What advertisers can do and cannot do with neuroscience

Peter Kenning

Recently, Nikos Logothetis, Director of the Max Planck Institute for Biological Cybernetics, in Tuebingen, Germany, published a very important article in *Nature* (Logothetis 2008). In this paper the author addresses the opportunities and limitations of the most popular neuroimaging technique of all: functional magnetic resonance imaging (fMRI). Every day, eight fMRI papers are published in a scientific journal; this number illustrates how much we have learned about the functionality of the brain. Obviously we are aiming to reach our goal of providing a single, general theory of human behaviour based on neuroscience in the very near future (Glimcher & Rustichini 2004).

But are we? Looking at the colour-coded brain maps, one has to bear in mind that the brain is probably the most complex organ of all. For instance, in humans, there are about 90,000–100,000 neurons under 1 mm^2 of cortical surface. In fMRI studies, the average voxel ('volume-pixel', a measurement unit) size before any pre-processing of the data is 55 mm^3, thus every voxel contains 5.5 million neurons, 22 km of dendrites and 220 km of axons. Moreover, there are several methodological constraints that are not always addressed clearly (Savoy 2005). So even if the use of fMRI, which is still relatively seldom in marketing and advertising research, allows us to better understand the consumer brain, this understanding is still rough and quite preliminary.

From this, we can derive several implications. The first is that much more transdisciplinary research is needed before, if ever, we understand how the human brain responds to marketing and advertising stimuli. However, establishing this research is time-consuming and costly, so much effort is needed here. The second implication is that we need to apply complementary methods to consumer neuroscience, such as lesions studies (Koenigs & Tranel 2008) or transcranial magnetic stimulation (Barker *et al.* 1985). According to Logothetis (2008, p. 878), 'a multimodal approach is more necessary than ever for the study of the brain's function and dysfunction'. This research is essential to validate the preliminary findings. Nevertheless, to date, neither such replications nor extensions are in sight, not only in consumer neuroscience (or 'neuromarketing') but also in wide areas of neuroscience. That said, we also need an ethical discussion about the boundaries of consumer neuroscience, because the use of some methods should, perhaps, be restricted for medical purposes. Finally, we as researchers should be aware of oversimplification. There is no such thing as a 'buy button' in the brain, nor does neuroscience enable us to read the consumer's mind. If we bear all this in mind, we will derive some helpful and interesting information from neuroscience, which might help us to test and further develop our theories about the human brain and its meaning for marketing and advertising.

Nevertheless this enterprise is much more a long-distance run than a 100-metre sprint.

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Minding the gap: the evolving relationships between affective neuroscience and advertising research

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Advances and developments in the technologies, techniques and knowledge arising from the field of neuroscience in general and affective neuroscience in particular have provided us with new insights regarding the functioning of the brain, how it processes information, and the power of emotions to influence complex behaviours. The tools of neuroscience offer a literal glance inside the black box of the brain, allowing us to examine what is going on at a structural and functional level. The power of neuroscience has attracted the attention of advertising and marketing researchers eager to apply the principles and techniques of neuroscience to further their pursuits. In fact, appreciation of neuroscience among advertisers has led to the emergence of a new field within advertising often referred to as 'neuromarketing'. However, neuromarketing – the application of neuroscience to market research – is not without its share of challenges, nor without its share of sceptics. The field is often portrayed in sometimes overly idealised or harshly critical terms, and this has done much to create an 'either–or' dichotomy (as either useful or not) among advertisers regarding its actual utility. This view is short-sighted. At this time, direct application of the findings from affective neuroscience has been slow, but progress is