

# COGNITIVE NEUROSCIENCE, MARKETING AND RESEARCH

## SEPARATING FACT FROM FICTION

*Graham Page*

*Jane E. Raymond*

### INTRODUCTION

Cognitive neuroscience seems to exert a unique pull on our curiosity. Is this because its science and technology seems to offer an objective, unbiased picture of what makes people “tick”? We all love to try to ‘work people out’, so the idea that there might be an objective way to do this is alluring. In marketing we want to really get at why people buy what they buy, think what they think, and say what they say. Cognitive neuroscience seems to offer us the chance to achieve this goal, to yield a bias-free view of consumers’ minds.

Indeed, the new technologies for brain imaging yield beautiful colour ‘snapshots’ of the brain in action. But what do these pretty pictures mean? To interpret them and apply their lessons to marketing in sensible, appropriate ways, we need to look beyond images of the brain and the high-tech ‘toys’ that neuroscientists use to generate them. Instead of focusing on the images, we need to examine the theories they help produce because this is the real gold of cognitive neuroscience. The emerging consensus of how the brain works has the power to give us tremendous insight into how consumers respond to marketing messages. Cognitive science can give us lot more than sets of numbers and computer generated images. It can give us a road map.

A very great number of papers have been written and presented on cognitive neuroscience in recent years – some by neuroscientists, some by enthusiastic

amateurs, some by start-ups with a product to sell. Differing interpretations of the science, and commercial pressures have therefore muddied the water somewhat, and created some lively debate – witness the difference of opinion expressed by Robert Heath, Erik du Plessis and David Penn, for instance. The purpose of this paper is therefore to separate the fact from fiction, to address the issues of what the latest cognitive neuroscience really means for marketing, and to assess the relevance of cognitive neuroscience techniques, like brain imaging, to marketing research. To do so we combine the academic scientist perspectives (Jane Raymond of the University of Wales, Bangor) with the views of the marketing research practitioner (Graham Page of Millward Brown).

The paper therefore consists of two parts. Part 1 discusses what cognitive neuroscience really says about how the brain works (a.k.a. how we think or feel), and what that means for creating successful marketing. It also discusses what the techniques of cognitive neuroscience actually measure.

Part 2 details the implications of the key findings from cognitive neuroscience for marketing and the research industry, and discusses the role we think cognitive neuroscience’s techniques should have in the market research industry.

In doing so we hope to give to clarity to an opaque topic.

## PART 1: WHAT DOES COGNITIVE NEUROSCIENCE REALLY SAY THAT IS RELEVANT TO MARKETING AND MARKETING RESEARCH?

### Cognitive neuroscience: its rationale, terminology, and techniques

It is essential before we begin to clarify what is meant by the term “cognitive neuroscience”. We also need to establish some common vocabulary because one source of confusion is that the same words mean different things in marketing research than they do in cognitive neuroscience.

Cognitive neuroscience is a sub-field of neuroscience. It asks questions about how humans (and sometimes primates and other animals) use the coordinated activity of the brain to engage in complex behaviours. These scientists want to understand how the biology and neurochemistry of the brain actually work to enable people to do complicated things (such as using computers, making appropriate conversation, or rapidly choosing the things that go into the shopping trolley each week). However, even ordinary tasks, like grasping a coffee mug, involve an overwhelmingly complicated series of brain events. So, most of cognitive neuroscience is directed at understanding extremely simple tasks, under somewhat restricted conditions. One of the most important things to understand about cognitive neuroscience is that it is a field in its infancy, that there are more questions than answers, and that each small finding is hard fought. However, substantial progress has been made in the last decade. There is now an emerging consensus of how the brain works that can provide highly relevant pointers for marketing research.

Cognitive neuroscience uses three types of techniques to ask how the brain controls behaviour. These are (1) experimental psychology (2) neuropsychology, and (3) brain imaging.

1. *Experimental psychology*. The emphasis here is the measurement of behaviour. The techniques used by experimental psychologists yield quantitative data about

how and why people *do* things in response to situations and events. The situation and events are called *stimuli* and these are carefully controlled and manipulated by the scientist to see their effect on behaviour. The behaviours that are measured include things like where people look, how fast they can move their finger and hands in response to events, how well they can name, remember, or associate things, and how they evaluate and choose things. One of the general strategies used in this field is to create situations that cause people to make mistakes and then measure the frequency and nature of the errors (e.g., Raymond, 2002). Much can be learned about a mechanism by watching when and where it fails. For example, if a consumer is familiar with two different brands, say *Mars* and *Cadbury's*, not much can be learned about how they might be differentially processed by simply showing each brand to consumers and asking them to label them. Everyone will behave the same; nearly everyone will do the task perfectly. But if consumers have to do the same task but are shown each brand while they are heavily engaged in another task, or shown each only extremely briefly, a systematic pattern of labelling errors that depends on the consumer's habit with and preference for the brand can be seen. This use of experimental psychology is able to reveal that brand recognition is not a simple perceptual process but, rather, involves both long-term memory and emotional processes in the brain.

Experimental psychology is extremely powerful when expertly applied. It can allow scientists to make causal inferences about how stimuli change behaviour and has been fundamental in developing theories of how the brain works. Behavioural techniques are reasonably inexpensive and can be used on large numbers of consumers quickly and easily. With the availability of web-based consumer testing, these techniques are now practical for marketing research.

However, the techniques of experimental psychology can't tell us what is going on inside the brain and for this we need to turn to two other techniques: neuropsychology and brain imaging.

2. *Neuropsychology* is the study of brain damage and is a sub set of neurology, the study of the effect of illness and trauma on the nervous system. The general strategy here is to use brain imaging to determine where brain damage has occurred and then to measure carefully what behaviours are missing or abnormal in that patient. This is then used to infer that the damaged brain tissue was somehow used to control those behaviours. This technique is slow, useful for theory development but of limited relevance to marketing research. Some of the medical neurologists working in this field, like Damasio and Sachs, have received a lot of attention in the marketing research world, but their studies are based on a small numbers of patients with unusual and rare brain lesions.

3. *Brain imaging* is the newest of these approaches and is, itself, composed of three main tools. These are functional magnetic resonance imaging (fMRI), electroencephalography (EEG), and magnetoencephalography (MEG). The first, fMRI, is primarily used to map out the brain, telling us where neural activity is going on when people are doing a particular task. This technique is not very good at telling us the sequence of things that happen in the brain. For this we turn to the second two techniques, EEG and MEG. These are superior for telling us *when* a mental event is occurring and less good at saying *where*. MEG, the newest tool, is particularly good for telling us which brain areas are working together at any given point in time. All imaging techniques are predicated on solid behavioural techniques developed from experimental psychology and most research teams have experts from the different specializations working together. Indeed the messy, noisy imaging studies that one sees so often, especially in the emerging so called 'neuromarketing' arena, are often sorely lacking in appropriate experimental designs.

By far the most common method for brain imaging is fMRI. This is still a highly experimental technique but recent advances are making it more and more applicable to market research, at least for insight development. This device requires a person to lie

extremely still within a large circular drum that makes a loud rhythmic thumping sound. They can view stimuli through a small mirror, listen to sounds and touch things. Around the person's head is a large magnet that measures the amount of blood that flows through specific areas of the brain. The technique is based on the assumption that when neurons in a specific area of the brain are exchanging information, blood flows to that area. The increased blood flow is called the BOLD response and it takes several seconds. This is why fMRI cannot tell us much about the speed of mental events because they happen too fast for fMRI to measure response times.

The general strategy in an fMRI experiment is measure blood flow when people are engaged in two different tasks. Brain activation as a consequence of doing task A is compared to that for task B. For example, you could compare brain activation when people drink cola, knowing that the cola is a Coke (task A) compared to when they drink cola, not knowing what brand it is (task B) (McClure et al., 2004). The difference in the pattern of brain areas that have been activated is identified, telling us which brain areas were used for Task A but not Task B. But what do we do with that information? Does it mean that the identified brain area is the "Coke" area of the brain, or maybe the "brand" area of the brain? It could mean that we have identified an area that is activated when people are more certain about what it is they are consuming, or the area that gets activated when people feel they are being advertised to, or perhaps the areas that gets activated when words and taste are combined. It could be an area that becomes active when people like things that are familiar with. Without the correct comparisons and behavioural controls, this type of study just can't discriminate among these potential interpretations. There are in fact many things different about task A and task B and any or all of them can contribute to the difference in brain activity.

However, having said that, brain imaging can be useful in identifying the constellation of areas that are used

when people have to process specific types of things. For example, careful research on face perception shows that one specific areas of the temporal lobe (the fusiform area) is probably just used to identify faces while another set of areas in the superior temporal sulcus is used to judge a face expression (Kanwisher et al; Haxby et al.) This is useful because it tells us that the brain gets different types of information from the same stimulus and shunts it to two different locations for two different purposes.

There are a few additional truths about imaging that should be mentioned. First, these techniques are completely correlational in that they can tell *that* a piece of brain is active whenever a person says they are thinking or experiencing a particular thing; but they cannot tell us why that bit of brain is active or what piece of the mental process that brain area is actually doing. However by piecing together work from experimental psychology, neuropsychology and animal research, inferences can be drawn and a more functional picture of the brain can be developed. Second, contrary to some naïve views, brain imaging studies cannot reveal much about the subconscious mind unless a great many assumptions are made. Brain imaging always involves measuring the activity of an intact, integrated brain. It is therefore very difficult, if not impossible, to measure activity that is not influenced by the person's ongoing conscious experience, because so much of the brain is interconnected. Third, the data produced by all brain imaging techniques are heavily "massaged" because they depend on a massive number of assumptions. They are not truly objective in the way one might think (Farah, 2006).

The second two approaches, EEG and MEG, use a logic similar to that used for fMRI. However, because these two techniques measure the electrical activity of sets of neurons directly, they can measure moment-by-moment events in the brain. Again, subtraction techniques are used, i.e., comparing the brain response in Task A to

the brain response in Task B. These techniques are especially useful for measuring attention and perception and other mental processes that change rapidly. Recent work by Steve Luck at the University of Iowa has shown that certain event-related potentials (ERPs) found within the EEG are highly correlated with the location of visual attention. A feature of the ERP waveform, called the N2pc, provides a 'signature' for momentary shifts in attention and so can be used to reveal the location of attention even when the eyes are pointing elsewhere.

Similar kinds of studies are being done using MEG. This technique picks up changes in the magnetic field generated by the brain's activity and thus is able to measure brain areas that EEG cannot. It is particularly useful for measuring a brain characteristic called 'synchronisation'. This is when different areas of the brain work together by firing synchronously and appear, thereby, to exchange information. This may well be the basis of "thought" or, perhaps, consciousness. Understanding the direction and timing of information exchanges among discrete and widely separated brain areas is a hugely exciting area for cognitive neuroscientists. An example of advance in this area is that successful detection of extremely brief stimuli is not possible when the brain is in a desynchronized state just before the stimulus appears. However, detection of the same stimulus is possible if the necessary brain areas are synchronized at least to some degree prior to its appearance (Gross et al, 2005).

As can be seen by this cursory and brief review of brain imaging techniques, they can offer real insight into how the brain works. Unfortunately, brain imaging of all types is quite expensive because the tools needed are expensive and the personnel to do the data crunching are highly trained. Testing people takes a long time and so these techniques will never replace the currently used large scale survey and other techniques in use at present. Their main potential is in developing and testing ideas for redefining current marketing research approaches.

### Some terminology

Scientists working in cognitive neuroscience use the words *cognition* and *emotion* in somewhat different ways than people in marketing research typically use them and this creates confusions. First, cognitive neuroscience uses the word cognition to refer to *any mental event*, conscious or unconscious. It is a general term used to refer to any mental or brain activity that is more complex than a reflex. In cognitive neuroscience, it is not used to refer exclusively to difficult 'rationale' decision-making. This would be referred to as 'complex cognition' or sometimes 'cold cognition'. The word emotion is used to refer to both mental, brain, and body states that occur in response to certain external stimuli and in response to certain internal need or goal states. Feelings are the conscious component of emotion and both conscious and unconscious components of emotions can produce cognition, i.e., mental events. Cognitive neuroscience sees cognition and emotion as highly interleaved and does not make the very large distinctions between them that seem to characterise marketing research. In fact most cognitive neuroscientists would agree that almost all cognition has an emotional component.

Lastly, the word 'information' needs a brief discussion. In cognitive neuroscience, the word 'information' is used to refer to the content of any neural signal. It is used like the computer industry refers to bits and bytes. Information is what neurons pass from one to other and it can be very simple stuff like the wavelength of a patch of light currently landing on the eye, or a hormone level in the blood. Or it could be highly complex, such as the motor action sequence need to start a car, a stored memory for a brand, an interpretation of a human gesture, or an emotional response to a story. In cognitive neuroscience terms information can reflect something real, i.e., present in the physical world, or it can represent something entirely imaginary. Cognitive neuroscience generally assumes that information is information, regardless of its source. Although information related to real

objects is different in that it is supported by ongoing sensory processes, information generated through imagination and mental association is treated by the brain in the same way as real information. Another important point is that information refers to messages the brain exchanges subconsciously or consciously, and such messages can be simple or complex, and emotional or not.

### What has cognitive neuroscience discovered that is relevant to marketing and marketing research?

It is obviously impossible in a paper of this type to cover even the highlights of what cognitive neuroscience has discovered in the last 50 years, so we will allow ourselves to engage in radical simplification and restrict ourselves to four main points that are directly relevant to marketing research. Taken together, we use these points to describe a *mental workspace* model of how human mental events might be organized by the brain.

#### *Point 1. The brain and its functions are modular at the low level.*

Through thousands of painstaking studies, it is now clear that different types of information (e.g., visual, auditory, tactile, pain, body states, etc.) are initially processed by discrete modules in the brain, each dedicated to one type of information, much like a TV channel. For example, the visual modules processes only visual information and are completely insensitive to auditory information. Such modules appear to involve both sub-cortical and cortical areas working together. Sets of these modules are grouped or assembled into larger, 'second-order' modules that rapidly share information amongst each other. Among other things, this enables coordination of information from different senses. For example, if you see a cat, you can coordinate the cat's meow, the feel of the hair, and the look of the animal to develop the conscious sense that this is a cat, not a dog. Evidence that this kind of coordination of information is done by a second-order module has been established through



psychological studies as well as neuropsychological studies of people with discrete brain lesions. Brain imaging studies have shown that there are discrete brain areas that seem to correspond to these 'second-order' modules

Second order modules are then grouped into higher order ones, and so on. To simplify, it appears that this module hierarchy ends with three mega-modules. One deals with knowledge about physical objects in the world; another deals with motor actions; and the last deals with emotional responses or evaluations.

*The knowledge module.* In this context, 'knowledge' refers to information about the physical properties associated with an object or idea that one might encounter or imagine. This could include the colours, shapes, and material properties of other objects associated with the object as well as the concrete words used to describe it. For example, if one encounters a brand image for Apple, then the knowledge modules will process and generate information about the bitten apple logo, the brand name, and images generally associated with it such as dancing silhouettes or white earphones. It might generate information and associations of smooth white and clear plastic, monitor screens, or other physical attributes of iPods, laptops or computer monitors, depending on the person's experience with the brand. Note that the information in the knowledge module generated for a brand will be different for different people but will be heavily influenced by both the marketing associated with the brand and the product itself.

The *action* modules will deal with all the information associated with interacting with an object. It will generate information about what you do with your hands, your feet, your body, your facial expression and social posture in response to the object or idea. In our Apple example, if the consumer was an iPod user, the logo image might activate information about the finger actions needed to find a song on the iPod, the problem of untangling the earphone wires, or the sequences of behaviours need to charge the battery.

Note that the activations of these motor signals may not result in real actions and they may be entirely subconscious. Evidence for a divisions between knowledge and action comes from numerous studies that show that people with brain damage to certain areas of the brain may be able to use their hands to grasp and use an object correctly but be unable to name the object, whereas other patients with lesions in other areas can name objects such a hammers or cups but be unable to tell you what their use is.

The *feelings* modules deal with all the affective and emotional information about an object or idea. They engage in object evaluation, probably along numerous dimensions, work to generate a value for the object, and relate this to short and long term emotional goals. Evaluated dimensions are non-physical and are socially or emotionally relevant. They might be simple dimensions such as good versus bad, but more likely are mapped onto the biologically relevant dimensions such as attraction versus disgust, fear versus safety, anger/frustration versus achievement, masculine versus feminine, social in-group versus social out-group, etc. Returning to the Apple example, the logo image will generate different response for different people, again depending on how the associated marketing appeals to them and their use of the product. A young person might feel a positive set of responses that include attraction and inclusion whereas an older adult might feel repelled and excluded. Evidence suggesting a separation of feelings from knowledge and action again comes from numerous studies in experimental psychology, neuropsychology, and brain imaging. For example, it is well established now that people with brain lesions to areas of the frontal lobe known to be important for establishing emotional value of an object are able to name and use objects entirely normally. However, their ability to choose among options and to respond to changes in the value of an item are very impaired.

The three mega modules, *knowledge*, *actions*, and *feelings*, provide a summarizing view of the way the

brain sorts and accumulates information. This could be really important for marketing research because from a consumer's mental perspective, we think these three components of information may well be the basis of a consumer's concept of a brand. We discuss this in more detail in Part 2.

*Point 2. The brain is massively interconnected at the higher level.*

At the top of this three mega-module hierarchy, there is an executive control mechanism that orchestrates the whole brain. There is a lot of argument about the specifics of this top layer (including the words to describe it) but everyone agrees that it exists, probably involves the frontal and parietal lobes of the brain, and that it is immensely powerful. This is because it can adjust or modulate the workings of virtually all of the low level modules, suppressing activity in any one of these when it is necessary, or boosting activity in a module when the information it carries is particularly relevant. This is why the football player can continue to play with a broken bone: the pain module is completely suppressed by the executive over-ride. Similarly, this is why the emotional response to a video ad may be remembered with perfect clarity but the brand being advertised is forgotten. In this case, the emotional response modules are heightened but the verbal encoding system is suppressed. In short, the executive decides the priority for addressing the type of information needed for a particular type of cognition (mental event). It could, for example, enhance the emotional evaluation and action modules and downplay the knowledge ones, or enhance the knowledge and action modules and downplay the emotional evaluation modules.

A key question is what sets up the priority? There are two main mechanisms that do this: selective attention and emotion. These are brain super-systems (called that because they involve a lot of different brain areas) that gauge how *relevant* something is. Emotion and attention work together, each assisting the other. There is a lot of discussion in the marketing research

world about emotion *driving* attention, and it can do this on occasion, but equally, attention can drive emotion. It is best to think of them as partners, each influencing the other. Relevance is everything when it comes to engaging with information; sometimes emotion is relevant and sometimes it is less relevant. Using both selective attention and emotion, the brain rapidly assess whether something in the external world, such as a marketing message, is important for what is needed right now, is needed for something in the future, is actively getting in the way, or is simply irrelevant. If information is relevant, then it gains priority. If it is irrelevant, it loses priority. No one really understands how this works in detail, but there is a mountain of evidence to show that relevance to current and future tasks is absolutely critical if information of any kind is to be registered at all.

*Point 3. The 'mental workspace' is crucial for complex cognition, and operates via competition.*

So how might the high level executive work? Is there a little man in our heads telling us what to do next? Of course, not. One possibility is that the control exerted by the executive is actually the result of a competition amongst numerous activated neural circuits (sets of cells) each making use of specific brain modules. (These are ideas expressed by Desimone and Duncan and later by Dehaene and colleagues.) Let's assume that activity of a neural circuit is the basis for representing a piece of information. At any given point in time, the information pieces compete for access to a specialized brain network that we will call here the 'mental workspace'. The competition takes time to find a winner and it is probably fought in 'rounds' such that information circulates between the front and the back of the brain in a way that brings together current sensory information with goals and task relevance. The time it takes to deal with the competition among pieces of information has important consequences that we return to later.

The workspace is critical because it enables information pieces to do five main things:

1. The workspace circuitry allows us to become conscious of any information that enters it.
2. It allows pieces of information to be integrated with other pieces of information so that relationships and connections can be formed. It is here that coherent representations of discrete objects, places, people, events, and even brands are formed. We will talk more about this important process later.
3. It allows information to be stored properly in long-term memory.
4. It allows information to control actions, including language.
5. Perhaps most importantly, it allows us to weigh possible outcomes and consider options for behaviour.

The workspace is where complex decisions can be made and where we change our minds about things. Information that doesn't get into the workspace is not used in the same way; we are not conscious of it, it cannot control our behaviour in the same way, and it doesn't get as heavily counted into decisions.

There are a few other important points to note about the global workspace.

- (1) It is very small in capacity, so competition among pieces of information is necessary and continuously ongoing.
- (2) Ideas in the workspace work to ramp up or down other mental processes in other less directly related modules. In essence, thinking about or becoming conscious of a particular thing can change how the rest of the brain deals with other things.
- (3) The pieces of information that get into the workspace are highly organized and tightly integrated into about four discrete bundles that we call 'representations'.
- (4) Real objects and events taking place at the moment are always more likely to gain access to the workspace than remembered or imagined objects or events.

Given the modulation of other processes generated by information in the workspace, this results in what has been called "situational cognition". The contents of the workspace, i.e., our conscious cognition and decision-making, are heavily affected by the current situation. This, of course, has obvious implications for marketing.

To get a sense of how this might work, imagine a workplace where there is a set of four of "hot" desks with access to the office intranet in an office of 150 staff. The hot desks are the global workspace and the office workers are pieces of information, corresponding to the current situation or to remembered or imagined things. The office workers have to compete for access to a hot desk to do their work and to communicate with one another. If one of the office workers has a really pressing job, s/he starts jumping up and down getting ready to jump into the first available hot desk. (They are activated.) They may even go over and yank another worker away from one of the desks or push other would-be workers out of the queue. (They exert active inhibition.) They might try to share a hot desk with other workers. (They get associated with existing information.) Some office workers may want to do their jobs but are not really motivated enough to engage in the hard work of acquiring a hot desk. (They are 'primed' but not activated.) Most couldn't care less and sit dozing in the corner. (They are dormant.)

A lot of work in cognitive neuroscience has led to the general notion that the brain deals with current and past information in this competitive way. The important thing to get from this is that a piece of information, say a fragment of a marketing message, can be in one of several different states. It can be *in* the global workspace (either via association or in its own right); it can sit passively *on the fringe* of the global workspace (primed but not available to conscious experience), it can be trying to enter but is actively prevented from this (inhibited), or it can be dormant (not registered). What we have described here is the various levels of paying attention to



something, or to use marketing research -speak, being engaged. These levels of engagement are: attending, passively ignoring, actively ignoring, and not registering. This, we think, provides a useful framework in which to understanding the potential impact of a marketing message.

The concept of mental competition for access to the global workspace and its small capacity is crucial in marketing because it means that if a consumer becomes engaged at the highest level with a piece of marketing, (gets that marketing message into the workspace), it can become integrated into the consumer's long term memory and be used for making purchase decisions. Without gaining access, a different fate awaits the marketing message. For example, if a person is reading a magazine article, an intruding marketing message may become subjected to active ignoring. Work in experimental psychology has shown that the inhibition used on distracting information often leads to suppressed memory for it (Tipper) and can lead to it being negatively evaluated when it is next seen (Raymond et al., 2003). These consequences are counterproductive for marketing and need to be avoided.

Passive ignoring on the other hand can have weak positive benefits both in memory and subsequent liking. For example, studies of affective priming (e.g., Fazio et al, 1986) and mere exposure (Zajonc, 2000) show that passive ignoring can in some cases enhance responses. In affective priming, a person is shown an image that is irrelevant and then shown an obviously positive or negative word (e.g., 'happy' or 'angry') and asked to categorize it as good or bad as fast as possible. If the preceding (priming) image has positive emotional value to the person, then they will be faster to categorize 'good' words as good and slow to categorize 'bad' words as bad. The reverse effect is found for images that have negative value. These effects are not found when the priming stimulus interferes with the task and are largest when people are unaware of the primes'

presence (i.e., it hasn't entered the workspace). Such effects reflect a sub-conscious influence of stimuli on behaviour, but it should be noted that their effects are subtle and small in magnitude.

Mere exposure is another well-known passive ignoring effect. Here, it has been found that prior exposure to a stimulus will produce a subtle enhancement of preference for that stimulus over a similar but completely novel stimulus. This enhancement effect is completely reversed if the first exposure actively interfered with an on going task (Raymond et al, 2005) or was associated with having to interrupt a planned behaviour (Finke et al, 2005). Passive ignoring phenomena are often used to support the notion of a 'low-involvement' response to marketing. However, experiments in the laboratory with such effects suggest that they are ephemeral and weak, especially when people are busy. Although their impact on people in normal environments is debatable, they offer effects that can be usefully exploited for marketing research within the laboratory. For example, affective priming effects have proven useful in Raymond's lab to measure emotional response to brands.

Lastly we consider the vast bulk of information that is simply not registered. When handed this fate, the data suggest that information leaves no enduring effect on a consumer whatsoever. This makes sense when you consider the vast quantity of information to which we are exposed to everyday. To incorporate all of it into our memories would be impossible and unnecessary. Indeed much of our brain's evolution has been directed at selecting out the relevant information and using it to learn and predict what to do in the future. Cognitive neuroscience offers a clear and succinct way in which to think about consumer engagement with marketing. Such a view allows predictions about how information in different settings will be used.

*Point 4. Information is organized into 'representations'.* One of the emerging facts from cognitive neuroscience is that our conscious experience, i.e., the

contents of the global workspace, is highly organized; it is not a haphazard jumble of associations and sensory information. Information appears to be organized in such a way as to provide us with a coherent description of discrete objects and events. We call these *representations*. Each 'representation' pulls together the relevant bits of information about something in the world: an object, person, place, event, or concept (such as a brand). The little bits of information are called 'tags' and can come from external real objects or from memory and imagination. The assembled bundle is a 'representation'. When we think of an object or brand, we conjure up a representation for it in our global workspace, or if you prefer, our consciousness. This is a time consuming job and uses up a lot of 'brain power'. Building mental representations is probably done in a serial fashion, i.e., only one representation can be built at a time. This has implications for marketing that we will return to later.

Building representations is where the brain's modularity becomes important. Research in cognitive neuroscience suggests that a representation of something, say, an ordinary object, a brand, or concept, must have at least three tags, one for each of the mega modules: knowledge, actions, feelings. This view proposes that every representation must have at least one tag that specifies (1) some knowledge about it physically (e.g., its shape, its name, etc.), (2) the motor actions or functions associated with it (e.g., do you eat it, sit on it, or look at it?), and (3) the evaluative feelings or emotional responses it typically evokes (e.g., is it pleasant, safe, irritating? Do I want it?). In other words, each mega module has to be consulted and *must* make a contribution to the representation for every object.

Figure 1 shows an illustration of the workspace model. Each of the rectangular boxes represents a simple "input" module for generating specific tags or pieces of information. The information is compiled in one of the mega-modules: emotion, knowledge, or action.

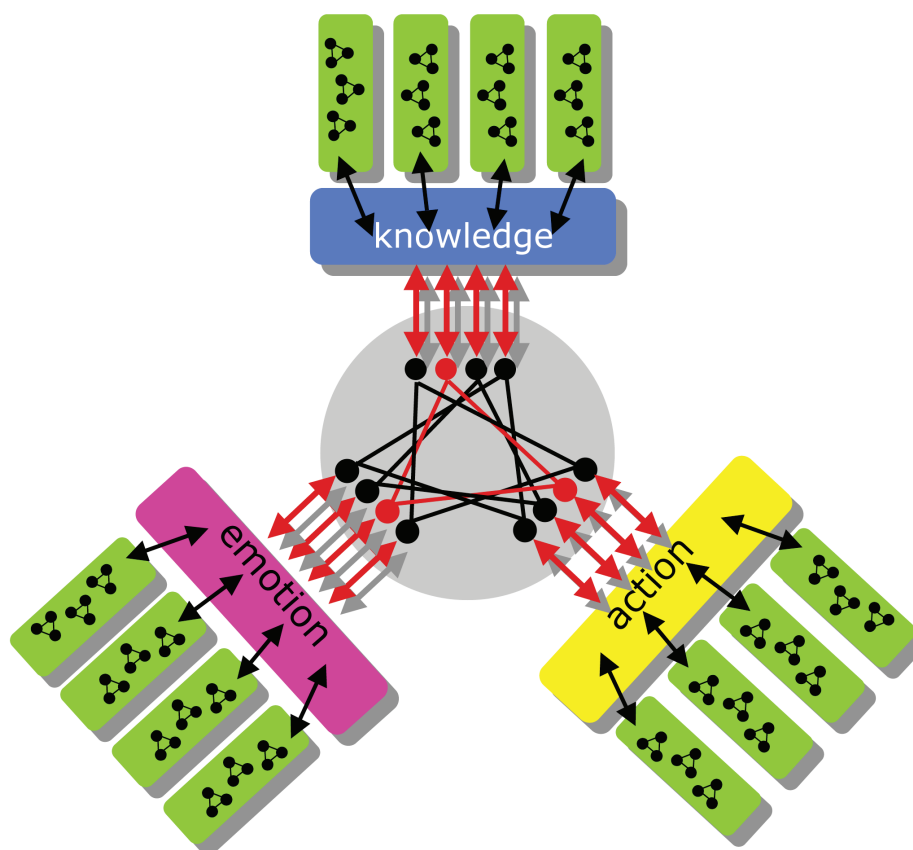
Information from these can enter the global workspace illustrated by the large central circle. One small black circle from each mega-module is connected to another in the other mega-modules and once fully activated, they constitute an assembled 'representation' (as shown in red). The activated representation can act 'backwards' on the green 'simple' modules, either inhibiting or facilitating them.

Let's consider some examples. First, we consider an ordinary object like a paper clip. The 'knowledge' tags might include 'office stuff' or 'metal'. The 'actions' tag would include the finger movements needed to use it or put it away. You might imagine that you have no 'feelings' tag for a paper clip but cognitive neuroscience suggests that such a tag is obligatory. You might have a mild feeling of familiarity, annoyance, or satisfaction depending on where the paper clip is and why it is there. Your affective response may be mild but that itself is important information for your brain. Now let's consider something somewhat more conceptual, such as a brand. Let's use "Vodafone" as an example. The 'knowledge' tag might be 'red and white', the connection with mobile phones, and a vague sense of speechmark shape in the logo. The 'action' tag might be the motor sequence for making a mobile phone call but more likely it might concern the sequences of action for paying a mobile phone bill or negotiating a phone contract. The 'feeling' tag might be a feeling of ownership ("that's my mobile phone company") or rejection, if the brand had been previously used and since changed. Now let's consider something even more conceptual: the notion of "freshness". The 'knowledge' tag might simply the spelling of the word or the colour green or blue. The 'action' tag might be drinking, washing, or being in the open air. The 'feelings' tag might be relaxation, relief, or, perhaps, exhilaration.

Two important aspects of building a representation are the time needed to assemble the relevant tags and the 'strength' of the representation, once assembled. The strength refers to its ability to compete with other

FIGURE 1

## AN ILLUSTRATION OF THE MENTAL WORKSPACE AND THE CREATION OF REPRESENTATIONS



representations being or trying to be assembled in the workspace. We know surprisingly little about these two aspects of building representations and this is a current area of intensive investigation. However, we can make conjectures about this by referring to the concept of competition to gain access to the workplace. Research in experimental psychology has shown that building representations takes less time when people are extremely familiar with something. This suggests that automaticity, that is extensive practice, plays a role when representations are being assembled. Such an idea makes sense when we consider how important familiarity is for the vast number of mental tasks that are effortlessly performed in complex, busy environments, such as shopping in a supermarket or reading. Work has

shown that people are faster at building a mental representation of Prince Charles than they are at building a representation of the leader of the UK's Conservative Party (Buttle and Raymond, 2003); they are faster to conjure up a representation of a Mars bar than a Bounty bar. All these things are familiar but Prince Charles and Mars bars are 'super-familiar' and their representations are built at lightning speed. To explain why this might be, let's return to the notion of the three obligatory tags that we think each representation must have. For the super-familiar items, the information needed for the three tags is clear, unambiguous, and readily available from the mental storage cupboard. People know what Charles looks like, they know his function in the world, and they know how they feel about him. They have built a

mental representations of him thousands of times in the course of their lives. This isn't true for a political leader recently launched onto the media landscape. People are unclear what to assign to each tag. Without a lot of prior "practice", making a representation of say, David Cameron, will be slower and more effortful.

These ideas have direct relevance to marketing because what effective marketing does is get people to assemble representations of particular brands, repeatedly, so that they become easy to evoke when the consumer has a relevant decision to make (e.g. during purchase or brand usage). Without gaining entry to the workspace a brand cannot be part of a purchase decision set, for instance. Effective marketing also shapes the nature of the tags so that they make the brand more attractive at the key decision points. As we describe later, the whole point of marketing should be to provide the consumer with consistent, unambiguous tags for each of the three mega-modules so they can build a brand's representation rapidly and robustly.

### Consumers need time to think

Two of the key relevant points to come out of cognitive neuroscience and its exploration of the global workspace is that (1) the workspace is very limited and access is competitive, and (2) that creating representations is time consuming. This leads to some important phenomena when people encounter large amounts of information at once or at a very fast pace (such as in a supermarket aisle, or in some marketing communications)

For the last dozen years or so, Raymond and other cognitive neuroscientists around the world have been studying just what happens when people don't have time to think about incoming information. They discovered a phenomena called the 'attentional blink'. What they found was that when people have to find an image, say a picture of a shampoo bottle, in a rapidly presented series of images, they are able to do this easily. They can report its presence even though the image is only there for a split second and it is

preceded and followed by lots of other images. People are able to do this by sharpening up their selective attention system and using it to boost processing of any image that matches the one they are trying hard to find. But, there is a cost to this. Images presented immediately after the shampoo image go completely unnoticed. People fail dramatically to see images presented within a window of about a half second after the "target" (shampoo) image even though they are presented for the same amount of time as the target image. It is as if the brain system "catches" what it wants from the image stream (the shampoo image), then blinks a metaphorical 'eye' (selective attention), failing to 'see' anything during the metaphorical blink.

This effect not only occurs in the laboratory but appears to occur when people watch fast-paced 'video' advertisements. We have found that when a scene in a video is very attentionally compelling, information in immediately subsequent scenes goes virtually unnoticed. For example, if the really funny or emotional segment in an ad is followed by a brand image, as it often is, recall of the critical brand information will be very much lower than if it is presented a little bit later. Research in Raymond's lab has shown that the information recalled from video ads depends directly on the duration and complexity of successive scenes. By lengthening some scenes or shortening others by as little as two-tenths of second, recall of critical brand content in an ad can be drastically improved.

This discovery has important implications. First, it implies that we do not consciously register everything that is visually presented to us and, second, that creating a consciousness experience of an object takes time (about a half second). Research in Raymond's lab and in others has shown that this 'half second' window of blindness is by no means a strict rule and depends on familiarity with the images. In recent years the attentional blink has been used to study the fate of information that does not gain access to the workspace; in other words, to ask what happens to images that are "blinked"? The answer is that if

they immediately follow the target image, they are inhibited. If they come a bit later but are still blinked, their representations get activated or “primed”. More importantly for marketing research, the attentional blink effect can be used to measure the ease with which a brand’s representation can be created and to determine how changes to the appearance of a brand enhance or impede its mental construction. Indeed, by exploiting this science, Raymond and colleagues have developed a method for measuring brand ‘strength’. From this work we have learned a lot about how representations for brands and products are built.

## PART 2: THE IMPLICATIONS FOR MARKETING

The first part of the paper has been extremely wide-ranging, and hopefully has dispelled a few of the myths surrounding cognitive neuroscience. The second part focuses on the implications of the key ideas expressed there for marketing and marketing research. The really important findings for marketing centre on the following:

- the importance of the limited-capacity workspace in complex cognition
- the importance of relevance in accessing the workspace
- the need for input from all the mega-modules in creating representations
- the effort required to assemble representations
- the ‘blinks’ in processing that this creates.

### 1. *The mental workspace is crucial for decision making, and processing meaning, and memory.*

This means the current emphasis in marketing on seeking engagement with consumers is absolutely right. Without getting consumers to devote mental resources to marketing activity, its effect is profoundly limited. The science demonstrating the importance of attention and the workspace in complex cognition is very strong, but there is also good evidence for this from our own industry. Without wanting to re-open the debate on the merits of advertising memorability as a measure, advertising memorability data has some

relevance here. Millward Brown have demonstrated repeatedly that the memorability of TV advertising relates to its sales effectiveness. For instance figure 2 shows the relationship between ad memorability as measured by the ‘Awareness Index’ and sales effectiveness, as determined by econometric sales modelling, for established brands. The relationship is clearly very strong. Likewise, figure 3 shows the relationship between ad memorability as predicted on Millward Brown’s ‘Link’ pre-test and subsequent sales-effectiveness of the tested ads. Again there is a clear relationship between memorability and sales-effectiveness. We’ll return to why this might be in a moment, but one of the key influences on memorability is *involvement* with the advertising. Figure 4 shows this clearly. When we split our ‘Link’ advertising pre-test database into ads which have high, medium and low levels of involvement, as rated by viewers, it is clear that the memorability of the advertising is highly related to viewers’ involvement with the ad. Given the relationship between memorability and sales effectiveness, it is therefore clear that involvement with advertising is crucial to its effectiveness.

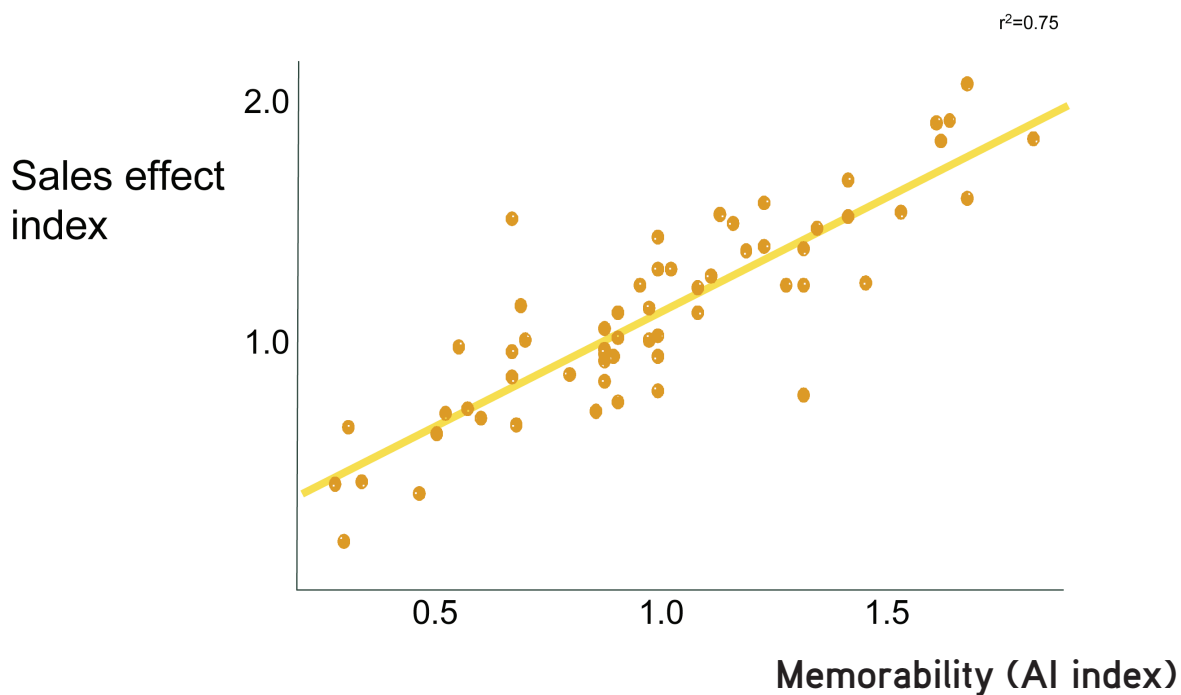
This may be at odds with the arguments of some authors, such as Robert Heath, regarding ‘low involvement’ processing – that advertising ‘works’ by slipping into the brain via low-level, almost unconscious processing. The cognitive neuroscience discussed earlier strongly suggests that this is not the case. Low involvement – ‘passive ignoring’ in our parlance above – means limited access to the workspace, which means the chances of the advertising being integrated with other elements of the brand’s mental representation are far lower than if the marketing gets high attention. This is not to say marketing that gets low involvement will have no effect – but in terms of return for advertising expenditure, it is clear that marketers are likely to get a much better return if they can engage strongly with their audience.

An important point of clarification here is that when we talk about the need for marketing activity to enter



FIGURE 2

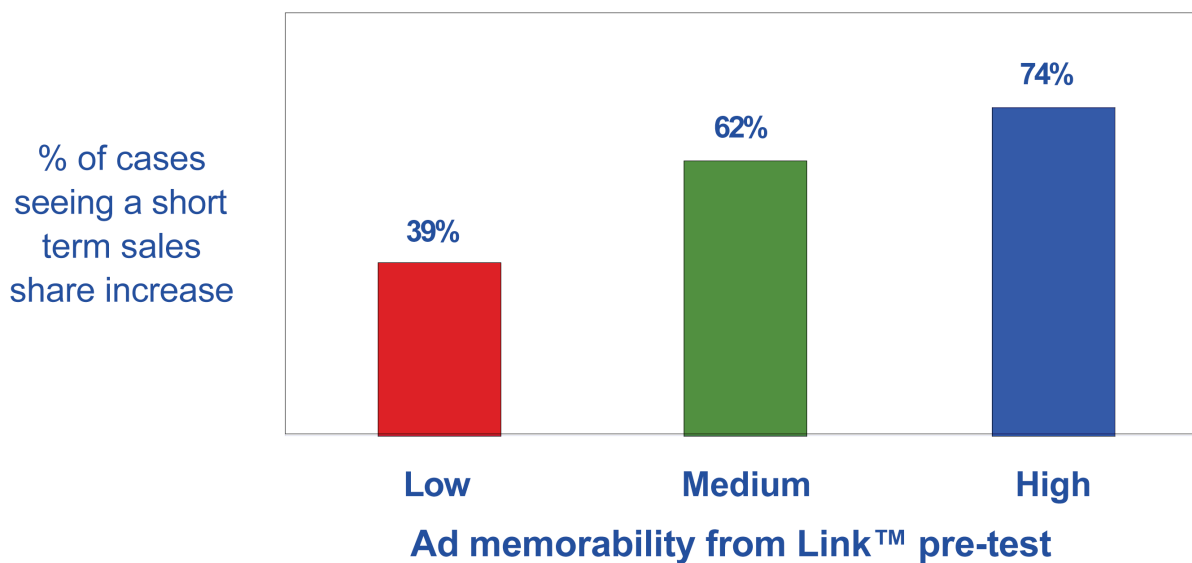
THE RELATIONSHIP BETWEEN TV ADVERTISING MEMORABILITY AND SALES EFFECTIVENESS IS STRONG



Source: Analysis of UK FMCG brands - short term sales effects, established brands only

FIGURE 3

ADVERTISING WITH STRONGER EXPECTED MEMORABILITY IN PRE-TESTING IS MORE LIKELY TO GENERATE A SALES EFFECT

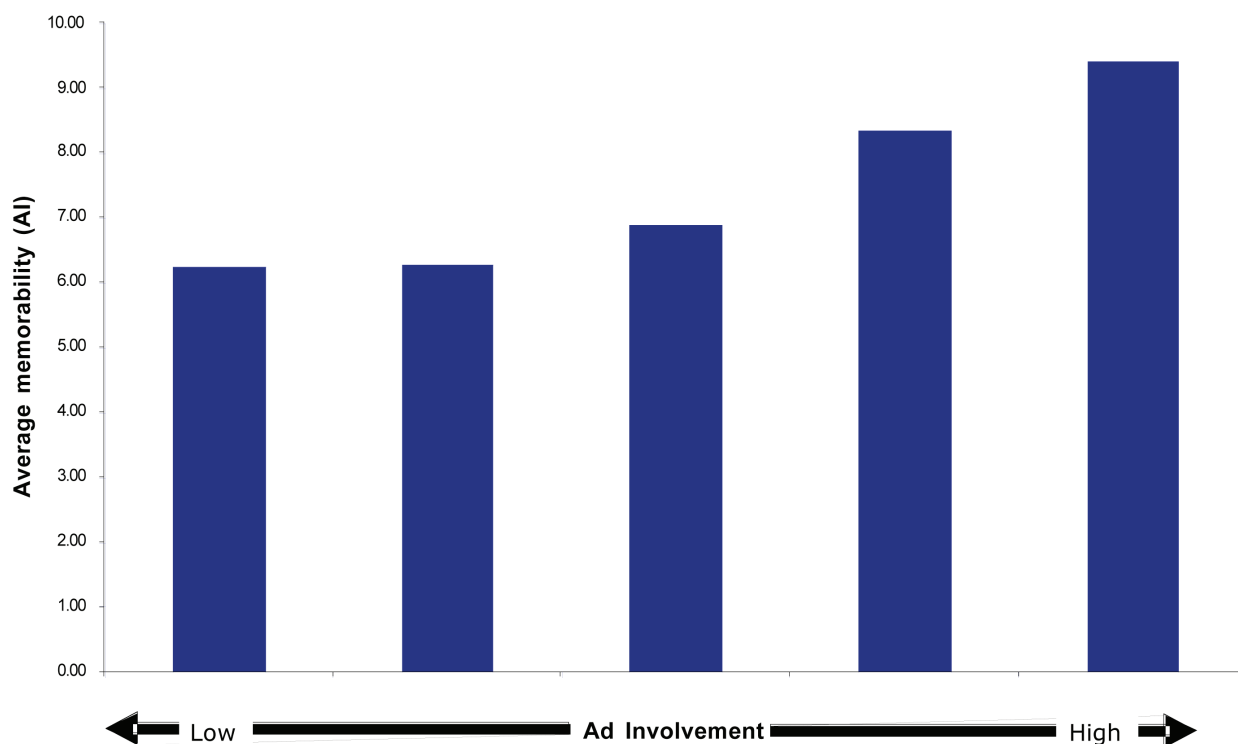


Based on 872 Cases

A sales share increase is one of more than 0.1% of a market share point.

FIGURE 4

INVOLVEMENT WITH THE ADVERTISING SHOWS A CLEAR RELATIONSHIP WITH IN-MARKET MEMORABILITY



Base: 270 ads from UK Tracking database

the workspace, or for consumers to engage with the activity and devote 'mental resources' to it, we are not suggesting that we're expecting consumers to 'think hard' about what the advertising means for their perception of the brand when they encounter the advertising. That is highly unlikely as they are not in the mindset of thinking or deciding about brand when most media are consumed (more on that in a moment). What we are suggesting is that for the marketing activity to have a good chance of influencing the brand representation and behaviour *later*, when consumers *are* thinking about the brand (often during the purchase process or usage), it has to enter the workspace and be processed when it is encountered, because only then can it enter long term memory. Equally consumers have to be able to link advertising to the brand when they encounter it for relevant parts of the advertising to re-enter the

workspace when they are thinking about the brand at a later time.

Returning to the topic of advertising memorability for a moment, the cognitive neuroscience discussed above gives a good rationale for why this is such a strong indicator of advertising success. Consumers are not making brand decisions when they consume the advertising, so its effect has to carry forwards to a point in time when the message *is* task-relevant. Unless the marketing activity is remembered, and key elements re-enter the mental workspace when the brand is thought about, it cannot have influence. Secondly, memorability can be seen as an inevitable by-product of the amount of processing, or work done on information. There is very strong evidence that the more mental resource we commit to processing an event or information, the more memorable it is. So the

memorability of advertising is a strong indicator that it has engaged the consumer, that it has been processed in the global workspace, and so is more likely to influence the representation of the brand when the brand is being considered.

*2. Relevance to current or future task determines what gets in to the limited-capacity workspace.*

This has two important implications. First, this strongly supports the notion that marketing activity needs to take into account the mindset, or task-orientation of consumers at the time it is encountered. When consumers encounter most marketing messages, they are not typically seeking information about brands – they are doing something else. When watching TV or at the cinema, they are often seeking entertainment; when reading a newspaper or magazine they are also seeking diversion but may be more likely to seek knowledge about topics of interest. When using the web they are often very goal-oriented, seeking to complete a specific task. To enter the global workspace, marketing messages have to fit with these needs. This is why creativity is so powerful and important in advertising – very often it is only by fulfilling the need for entertainment or diversion that the marketing activity can get attention. This also strongly supports the notion of placing advertising in topic-relevant spots (e.g. newspaper ads for beauty products in beauty supplements, sports products in sports programming etc). By being more relevant to the topic that the audience is interested in at that time, the chances of the marketing message entering the workspace are maximised, so it can have more effect.

The notion of ‘active ignoring’ is also highly relevant here, as are the negative effects this bestows on the information being actively ignored. Raymond et al’s work in this field showed clearly that information which interferes with the current task is actively ignored, and is later evaluated more negatively. This means that marketing messages that distract from, or interfere with the consumer’s task are likely to be

actively ignored, and the brand may be negatively evaluated as a result. The obvious example is pop-up internet advertising, which most people find annoying – the cognitive neuroscience suggests that the active ignoring this engenders is likely to have a negative effect on the brand for many people. As new media opportunities open up, and marketers seek to engage more deeply with consumers via these new channels the same issues need to be considered. This strongly argues that permission-based marketing is a minimum, and that marketers have to seek a more equitable exchange with consumers where they get something back for their attention, or not only will the activity be screened out, it may backfire.

New marketing research techniques are emerging which help marketers match their marketing activity with consumers goal-orientation at the time of consumption, and avoid annoyance and active-ignoring. For instance, Millward Brown’s ‘ChannelConnect’ research approach is designed to do just that. A qualitative research tool, this approach employs a variety of techniques to understand consumers’ mindset when they encounter media, and their receptivity to brand messages through these encounters. This includes diaries or visual journals, observational work, depth interviews and group discussions, to fully explore the way in which target consumers can potentially connect with the client’s brand.

The second implication of the importance of task-relevance is that only the aspects of the marketing message that are relevant to the task will enter the workspace. When consumers are seeking entertainment or diversion, it is only the aspects that are entertaining or interesting which will be processed. Crucially, most of the time, consumers are not interested in learning about brands when they consume the marketing message – therefore the brand and its supporting benefits are often tuned out. This is catastrophic for advertising effectiveness, as unless the brand enters the workspace the creative idea cannot be integrated into its mental representation.

We all know branding in advertising is important, but this argues strongly for the importance of integrated branding – that the brand needs to be integrated fully into, and relevant to the creative idea for the advertising to be effective.

Millward Brown have strong evidence that not everything in a commercial enters the workspace, and that branding is often driven by integration. Figure 5 is a visual representation of an effect we often see – that only the ‘involving’ elements of an ad remain in memory. Typically strong branding occurs when the brand is well integrated into those involving elements. In contrast, how early the brand is shown in an ad (figure 6) or how continuously the brand is shown (figure 7) do not show any relationship with branding.

### 3. The capacity of the global workspace is limited.

This has, as we have seen above, implications for the processing of marketing activity. However, it also has profound implications for consumer decision-making. The global workspace is where we make decisions –

put simply, it’s where you change your mind. Its limited capacity means that only a small number of variables will be considered when making that choice. This is one of the reasons why brands have power – they represent short-cuts for consumers, and so are less taxing on the workspace. But it also means that brand representations must be as easy as possible to assemble or they risk being displaced from the workspace by other brands. It also means that the workspace can’t handle brand representations with lots of disparate facets or elements – not everything will make it into the workspace, and the representation may not get assembled at all.

This means that the brands with the strongest brand representations are much more likely to be considered by consumers at the point of decision-making. The ‘super-familiar’ brands, with their lightning quick representations, have a clear advantage over and above the meaning and power of the representations themselves. Boosting brand saliency, reinforcing the brand’s associations, is likely to have clear and

FIGURE 5

THE ‘CREATIVE MAGNIFIER’ - THE INVOLVING PARTS OF ADS DOMINATE ADVERTISING MEMORIES

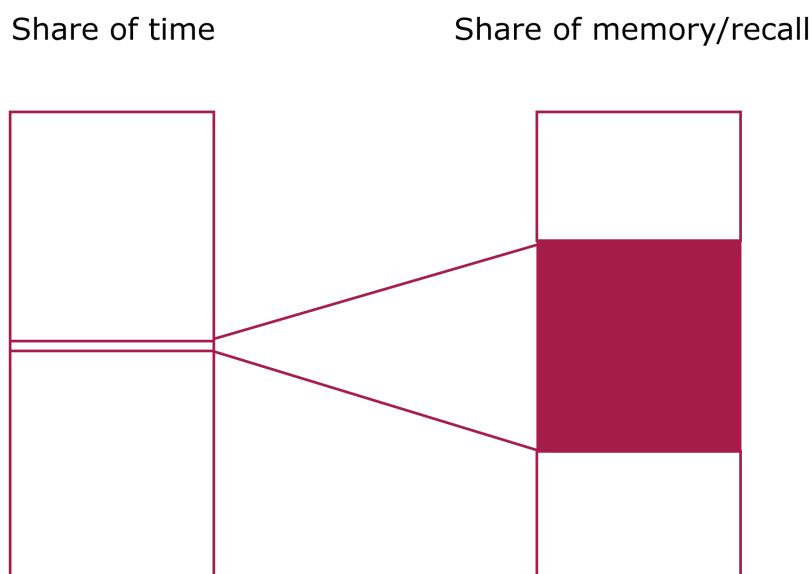


FIGURE 6

WHEN A BRAND FIRST APPEARS IN AN AD HAS NO RELATIONSHIP TO HOW WELL BRANDED IT IS

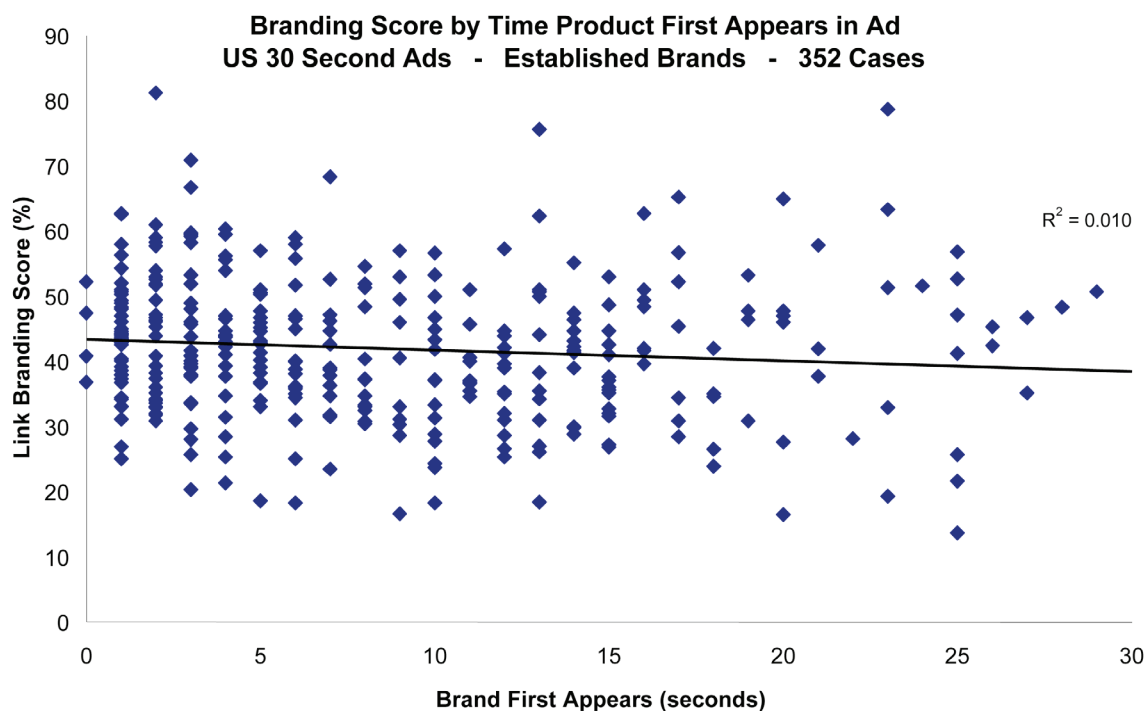
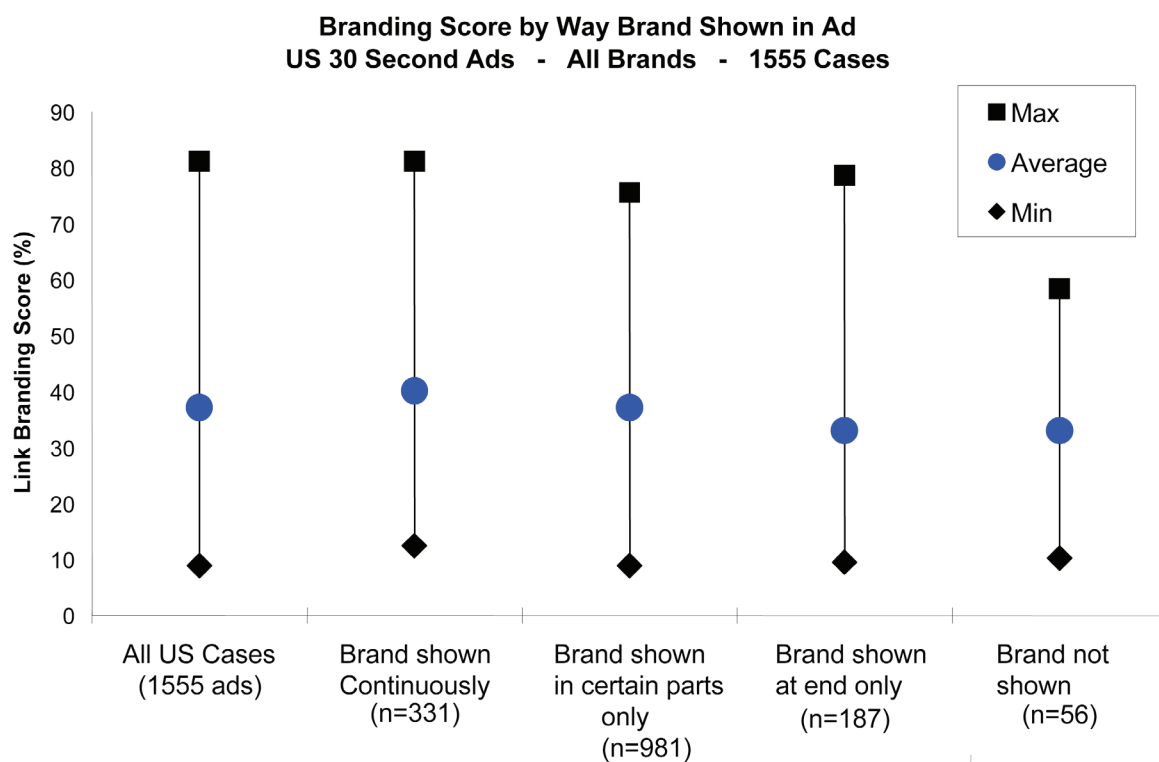


FIGURE 7

HOW THE BRAND IS SHOWN IN THE AD ALSO HAS VERY LITTLE IMPACT ON THE ASSESSMENT OF THE BRANDING



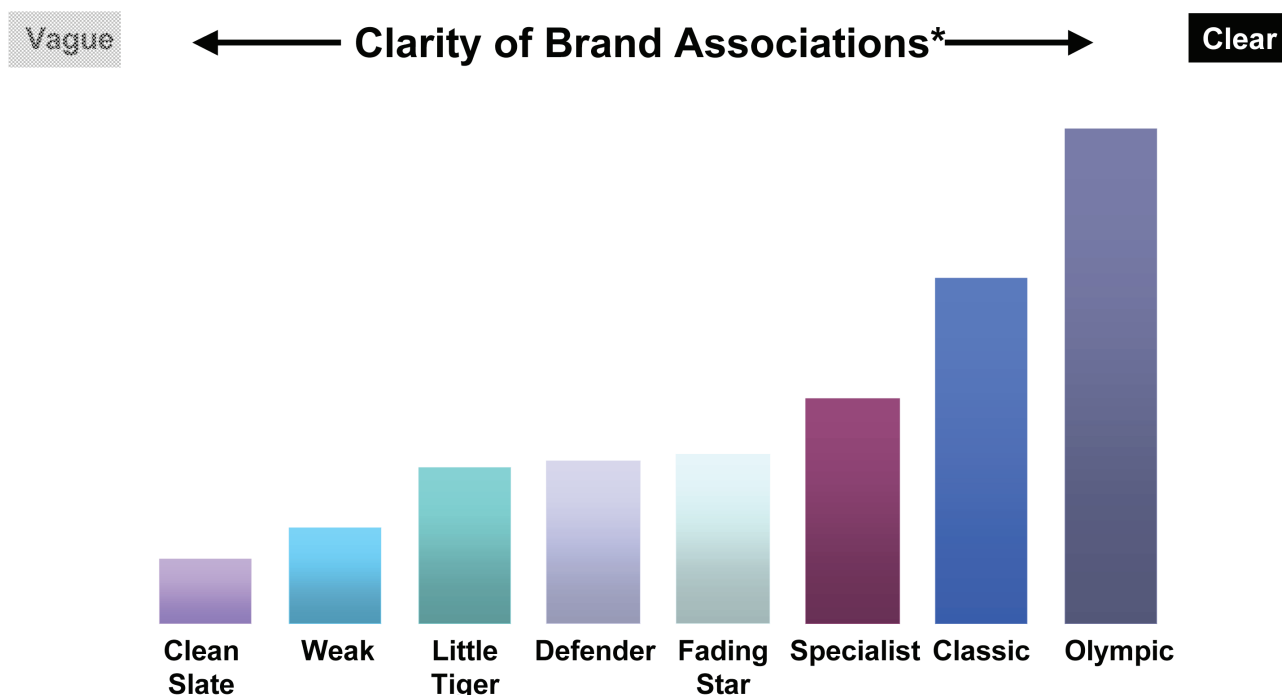


beneficial effect on brand strength and long-term sales. We have clear evidence for this from Millward Brown's brand equity databases. Using the BrandDynamics methodology, we have evaluated the brand equity of over 25,000 brands worldwide. From that database we have created a series of brand 'typologies' – brands which face similar challenges and have similar market positions. The most successful group of brands we term 'Olympic' – they are usually market leaders, and exhibit strong growth. A key characteristic of these brands is that they are universally known – far outperforming their category competitors in terms of familiarity, saliency and understanding of their benefits. They are, in cognitive-neuroscience terms, 'super-familiar' and this is a key contributor to their success.

The problems that the workspace has in handling brand representations with lots of disparate elements also reinforces the need for brand clarity. Attempting

to create a brand which is strong in all respects is difficult for this reason, and is unlikely to yield a strong brand representation. Likewise the workspace is unlikely to be able to handle marketing activity that attempts to communicate large numbers of messages in one go. Such attempts are likely to yield fuzzy brand representations which are less likely to be accessed when the buying decision is made. Again there is good evidence for this from Millward Brown's databases. One of our measures of brand equity is a measure of 'Clarity' – the distinctiveness of a brand's image or associations. When we look at the brand typologies in our database, again we see that the Olympic brands are the ones that score very strongly on this measure (see figure 8). The most successful brands do not attempt to be all things to all people – they have distinct strengths and so their representations are clear and easily assembled by and manipulated in the global workspace.

**FIGURE 8**  
**MORE SUCCESSFUL BRANDS HAVE GREATER CLARITY**



\*Source: BrandZ™, UK, 2003

#### *4. Representations require input from all three 'mega-modules' – knowledge, actions and feelings.*

Like the effort required to assemble representations, this has important implications for the goal of marketing. Marketing's role is to ensure that consumers have clear, strong representations of the brand – so they can easily be used in the mental workspace when consumers make decisions. The necessity of inputs from all three mega-modules in creating representations suggests that brand representations must include strong 'tags' for all three areas. Consumers need to know what the brand is and what it looks/feels like, what it does/how they use it, and how they feel about it. Strong, clear physical identities are stock in trade for brands, but generating functional and emotional benefits are often where difficulties arise. Yet there is strong evidence from marketing research databases as well as neuroscience that strength in all three areas is important in building strong brands.

Another of Millward Brown's research tools when investigating brand equity is a series of questions which probe, in as raw a form as possible, the nature of the consumers' brand representations. Using open-ended questions, we encourage respondents to reveal as many of the associations that they have with the target brand as possible. We recently took data from over 8,500 such interviews, covering 42 brands from our BrandDynamics database, and coded the data to reflect the inputs from the three mega-modules. We can then measure how strong each brand was in terms of Knowledge tags, Action tags, and Emotional tags, and then compare that to our broader measures of brand strength. The results were highly illuminating. We created two metrics, one a measure of the depth of associations that each had (do people have a lot of associations or not) and the other a metric of the 'balance' of those metrics – were the associations weak in any of the three key areas? We then split the brands into four groups based on where they lay on those two dimensions (see figure 9), and looked at the average strength of the brands in each group,

using two metrics – 'Bonding' (BrandDynamics' headline measure of brand strength), and Voltage (a forward-looking measure that reflects brands' likelihood of growth). The brands with the most, and crucially the most *balanced* associations across the three areas were stronger on both measures of brand equity. The brands with the least associations, and the least balance were, unsurprisingly, a lot weaker. Interestingly, balance seems to be the more important variable, with brands with lower levels of associations which were balanced across the three mega-modules being stronger than brands with lots of association, but with less balance between the three types.

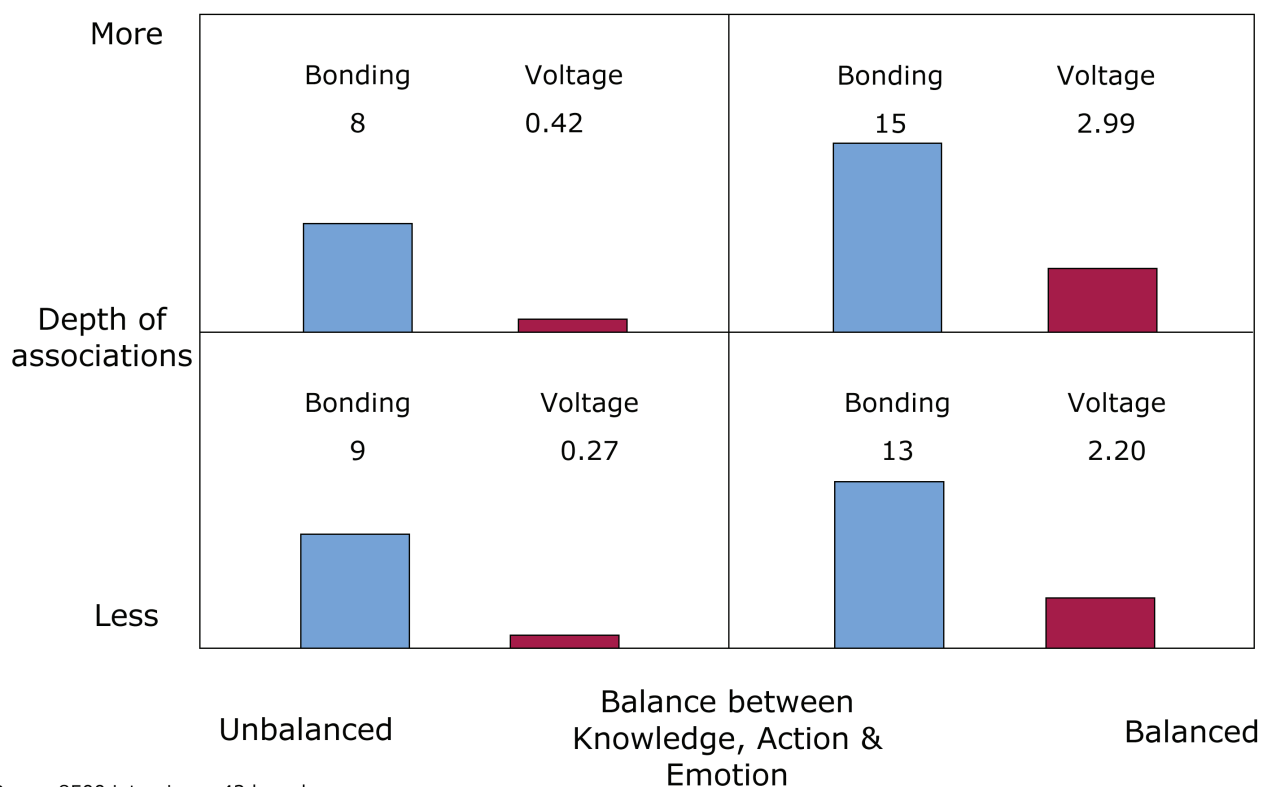
This provides powerful evidence for the importance of establishing brand representations which are strong in all three types of 'tag'. Without this balance, brand strength seems limited, which is entirely consistent with the neuroscience presented above.

It is also consistent with previous analyses on many more brands that MB have published (e.g. Page, 2005). For instance, we have previously examined the associations of the different types of brand in our BrandDynamics database using other measures than those described above, simply splitting them into emotional or functional associations (the latter a combination of knowledge and actions, in our terms here). Again the strongest brands were strong on both, rather than having an imbalance between them, as shown in figure 10. Likewise we have previously shown that advertising which pursues a balanced strategy, conveying both emotional and functional benefits, is more likely to elicit a sales response than advertising that only favours one or the other (figure 11).

#### *5. Attentional 'blinks' have huge implications for creative development.*

These can most easily be grasped for 'video' advertisements, where the workspace has to create and retain multiple representations very quickly, to enable us to understand the ad. Care needs to be taken to ensure that the workspace can create a representation for

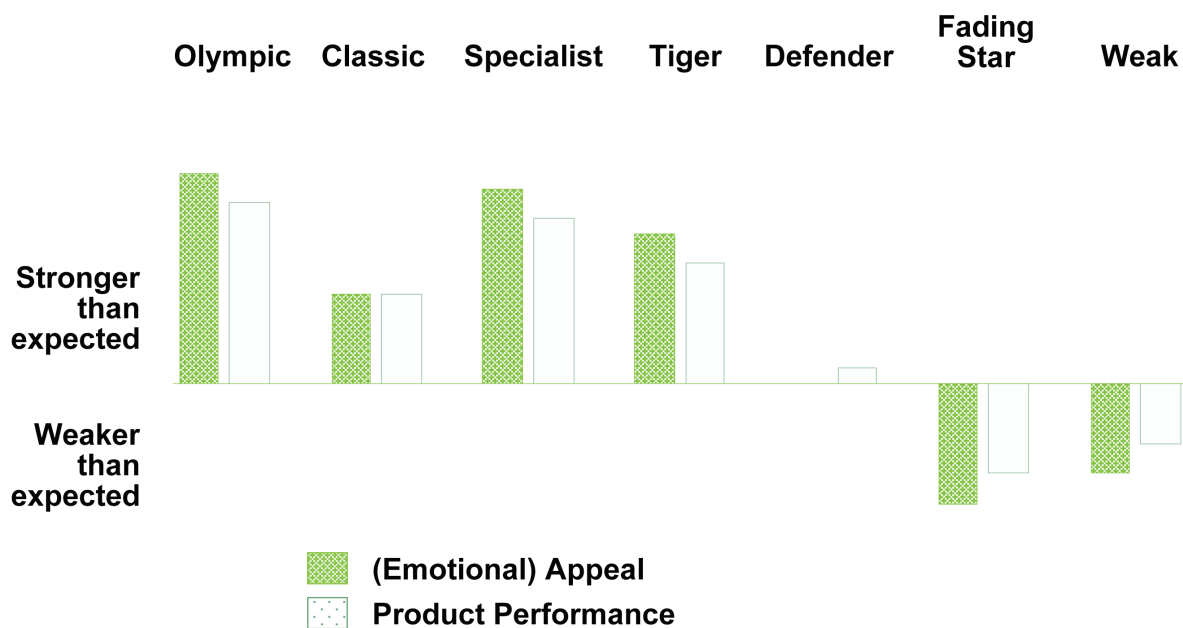
**FIGURE 9**  
**STRONGER BRANDS HAVE MORE BALANCED BRAND REPRESENTATIONS**



Base: 8500 interviews, 42 brands

Source: Millward Brown BrandDynamics™ database

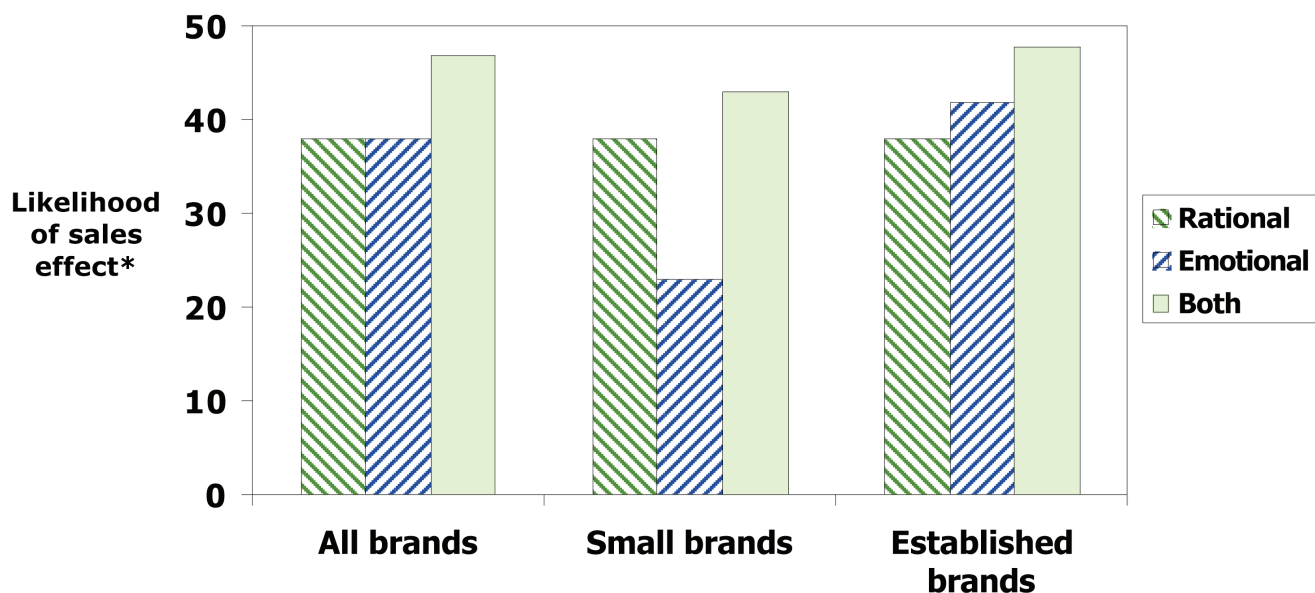
**FIGURE 10**  
**STRONG BRANDS HAVE A BALANCE OF EMOTIONAL APPEAL AND "RATIONAL" BENEFITS, LIKE PRODUCT PERFORMANCE**



Source: Brandz 1999 & 2000

FIGURE 11

ADS WHICH PURSUE A DUAL EMOTIONAL-RATIONAL STRATEGY ARE MORE LIKELY TO BE SALES-EFFECTIVE



\* &gt;0.5% market share uplift

Base: 330 ads

the idea or concept, or crucially, brand, before the next element of the creative comes along – as it will either shove the first one out of the workspace before it can be fully assembled and used, or the process of creating the first representation will stop the next one even being registered. As discussed previously, in Raymond's lab it has been demonstrated that small changes to the timing of scenes can make a big difference to how consumers process and respond to advertisements – and crucially giving them more time to 'think' can be hugely beneficial. It is a further reason why integrated branding is likely to be crucial in successful advertising, as switching from 'story' to brand to 'story' quickly may mean that certain elements of the ad may not even register. The tendency of new information to displace existing representations in the workspace may also mean that the quick 'reprise' of the creative idea common in many ads, after the pack or brand shot at the end, may potentially limit branding, as it minimises the chance of work being done on the brand representation.

It is certainly true that ads that try to cram too many messages in seem to be less effective at communicating any of them, which is entirely consistent with these cognitive effects. As figure 11 shows, evidence from our Link database suggests that once ads begin to include more than two messages, consumers' ability to absorb them begins to tail off. Figure 11 shows the playback of messages from advertising in our Link™ pre-test, depending on the number of messages the ad is attempting to convey. When more than two messages are attempted, playback of all the messages begins to drop. Again, clarity of message seems to be an important trait in effective marketing.

This may seem most applicable to 'video' advertising, but analogous effects are likely to be observed in static media. Take a newspaper ad – while the reader has much more control over exposure to the ad, they are still usually engaged in another task (reading the paper), and so will limit the time they spend with an ad, even if it has engaged their attention. This reinforces the need for creative to effectively guide

FIGURE 12  
MESSAGE TAKE-OUT TAILS OFF AS THE NUMBER OF MESSAGES IN THE AD INCREASE BEYOND 2

	Number of messages in ad			
	1	2	3	4
% recall of message	%	%	%	%
Message 1	42	42	37	34
Message 2		30	28	28
Message 3			20	19
Message 4				16

Source: Link pre-testing database

readers through to the key message and brand, or there are risks that key elements may be missed.

6. *Cognitive neuroscience techniques are powerful – but will have limited day to day applicability in marketing research.*

Much has been talked about using the techniques of cognitive neuroscience, particularly brain-imaging, in marketing research. They have great power, but they are dependent on a lot of assumptions and interpretation by users to yield their results. ‘They do not, as is often claimed, offer an objective window on the unconscious mind, but rather they reveal the biological correlates of thought, which is influenced by both conscious and unconscious processes. They are also often highly expensive, and unsuited to testing the large numbers of respondents that the research industry and clients typically look for in research. This is definitely not to suggest that they have no place in the research industry – rather that they are unlikely to displace qualitative or quantitative survey research as the main tools. Neuroscience techniques have great potential in helping us to create, refine and test hypotheses about what makes

effective marketing, and to help us understand more about what different survey metrics are measuring. As such, they may be used most often by industry groups or research providers themselves to help further our understanding of key marketing issues, rather than on day-to day projects for individual clients.

SUMMARY

Cognitive Neuroscience has tremendous implications for marketing and marketing research – but it is a field that is still growing, and evolving, with much less certainty than has perhaps been portrayed in the past. However the most robust facts from the field do have some direct lessons for marketers, which we can summarise in what we might call the ‘Workspace model’ of marketing. This is that a key goal of marketing is to create and sustain strong, clear brand representations, which are easy to bring to mind, and task-relevant when consumers are in the purchase window or thinking about the brand. These representations must be strong in three key areas – Knowledge, Action and Emotion.



To do this it is crucial to understand and effectively use consumers' mental workspace. Engagement with consumers is vital, as marketing must enter the workspace (be consciously attended) for it to be processed and influence the brand representation. Marketing must be task-relevant at the time it is encountered for it to enter the workspace, and only the task-relevant elements of the marketing message will make it in. This further reinforces the necessity of integrated branding in ad effectiveness. Marketing which interferes with consumers tasks' is likely to be actively ignored, which may yield negative effects for the brand – reinforcing the need for permission, and respect, by marketers as they seek to use more interactive channels in engaging consumers. Finally, the limitations of the consumers' workspace means that giving greater time for consumers to process elements of marketing activity is vital – otherwise the mind may 'blink' and miss key elements.

This model is strongly supported by evidence from cognitive neuroscience, and quantitative survey-based research. It is in refining, testing and extending this and other hypotheses about marketing effectiveness that we are likely to see the best and most relevant applications of cognitive neuroscience techniques to the marketing and research industry.

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#### **The Authors**

*Graham Page is Global Director of Innovation, Millward Brown, United Kingdom.*

*Jane E. Raymond is Professor, School of Psychology, University of Wales, Bangor, United Kingdom.*

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ESOMAR  
Vondelstraat 172  
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Fax: +31 20 6642922  
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