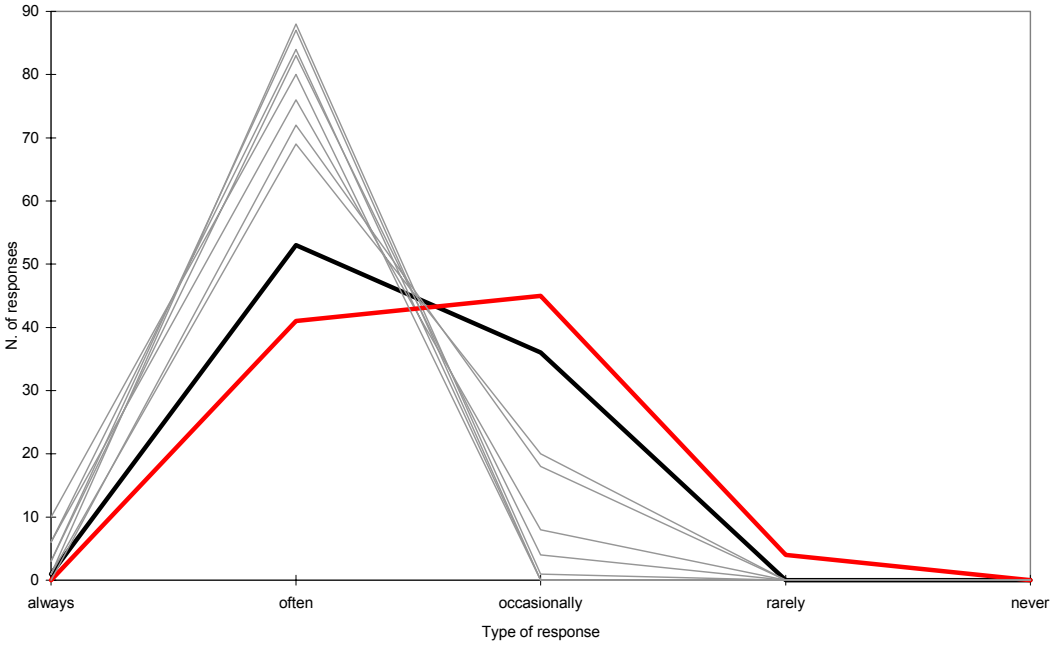

Figure 4: Breakdown of frequency of colour responses by Participant 4: who expressed no colour preference **("all of them")**

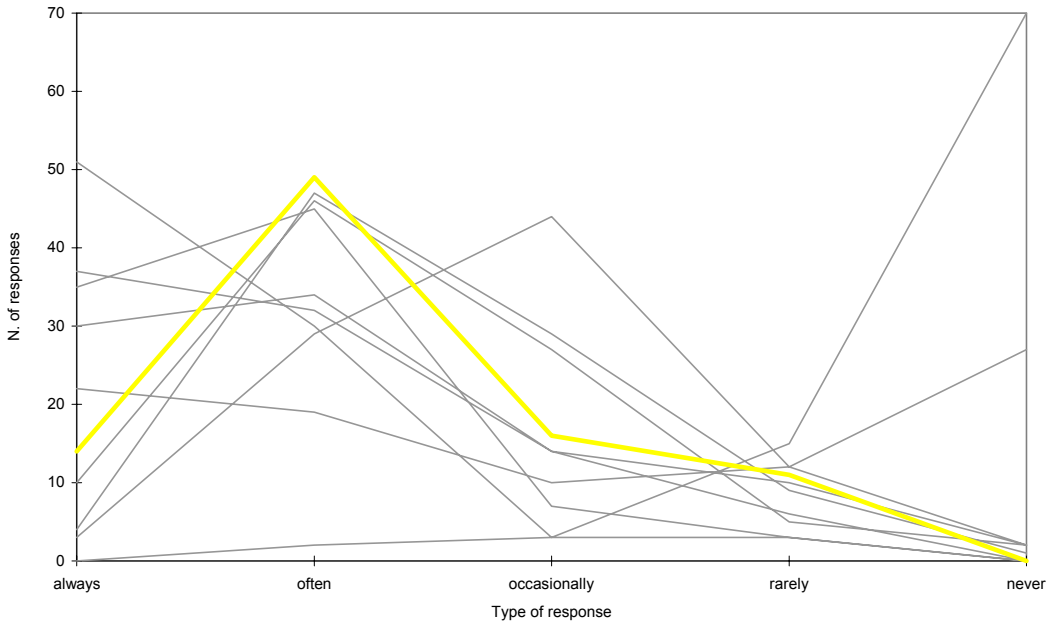

Figure5: Breakdown of frequency of colour responses by Participant 1: who preferred "**(Primrose) Yellow"**

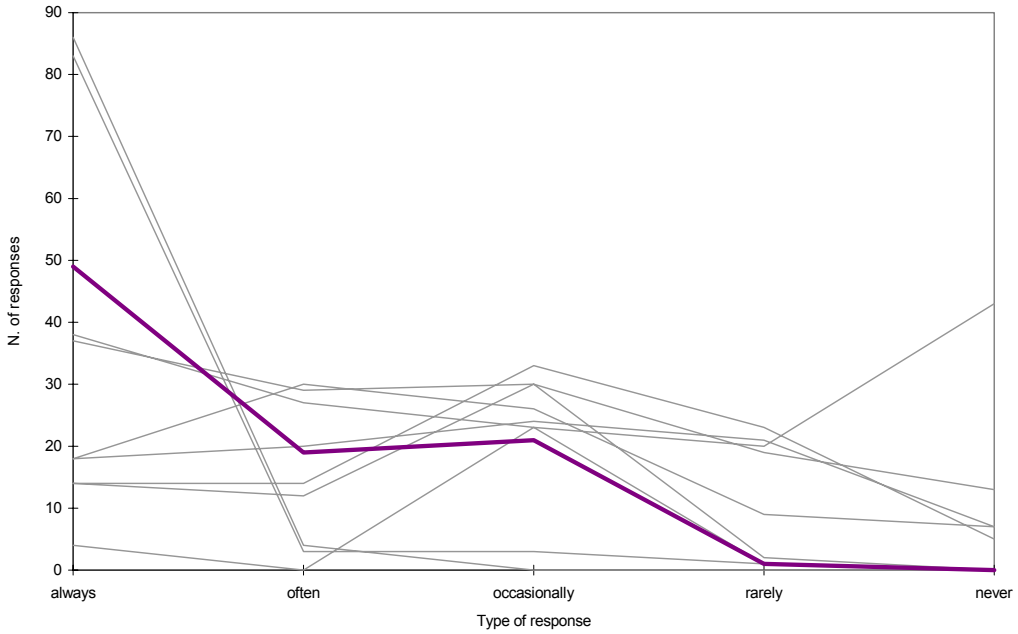

Figure 6: Breakdown of frequency of colour responses by Participant 2: who preferred **"Purple"**

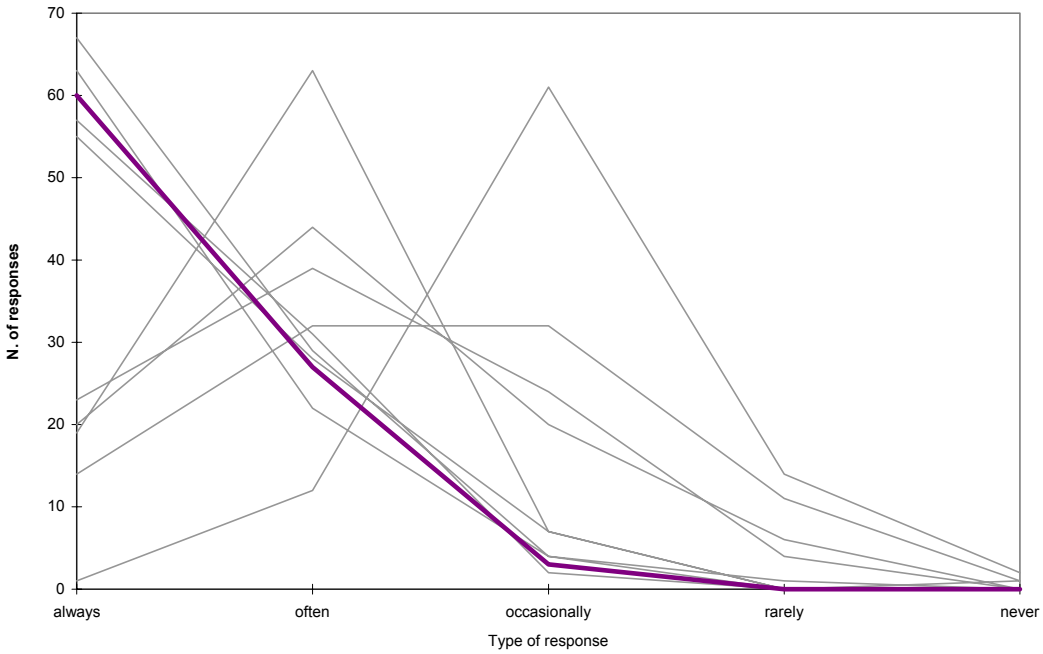

Figure 7: Breakdown of frequency of colour responses by Participant 3: who preferred **"Purple"**

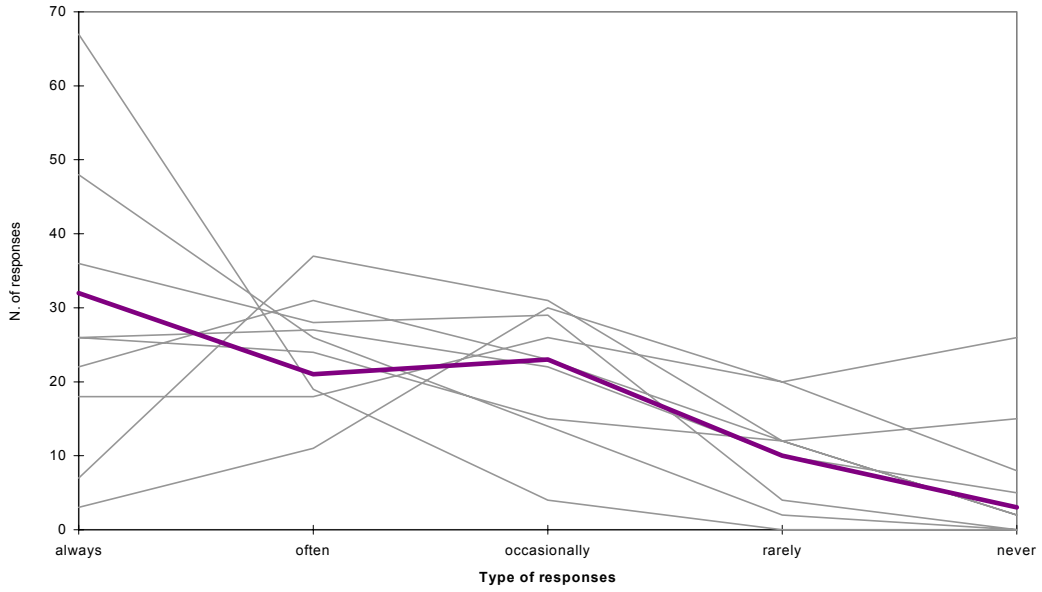

Figure 8: Breakdown of frequency of colour responses by Participant 5: who preferred "Purple"

Visual Violet versus Visual Purple

Each visual stimulus was presented twice in each of 3 trials, hence 6 presentations overall; each attracted 10 verbal ratings; giving 60 responses per participant. Overall rating responses were similar (purple: mean 2.31, SD 0.84; violet mean 2.85, SD 1.1). However participants 1, 2, and 3 all had significant within-subject positive correlations over the reliability threshold of 0.7 (r_s for all > + 0.8, n = 60, p < .01, one tail) between-subjects for use of violet. The highest within-subject correlation for purple was significant, *but* below the reliability threshold of 0.7 (r_s = + 0.63, n = 60, p < .01, one tail). Since visual Purple and visual Violet produced significance but only violet was reliable, Hypothesis Hv2 is rejected: there is a healer response difference between these two colours.

Mirror-comparisons

Analysis of visual and verbal colour correlations showed no significant differences in Likert ratings for colour name over visual colours, t (20) = + 1.64, p > .05, two-tailed. This is illustrated in figures 9-12, following. Separation on each bar indicates the degree to which these categories match on mirrored responses; the smaller the gap the closer the match. Figure 9 shows the generally higher correlations for colour names than visual colours themselves.

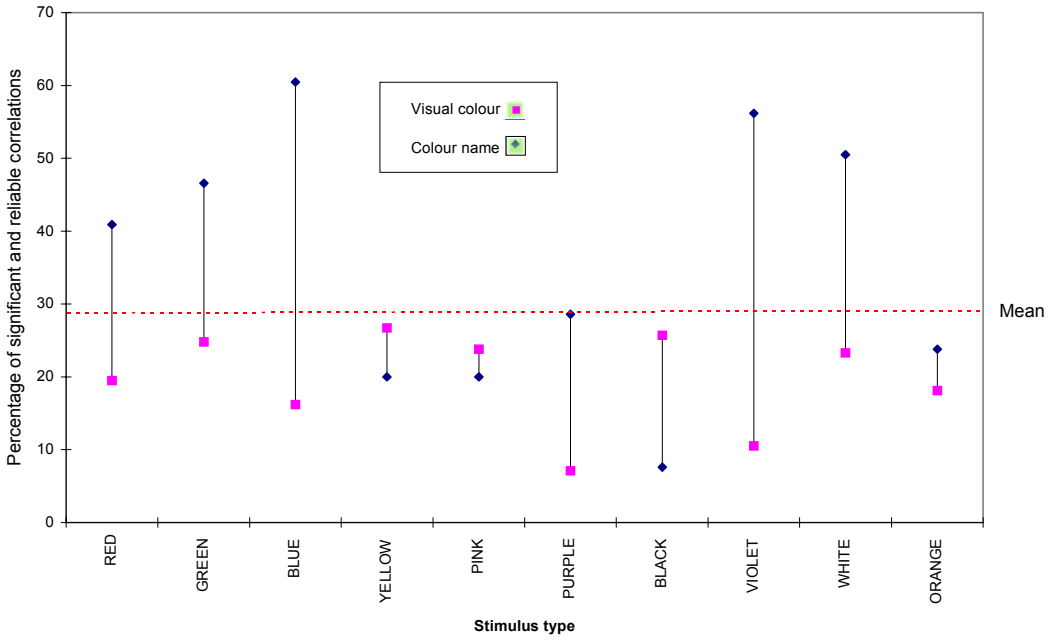

Figure 9: Comparison of significant and reliable visual colour versus colour name correlations of associations to human states and healing properties; showing overall mean

This finding is repeated when comparing verbal to visual colours in treating human states: see figure 10. A three-way comparison of verbal and visual colour plus healing property against human state was performed, with similar results: see figure 11. Three-way comparisons of verbal and visual colour by healing property again show verbal colour correlations being higher than visual colour correlations: see figure 12.

The findings are repeated in figure 13; comparisons of human state with healing property, and figure 14; visual colour correlations compared to healing property and human state. There are 4 possible levels of reporting: an overall level, a category level (i.e., colour by human state), a component level (i.e., red by human state) and an individual stimulus level (i.e., red by depression). Examples of two types of matrix appear as Appendix T, and summarised data is given in table 15, below.

Table 15: Percentage of significant and reliable correlations per correlation matrix; by overall and category levels of reporting.

Overall Level			
Visual colours by all verbal stimuli	7.6		
Visual words by all verbal stimuli	10.5		
Category Level			
	Visual colour	**Human state**	
Cleansing	17.6	28.1	
Energising	43.8	27.6	
Strengthening	23.3	18.1	
Cooling	57.1	16.2	
Calming	65.7	10.5	
Restructuring	14.3	12.4	
Immunising	21.4	13.3	
Balancing	23.3	18.1	
Clearing	16.2	11.4	
Loving	22.8	67.1	

Human State	**Visual colour**	**Verbal colour**	**Healing property**
Headache	38.6	61.9	28
Sprain	15.2	25.7	17.1
Fracture	20.9	35.2	14.3
Fatigue	33.8	28.6	22.4
Infection	13.3	16.2	13.3
Confusion	13.3	39	16.7
Hyperactivity	35.2	38.6	37.6
Depression	36.7	47.6	20
Stress	24.8	70.9	14.3
Healthy	45.7	56.2	27.6
Visual Colour	**Verbal colour**	**Human state**	**Healing property**
Red	40.9	19.5	63.3
Green	46.6	24.8	17.1
Blue	60.5	16.2	28.6
Yellow	20	26.7	17.1
Pink	20	23.8	41.9
Purple	28.6	7.1	28.1
Black	7.6	25.7	8.6
Violet	56.2	10.5	20.9
White	50.5	23.3	33.8
Orange	23.8	18.1	45.2

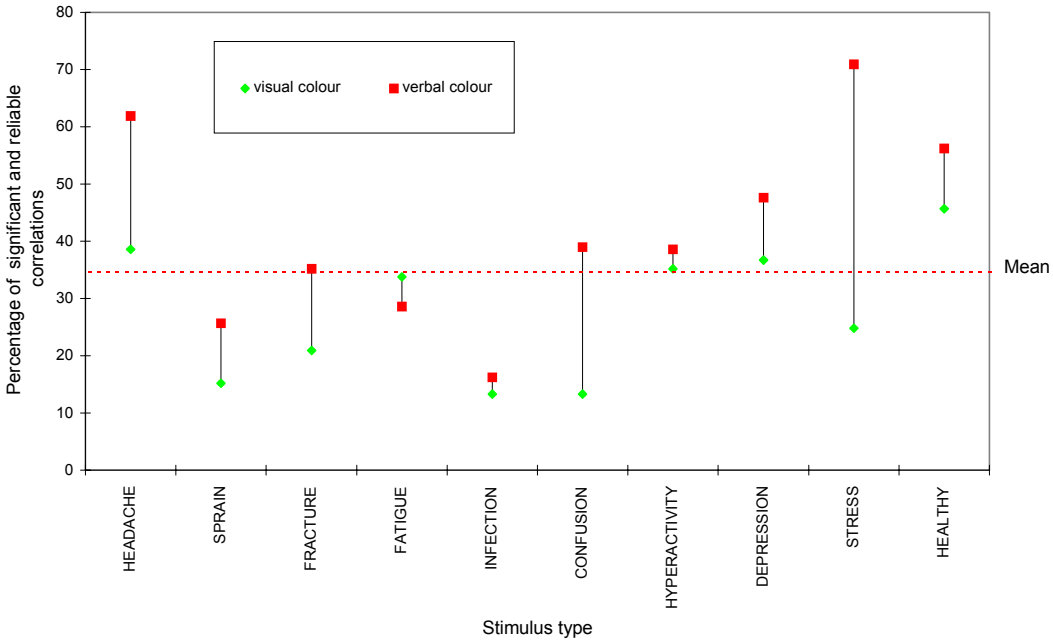

Figure 10: Comparison of significant and reliable human state correlations with visual and verbal colours. The correlation of the state, on X-axis, with the colour is shown by the respective green or red marker on the vertical bar above each X-axis category.

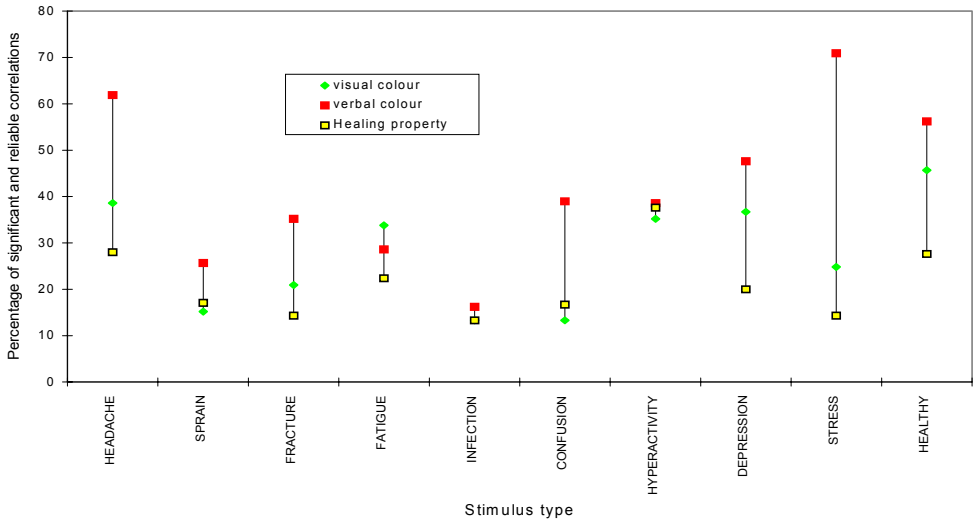

Figure 11: Comparison of significant and reliable human state correlations with visual/verbal colours and healing properties: the correlation of the state, on X-axis, with the colour and property is shown by the respective green, red or yellow marker on the vertical bar above each X-axis category.

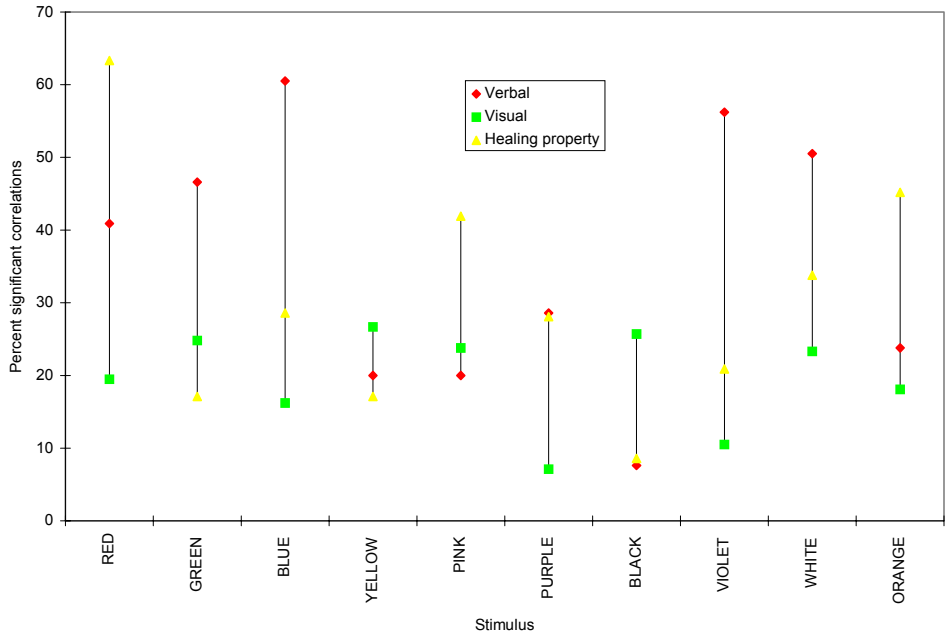

Figure 12: Comparison of significant and reliable colour correlations with visual/verbal colours and healing property: the correlation of the colour, on X-axis, with the visual or verbal form and healing property is shown by the respective green, red or yellow marker on the vertical bar above each X-axis category.

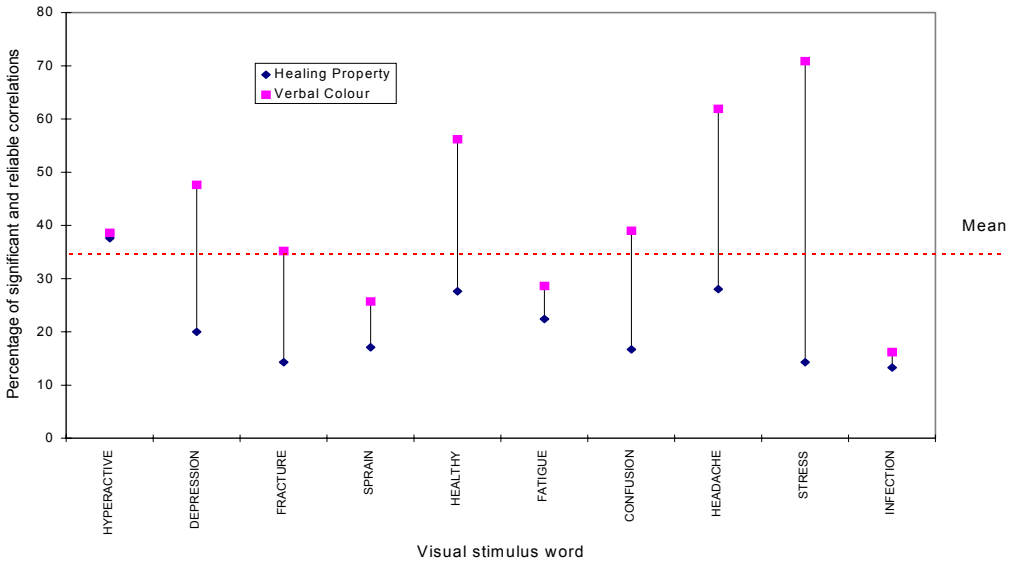

Figure 13: Comparison of significant and reliable human state correlations with healing property and verbal colour: the correlation of the state, on X-axis, with the colour or property is shown by the respective blue or pink marker on the vertical bar above each X-axis category.

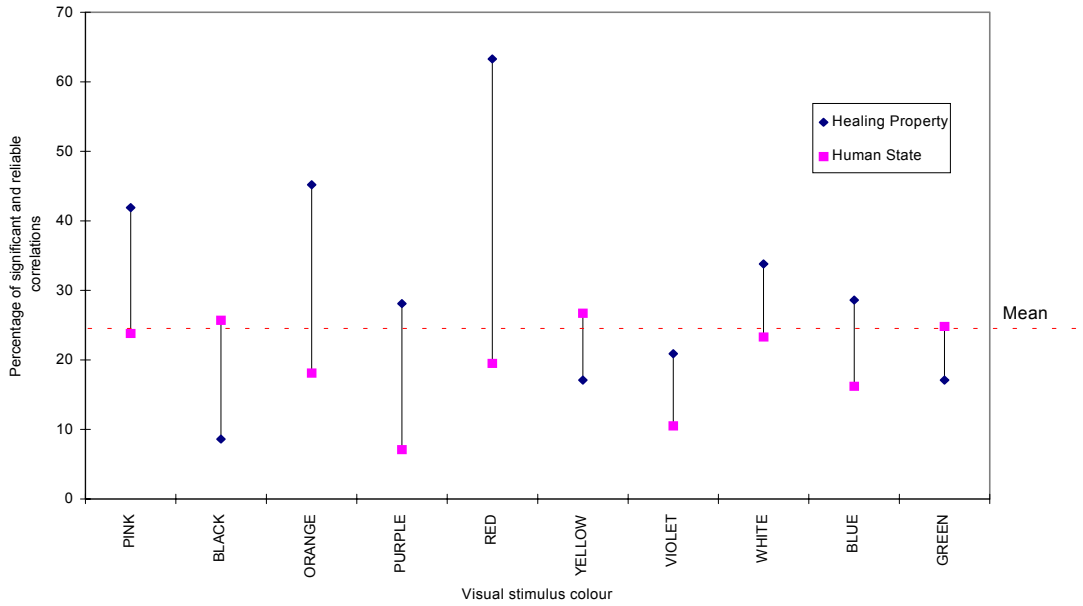

Figure 14: Comparison of significant and reliable visual colour state correlations with healing properties and human states: the correlation of the colour, on X-axis, with the property or state is shown by the respective blue or pink marker on the vertical bar above each X-axis category.

Over category and component matrices between 7 and 67% of all cells held correlations that were both significant and above the 0.7 threshold for reliability. Mean percentage of significant and reliable cells per matrix was 27.6, median = 23. 3, SD = 15.2. In matrices a score of over 14% of cells with significant and reliable correlations indicate that there *must* be at least one cell with a between-subjects significance *and* a reliable score [18] (i.e., over $r_s > .7$).

Descriptive Statistics

The mean and standard deviation of individual participants' Likert scores from their responses compared to the overall mean response appear in figure 15; below: showing broad similarity between participants, with the lowest standard deviation being that of participant 4.

Consistency of responses

The distribution of responses (overall) by participant is shown as figure 16; below; which illustrates the high use of the response 'often' (Likert score 2) by participant 4 compared to other participants. The stage response distributions shown in figure 17 below support the notion that each stage of the trial was broadly equivalent in response by participants.

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[18] These matrices are 5 participants by 3 trials each; hence 225 cells of which 15 are invalid; being 'correlations with self'; thus automatically scoring 1.0. Thus total is 210. From these there are 30 cells which are within-subjects. Assuming that all of these are significant and reliable, a score of over 30 cells with significance at or above a reliable level means there must be at least one cell between subjects with significant correlation and a reliable level of $r_s > .07$

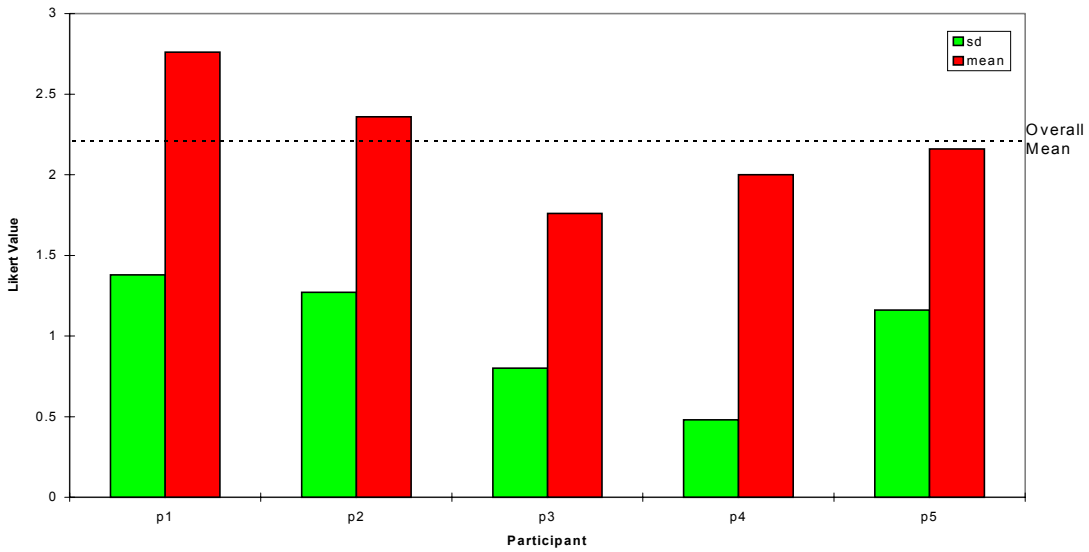

Figure 15: Overall individual participant response mean and Standard Deviation of Likert scores; also showing overall mean response of all participants.

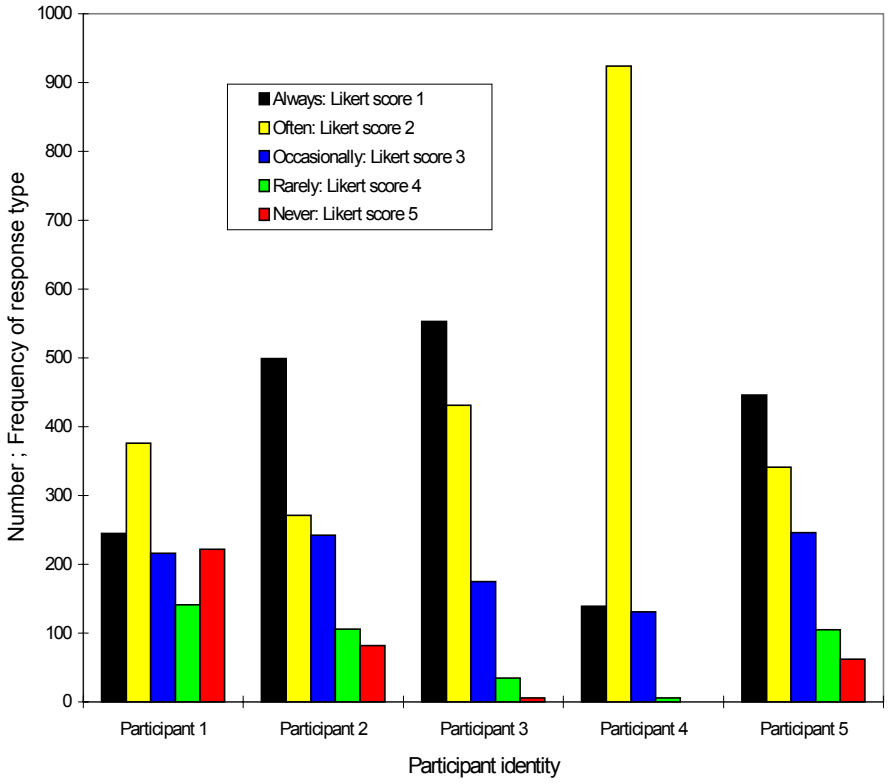

Figure 16: Overall distribution of Likert response types by participant; showing differences in participant four from the other participants.

Since this was so close 'by eye,' statistics were not performed and hypothesis Hds2 is rejected.

Findings between correlations were compared to highlight any possible learning effects, which would be found by major differences in correlations between trials.
This was not found; as shown in figure 18: below.

However comparison of response variance by trial indicates a general reducing trend as the study progressed; as shown in figure 19, below.

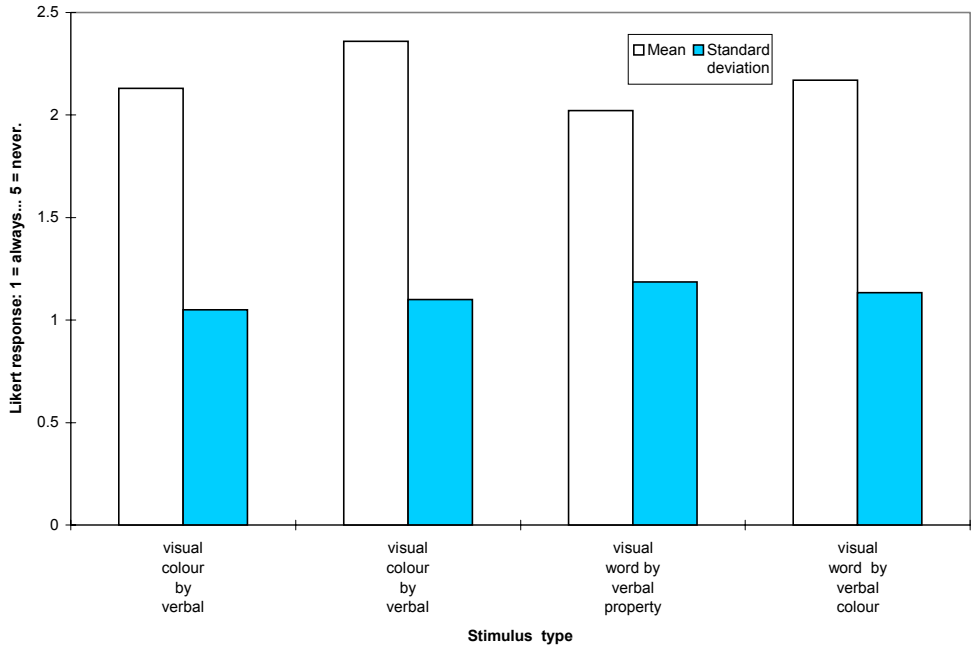

Figure 17: Variability between each component part of the study; illustrating high within-component consistency of responses.

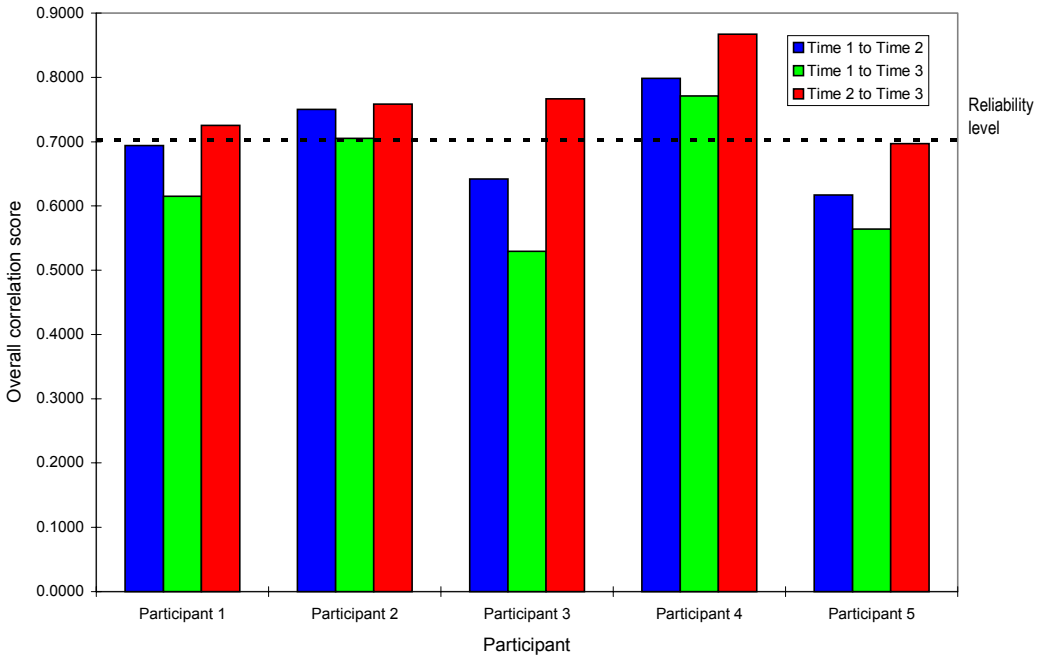

Figure 18: Correlations by participant by trial to show any possible learning effects; indicated by steep rise in correlations after trial one or two.

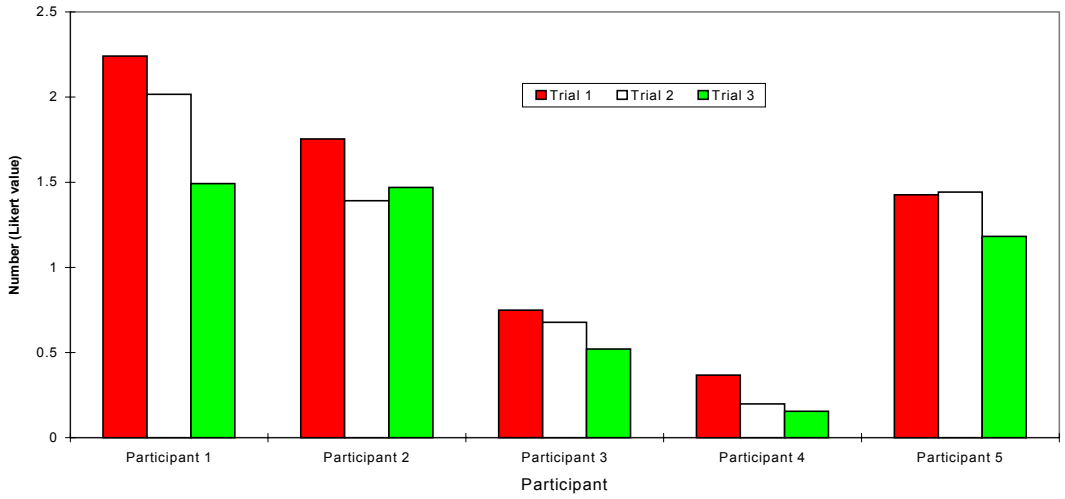

Figure 19: Participant response variance compared by time of trial to show general trend of reducing variance as the study progressed.

Stratification

Table 16 shows the percentage of significant and reliable correlations stratified by age, gender and known belief system.

Table 16: Percentage of overall significant and reliable correlations stratified by age, gender and known belief system

Stratification by category	Percentage of significant *and* reliable correlations ($r_s > .07$) found overall
Witch	11%
Non-Witch	40%
Age over median (38 yrs)	27%
Age under median (38 yrs)	17%
Male	13%
Female	16%

Training

From questionnaires, healers' training and uses of colour were compared. The results appear in table 17, below; indicating that there was no common system or experience within-subjects.

Table 17: Healer's experience, qualifications and colour usage in healing practice (from questionnaires). NB/ The healing qualifications and types are described in the glossary

Participants	1	2	3	4	5
Gender	**m**	**f**	**m**	**f**	**f**
Healing qualifications	Magnified healing Θ	Reiki 1 Θ, Magnified healing, Crystal, Absent healing Θ, Psychic healing-Channeling Θ	Diploma in Aromatherapy Θ	IACHT-BCMA Θ Certificate, IACHT Postgraduate Certificate in Clinical Crystal Therapy Θ	Reiki 1, Reiki 2, Crystal healing Θ
Other Healing Experience	Witch, Massage, Crystal healing Θ	Witch, Herbalism, Aromatherapy Θ,			Witch
Any formal colour training?	no	yes	no	yes	yes
If so, what?	Magnified healing Θ	Magnified healing, Θ Reiki Θ	-	All above	Crystal healing Θ, Reiki Θ
Which colours do they use especially in healing?	All	Green initially, then as required	No set routine	Depends on client and wide frequency within colours	Red for warmth or cleansing; black for protection

Discussion

Concise Major Findings

- *A priori* significance levels were set at $\alpha = .05$, but all correlations in these main findings were significant at the higher $\alpha = .01$ level.
- Participants demonstrated a highly significant but non-reliable system of associations between-subjects.
- Within-subjects there was also a highly significant system; two participants showing overall reliability, and two others showing partial reliability (on one of three trials).
- Participants' individual systems are thus reliable to some extent; but there was not an apparent shared system of reliable associations between them.

Correlations Between-Subjects

Despite highly significant inter-rater correlations overall, none were reliable ($r_s > .7$). This suggests there was no wholly coherent association system; but some commonality was found, regardless of the overall non-reliability. This is highlighted by some component items having highly significant correlations over all five participants (including many perfect +1.0 correlations).

A selection of a subset of the data (*either* by eliminating the colour black, plus some of the human state and healing property words; *or* by excluding all data for participant 5) would show both significance and reliability.

This would not be procedurally legitimate *post-hoc,* but illustrates that with different design and selection procedures results could have been either much more reliable, or far less significant; depending upon which subset was accessed. This reflects the problems of reifying 'healer;' participants had no common background of experience or qualifications; as detailed in table 17, above.

Another factor may have been selection of healing terms and human states. A wide range of terms was chosen, possibly not all participants had met all conditions mentioned, thus had no system for treating them. Their unreliable scores may therefore be an artefact of the stimuli not being sufficiently operationalised for a healing context.

This would be a similar situation to a general study of 'doctors' giving inconclusive results on a medical quiz about skin conditions because some were surgeons, some were psychiatrists, some were dermatologists and some were GPs. As mentioned; 'healer' is a generic term. The selection process was voluntary by participants who were naive to the exact content of the study, and 'blind' to participants' healing type by the experimenters. With more time for recruitment, details of healing type would have been researched first, and participants chosen from one healing sub-type. Between-subject reliability cannot be expected since the sample group derived from a heterogenous healing population. As mentioned, individual stimulus level correlations are not reported in detail here, but those stimuli (some applications of the colours white, blue and green) producing perfect + 1.0 between-subject correlations should be investigated in further studies.

Correlations Within-Subjects

All participants showed significant similarities of their individual systems over time; i.e. good test-retest reliability. As individuals, participants 2 and 4 had statistically reliable systems; giving credence

to them demonstrating a *meaningful* system of healing. This is an important finding; their reliability is higher than in broadly comparable studies of psychiatrists (Schmidt & Fonda, 1956; Beck, 1962) using similar contextual trials, which gave brief patient details and asked for diagnoses (see Appendix D).

This should not necessarily be seen as a negative finding for participants who were either partially or wholly unreliable in their responses. This study made no allowance for experience of treating each human state, as mentioned above. There is also scope for 'specialists' to perform poorly on this study. A healer may have excellent skills at diagnosing and treating several of the human states presented, but a lack of experience of other states may 'average out' their high scores, to give an overall unreliable score. Perhaps the two reliable healers are good 'all-rounders' and the other three are more specialised. Without substantial further research, probably involving detailed interviewing, this cannot be verified.

Operational problems with this study (discussed below) may slightly detract from the validity of the findings. However, despite this, and without implying that healing works via the mechanisms claimed, this within-subject finding provides valuable 'process question' data. This was identified by Vincent *et al.,* (1997) as a prime requirement towards operationalising alternative therapies, with a view to clinical trials. Again, within-subject there are some highly reliable and significant component scores for all participants; regardless of reliability overall. These specific within-subject findings are discussed under the relevant headings below.

Subsidiary Analyses

Line bisections

These are dealt with as Appendix R and C. The critical finding is that FK's visual neglect problems did not appear to be a confound.

Colour Favourites

From table 14, above; purple was chosen by 3 of the 4 healers who expressed a preference. Appropriately for the general belief-systems, Lüscher (1969) identified this as indicating spirituality, a wish for mystic union, dream fulfilment, intuition, etc. This is interesting. However the rationale for this question was to exclude the confounding possibility that participants were simply favouring these colours; i.e., choosing 'always' or 'often' responses for them (rather than giving the healing responses the task required). Failure to reject hypothesis Hc1 would invalidate the study's claim to measure healing responses, reducing it to a longitudinal (and pointless) measure of whether participants could remember their own favourite colour. The chi-square result and figures 4-8, above, confirm this was not the case. Participant 4's results gave no significant difference for *any* colour, but a slight, non-significant tendency for less frequently using black and red. This supports the honesty of their original expressed lack of any colour preference. Figure 4, above, especially illustrates the remarkable consistency of participant 4's responses; shown by virtually identical curves for 8 of the 10 colours. This is discussed later.

Possibly there were un-detected learning effects with healers trying to recall earlier responses, but this seems unlikely. *Memorising* 400 responses would be daunting; especially against randomised stimuli order. The complex mnemonic required could not be devised 'on-the-fly' during trial 1 while at the same time performing the test. Thus it is unlikely the positive correlations merely indicate polished remembering skills, either for favourite colours or earlier responses.

Visual Violet Versus Visual Purple

Using visual violet and purple was based on differing healing properties of these visually similar colours in the literature. The significant and reliable results of three participants for violet but none for purple support this notion. Precisely what this difference is will require design of a more refined discriminatory test.

Mirroring of stimuli

Use of two complementary measures of association (visual colour-verbal word and then visual word-verbal word) avoided a 'mono-method bias' (Coolican, 1995). Solso (1971) found visual colour names elicited higher imagery scores than 'the same' visual colours. This study is slightly different. However, it was tested whether purported healing properties and associations for a visual colour would be similarly rated for the same verbal colour name, also whether visual and verbal versions of the word stimuli had similar results. The main finding corresponded with Solso (1971) in that a verbal version of any stimulus showed higher correlations than the visual version.

More detailed comparisons were made, as in figures 9-14, above, such as verbal and visual colours allied to associated healing properties and human states. Length of bars on figures 9-14 indicate closeness of responses to linked stimuli; i.e. 'parallel-forms' validity. These responses were to visual and verbal forms of the same stimuli and terms that were linked in other stages of the study. For example, if 'red' were strongly correlated with 'energising' in one stage of the study and 'energising' strongly correlated with treating 'fatigue' in another stage, one would expect 'fatigue' to be similarly correlated with 'red' elsewhere. This type of finding was not the case. There are *no* closely scored, significant *and* reliable categories between linked stimuli. For the human states of infection and hyperactivity there were very similar correlation scores for visual colour, verbal colour and healing property to treat these states. However, although significant, this was all at well below a reliable level. The wide spread on many bars on these graphs re-emphasises the non-reliable overall findings between-subjects. From the results, overall parallel-forms validity is shown to be poor.

Distractors

The effects of distractor stimuli (visual and verbal colour black and visual and verbal word 'healthy') are reported and discussed in Appendix C.

Descriptive Statistics

Variances in response type reduce over time; see figure 19, above. This could be a regression towards the mean phenomenon and/or Hawthorne effects; i.e., the participants deciding to 'hedge their bets' on later responses, having had time to consider the study after completing trial one.

Differing standard deviations among participants highlights a possible confound that became obvious during trial one, and continued throughout. Participant four gave the response 'often' (Likert score 2) to *virtually every stimulus*. This may be an experimental effect or could relate to their particular healing style (crystal healing), a seemingly very homogenous practice, with every colour being potentially therapeutic in any condition. On the occasions when 'often' was *not* their response, this participant was very consistent over time in what else was said. Therefore, with reservations, it is believed that these responses were honest and not some artefact of the procedure.

Participants were discouraged from discussing the study between trials, but since some participants know each other there may have been discussions between them. That responses were often very different over time between-subjects implies that if any discussion did occur, it did *not* result in

responses reflecting some confounding consensus of opinion. Were there some collaborative plot between healers to produce a 'group answer' for all to follow it would be expected that correlations after trial 1 would have been different, and very much closer to $r_s = +1.0$. They were not, as can be seen by referring back to table 12, above; which shows very similar scores over time.

The Likert scale used poses some problems. The scale had non-interval ratings within two absolute parameters; using interval scaling would be an improvement. Generally, people tend to avoid Likert extremes or absolutes (Coolican, 1995) i.e., always (1) or never (5); to give a normal-like distribution curve. However, this was not found apart from participant 4, who rarely used 'rarely' (4) and never said 'never' (5), as indicated in figure 16, above. This also illustrates the high use of 'often' (score of 2) by participant 4 compared to the others (over twice as often as any other participant).

Stratification

Some simple comparisons were made between the data stratified by three categories; see Table 16, above. Since these percentages derive from a small-sample permutation of only 2 participants in one cell and 3 in the other, further statistical analyses were not performed. The most striking difference is in witches to non-witches; where the consistent, possibly Hawthorne-effect influenced scoring of participant 4; (not a witch) accounted for most of the 40% rate. Due to this possible confound it should not be taken to support any notion that witches were around one-quarter as reliable as non-witches.

The increased reliability above median age supports a common-sense view that healers (like any profession) improve with practice. Older healers might have had more practice. This depends on at what age healers *started* to work, of course, so without further details of experience this cannot be investigated further.

Training

Due to the variation in individuals' training shown in Table 17, above, and the problems of defining 'healer,' ecological validity is doubtful. Despite some healer inter-relationships, findings did not reflect closeness of known personal or professional contacts, and those few who shared any similar healing qualification. Healers who (to knowledge of experimenters) had *never met* were often closer in terms of reliable correlations than known healing co-workers were. This in itself was unexpected, as people working together would be expected to exhibit similar systems. Since exact degrees of co-working, experience and shared beliefs involved are not fully known this also cannot be investigated further.

Validity and Reliability Issues

Inter-Experimenter Reliability

This was intended to be controlled by strict adherence to experimental procedure (Appendix F). This entailed both experimenters jointly-running each trial (one changing visual stimuli and scoring Likert tables; the other administering verbal stimuli). Experimenter roles were to alternate between trials; to counterbalance experimenter effects, including voice differences in delivery of verbal stimuli.

Due to unforeseen circumstances, nine of the fifteen trials were performed solo (seven by one experimenter and two by the other) with six trials jointly run. The only obvious solo effect was slowing of total trial time by approximately 2 minutes (on a mean of 38 minutes per trial).

Since the apparatus was purpose-built shortly before the study, experimenter practice time before trial one was limited. Hence there was possibility of learning effects, in fluency of running trials, *for the*

experimenters. Subjectively, the final trials seemed considerably more 'polished' than earlier; even though procedure was kept constant.
Despite the low likelihood of any confounds due to these two procedural variances, inter-experimenter reliability cannot be guaranteed. This could be improved by allowing more time for experimenters to perform 'dry runs' with the equipment.

External Validity
It was never intended that results could be generalisable due to the small sample size and non-random sampling (Mook, 1983). Due to probable learning effects (both from participation in the study and further training and/or experience as healers) this study will probably not be replicable *in the same group*. Participation certainly made them evaluate their own systems, as reported in conversations after the final trial, although it is doubtful that any maturation effects could have affected such a short study. Participants certainly found the task both demanding and repetitive, so it is unlikely they would *wish* to repeat the experience.

Other Kinds of Validity
There is a prospect of predictive validity. Similar tests could monitor individuals' over time, consistency-wise, rather than their making similar attributions to stimuli. This could perhaps be as part of healer training courses. National Bodies of Healing and the Parliamentary Committee on Alternative Medicine were contacted to establish whether a monitoring system is already in place. Unfortunately neither organisation replied, despite several letters being sent to both.

Assignment to groups could not be random by definition, since there was only one group. Thus internal validity is impossible on a participant level. However randomisation of stimuli was performed, so this *was* internally valid.

Verbal word stimuli were read orally by one of the two experimenters; with roles being exchanged between each trial to counterbalance the different voices [19]. Despite attempts to keep volume, tone and vocal 'manner' constant, this is an uncontrolled variable. Future studies would use a pre-recorded set of stimulus words produced using Received Pronunciation [20]. This could be replayed at a known fixed volume to maintain standardisation.

Apart from this, stimuli remained constant. However the experimental venue varied (Appendix B). Due to this, absolute construct validity cannot be ensured, but it is doubtful it had any detrimental effect. Possibly by being tested in their own homes (where many also do healing) participants were perhaps *more* relaxed and 'natural' than in a laboratory. This may have diluted any experimental effects.

Cross-study and concurrent validity cannot be claimed, let alone demonstrated, since no comparable study was found.

Criticisms and strengths of the study
Healing type was not ascertained before testing. Different healing types of participants made it very unlikely that between-subjects findings would be reliable. Future studies *must* be grouped by known healing types. It was impossible to pair by age, training, experience, handedness or gender; in a larger

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19 One male, one female; with two slight, but different accents: 'Midlands' and 'London' respectively.

20 Formerly 'BBC English' (Romaine, 1994); i.e. clear, modulated and distinct.

study this should be possible.

The participation of FK was based purely on his 30 years of healing experience, and regardless of his visual neglect. The additional work created by running line-bisection tasks was not excessively time-consuming and improved the study by giving credence that all participants could see adequately. Many visual experiments either perform this and do not mention it, or do not perform it at all. A better study would include verification of visual acuity, colour perception, hearing (for verbal stimuli) and reading ability.

Standardisation could be better achieved via computer-controlled stimulus presentation to eliminate the variable awkwardness of manipulating the lightbox. A laptop PC would also be more portable in the field than the bulky lightbox was. Changing responses from verbal ratings to making fixed-choice key presses would also save experimenter time on data input by having the participants do it.

Colour range might be an issue. Future participants might benefit from choosing their own 'best healing colours' from a larger sample. This could be a selection of perhaps five Pantone shades of each of ten colours used. Cue-sorting or rank-ordering these by effectiveness would be useful to extend the number of colours tested. Conversely, healers may also work with a few colours. The choice of ten colours for this study may have been too many; perhaps a study using just shades of red, blue, green, yellow, black and white may focus the area of enquiry better.

Healing experience in terms of approximate numbers of clients that responses were based on is unknown. Since one participant's 'often' (or 'never') may be based on 10 clients and another may have treated 500, the Likert scaling cannot be regarded as a wholly valid measure *between*-subjects. Either some means of producing at least interval data needs to be found for this subject area, or only healers paired by known and quantified experience should be tested.

Analyses not performed

Were more time and participants available, similar results found and standardisation issues resolved, then as an unpublished research area, this could be submitted to journal editors. 'Unpublished' does not mean un-researched, however. Rosenthal's (1979) 'file-drawer' problem is the likelihood that significances are eminently publishable; with unsuccessful studies gathering dust in file drawers. His compensatory statistic estimates precisely what data from unreported studies would be required to negate the significance of a study; were all combined in meta-analysis. Likelihood of studies producing these results is then computed and the original findings are either strengthened or weakened, depending upon the likelihood levels.

Similarly, chances of Type I and Type II error would be estimated. This 'estimate' means something more accurate than the standard $\alpha = .05$ level, i.e. a 1 in 20 chance of making an error. The actual data changes required to alter non-significant findings to significant (and vice-versa) can be calculated and the likelihood of such results assessed (Tversky & Kahneman, 1971). As this is such a small 'n' study, any significance is noteworthy: i.e., if an experiment with 30 trials is performed at $\alpha = .05$ there is a 16% chance of finding a significant effect; 50 trials boosts that to about 33% (Utts, 1986). However, this is a cleft stick; there are also chances of small samples giving apparent effects which are artefacts entirely due to the sample size, and which vanish on larger studies.

There is considerable scope to discuss component level data. This has not been reported due to time pressures and the size limit of this report, which precludes further elaboration.

Studies Suggested by this Experiment

The pilot design (Appendix D) involved multiple semantic differential scaling (Osgood, Tannenbaum & Suci, 1957) which remains viable, given refinement and sufficient resources, especially time. Due to the specialised nature of semantic differentials, two papers could result. One would be on the findings and one simply on design, execution, content analysis and qualitative statistics performed.

A Stroop (1935) test could be devised with words presented in congruent and incongruent healing colours. Suppose 'visual red' correlated highly with 'energising' and poorly with 'calming,' which itself correlated highly with 'visual blue.' Stroop interference on naming of ink colours should be higher for 'energising' in blue and 'calming' in red, and lower for the words presented in their highly-correlated colours. Since the Stroop effect accesses less-conscious awareness (McLeod, 1991), it can be tailored to almost any group; i.e., panic disorder patients (McNally, Rieman, Louro, Lukach & Kim, 1992), depressives (Williams & Nulty, 1986) and phobics (Burgess, Jones, Robertson, Radcliffe, Emerson, Lawler & Crowe, 1981). This may be useful to perhaps reduce any possible Hawthorne-type (i.e., conscious) effects, as typified by participant four.

From meta-analysis of many studies (when/if performed) and converting all colours to one scale (e.g., Munsell) a 'healing spectrum' could be constructed; see figure 20, below; which shows the CIE colour space spectrum. The outline spectrum below it in figure 21 speculates a corresponding 'colour healing space.' Perhaps (seemingly) semantic opposite healing properties such as energising and calming correlate with opponent visual colours? It must be stressed this is an un-tested and approximate theoretical model awaiting falsification [21].

There may be a systematic confound by using the *context* of a healing session, i.e., words and colours alone, without a client present. Other factors, such as body-language, pallor (or otherwise), respiratory rate, general demeanour and numerous other non-verbal cues may all be needed for an holistic assessment.

As mentioned above, Schmidt and Fonda (1956) and Beck (1962) both found poor results using contexts only as diagnostic prompts. If healers diagnose via clients' auras they would be especially handicapped by this design. Imagine an expert wine-taster being forced to rate an untasted, unknown vintage merely by having the colour of the bottle described to him/her via the telephone....

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21 XXXXX and Evans (1998); a model proposed by the experimenters.

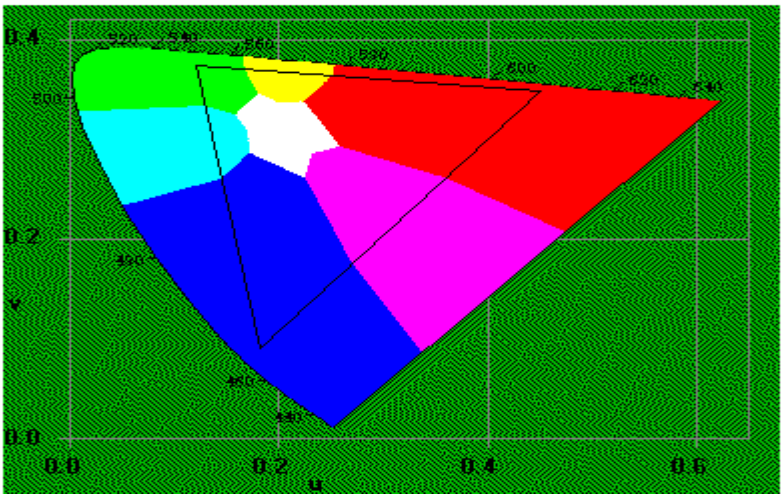

Figure 20: CIE colour space; showing the ratio distances between any two colours. (Reproduction of this diagram is limited by the printing hardware used to produce this report; the CIE scale itself shows considerably more colour separation and hue variance detail than the above).

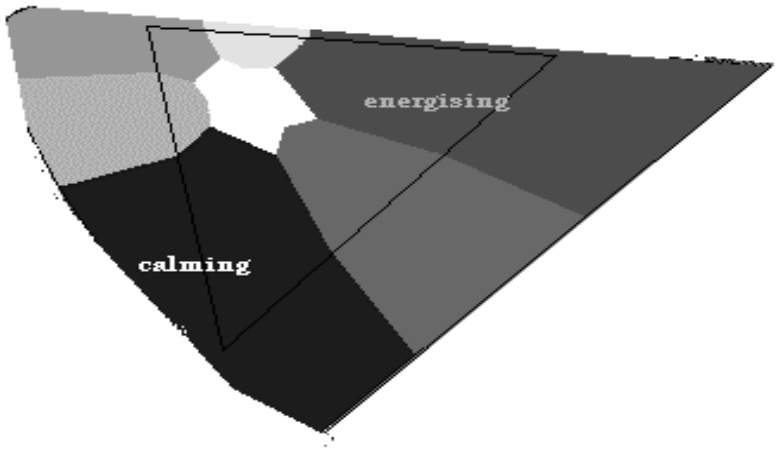

Figure 21: Purported 'healing space' (XXXX & Evans, 1998), based on the CIE model of colour space (above). We suggest that with more refined tests a ratio level of measurement could be devised to differentiate semantic healing terms associated with particular colour wavelengths.

Extending study of Healing

Given high parallel-forms validity (not achieved by this study) the logical next test would be of face validity. This is whether healers show the same colour-word diagnostic and treatment associations with a real client, or whether other factors intervene. This would require major re-design and ethical review; since it would involve access to medical records.

For healing to be scientifically accepted, study must eventually reach a 'real-world' clinical setting. Randomised control trials on a given illness using an operationalised and named healing technique

allied to a recognised orthodox practice [22] could be compared to two control groups. One control would receive just orthodox treatment; the other would be those on a waiting list. Should there be significant positive differences (clinical and/or statistical) between the allied treatment and orthodox groups this could support the effectiveness of the healing technique. Since accepted measures of many illnesses already exist this study should be valid and relatively easy to run.

[22] For ethical reasons it may not be possible to run a healing-only group. Regardless of any value to perhaps be found from healing this would mean withholding already recognised effective medical treatment from real, ill individuals who may benefit from it.

Conclusions

This study has shone a small light into an important, and neglected area. The findings support the belief that various branches of 'alternative' medicine (and individual practitioners) have reliable diagnostic and treatment systems. At no stage has it been implied that healing works *via the mechanisms claimed*, that is a matter for further research. There is a duty of good science to investigate unknown areas. This must be done objectively; albeit with healthy scepticism. There is no place for dogmatism: it is better to selectively test hypotheses, attempt replications via other researchers and be open to new lines of thought. If, after in-depth research of healing, including outcome studies (Vincent *et al.*, 1997) it is found that any branches of alternative medicine are as effective, less invasive, painful, toxic or cheaper than orthodox methods, this would be a welcome advance in the relief of suffering.

The threat (or challenge) to science is that research will eventually need to encompass all psi phenomena; including the seemingly impossible one such as telepathy and telekinesis Θ. It would be better to base conclusions on collaborative empirical cross-disciplinary studies (psychology, parapsychology, physics, biology and medicine) than to commit something that could perhaps be called a 'Type III Error.' By this I mean that by simply denying the existence of anything not currently understood, rather than trying to investigate it, we risk losing *the chance* to make further advances.

For a limited experiment this has illustrated significant and reliable phenomena in healers. It is hoped that resources and support will be available to enable future researchers to extend objective study in this worthwhile field.

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NB/ Ψ Indicates where reference has been made to an article in a foreign language but with an English abstract; this was done five times.

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25 David Solomons; BA, MSc is a personal friend working n the film directing and production business and provided general information on the colour-register uses of film in world cinema to confirm and supplement the article by Rule (1998).

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Appendix A: Glossary of healing-related terms for Researchers

This glossary includes all items in text marked with Θ , giving definitions and additional information to aid the reader with non-psychological terminology which may be unfamiliar.

A

Absent Healing : Healing at a distance (often without client's knowledge); which can be from yards to inter-continental.
Acupuncture: Fine needles are placed into the skin to stimulate or unblock 'energy channels' to treat a variety of conditions. An area where 'cross-over' between alternative and orthodox medicine has already occurred: around 0. 2% of GPs have trained in medical acupuncture (Nickson, 1998 [26]).
Aromatherapy: Application of plant oils or derivatives in massage or via oil burners to perfume the air; different oils are used to treat different conditions. Since chemicals may be applied to the body there are likely pharmaceutical effects and benefit from massage (if used) as well as anything spiritual.
Aura: This is not the 'aura sensation' often reported by patients with; for example, severe epilepsy or migraines (Sacks, 1985); as it is described by healers (and others) in a non-pathological state (R.A. Wilson, 1977).

B

Bardic: Following a poetic occult tradition similar to modern-day Druids.
BCMA: British Complementary Medicine Association: One of the training and governing bodies of alternative medicine.
Bioenergy: Catch-all term for anything related to 'subtle energies' (*q.v.*).

C

Channelling: Activity whereby the healer acts as a willing conduit for 'higher forces' to act, speak or heal through them.
Chakras: Localised energy centres of the aura (*q.v.*) which seem to share some commonality with modern medical and anatomical knowledge; especially endocrinology; however since some chakras lie outside the physical body (see figure 22, below), how they can influence with biological processes is problematic. In any case, the concept of 'spheres' of the body controlling different functions is ancient and spans many cultures; i.e., the pre-Christian qabbalah system calls a very similar concept; 'sephira' (*q.v.*) (meaning spheres).
Christian Scientist: Spiritual healing, but where the spirit channelled (*q.v*) is that of Jesus.

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26 Dr. Nickson was at the time my GP; and a trained acupuncturist; about which he supplied useful information..

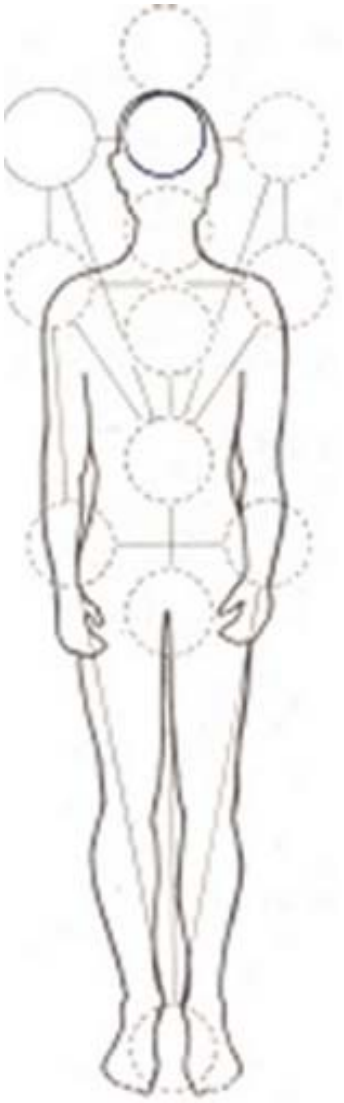

Figure 22: Schematic of chakra and sephira system (adapted from Regardie, 1987; Richardson, 1981)

Crowley, **Aleister** (1875-1947): viewed by many (Regardie, 1986; R.A. Wilson, 1977) as the most knowledgeable occult scholars ever; his book '777' (1912/1973) especially being a standard text of occult symbolism systems.; including colour attributions. Unusually among occultists, Crowley studied classics, logic and philosophy at Oxford. His later teachings centred on 'scientific occultism.' By systematic doubt and use of empirical procedures of multiply repeating the same spiritual exercises a reliable effect was established: Crowley's motto was **"to synthesise the methods of science and the aim of religion"** (Crowley, 1912/1973, p 84).

Crystal Healing: Use of mineral crystals in proximity to, or contact with body to re-align energies. Since different crystal structures emit different micro-electrical charges (such as the quartz crystals that regulate clocks) it is thought different crystals may act as agents of differential healing.

E

Energy channel: similar to chakra

Etheric level: spiritual plane of awareness

H

Herbalism: The 'prescription' of plant products to treat illness. The precursor to modern pharmacology, often with great justification; i.e., willow leaves are an old herbal cure for headache. Varieties of Willow tree (genus *Salix*) supply us with Salicylic Acid; now better known as Aspirin.
Higher self: spiritual consciousness, the soul.
Holistic: A 'whole person' view: contrary to the 'organ-centred' attitude of some Western medics.
Homeopathy: System of therapy where chemicals (often highly poisonous) are sequentially diluted to parts per billion. A microscopic quantity of this dilution is then made into a pill (other ingredients are inert). The pills have measurable effects well above placebo rates. When considering the low dosage of pills and the enormous dilutions, there should not be *one molecule* of the original chemical present in the patient; let alone a therapeutic level. Hence the mechanism of action is not understood.

I

IACHT: International Association of Crystal Healing Therapists: one of the training bodies of crystal healing.
Iridology: A diagnosis system depending entirely upon examining the eyes. Pathologies anywhere in the body are apparently revealed by changes in the iris.

K

Kirlian photography: photographic plates are placed near a living organism (but are not exposed in a camera) and produce an image of the physical body, with a brightly coloured surround; i.e., the aura. In illness and purported healing states the aura is emphasised where the site of illness lies or healing energy is concentrated. The Kirlians are two scientists truly held back by world events. Their original discovery was made in 1939, kept from publication by World War II and remained unpublished in the former USSR until 1959. Due to its economic advantages in crop yield work (Rud & Sukach, 1977) the 'Cold War' prevented translation and world-wide publishing until 1974, some 35 years after the original work.

M

Magick: Spelt with a 'k'; this indicates the brand of occultism devised by Aleister Crowley (*q.v.*).
Magnified Healing: The healer first 'charges-up' themselves via a channelling exercise (*q.v.*) in order to give stronger healing; metaphorically akin to a turbocharger on a car engine.

O

Occultism: Umbrella term for (literally) study or practice of unknown or hidden arts. These include witchcraft, magic, mediumship, clairvoyance and practices akin to psychodrama (R.A. Wilson, 1977). Jung researched heavily into mythology, occultism also relies heavily on this. Occultism and Witchcraft: These terms are not interchangeable, but much as Cheddar is cheese not all cheeses are Cheddar; Witchcraft is occultism but not all Occultists are Witches.

P

Psi: Anomalous processes of information or energy transfer, such as telepathy and healing that are currently unexplained in terms of known physical or biological mechanisms. 'Psi' does not imply a paranormal cause (Bem *et al.,* 1994).
Psychic: In the psychological sense, anything pertaining to the psyche. In a healing sense this indicates a spiritual or non-physical aspect.

Psychology-psi debate: Most psychologists refute psi-. Of 1,100 US non-psychology professors surveyed; around 60% believed ESP is either factual or a likely possibility. The comparable figure for psychologists was only 34% (Wagner & Monnet, 1979). Bem et al (1994) suggest this may be because psychologists are used to building hypotheses, test-retest reliability and statistical replication etc., and distinguish sharply between phenomena whose explanations are controversial (e.g., hypnosis) and phenomena such as psi- that appear impossible. Physicists are more open: The empirical confirmation of Bell's theorem states any model of reality compatible with quantum mechanics must be allow for incompatibility with any physically permissible causal mechanism. Several possible models of reality actually *require* psi- (Cushing & McMullin, 1989; Herbert, 1987).

Q

Qabalah: (Also variously spelt kabbalah, quabalah) Interpretations of Qabalah vary hugely. In short a pre-Christian holistic system of beliefs centring around correspondences (including colours) between the body, the soul, God(s) and the Universe. Crowley (*q.v*) demonstrates numerous colour-symbolism-semantic systems of attribution, involving zodiacal signs, symbolic animals, Greek gods, planets etc. Crowley himself had four colour scales depending upon which etheric level (*q.v.*) was involved .

R

Reich, Wilhelm (1897-1957): advocated the positive effects of unhindered sexual energies; believing neuroses resulted from repressed sexual energy. He used yogic-like breathing and relaxation combined with "orgone energy" (apparently analogous to healing energy: Hyatt, 1988). Reich, a psychoanalyst, moved towards a slightly more physical treatment and was thus arrested by the US Food and Drug Agency, on the perhaps rather trumped-up charge of practising medicine without a licence. His books and notes were burned and his experimental equipment destroyed by agents armed with axes. Reich was imprisoned and died shortly afterwards of "heart failure." Ironically, as a Jew and Communist he had fled 1930's Germany to avoid persecution, and as a scientist he had been horrified by the book-burning activities of the Nazis. Despite being a respected figure in the psychiatric community previously, less than 20 of his scientific brethren gave him public support during his imprisonment (Reich, 1989; R.A. Wilson, 1977).

Reiki: (Pronounced: ray-key) Japanese word for Universal Life Force; i.e., healing energy. A system devised by a Japanese Buddhist Christian; thus with multi-faith appeal.

S

Sephira: (Plural: sephiroth: spellings vary): spheres representing bodily and spiritual functions, arranged on the 'tree of life' in the Qabalah (*q.v.*). Roughly analogous to chakras (*q.v.*) (McGregor-Mathers, 1970).

Seventh layer: the aura (*q.v.*) can be subdivided into outwardly radiating levels or layers (much like an onion skin) depending upon belief system.

Shaman: Tribal 'medicine man' (or woman) of any aboriginal people; i.e., native American, or Tungsuk people of Siberia. A less pejorative and more anthropological term than witch (*q.v.*); but of similar meaning.

Shielding: Healing process of protecting a damaged chakra or aura by covering the damage with a 'patch' of restorative energy; akin to a physical wound having a medicated dressing or poultice applied.

Soul age: as distinct from physical age. The summated age of the being inhabiting the physical body, including past lives.

Subtle energies: general term for psi-related energies which are hard to detect using physical and

electrical monitoring equipment.
Spirit healing: process involving the intervention of outside entities to aid the healer; who either acts as a conduit for channelled (*q.v.*) spiritual energy or follows the instructions of these entities re: what healing to do.

W

Witchcraft: A nature-based religion, which claims pre-Christian origins. Heavy emphasis on balance of energies (male-female, dark-light etc.) and strongly ecologically aware. However, Witchcraft is a generic term with the subjects often having considerable differences in beliefs; just as the label 'Christian' includes the disparate strands of Protestants, Catholics and the Ku Klux Klan. Full exposition of the underlying beliefs of healers is impossible within this report (see Aldridge, 1993b; Jilek, 1986; Regardie, 1987, Rappaport & Rappaport, 1981). Before the Inquisition, the village witch was valued for their knowledge of healing, medicinal herbs, horticulture etc. (Drury, 1991; Breakspear, 1995). 'Witch' brings to mind the stereotypical old crone of Shakespeare; but witches can be male or female (Sanders, 1976). On other continents 'witches' are often working in harmony with modern (i.e., Western 'scientific') medicine (Jilek, 1986). Prejudice remains in the West; even within the spiritual field. Immediately prior to the study, attitude differences were highlighted by the owners of the planned venue for the trials having a purge of staff. This was seemingly based on prejudice to individual spiritual leanings (rather than comparing healing success rates, client satisfaction levels, healing methods or profitability). This resulted in the loss of two potential participants and the venue demanding a steep fee for the experimenters' use of their premises. This had previously been willingly and openly offered free of charge. Thus alternative venues and new participants were found. A nasty case of attrition!

Appendix B: Additional information required for replication

The methods section gives an outline of the equipment, procedure, stimuli etc. The following information should give sufficient detail for a researcher to be able to replicate the study. Should further detail be required please contact Dave Evans on achad13@hotmail.com

Stimuli

All stimuli were mounted using "Pritt" contact adhesive (i.e., which dries to a transparent and colourless finish and does not soak into or stain paper, thus not interfering with perception of any stimuli) on strips of stiff matt black card (180 grammes per square metre 'artists board'), measuring 60 cm by 13.5 cm, with the centre of stimuli displaced 15 cm to the right. This displacement was to facilitate presentation in the centre of the lightbox (which had a stimulus tray 45 cm wide) with the asymmetric 15 cm of card providing a 'handle' for ease of sliding the stimuli in and out of the side aperture.

Black card was chosen to avoid extraneous colours being introduced into the participants' visual field. Colour stimuli were squares of Pantone colours measuring 115 mm by 115 mm printed on 80 grammes per square metre white paper.

The stimuli words were output on 80 grammmes per square metre white A4 typing paper (with no visible watermark under the lightbox conditions, which may have been distracting) via a Hewlett Packard Deskjet 510 printer at print density of 180 dots per inch. After printing, the stimuli were positioned on matt black board to ensure presentation in the centre of the lightbox. Word length may

have been a confound, so all words are within 6-12 characters on a background 115 mm wide; thus occupying approximately the same proportion of the visual field as the colour plates (Coren *et al* , 1994), when viewed at a distance of 70-80 cm. This avoided any systematic confound of one type of stimulus being bigger than another.

'Healthy' was intended was a slight distractor; since it needs no *healing* as such; but each healer gave responses, after prior instruction from the experimenters to "rate the spoken words for the *maintenance* of the state in the lightbox."

The black visual colour stimulus was presented on a very similarly coloured black card; giving operational problems, i.e., black on black is hard to distinguish; hence a 3 mm wide white paper border (80 grammes per square metre) was placed around the stimulus, with the healers instructed to "please rate the colour *within* the white border". This additional instruction (and/or the white border) may have given a confound. This was unavoidable, but this procedure was standardised across all trials and participants with the visual black stimulus. Colour and word stimuli were kept in a nominally 'light-proof' state [27] between trials in case of bleaching effects from sunlight which could void standardisation of stimuli over time.

The fixation point marker was a black, equal-armed cross, measuring 5 cm x 5 cm with lines 1 cm thick presented on a white background, on a strip of matt black card (as above) in the lightbox. The cross was printed via the same Hewlett Packard printer as the word stimuli, and using the same paper.

Stimulus presentation time varied within trials and within participants since presentation was directly *driven* by the differing response times from participants. The trials had to proceed in this manner, as a null response from the participant would have been useless in terms of data produced; i.e., one cannot correlate an actual response with no response.

In practice an entire session took from 30-50 minutes (including breaks) for 40 visual stimuli (hence 400 verbal responses), with a mean of 38 minutes; thus presentation time (including participant time to respond to 10 verbal stimuli) was approximately 45 seconds per stimulus. A gap of approximately 10 seconds occurred between presentation of each stimulus in order to prevent colour-opponency carry-over effects (Dennett, 1991; Coren *et al*, 1994) Participants remained looking into the lightbox, with no stimuli, during this time. This interval was a function of the time needed by the experimenters to manually slide stimuli cards in and out of the lightbox.

Line Bisection sheets (Appendix I) were printed via a Canon BJ-10e inkjet printer in black on A4 80 grammes per square metre white paper at 180 dpi. In the Appendix the page has been shrunk to fit the binding and margin demands of this report, hence the

lines are shorter and closer together than on the actual sheets used, but the proportions are the same. Further prints of the exact-sized sheets used are available from the author on request.

Double-blind scoring

When scoring responses, experimenters were blind to scores of all participants or scores from previous trials to avoid any possibility of leading or influencing participants, consciously or otherwise.

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27 Tightly folded within a black card cover and kept within the lightbox chamber itself between trials.

Participants were not allowed to see their response scores from any trial to prevent them attempting to duplicate earlier responses.

Storage and Retrieval of Raw Data

Raw data have not been included for reasons of confidentiality; since personal information is contained therein. All participants' response sheets, line bisections, questionnaires, audiotapes of trials and consent forms have been retained under lock and key (and in the case of computer data; password-protected) and are available for inspection by internal and/or external markers if required. Data on computer disk is mostly in ASCII format, Excel or SPSS spreadsheets and Word 6 .doc files on IBM-compatible PC. These should be stable or translatable cross-platform, but from experience they are not read well by Macintosh computers.

No responsibility will be accepted for failure of Macintosh computers to read any data discs which may be required for inspection.

A further reason for exclusion of raw data is space: results sheets would extend to over 100 sides of A4. Once a final mark for this project (and the project of my research partner XXXX which is based on the same response data) has been given, all paper data will be destroyed and audiotapes will be erased. Computer files containing personal data will be overwritten and permanently erased using utilities which "shred" the data, to prevent it being recovered by various "undelete" programmes.

Recording Equipment

A Realistic CTR-73 6 volt DC audio cassette tape-recorder (with integral microphone) and Maxell UR90 120_{us} 90 minute cassette tapes.

Lightbox

This was purpose-built by the experimenters from 5.5 mm thick exterior plywood, 3 mm thick aluminium sheet and 5 cm x 2 cm wooden battening. Illumination was by a Phillips Classictone 240 volts 60 watts A60 E27 ES FR Lightbulb. To reduce extraneous reflections the box was painted matt black inside and out with two coats of Plastikote Flat Black code 1102 enamel spray paint [28]. There was no aperture or chin rest due to additional confounds which are inherent in aperture calculations (Jordan, 1998), but viewing range was held at approximately 75 cm by positioning of seating relative to the lightbox. Blueprints appear as Appendix J.

Environment

Trials were held in 3 venues as in Table 18, below

Table 18: Distribution of trial venues and participants

Venue	Participants tested
1	numbers 1, 2
2	numbers 3, 4,
3	number 5

All venues were rooms with minimal ambient lighting; using the same furniture at the respective venue

[28] Manufacturer: Plastikote LTD, Sawston, Cambridge CB2 4TR

for each trial [29]. The experimenters wore plain dark clothing for all trials to avoid any problems with distracting bright colours and opponent-afterimage patterns etc. (Dennett, 1991; Coren *et al*, 1994).

Extra Procedural Details

In brief, experimenters gave consent forms (including ethical and confidentiality) and verbally explained the experimental area in concert with the participants reading a briefing sheet (Appendix O). Then the qualitative questionnaire (Appendix M) was administered, and the apparatus and procedure was explained.

Prior to the first trial and after the third trial a line bisection task was explained and administered (Appendix I). Participants were comfortably seated and testing commenced with a 60 second period for light acclimatisation (Jordan, 1998), during which the tape-recorder was checked for correct function and that spoken-word volume of both participant and experimenters were adequate to register on the tape.

The fixation point slide was inserted into the lightbox and was indicated to the participant. 2 practice trials were run (one colour; gold, and one word; 'sad', neither of which were used as stimuli in the trials proper; to prevent practice or priming effects), then the trials themselves as detailed in the main write-up.

Breaks were offered after every 5 visual stimuli (i.e., 50 responses), or as requested by participants. A break of approximately one minute occurred between the colour and word visual stimuli while the two sets of stimuli were being exchanged. Responses were not discussed during breaks, and after each break, 60 seconds of light acclimatisation was allowed before any stimuli were presented.

De-briefing and questions from participants was scheduled after each trial. Finally an appointment was made for the subsequent test(s) and participants were thanked.

Re-testing procedure:

Participants were reminded of their rights, and completed the interim questionnaire (Appendix N). They were then re-briefed on the trials, and given light acclimatisation and practice trials as above. Testing, rest periods and de-briefing were as above. Re-testing occurred 3 times at 4 -week intervals, with the final testing followed by line-bisection tasks again.

Finally, after all participants had completed all three trials a verbal de-briefing was given and any questions answered. Once some outline results had been prepared a formal debriefing was done by letter (Appendix Q) , with a further invitation to ask any questions, and opportunity given to request sight of the final written report; when available.

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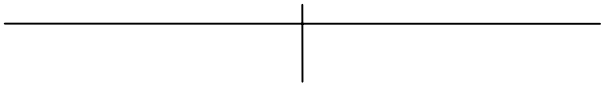
29 Due to the attrition of venue problem mentioned in the glossary, trials were held by kind permission in participants' own homes; typically using the kitchen table and a comfortable seat, with curtains drawn.

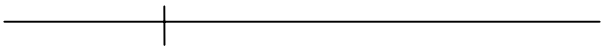
Appendix C: Findings from line-bisections, questionnaires and subsidiary analyses re: potential confounds

Vision: Results and interpretation of Line-bisection tasks.

Participants with serious visual neglect should perform poorly on line-bisections tasks. These are a simple measure of the visual field: the lines used are horizontal and vertical (to cover both left-right and up-down fields) and participants are asked to mark where they judge the centre of the line to be. Scoring is done by measuring the difference between the mark and an exact 50% bisection of the line. A 'normal' score would look something like this:



Whereas someone with severe neglect to the right visual field would probably produce a response of this order, since they simply cannot consciously 'see' the entire line:



Since this study used visual stimuli, which needed to be seen in their entirety; i.e. words, the line-bisection tasks were run to exclude the possibility that FK's purported visual neglect might affect his performance.

ANOVA for line bisections (both pre- and post-test) for individuals compared to an exact 50% bisection showed no significant differences, $F(1,8)$ varied between .006 and 2.161, $p > .05$ (for all of this range).

This is illustrated as a boxplot of scores (percentage deviation from 50% of line length) arranged by line length, in figure 23, below.

The ANOVA table appears as Appendix R.

Despite the non-significance, there were several outlying values on the boxplot; these indicated small variations between genders and line orientation. This was a cause of some concern, but Chewning, Adair, Heilman and Heilman (1998, p 1097) suggest most 'normals' will make some seemingly large errors. This is due to **"body, object-centred and retinotopic biases"** but since these are often diametrically opposed they generally cancel out to give a non-significance overall.

ANOVA indicates that all participants could see the stimuli properly. Thus FK's responses were not excluded due to his self-reported visual neglect. It may be that he had developed coping strategies, such as slightly turning his head to accommodate any neglected area, but since this verification was the sole purpose of the task, bisection results were not analysed further.

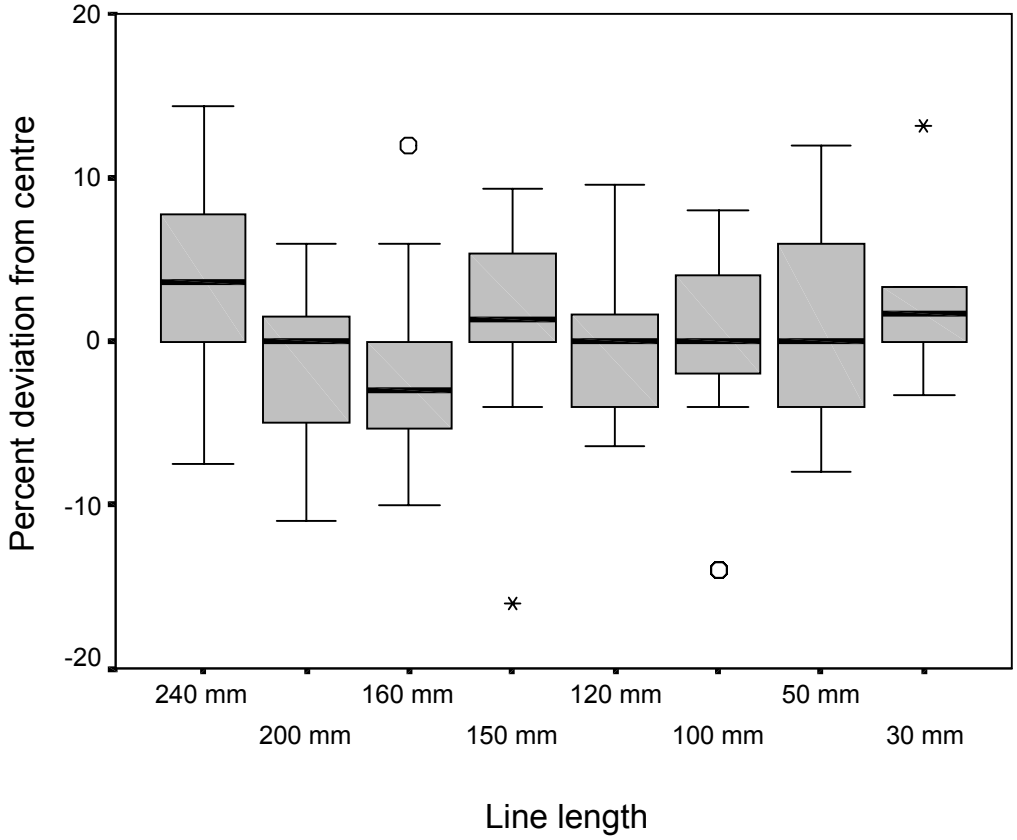


Figure 23: Boxplots of Line-Bisection results; percentage deviation from centre is measured against a perfect bisection, i.e., at 50 mm on an 100 mm line.

Participant FK

Participant 1: FK; was a 60-year old male, who had recently (12/97 and 5/98) been hospitalised with several 'strokes' (CVA). From his verbal descriptions and gestures indicating location of the original pains these CVA seemed to be sited broadly in the upper frontal and left temporal lobes. He had experienced verbal and written language and concentration difficulties (which eased with time) and had self-reported visual neglect. Various changes of medication for headaches occurred between trials, which FK self-rated as not affecting vision, thought-processes or alertness. His GP had apparently not warned of any such side-effects.

As mentioned, FK was not significantly different from the group in line-bisections. However there may have been confounding neurophysiological and neuropsychological effects on performance.

He seemed to experience response choice problems during trial 2; where he seemed frustrated and was 'stuck' on the same answer for some 25 consecutive responses. Despite this, Trial 2 was still significantly (and reliably) correlated with trial 3, and correlated significantly with trial 1, but narrowly fell below the 0.7 threshold for reliability (r_s = + .6940).

Perseveration and sequencing of action problems are associated with frontal lobe lesions (Gazzaniga, Ivry & Mangun, 1998) and this site also relates to emotional control, which may have contributed to his frustration. However FK was not the only participant to repeat the same rating over 20 times

consecutively, participant 4 also did so for reasons which are covered in the discussion section.

Since FK reported strokes in an area approximating to temporal lobe, the localised roles of language perception, processing and output of this area is relevant (Compton, Grossenbacher, Posner & Tucker, 1991). However, without neuropsychological imaging on FK to locate his lesion(s) and further testing, any more discussion is speculative. *Post-hoc* it was debated whether to exclude FK from between-subjects data and re-run the calculations; but since this would remove 20% of the data (and this *despite* the line-bisection results) this was rejected.

Apart from FK's problems, all participants had normal, or corrected-to-normal visual acuity.

Colour Vision

No participants self-rated as colourblind. Three had no knowledge of colour-blindness in their blood relatives. One participant reported father, niece and nephew with colourblindness. Since this participant was able to accurately name visual colour stimuli and produces chromatically conventional artwork, for the purposes of this study it was assumed they were not colour blind. One participant was adopted, with no knowledge of their genetic family's visual history.

Colour vision and acuity testing of participants was not performed. Given time, financial support and access to the necessary expertise and equipment this would have been done to verify participants visual abilities rather than reliance on self-report and a brief line-bisection task. Between trials no vision changes were self-reported.

Race-Culture-Age

All participants self-rated as of white ethnic origin. This, the limited age range and the small 'n' prevented the findings of Marmor (1978), Hemphill (1996) or Boyatsis *et al.,* (1994) on age and Te Linde *et al* (1979) on cultural differences to be investigated further.

Handedness

Four participants self-rated as mostly or entirely right-handed, with one ambidextrous (but who wrote right-handed); hence hemispherical differences were unlikely to be confounds (Gazzaniga, 1994; Dyer, 1973).

Languages

Participants were all very competent native English speakers. One participant reported a small knowledge of French and one had conversational-level French and Spanish. Since neither used these abilities often, the bilingualism findings of Zollinger (1984) should not have been a confound. In future studies when participants have other languages perhaps 'catch trials' using foreign colour terms could be included to compare across languages.

Dyslexia

Four participants self-rated as non-dyslexic. The one allegedly 'dyslexic' participant had reported no difficulty reading stimuli or documents in the study. On further questioning they reported considerably more trouble with *numbers* than words; so perhaps 'dysnumerate' is a better label, and this would not confound the study. However, this was participant 5; who showed the lowest overall within-subject correlations, with none above the 0.7 reliability threshold. It cannot be established whether their 'dyslexia' was a contributory factor here; without specific testing. This was not

performed due to time pressures.

Effects of Distractor Stimuli

Black

Black was intended as a distractor. From early readings it seemed that using black on a client may be akin to administering poison. In practice, wide variance between healers in their responses to black was found. This is illustrated by the bars for black in figures 9, 12 and 14 (variance-bar charts, pages 44-47 above). Black certainly had several negative attributions among participants, but is nevertheless still used. Perhaps this is in much the same way poisons are used medicinally in minute doses. One healer admitted to being **"very confused"** about how (or if) to use black; while another regarded it as, while not strictly a 'colour', being **"a vital part of the healing spectrum."** A third remarked; on rating it for treating depression that they would never use it for that, because **"it'll cause depression!"**

Healthy

Healthy was intended to be partly a 'catch' trial. Healers were being exposed to a variety of 'unhealthy'-related stimuli, and the use of 'healthy' was to examine if responses really were being carefully considered. For example, if a colour was seldom used in illness it was reasoned that it would be unlikely to be always relevant in maintaining health, in much the same way that a rarely-used drug for particular illnesses would probably not be prescribed to a healthy patient by a GP.

That responses *were* considered is borne out by figures 10 and 13, pages 45-46, above, the short bar showing that agreement for healthy was not only close, but of well above the average numbers of correlations.

Additionally, the use of healthy was to examine whether healers give 'maintenance' treatments; similar to the way that GPs might give dietary and exercise advice, or suggest vitamin pills to a patient in otherwise good health. Seemingly this is the case, as none of the healers were surprised or hesitant about giving a rating. This concurs with the introduction, which mentions the mental-emotional-spiritual balance needing to be *maintained* to avoid illness.

Appendix D: Pilot Study: Method and Procedure

The pilot study was run in spring 1998. This data is in an Appendix because it is of background importance to the final study; due to major changes in method which resulted directly from piloting.

The initial design was to build multiple semantic differential scales (Osgood *et al*, 1957) in response to structured questions based around visually-presented colours. While this seemed a good design it posed a number of logistical difficulties. These included the time and effort to research and construct up to 800 different 8-point Likert-like semantic scales, which would have had to be done *post-hoc*, since it would be driven by participants' responses; the objective justification of the content of these scales and their debatable relative worth at the end of the experiment.

Time available was a major constraint; for an undergraduate project with the data collection and processing to be completed in a few short months this task became impractical; perhaps for a Psycholinguistics Ph.D. it might be more appropriate.

Alternative designs which were considered

Were finance no object the participants would have been asked to visualise healing a state and their

brain activation monitored via ERP or fMRI scanning (Gazzaniga, 1994) in tandem with the Likert scaling.

A paragraph describing an individual with symptoms and asking the colour the aura would be was also rejected. In similarly organised pseudo-diagnostic tasks based on brief written specimens of medical observations, psychiatrists have performed extremely poorly. Schmidt and Fonda (1956) had over 400 patients' records checked by different psychiatrists and found wide variances in diagnoses based on the same information. Beck (1962) found variance of diagnosis by *the same psychiatrist* using identical information on separate occasions.

Ideally, this could have been solved by having an ill patient and keeping them 'stably ill' to provide a standardised patient for the testing period; but this would be totally unacceptable ethically, and practically impossible since it depends upon a stable aura, which may in any case have no objective existence.

Thus the design used emerged from markings and discussions of the project proposal and consequences of the pilot study.

Pilot:
With one trial on one healer, 4 words and 4 colours were presented. This study did not use a lightbox or Pantone colours, but within-subject the procedure and stimulus presentation was identical; so the results can be regarded as internally valid.

The main 'result' was rejection of the semantic differential scale method. By this, a part of the original method which would have only given data suitable for a binomial sign statistical test was lost; thus the statistical power of the study as a whole was increased.

Procedure

After explanation and scene-setting: Question for colours: **"what healing properties does this colour have; in order of your 2 most common uses first?... And what states have you used it on?"** Colour presented. Sample actual response: for Red coloured stimulus: "energising... treatment for lethargy, tiredness, people being run down; that sort of thing..." Full results appear in table 19, below

Table 19: Pilot Study: Responses for colour stimuli

Colour	Stimulus named correctly?	Healing properties stated	States treated
Blue	y	protecting, calming,	vulnerability, over-excitement
Red	y	energising (no second response)	tiredness, lethargy, being run-down
Yellow	y	cleansing, purifying,	blockages of channels
Green	y	balancing, calming	unbalanced, over-excited

Content Analysis Method: Colours
1. Unitise into (a) properties and (b) states: i.e., for red:
(a) energising... (b) treatment for lethargy, tiredness, people being run down; that sort of thing...

Unitise further: i.e., for yellow:
(a) || cleansing || purifying ||
Are responses related or different? "cleansing" and "purifying" are similar.
(b) treatment for || lethargy ||, tiredness ||, people || being run down ||; that sort of thing. ||..
ignore "treatment for" as it's restating the question. Three states and one generalisation.
Categories: "lethargy, tiredness" are very similar; differing in magnitude only. "Being run down" is a different state, *implying* a chronic condition perhaps?
2. Code by Categories:
(a) for properties: energising
Scoring criterion; based on a semantic differential scale method (Osgood *et al*, 1957). This is a 7- (or 8-) point Likert-like scale, with 7-8 being an identical word and zero being an antonym (or equivalent), with 3-4 being neutral words. Antonyms, intermediates and neutrals words would be ascertained from a linguistic database (MRC, 1998) : i.e.,: for vulnerable; see Figure 24 (below):

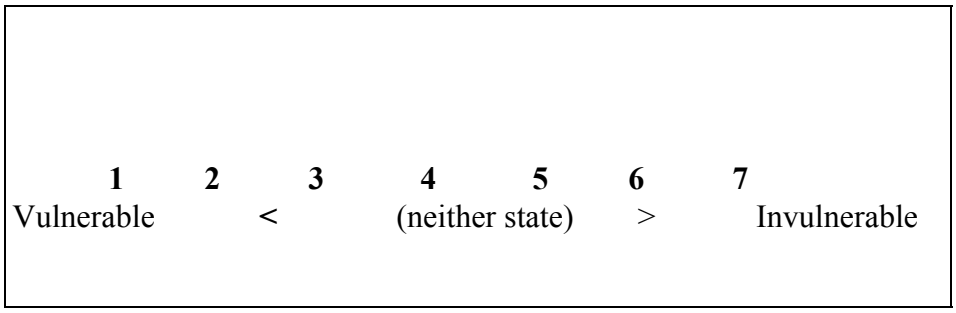


Figure 24: Semantic Differential Continuum

A scale would be constructed for each term; this was the subjective area of the data analysis and justification for each scaling would have to be given.
(b) for states: categorised by
Emotion - anger
- sadness
- happiness
Physical State -any named conditions
- any descriptors
Mental State -any named conditions
- any descriptors
Spiritual State -any named conditions
- any descriptors

And frequency of each measured and expressed by graph. States would be coded on semantic differential scale as above (Osgood *et al*, 1957)
3. Assign Values to Codes.
4. Statistics
Question for words: **"What healing properties would you use on this state (the 2 most appropriate first), and please give the single most appropriate colour to treat this state".** Word presented.

Content Analysis Method: Words
Table 20 shows results for the second stage of the pilot trials

Table 20: Pilot Study: Word stimuli responses

Word for state	Stimulus named correctly?	Healing Properties to use	Colour name
Lethargy	y	energising, (no second response)	Red
Vulnerability	y	protecting, calming	Blue
Confusion	y	etc.	Green
Unbalanced	y	etc.	Green

1. Unitise
2. Code by Category: i.e., Healing property as per semantic differential (above); Colour name can only be coded right or wrong (compared to baseline response in trial 1); so this would be subjected to Binomial Sign test. Other words coded by semantic relatedness.
3. Assign Values to Codes
4. Statistics
The coding strategies to be used would allow for various statistical operations to be performed on the data from the full study.

Appendix E: Justification For No Control Group

This experiment was somewhat unusual in that a 'normal' control group was not included. The results of a comparison to the pilot study (April 1998; see Appendix D) were compared to the Edinburgh Associative Thesaurus database (EAT, 1998). From this (summarised in Table 21, below) it was found that there was no justification for a 'normal' control.

Table 21: Pilot study findings from one healer compared to Edinburgh Associative Thesaurus Database for the same stimuli.

Colour	Properties named by healer in pilot	States named by healer in pilot	EAT top 4 responses (and percent of sample)
Blue	protecting, calming, cooling down	vulnerability, over-excitement	sky (20%), black (10%), green (10%), red (9%)
Red	energising	tiredness, lethargy, being run-down	blue (18%), white (11%), green (8%), black (7%)
Yellow	cleansing, purifying, sometimes energising	blockages of channels	red (9%), black (6%), green (6%), sun (6%)
Green	balancing, calming	unbalanced, over-excited	grass (30%), blue (8%), red (7%), yellow (5%)

For Red, green and yellow there were *no common words* between responses by EAT subjects and healers. For blue, 1% of EAT subjects also used "calm". In this particular EAT sample area 1% represents only *one individual*. In a subsidiary search with target word of "calm" the word "blue" *did*

not appear at all. From this drastic difference of responses it was concluded that comparison of 'normals' and healers would be invalid since the pilot study healer seemed to be in a different population from the EAT sample.

Appendix F: Experimental Script

This document was given to each participant before trial one (instructions and reminders to experimenters are in **bold**, these were omitted from participants' copies).

Give ethics sheet and have copy signed. If you have any queries about what has been stated on any sheets or by the experimenters now or during the experiment, please ask the experimenter. **If this is first trial, explain line-bisection task and run it. Give relevant questionnaire.** It is understood that healers see or visualise colours when healing. This study examines the colour associations of healing properties and treatments used by healers. It is a two part study, which will take approximately one hour to complete. You will be needed to do this three times at around 4-week intervals; as is convenient for you. You will be given instructions for each part of the study separately. For both parts, you will be presented with stimuli, which will appear in the lightbox in front of you. You will then be required to respond to each of the stimuli verbally. Your responses will be recorded by the experimenters, one of whom will write them down, and by the tape recording equipment next to you. Try to respond to every stimulus, however, if you feel that you cannot respond to any one stimulus then tell the experimenter. The experimenter may ask why you cannot respond in order to obtain more detailed information; if you choose to discuss this; please answer honestly, but you are under no obligation to answer at all.

You are not in any way obliged to do any part of this experiment and you can stop at any point. This will not affect your rights as described in the consent form. Anything you say or do is strictly confidential. If you decide afterwards that you want your responses removed from the study this too can be done.

What you will be asked to do: **Turn on lightbox to warm up bulb.**

Before each part of the study begins you will be required to look into the light box and fixate on the cross for 60 seconds to allow your eyes to adjust to the light. Two practice trials will be conducted so that you can get the feel of what you are to do, the practice responses will not be analysed. The experiment will then begin. You will be offered a break about every 5 minutes. If you need a break at any other time, tell the experimenter. After each break, you will be required to re-adjust your eyes by looking directly at the cross in the light box for 60 seconds. Please refrain from looking away from inside the lightbox unless a break is to be taken. **Run practice trials; check tape-recorder is running and voice levels are OK**

Part A You now need to look into the lightbox for 60 seconds to acclimatise your eyes. In each trial, you will be presented with a colour and will have words read out to you, one by one. Please rate the colour in front of you for it's level of effectiveness at healing the human states which will be read out. Please give your response as either 1) Always effective, 2) Often effective, 3) Occasionally effective, 4) Rarely effective, or 5) Never effective. A reminder sheet of these responses is in front of you in the lightbox. This will be done for 10 colours. **Run trials** There will now be a short break.

You now need to look into the lightbox for 60 seconds. The next part of the study involves another 10 colours in the lightbox and 10 words for each. This time please rate the colour in front of you for it's level of association with the healing property which will be read out. Please give your response as either 1) Always associated, 2) Often associated, 3) Occasionally associated, 4) Rarely associated, or 5) Never associated. A reminder sheet of these responses is in front of you in the lightbox. **Run trials** There will now be a short break.
Part B You now need to look into the lightbox for 60 seconds. In each trial you will be presented with a word, which describes a human state. Please rate the healing properties, which will be read out for their level of effectiveness at healing the human state in front of you. Please respond as either 1) Always effective, 2) Often effective, 3) Occasionally effective, 4) Rarely effective, or 5) Never effective. A reminder sheet will be in front of you. **Run trials** There will now be a short break. You now need to look into the lightbox for 60 seconds again. There are ten more trials left. In each trial you will be presented with a word describing a healing property. Please rate the colour names, which will be read out for their level of association with the healing property in front of you. Please give your response as either 1) Always associated, 2) Often associated, 3) Occasionally associated, 4) Rarely associated, or 5) Never associated. **Run trials Lightbox off and allow time for re-acclimatisation. Prevent participants from seeing their response sheets**. **If trial 3, remind about line-bisection and run this test. Answer any questions. Pack up equipment. Thank participant. Make appointment for next trial. Go home and input data!**

Appendix G: Justification of stimulus words used

Words were examined to ensure that they were not just awakening common cultural responses relating colour to medical states; such as 'black dog' or 'the blues' for depression (Thorne, 1990). From the data following (table 22) it was calculated that were the stimulus words presented to the EAT sample there is on average a 99.85% chance that they would NOT produce a response which was related to, derived from another, or actually was any other stimulus word.

There are 32 words; not 30, due to a couple of alternatives, but that is accounted for in the maths. If anything this procedure has been over-strict; as words like vigour (which relates to health) and mellow (converse of hyperactivity) or mood (distant link to depression) have been included and some of the connections are pretty tenuous. The real percentage would be even closer to zero. Two are worthy of mention: strength (for strengthening) had 26% correspondence with weakness and active (for hyperactivity) had a 15% relation to passive. The former would not be relevant to this study as 'weakening' was not part of any healing property stimulus. The latter implies a common semantic link for (hyper) active; that it's associated with an opposite; and therefore potential treatment, which would be something passive; such as 'calming' as a treatment. The link is tenuous and so all words were accepted as valid stimuli.

Words were compared for ratings of occurrence in language (Thorndike & Lorge, 1944; Brown, 1984), age of acquisition in vocabulary (Gilhooly & Logie, 1980) , and imageability, concreteness and meaningfulness, (Paivio *at al* , 1968; EAT, 1998; Toglia & Battig, 1978). Word selection was based on a need for a variety of physical, mental and emotional states to cover conditions which healers may commonly encounter (and treat); i.e., hyperactivity is a physical and mental state word. Spiritual states are also treated by healers; but could not be used in this study due to problems of standardisation; i.e., 'unbalanced heart chakra' (Brennan, 1988) is (psychologically) meaningless.

Table 22: Associations are words used **in response** to the stimuli. Responses are words used as stimuli, which **elicited** the response word. I.e. for balancing: when they said balancing the response was power (4% of time) and when they said tire the response was balancing (1% of the time).

Stimulus word	Present in EAT?	If not present in EAT; Substitute word used:	Associations; with stimulus and decimal % occurrence [30]	Responses to stimulus and decimal % occurrence
BALANCING	**n**	**balance**	power 0.04	tire 0.01
BLACK	**y**	**-**	white 0.58 clean 1 0.01	depression 0.01 * gangrene 0.01 *
BLUE	**y**	**-**	sad 0.02 *	mood 0.01 clearer 0.01 * depressed 0.01 *
CALMING	**n**	**calm**	cool 0.05 clear 0.01 loved 0.01	coolness 0.07 *
CLEANSING	**n**	**cleanse**	n/r	**n/r**
CLEARING	**y**	**-**	**n/r**	**n/r**
	n	**clear**	cool 0.03 dark 0.03 calm 0.01 clean 0.01	**n/r**
CONFUSION	**y**	**-**	clarity 0.01 hysteria 0.01	**n/r**
COOLING	**n**	**cool**	calm 0.03 moody 0.01	passive 0.01 placid 0.01 relaxed 0.01 soothe 0.01
DEPRESSION	**y**	**-**	blues 0.01 stabilisation 0.01	blues 0.04 activity 0.01 liveliness 0.01 strain 0.01 tired 0.01
ENERGISING	**n**	**energy**	strength 0.03 * fatigue 0.03 *	nervous 0.01 relaxing 0.01 tiredness 0.01
ALTERNATIVE FOR ABOVE:	**n**	**energetic**	tired 0.04 strong 0.01	rigour 0.04 robust 0.04
FATIGUE	**y**	**-**	**n/r**	despair 0.02 energy 0.02 gloomy 0.02 relaxation 0.02
FRACTURE	**y**	**-**	**n/r**	**n/r**
GREEN	**y**	**-**	blue 0.08 red 0.07 yellow 0.05	gangrene 0.01 sickly 0.00 abcess 0.01 *
HEADACHE	**y**	**-**	weary 0.01	confused 0.01 depressing 0.01 strain 0.01 tired 0.02 *
HEALTHY	**y**	**-**	robust 0.02 clean 0.01 strength 0.02	strong 0.03 cancerous 0.01 cleaned 0.01 lively 0.02 * tired 0.02 *
HYPERACTIVITY	**n**	**active ***	passive 0.15 energy 0.03 * health 0.01 tired 0.01	adrenaline 0.01 energy 0.02 *
ALTERNATIVE FOR ABOVE:	**n**	**immunity**	protection 0.02 clean 0.01 infection 0.07 * strength 0.02 *	n/r
INFECTION	**y**	**-**	**n/r**	immunity 0.06 protection 0.06
LOVING	**y**	**-**	**n/r**	**n/r**

30 Zero percent scores indicate a very low score; typically 1-5 responses from a pool of over 1500 participants; actual non-occurrences are given as n-r.

ORANGE	**y**	**-**	red 0.05 vigour 0.01	**n/r**
PINK	**y**	**-**	red 0.13 blue 0.07 white 0.06 soothing 0.01	clean 0.01
PURPLE	**y**	**-**	red 0.10 blue 0.08 green 0.05 sickly 0.01	mood 0.01
RED	**y**	**-**	blue 0.18 white 0.11 green 0.08 black 0.07	**n/r**
RESTRUCTURING	**n**	**restore**	health 0.03 * tired 0.01	n/r
	n	**rebuild**	**n/r**	n/r
SPRAIN	**y**	**-**	**n/r**	**n/r**
STRENGTHENING	**n**	**strength**	weakness 0.26 * calm 0.01 protection 0.01 stress 0.02 * vigour 0.02 *	weakness 0.13 vigour 0.09 might 0.03 energy 0.01
STRESS	**y**	**-**	pain 0.02 structure 0.01	strength 0.01
VIOLET	**y**	**-**	**red 0.5** **purple 0.1** **mauve 0.1**	n/r
WHITE	**y**	**-**	black 0.55	clean 0.02 *
YELLOW	**y**	**-**	red 0.09 black 0.06 green 0.06 blue 0.05 mellow 0.03 fever 0.02	mellow 0.1 * bile 0.01 fever 0.01

The Edinburgh Associative Thesaurus is a database of word-association norms based upon 8400 stimulus words, of which a sample of 100 were presented to 100 different subjects, giving an associative network of over 55,000 items. Percentages of each response are included in the database and can be used to predict probability of a response to a given stimulus word. These references following are those directly relevant to EAT and the construction and use of the larger MRC psycholinguistic database and are included here rather than citing them in full in the main body of the text: Amsler (1984), Brown, (1984), Coltheart (1981a), Coltheart (1981 b), Dolby, Resnikoff, & MacMurray(1963), Gilhooly & Logie (1980), Guierre (1966), Kiss, Armstrong, Milroy & Piper (1973), Kucera & Francis (1967), Mitton (1986), Paivio *et al* (1968)[31], Quinlan (1986), Svartik & Quirk (1980), Thorndike *et al* (1944), Toglia & Battig (1978), Wells (1986).

Appendix H: Stimulus presentation order and randomisation

These tables show the order of presentation of each stimulus in each trial.

Table 23: Ordering of stimuli by trial (1 = first, 10 = last)

Stimulus Name and Type	Trial 1 order of presentation	Trial 2 order of presentation	Trial 3 order of presentation

[31] The MRC database includes Paivio imagery and concreteness ratings which were not originally published in the original paper by Paivio *et al* (1968).

Visual Colours:			
pink	**1**	**1**	**10**
yellow	**2**	**5**	**7**
black	**3**	**4**	**1**
violet	**4**	**8**	**2**
orange	**5**	**7**	**6**
white	**6**	**6**	**3**
purple	**7**	**9**	**5**
blue	**8**	**3**	**9**
red	**9**	**10**	**8**
green	**10**	**2**	**4**
Stimulus Name and Type	**Trial 1 order of presentation**	**Trial 2 order of presentation**	**Trial 3 order of presentation**
Visual Words:			
fatigue	**1**	**2**	**5**
stress	**2**	**8**	**9**
healthy	**3**	**9**	**8**
infection	**4**	**10**	**7**
depression	**5**	**3**	**2**
confusion	**6**	**4**	**1**
fracture	**7**	**5**	**3**
hyperactivity	**8**	**1**	**6**
sprain	**9**	**7**	**4**
headache	**10**	**6**	**10**

NB/ Stimuli order was preserved within parts A and B of trials; i.e., colour order was identical for human states and healing properties of each trial.

Table 24: Ordering of verbal stimuli presented in each part of the experiment

Verbal healing properties versus visual colours	**Verbal healing properties versus visual human states**	**Verbal human states versus visual colours**	**Verbal colour names versus visual human states**
cleansing	cleansing	headache	red
energising	energising	sprain	green
strengthening	strengthening	fracture	blue
cooling	cooling	fatigue	yellow
calming	calming	infection	pink
restructuring	restructuring	confusion	purple
immunising	immunising	hyperactivity	black
balancing	balancing	depression	violet
clearing	clearing	stress	white
loving	loving	healthy	orange

NB/ this ordering remained constant throughout the three trials.

Appendix I: Line-Bisection Sheet

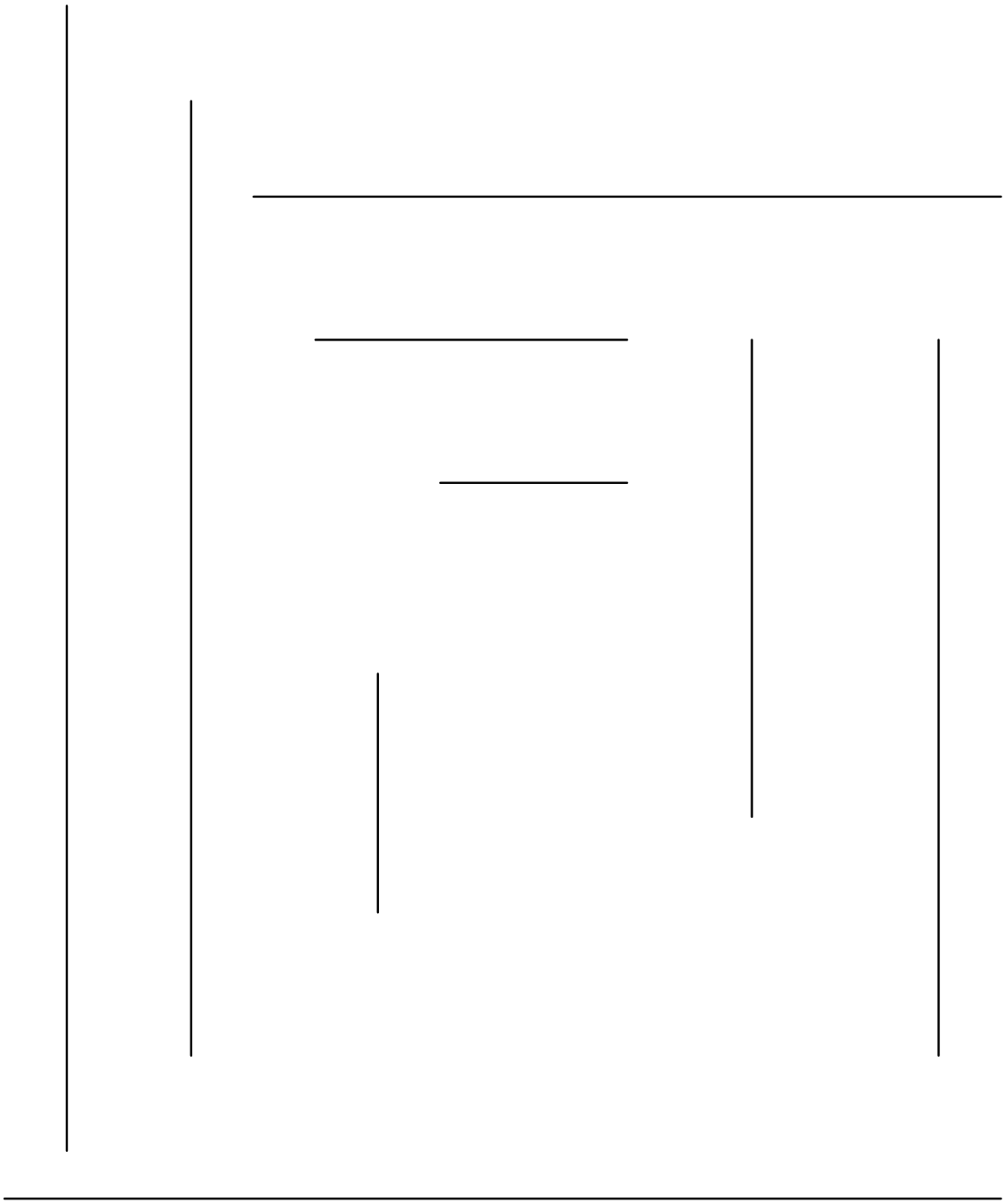


Figure 25: Layout of line-bisection sheet administered pre-trial 1 and post trial 3. NB/ line lengths have been shrunk to fit the margin specifications of this project. Actual size printouts dimensions are available from the author.

Appendix J: Lightbox plans

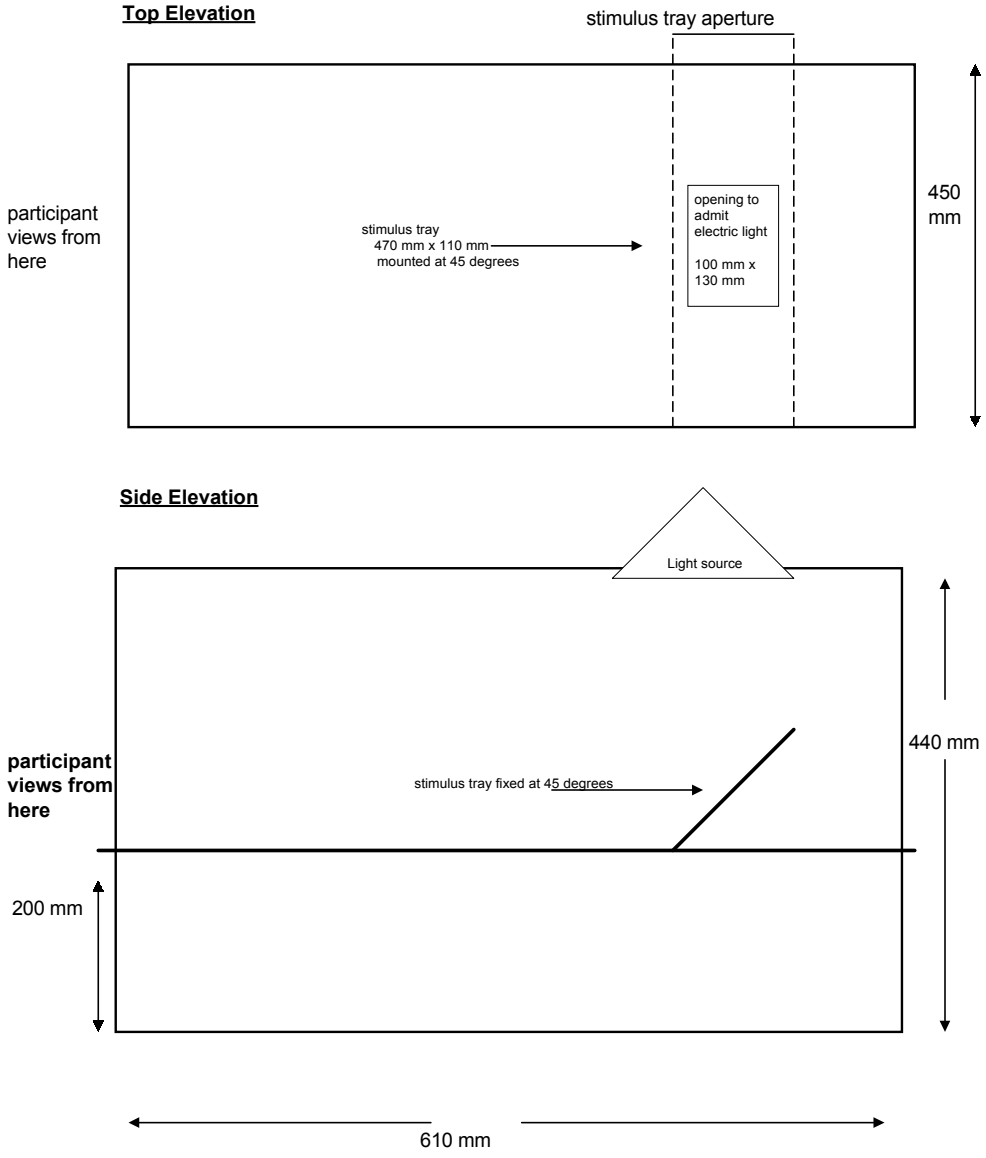


Figure 26: Blueprint for lightbox

Appendix K: Text of Consent Form

This form was given to participants prior to trial one to obtain their consent to take part after giving them information about the study and their rights as participants.

University of Wales-Bangor Psychology Dept. headed paper was used on actual forms: participants signed two copies and kept one for their own reference.

PARTICIPANT RELEASE AND CONSENT FORM

NAME:

I, the undersigned, verify that XXXX and **David Evans,** who are both Undergraduates of Bangor University Dept of Psychology have my prior informed consent that I will voluntarily

take part in their research project to investigate word-meaning and colour. I understand that this procedure will include:

1). Viewing articles under electric lighting for short periods of time and commenting on them.

2). Having an audio recording and written notes made of each session of an experiment in which I participate. I understand that this recording will be used to transcribe my responses to items that I am asked to speak about during the experiment, for the purposes of researching colour and word meaning. I further understand that my transcribed details and audiotapes themselves will be identified only by a number and that they will be securely stored until the experimental report is completed and will remain entirely confidential; ensuring that I will not be identifiable from the results.

3). Completing a short questionnaire about myself at each experimental session.

I understand that each experimental session will take approximately 45 minutes, including appropriate breaks (and that I may ask for, and be granted, breaks at any time); and that testing will be repeated 4 times at 3-weekly intervals, which will be pre-booked at my convenience.

I understand that I will not receive reimbursement for this participation.

I understand that my participation in this experiment is entirely voluntary and that I may refuse to take part entirely, or withdraw at any time, without explanation on my part. Should I withdraw at any time I understand that my experimental results will remain entirely confidential, and that I may ask for these to not be used for analysis of the experimental results; and that all paper copies, data on computer floppy disks, cassette tapes etc. Will be either be given to me or destroyed or permanently erased should I request this.

Data protection Act 1984. Information form this experiment will be processed on computer equipment by the investigators. Your rights to privacy and confidentiality under this Act will be upheld and all data will remain secure, no third party will have access to any personal data held on computer. This information will be permanently erased after the completion of the study in 1999.

I have been told that I may ask questions about the procedure and the research in general *at any time*, and that it is my right to have such questions answered; including any that arise *after* I have completed the last series of tests. For this purpose I have been provided with an address to contact the investigators if necessary. I understand that specific questions about the *results* of this experiment may not be answerable until the completion of the research (1999), but that any such questions will be dealt with promptly, once this is possible.

I understand that I will have access to read a final copy of the experimental write-up once it is completed, and to ask any questions that I have.

Complaints Procedure: It is our intention that this research shall be conducted ethically and that the safety, mental and physical well-being, dignity and all interests of the participants should be paramount at all times. Should you feel that this is not the case, please tell the investigator(s) at any time. In case of any complaints concerning the conduct of this research, these should be addressed to Professor C.F. Lowe, Head of School, Dept of Psychology, University of Wales-Bangor, Gwynedd, LL57 2DG, giving the names of the investigators and the nature of your complaint in as full detail as possible.

I have been given a copy of this document for reference, and have had the opportunity to read and discuss it before signing.

Signed: Date: /98
Name (PLEASE PRINT)
Signature of investigator: Date: /98

Appendix L: Ethical Matters

This Appendix details the ethical considerations relevant to this study and expanded on the minimum guideline general ethical standards required for a psychology experiment; which were supplied by the School of Psychology, University of Wales-Bangor. Matters directly relevant to the study were added to this framework.

Ethical approval was granted for this study on 10/7/98 by the University of Wales-Bangor School of Psychology Ethics Review Committee (Human Subjects); Chair: Prof. K. Shapiro, under reference number **98/25**.

University of Wales-Bangor Dept. of Psychology contributed £20 towards the equipment and running costs of this study, for which we are grateful.

It was not considered that the research was in any way more dangerous than normal daily life. FK was carefully monitored to particularly ensure that participation caused him no harm or distress. In trial two he became quite tired and was compelled by the experimenter to take a long break (15 minutes) and strongly reminded that he was under no obligation to continue; but he chose to do so; with no obvious ill effects. It is with his express permission that his condition is mentioned at all. All measures were taken to preserve his anonymity in the finished written report, such as the label "FK", (which are not his real initials).

Participants had to be tape-recorded to prevent switching their gaze from the lightbox; thus needing 60 seconds of viewing the lightbox to re-acclimatise their eyes after each saccade (Jordan, 1998); recording thus considerably reduced the cumulative exposure to bright lights; and shortened the time taken to perform the tasks.

Participants were *not* naive to the purposes of the experiment, since they were pre-briefed before each measurement visit. It was considered deceitful to withhold the true purposes of such a study from *any* health professional. A full verbal debriefing was given after trial three, followed by a written debriefing around five weeks later. Debriefing of participants was included in the procedure section, as was time for feedback. The participants had a contact phone number and address for each of the

experimenters and the department for use between or after trials for any queries.

This study, since it used words as stimuli, could not be presented to anyone with severe Dyslexia or similar problems. Participants were asked beforehand whether they have any such difficulties. Participants were all English speaking, so a Welsh language version of the consent form was not composed.

Consent forms follow the guidelines laid out for clarity and non-discriminatory language; and include full details of the School of Psychology complaints procedure.

These forms (and all other documentation, data on disk, cassette tapes etc.) Are retained and kept confidential, to be destroyed when this is academically permissible (i.e., after marking of project). All participants are adults and able to give informed prior consent. There was no element of deception or compromising of dignity of any participant intended by this study. Participants were fully aware of their rights to withdraw from, or not participate in, this study, including retrospectively withdrawing their responses from the data pool. Participants were reminded of this before each trial.

Advice on any medical or psychological problem: should any such problems have arisen the advice would have been for the participant(s) to visit their General Practitioner as soon as possible. As undergraduates we are in no position to proffer diagnoses, but were be happy to suggest consulting health professionals. In the case of this participant group; who are health professionals anyway it was not envisaged that this would be a problem; and this proved to be the case.

Postscript: 4 months after the final trial was completed, none of the participants had reported any adverse effects from performing this study.

Appendix M: Text of Initial Questionnaire

Participants completed this detailed questionnaire prior to commencing trial one. The layout of the original sheet included spaces for longer answers: the following omits these for economy of space. Ethical and confidentiality reminder here

Please complete in block capitals or clear handwriting and do not hesitate to ask for clarification of any questions; if you need more space for any answers please use the back of the sheet..... thankyou

1. Your First names:_____ Surname:_____
2. Your Age in years: _____ Date of Birth: day ___ month___year _____
3. Your Gender (please delete as applicable:) **Female/ Male**
4. Your Ethnic Background :

(please delete as applicable:)
Afro-Caribbean
A**sian**
Sino-Japanese
Native Amerindian
Mixed-Race (please state which below)
Native Polynesian
White
Other (please state which below)

5. Your Healing Qualifications or experience *(brief description, i.e., Reiki 1, 2 years crystal healing etc.)*
5a. Did any of you courses include training with colour, and colour associations? **YES/ NO**
5b. If "yes" to previous question, Which course included such 'colour training' and what did it involve?

Course Training involved

5c. Do you use colour during a healing therapy session? **YES / NO**
5d. If "yes" to previous question, what do you use colours for and how do you use them?
6. Your Native (**first-learned**) Language:
6a. To your knowledge, are you dyslexic?
(please delete as applicable:) **YES/NO**
7. Your Educational Level in this language: *i.e., English Language (or Literature) 'O' Level or GCSE, A-Level, etc.*
8. Do you speak any other languages? **YES/NO** (please delete as applicable:)
9. If so which?
10. If yes to the above, do you use these languages regularly? **YES/NO** (please delete as applicable:)
10a. If yes, how often?
11. Handedness: are you (please delete as applicable:)
entirely right-handed
mostly right-handed
entirely left-handed
mostly left-handed
ambidextrous
depends upon task
12. What is your favourite colour, and why?
13. Do you wear spectacles or contact lenses? **YES/NO**
(please delete as applicable:)
14. If yes to above, at what age (approximately) did you start wearing them?
15. Approximate date you last consulted an optician
16. Have you ever had any problems with vision, or medical treatment for your eyes?
(please delete as applicable:) **YES/NO**
17. If yes to above, what was the nature of the problem and when did it occur? *i.e., cataracts 1986, eye injury 1992 etc.*
18. To your knowledge, do you have any difficulty with colour vision, or "colour-blindness"?
(please delete as applicable:) **YES/NO/DON'T KNOW**
19. If so, what?
20. Are any blood relations affected with colour-vision disorders?
YES/NO/DON'T KNOW (please delete as applicable:)
21. If so, which relatives are they? *(i.e., mother, paternal cousin etc.)*
22. Are you currently taking any prescribed medication which you have been told may affect your vision or make you feel drowsy? **YES/NO/DON'T KNOW** (please delete as applicable:)

Thankyou for your co-operation

Reminder here that it's all confidential and will be kept safely and destroyed at the end of the experimental write-up

names and contact numbers of experimenters here

Appendix N: Text of Interim Questionnaires

Participants completed this questionnaire at trial two and three (the text is identical) to monitor for changes in any circumstances covered by the initial questionnaire (Appendix M). Any changes on these categories may have been confounding for the study, or indicated possible history effects. As above, the layout of the original sheet included spaces for longer answers: the following omits these for economy of space.

Institution details and name of study here
Ethical and confidentiality reminder here

Please complete in block capitals or clear handwriting and do not hesitate to ask for clarification of any questions; if you need more space for any answers please use the back of the sheet..... thankyou

Name:
1. Have your Healing Qualifications or experience *changed since your last testing session.*
2. You stated you were not dyslexic? Has this *changed since your last testing session*
3. Have you started to learn any new languages *SINCE YOUR LAST TESTING SESSION?*
4. Have you recently started (or ceased) wearing spectacles or contact lenses, or have you had any problems with vision (including colour vision), or medical treatment for your eyes?? *SINCE YOUR LAST TESTING SESSION* ?
5. *IF CHANGED SINCE YOUR LAST TESTING SESSION* , do you know of any blood relations affected with colour-vision disorders?
6. Have you been prescribed any medication that you have been told may affect your vision or make you drowsy, or Do you feel that your health has significantly changed since your last testing session? If so, in what way?

Thankyou for your co-operation Reminder that it's all confidential and will be kept safely and destroyed at the end of the experimental write-up.

Appendix O: Pre-Trial 1 Briefing Sheet

Potential participants were given this text and were encouraged to ask questions before giving their consent to participate

This experiment is an attempt to assess whether there is a consistent system of colour and word association amongst healers. There has been no research done in this area (so far as we know), so you are very much pioneers! We are hoping to show that there is a reliable system in use, much as in conventional medicine where several different doctors should (without conferring) all recognise a patient with (for example) measles as having the same illness. Before the first test itself we need to do a quick test of your vision. You will be given a sheet with horizontal and vertical lines printed on it. Holding the paper at arms'-length and with a pen please mark the middle of the line using one small line (see example);

_____ |

It is important that you don't twist your head (or the paper), as we need to check your vision on both horizontal and vertical planes. You will be asked to do this test again after the third trial (in 8 weeks time). Onto the test itself. There are no "wrong answers"... all we ask is that you respond honestly from your experience as a healer, rather than saying what you think we want to hear. You will be seated and looking into a lightbox at a plate with

either a word or a coloured rectangle. We will be speaking words to you for comparison to the word or colour inside the lightbox.

You will be shown a stimulus word (i.e. a human state). Please could you then rate ten spoken colours for their effectiveness in treating this state, replying verbally either "never effective", "rarely effective", "occasionally effective", "often effective" or "always effective" . There will be a reminder sheet for the ratings inside the light box. You will be given ten words in the lightbox, each of which will have ten words to rate; hence 100 responses.

You will be shown a stimulus word (i.e. a human state). Please could you then rate ten spoken words (healing properties) for their effectiveness in treating this state, replying verbally either "never effective", "rarely effective", "occasionally effective", "often effective" or "always effective" . There will be a reminder sheet for the ratings inside the light box. You will be given ten words in the lightbox, each of which will have ten words to rate; hence 100 responses.

You will be shown a visual colour plate. Please could you then rate ten spoken healing properties for their level of association with the colour, replying verbally "always associated" " often associated" occasionally associated" "rarely associated" or "never associated". There will be a reminder sheet for the ratings inside the light box. You will be given ten colours in the lightbox, each of which will have ten words to rate; hence 100 responses.

You will be shown a visual colour plate. Please could you then rate the colour against ten spoken human states for effectiveness of the colour at treating the state, replying verbally "never effective", "rarely effective", "occasionally effective", "often effective" or "always effective". There will be a reminder sheet for the ratings inside the light box. You will be given ten colours in the lightbox, each of which will have ten words to rate; hence 100 responses.

All of your responses will be tape-recorded and written notes taken; the tape acts as a back-up to our notes (and vice-versa) and is for no other reason. All data remains confidential as explained on the consent form, with you being only identified by a number from now on. Since there are 400 responses in total it is important that you do not spend too long thinking about what to say; what we are after is your "instinctive" response as a healer, and this should come to you quite rapidly; you can "pass" if there isn't an answer after 5 seconds and we will go back to these at the end. This is a quite demanding task, needing your concentration; which we understand, so you can ask for a break at any time, and you will be offered breaks too. There will be a pause between the colour plates and word plates part of the experiment for us to set up. After you have a break or look away from the lightbox for any other reason you will need to look into it for 60 seconds before we re-commence; as the eye needs this long to get used to the light level (this is especially important for colour vision). The experiment should take around an hour; and will be repeated in 3 and 6 weeks time (approximately; according to your availability). It is probable that you know others who are taking part in this experiment; it is important for the purposes of the testing that you do not discuss your own responses or "compare notes" with the others as we are after what <u>you</u> think as an individual, not a group verdict. The consent form has our home phone number and address; please do not hesitate to contact us if you have any queries.

Thankyou again for your help.

Appendix P: Debriefing after each trial

Participants were debriefed after each trial, this comprised:

- Discussion of any general healing matters, which had arisen during the trials. this was only tape-recorded with express prior permission
- Ensuring they did not have headache or any discomfort from the lightbox task
- Thanking them for their time and efforts
- Reminder not to discuss responses with any other participant.
- Reminder of their ethical rights as participants.
- Booking of next appointment (if applicable)

Appendix Q: Final de-briefing letter

This letter was posted by first-class mail to participants' home addresses approximately 5 weeks after they had finished their final trial. It contains a repeat of our thanks and a reminder of the contact information.

It is our Department's condition of this study that you have so kindly helped us with that you are provided with some information in writing after the study has been completed. Much of this will be a written re-cap of what you have been told verbally after you finished your third and final set of responses. We are still doing the statistical part of the study; so we don't have any solid results as yet; but from the current perspective on the data you have provided us with some very good and useful answers; so thankyou again.

This study has been designed to look at the reliability and validity of colour associations of healing properties and treatments used by healers. It is intended that a comparison can be made of the associations used by each healer over the experimental period and the associations used by all healers over each time of experimentation. It was the researchers' goal to test if the various associations are consistent and therefore reliable and show signs that they are valid. The responses produced shall be coded and analysed and we shall be testing the scores on each part of the study and comparing them across the various times of experimentation. If there is little change between these scores, and the scores between part A and part B of the study (colours and words in the lightbox) mirror each other well, then the associations will be thought of as reliable.

This study did not test the effectiveness of treatment given by healers; i.e., you. There are other studies that have studied this and found supportive evidence for this. We did not intend to assess whether "Fred Bloggs" is a better healer then "John Smith", as that is (a) something we cannot have studied in an undergraduate degree for time and resource reasons, (b) it would have involved delving into confidential client records which was probably not ethically acceptable, and (c) healing probably cannot be reduced to a simple 'whoever makes more people better is the best healer'-type approach. For reason (a) we will not be giving out individual 'scores' for each healer to any of you; all of your answers were equally valuable to us. This study instead aimed at scientifically studying healing from a different angle, without getting too involved in the therapeutic methodology of healing.

This study should not have affected you any more than ordinary daily life. If you have any queries or problems in the future with reference to this study, then you can contact the Department of Psychology at Bangor University (see address on consent form) or you can contact one or both of the researchers, Dave or XXXX on the phone numbers that we have given you, which should be valid until at least June 1999. Both the Department and the researchers will be happy to help you at any time. If you wish to know of the general results the researchers find from this study, or would like a read of some or all of the final report (due for submission around Easter 1999) please contact either Dave or XXXX. Again thank you very much for participating in our study and we wish you every success and happiness in your work.

Appendix R: ANOVA table for line-bisections

Table 25 gives ANOVA findings for the results of the line-bisection tasks undertaken by all participants pre- trial one and post- trial 3. Discussion of these results appears as Appendix C.

Table 25: Analysis of Variance table for results of pre- and post-test line bisection testing for all participants.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
240 mm	Between Groups	21.609	1	21.609	.473	.511
	Within Groups	365.832	8	45.729		
	Total	387.441	9			
200 mm	Between Groups	19.600	1	19.600	.637	.448
	Within Groups	246.000	8	30.750		
	Total	265.600	9			
160 mm	Between Groups	40.000	1	40.000	.853	.383
	Within Groups	374.976	8	46.872		
	Total	414.976	9			
150 mm	Between Groups	101.761	1	101.761	2.161	.180
	Within Groups	376.648	8	47.081		
	Total	478.409	9			
120 mm	Between Groups	1.024	1	1.024	.037	.852
	Within Groups	220.160	8	27.520		
	Total	221.184	9			
100 mm	Between Groups	.400	1	.400	.006	.939
	Within Groups	513.600	8	64.200		
	Total	514.000	9			
50 mm	Between Groups	1.600	1	1.600	.029	.870
	Within Groups	448.000	8	56.000		
	Total	449.600	9			
30 mm	Between Groups	9.801	1	9.801	.419	.536
	Within Groups	187.308	8	23.414		
	Total	197.109	9			

Table 26: Example correlation matrix; Visual Colours by Verbal Human States (overall level) Reliable cells are printed in bold. Participant and time of trial is indicated by codes above; i.e. P1:2 indicates participant 1, trial 2.

	P1:1	P1:2	P1:3	P2:1	P2:2	P2:3	P5:1	P5:2	P5:3	P3:1	P3:2	P3:3	P4:1	P4:2	P4:3
P1:1		.6572	.5298	.5529	.6465	.5323	.2147	.3862	.4500	.5309	.5049	.5216	.4425	.5532	.5322
P1:2	.6572		.5375	.5783	.6250	.4503	.1813	.3391	.4642	.4980	.4106	.4413	.4211	.5793	.5558
P1:3	.5298	.5375		.4564	.6002	.4784	.2660	.4520	.3953	.5201	.4811	.4526	.4458	.5408	.5068
P2:1	.5529	.5783	.4564		**.8391**	.6679	.1967	.3915	.5665	.5262	.6651	.6699	.5991	.5905	.6047
P2:2	.6465	.6250	.6002	**.8391**		.6997	.2588	.4674	.5767	.6270	**.7230**	.6987	.5989	.6398	.6088
P2:3	.5323	.4503	.4784	.6679	.6997		.1095	.3930	.4270	.5483	**.8119**	**.7395**	.5487	.6676	.6322
P5:1	.2147	.1813	.2660	.1967	.2588	.1095		.5450	.4724	.3341	.1900	.2852	.4312	.3830	.4438
P5:2	.3862	.3391	.4520	.3915	.4674	.3930	.5450		.6829	.3782	.4243	.4239	.5285	.4613	.5515
P5:3	.4500	.4642	.3953	.5665	.5767	.4270	.4724	.6829		.4551	.5100	.5791	.5171	.5717	.5903
P3:1	.5309	.4980	.5201	.5262	.6270	.5483	.3341	.3782	.4551		.6993	.5592	.5036	**.7016**	.5857
P3:2	.5049	.4106	.4811	.6651	**.7230**	**.8119**	.1900	.4243	.5100	.6993		**.8294**	.6549	**.7116**	.6695
P3:3	.5216	.4413	.4526	.6699	.6987	**.7395**	.2852	.4239	.5791	.5592	**.8294**		.6390	.6532	.6062
P4:1	.4425	.4211	.4458	.5991	.5989	.5487	.4312	.5285	.5171	.5036	.6549	.6390		**.7238**	**.7611**

Appendix Y: Internet Survey Text

This electronic mailshot was posted to Internet newsgroups in Spring 1998 to gain a more global picture of healing colour attributions. Since it was sent to a selection of newsgroups it cannot be regarded as anything more than a limited opportunity survey. Newsgroups were selected by the experimenters after visiting each group and reading some of the content. Provided that healing-related discussions were already evident on the newsgroup, the survey text was posted. These were:

sci.med sci.language sci.anthropology sci.image.processing alt.folklore alt.pagan alt.folklore alt.meditation.transcendental alt.psychoactives alt.religion.all-worlds alt.sci.physics.new-theories soc.religion.paganism soc.religion.shamanism psi.general talk.religion.misc talk.religion.newage alt.self-improve alt.magick

As previously, the spaces for full answers on the original have been omitted from this example for

space reasons.

Greetings,

We are psychology students. We're currently doing a major research project on the colour-word association systems in use by "spiritual" healers. By "healers" we're covering a multitude of terms, from Christian Scientists Θ, Witches, Magicians, Shamans Θ, Crystal Healers Θ, Reiki teachers Θ etc. etc..... basically anyone who uses colour imagery, visualisations etc. for treating physical and-or mental and-or "spiritual" conditions (note: not necessarily anything that is an "illness", since a lot of healing is to make that which is already good into something better) within themselves or others.
We wonder if you can help, by sparing a couple of minutes: We are looking at whether there is a "universal" system of colour associations with symptoms; i.e., does a purple "aura" mean the same to a healer in Papua New Guinea as it does to someone in Canada. We think the answer to this will be "no", but to this end We're collecting as many systems as possible, so we'd be grateful if you could give a few symptom-word associations to the following, and e-mail it back at your convenience..... just two or three words on each please. We realise that "aura" may not be the correct term for all healers' philosophies, but everyone should know what we mean (hopefully)!

When: "aura" is

Red
Blue
Green
White
Grey
Black
Pink
Orange
Yellow

If you wish to call yourself anything (witch, shaman, reiki master etc.) then please enter it here:

The second matter is whether the colour-symptom system is stable *within* individual healers, and for this we are conducting an experiment over this summer coming (1998) to establish whether a coherence can be demonstrated. If you'd be interested in the results please indicate on your reply and we'll send you an e-copy of the report paper when it's completed (may be as late as June 1999 I'm afraid). Any information you are kind enough to send will remain confidential and you will not be directly linked to any data we express in the report; although of course all assistance will be acknowledged in our foreword, if published.

Thankyou again for your time

Dave Evans and XXXXXX

Thanks for reading