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# WAKING UP TO SLEEPINESS: MODAFINIL, THE MEDIA AND THE PHARMACEUTICALISATION OF EVERYDAY/NIGHT LIFE

## Introduction

Recent years have witnessed an upsurge of sociological interest in pharmaceuticals, including on-going research on the regulation of the pharmaceutical industry (Abraham 1995, Abraham and Lewis 2002); related debates on globalisation and the pharmaceutical industry (Busfield 2003); the role of the pharmaceutical industry in ‘disease mongering’ (Blech 2006) and the medicalisation of society (Conrad 2007); the meaning and use of medications in lay culture and everyday life (Britten 1996, Gabe and Lipshitz-Phillips 1982), and; studies of pharmacies, pharmacists, prescribing and concordance (Britten et al 2004, Stevenson et al 2002, Harding and Taylor 1997).

### *(i) Pharmaceuticals and the media*

Another key issue here concerns the role and function of the media in relation pharmaceuticals and the pharmaceuticalisation of everyday life. Media coverage of pharmaceuticals, as previous studies have shown, is complex and variable over time. Often, when drugs are first discovered or licensed, media coverage tends to be positive in tone and content, including enthusiastic headlines extolling the virtues of a new ‘breakthrough’ or ‘wonder drug’. Nelkin (1995), for example, highlights

the wave of enthusiastic media attention which Prozac (dubbed the ‘feel good drug’) received in the 1990s, with Viagra subsequently following in its footsteps. If or when unwelcome side effects become apparent, however, or misuse of some sort on the part of doctors or the lay populace is detected, then negative constructions or demonisation of the drug in question seems to predominate or prevail. We see this very clearly, for example, with regard to media coverage of benzodiazepines over time. Gabe and Bury (1996), for instance, note the considerable media attention devoted to the risks of taking benzodiazepines over the last 40 years. When first prescribed to patients in the 1960s, the media gave these drugs a ‘generally enthusiastic welcome’ (1996: 76). As this new generation of tranquillizers became more popular, however, their therapeutic value ceased to be ‘newsworthy’, with more critical coverage developing from the 1970s onwards -- coverage highlighting both the risks of the drugs ‘addictive potential’ and journalistic imperatives for ‘dramatisation’ and ‘personalisation’ (1996: 78. See also Cohen 1983).

Media treatment of medicines and drugs then, as Seale comments, ‘demonstrates a tendency to idealise or stigmatise, creating oppositional extremes’ (2002: 152: See also Entwistle and Sheldon 1999). Rarely do the media present a ‘balanced picture of harm and benefit contained in a single substance’ (2002: 148). Whilst the actions of drug companies, indeed, are often subject to criticism, the media are frequently accused of promoting rather than challenging pharmaceutical interests, wittingly or unwittingly: a point which returns us notions of ‘disease mongering’ mentioned above (see, for example, Blech 2006 and Moynihan et al. 2002). Whilst ‘new’ media such the Internet, moreover, may provide spaces or forums to challenge or resist these processes, they may equally

provide new avenues or channels for the medicalisation or pharmaceuticalisation of daily life (see, for example, Fox et al. 2005).

*(ii) Modafinil: The shape of things to come?*

It is against this backdrop of recent sociological work on pharmaceuticals in general and the role of the media in relation to pharmaceuticals in particular, that this paper is located. Our focus, in contrast to the previous studies, is on British newspaper coverage of the new wakefulness-promoting drug Modafinil, a drug manufactured by the American Pennsylvania-based pharmaceutical company Cephalon, under the brand name Provigil<sup>1</sup>. Originally approved for the treatment of excessive daytime sleepiness associated with narcolepsy, Provigil has now received both Federal Drugs Administration (FDA) and Medicines and Healthcare products Regulatory Agency (MHRA) approval for the treatment of excessive sleepiness associated with obstructive sleep apnoea. Additionally, it has now received FDA approval for the treatment of excessive sleepiness associated with ‘shift work sleep disorder’ ([www.Cephalon.com](http://www.Cephalon.com); [www.provigil.com](http://www.provigil.com)). Provigil, it is claimed, is a drug that truly breaks new ground. Unlike former stimulants, Modafinil (an ampekinone) is a *eugeroic* drug (Greek for ‘good arousal’) that can promote alert wakefulness with none of the buzz, jitteriness or highs and lows of its predecessors. It has also been found to improve memory, cognition performance, mood and concentration and is, supposedly, non-addictive with few reported side-effects. Perhaps most remarkably of all, Modafinil does not disturb sleep and only seems to promote wakefulness ‘under conditions where vigilance is sought by the person who has taken it’ (Wolpe 2002: 391).

The market potential of this drug is huge, as Cephalon's year-on-year sales figures clearly attest (<http://www.Cephalon.com>). Cephalon, indeed, appear to be a very enterprising company having joined the list of companies included in the Fortune 1000 annual rankings of America's largest corporations (<http://www.cephalon.com>). A recent feature on Cephalon in *BusinessWeek*, moreover -- tellingly entitled 'Eyes wide open' and proudly posted on Cephalon's own website -- suggests that the Company business strategy can serve as a model or exemplar for other biopharmaceutical enterprises. 'Cephalon's scientists', the article proclaims, 'respond to doctors who report that Provigil is helpful with various disorders such as sleep apnoea. Collaborating with doctors, Cephalon can provide the FDA with persuasive data on these ailments, and thus expand the use of the drug' (<http://www.Cephalon.com>).

The potential market for Modafinil, however, extends far beyond the boundaries or confines of the doctor's surgery or sleep clinic, including a significant 'off-label' market. As with a range of other so-called 'enhancement' technologies designed to make us 'better than well' or 'better humans' (Miller and Wilsdon 2006; Parens 1998), if not 'better than human', Modafinil therefore raise some intriguing if not disturbing social and ethical questions, which in this particular case translate into debates over the prospects and possibilities of a world in which wakefulness, for better or worse, can be more or less readily conjured at will or manufactured/medicated on demand.

What then do the media make of Modafinil? How is Modafinil being constructed and represented in the British press? What cultural commonsenses are being circulated and conveyed regarding this new drug? Are there any particular points of convergence or consensus,

contestation or controversy in this newspaper coverage? And what does this tell us about the role of the media in the medicalisation or pharmaceuticalisation of alertness and the governance of sleepy bodies in contemporary culture? These are some the questions this article seeks to address. Before doing so, however, a word or two about methods.

### **Methodological matters: Retrieving and analysing newspaper stories**

This paper is part of a broader project on social constructions of sleep in the British print news media. The study, in this respect, was primarily concerned with print media discourses and debates on sleep, rather than audience reception of and responses to these messages, or the institutional arrangements involved in the production of news. Articles for the study were retrieved from the Lexis Nexis archival database. Our selection of 6 UK national newspaper texts (*Times*, *Guardian*, *Independent*, *Daily Mail*, *Daily Mirror*, *Sun* and their Sunday equivalents) was influenced by knowledge of the circulation figures and readership profiles (obtained from circulation figures on the Newspaper Marketing Agency website [www.nmauk.co.uk](http://www.nmauk.co.uk)), alongside sampling for contrasting tone, format and political orientation.

All searches started from the date of first loading onto the Lexis Nexis database until 31<sup>st</sup> August 2006<sup>2</sup>, using search terms such as ‘Modafinil’, ‘Provigil’, ‘wakefulness promoting drugs’. As it was substantial press coverage we were most interested in, for the purposes of this particular

paper at least, articles were selected from inclusion in the study if any of these search terms were mentioned three or more times. This resulted in a total of 54 articles across all papers sampled, with a higher proportion of articles in the more 'serious papers' – a finding which held across all search criteria deployed.

A variety of different techniques are now available for the analysis of media materials in general and newspapers in particular, including more quantitative forms of analysis such as content analysis and more qualitative forms of analysis such as discourse analysis (Fenton et al. 1998, Potter 1996). Our own approach favoured a more qualitative approach. Articles were read, catalogued and compared in terms of key words and phrases, key developing issues and storylines, the use of 'experts' and/or research data, evidence of medicalisation/disease mongering, how the reader was addressed/drawn into the piece, and the vocabulary used, particularly the 'moral' messages, rhetorical styles and/or 'emotional' overtones of these selected articles. Emerging debates and discourses were then used as an aid to further qualitative, interpretive analysis on how such articles constructed their subject matter and how they were intended to be read.

### **Discourses and Debates: Medicalisation and beyond**

Four main themes emerged in our sample, which pertain respectively to the following uses and abuses of Modafinil/Provigil: (i) clinical treatment of medical conditions; (ii) lifestyle choices; (iii) military operations; (iv) (un)fair competition. The distribution of these four themes according to newspaper and year are shown in Tables 1 and 2 respectively.

## TABLE 1: ABOUT HERE

## TABLE 2: ABOUT HERE

As Table 1 indicates, the most commonly reported theme in our sample as a whole pertained to (un)fair competition, primarily in the field of sport, followed by medical matters, lifestyle choices and finally military uses and abuses of the drug. The *Times* was the paper in which the clinical and medical applications of Modafinil featured most often, followed by the *Mail* and the *Independent*. Concerns over the drug as a lifestyle choice were also most evident in the *Times*, followed by the *Independent* and the *Mail*. Military coverage, in contrast, was almost exclusively featured in the *Guardian*, centred on an issue which materialised in 2004 – see Table 2. Similarly, the majority of press coverage of sporting competition across all newspapers pertained to an event that materialised in 2003 and rumbled on into 2004 – see Table 2.

As Table 2 indicates, apart from a couple of early stories surrounding the clinical launch of the drug in 1998, the majority of press coverage has occurred since 2003, with sport, as noted above, featuring prominently in 2003, and a more even distribution of themes the following year 2004. Since then, however, medical and lifestyles themes seem to have

predominated, though our sample, to repeat, only takes us up to 31<sup>st</sup> of August 2006.

It is to a more detailed account of each of these key themes that we now turn.

(i) *Medical conditions: from narcolepsy to...?*

The earliest reportage of Modafinil in our newspaper sample occurred in 1998, when the drug was first launched in the UK. A story in *The Independent* (March 4<sup>th</sup> 1998), for example, entitled ‘Wonder wake-up boosts alertness’ (in the ‘News’ section of the paper), informs us that ‘A wake-up pill that increases alertness and boosts memory in people who are sleep deprived was launched yesterday’. The drug, it is noted, ‘could provide the *pharmacological equivalent of the electric light bulb*’ (our emphasis). The bulk of the story, however, rests content with mere reportage, with no comment or judgement passed, of the somewhat delimited claims and ambitions of the manufacturers of the drug. The medical director of Cephalon UK, Dr Colin Makland, for instance, is quoted as saying that there are ‘no plans’ to explore the drugs potential as an ‘alertness pill’. ‘All our activities’, Makland assures us, ‘have been in the area of narcolepsy. If we wanted to seek another indication for the drug we would have to go back and conduct other studies’.

Much of the newspaper coverage of the medical use of Modafinil, as this suggests, has narcolepsy somewhere in the storyline. This however took a variety of forms, from straightforward matter-of-fact reportage about the efficacy of the drug in the treatment of narcolepsy (sometime written by doctors or sleep experts themselves, particularly in the more ‘serious’

papers), to more glowing reports of how this new wonder drug transforms lives through personal stories and case studies drawn from sufferers of narcolepsy themselves. We see this, for example, very clearly in an article in the *Times* (27<sup>th</sup> July, 2004), in its 'Features' section, which opens as follows:

As a teenager, Brendan Maguire had to be careful not to laugh. If he did, he could fall to the floor in a deep sleep. He spent most of his days in bed because he always felt sleepy.

Maguire has narcolepsy and his life was transformed two years ago by a new drug, Provigil, that allows him to live an almost normal life. 'Now I can do a 12 hour shift at a call centre', he says.

The *Independent* (September 28<sup>th</sup>, 2000), in similar fashion, carried a story (in the 'Features' section of the paper) entitled 'Health: The fast asleep club'. 'For sufferers from narcolepsy', the paper notes, 'fighting weariness is a way of life. They live everyday as if the previous 48 hours have been sleepless'. Sufferers are then drawn into the storyline, such as Kerry James, (a college lecturer), who became so bad that she 'frequently fell asleep during meetings, over meals and once even had to find an empty teaching room in which to take a nap on the floor'. Kerry, the reader is told, was eventually diagnosed with narcolepsy and since then she has been taking Provigil, which means she 'can now go virtually through the day without needing to nap'.

Gradually however, over time, these narcolepsy based storylines are joined if not eclipsed by newspaper coverage of other clinical or experimental applications of the drug, again largely uncritical in tone and

content, for conditions such as obstructive sleep apnoea (OSA), multiple sclerosis, ‘shift work sleep disorder’ (SWSD) and Attention Deficit/Hyperactivity Disorder (ADHD). The *Times* (August 15<sup>th</sup> 2005), for example, in an article by Dr. Thomas Stuttaford, informs readers that Modafinil is useful not simply for the treatment of narcolepsy but also for ‘...treating the daytime sleepiness associated with obstructive sleep apnoea’. Readers are also told in this article that ‘*The New England Journal of Medicine* has recently reported on another use for Provigil: 10 per cent of night-shift workers find that the irregular hours makes them excessive sleepy while they are working’. The ‘careful double-blind trial’, carried out by the Division of Sleep Medicine at Harvard University and researchers from other centres, Dr. Stuttaford informs the reader, ‘showed that Provigil did bring about modest improvement in the night-shift workers’ problems: they were more alert when working and their accident rate on the way home was significantly reduced’ (*Times*, 15<sup>th</sup> August, 2005).

Further justifications for these new clinical uses of Modafinil could also be discerned in other stories, particularly in terms of accident reduction or prevention. Dr. Hilary Jones, for example, in his ‘Drug of the Week’ column (Sunday Surgery, Health Section) in the *News of the World* (April 11<sup>th</sup>, 2004), asks his readers:

Do you nod off during the day? *It’s a serious problem if you’re operating machinery or driving.*

Readers are then informed that:

Provigil (also known by its generic name Modafinil) boosts alertness and is prescribed in severe cases such as people with Parkinson's disease. *Many of Britain's four million night workers could use it too* (our emphases).

Sleep experts and doctors are then drawn upon to provide further endorsement for these particular uses of the drug. The use of doctors and sleep experts indeed was a common theme in our newspaper sample. The *Daily Mail*, for example, quotes a consultant neurologist who stresses how this drug 'really can transform people's lives', adding that it 'should help people with a *wide range of conditions* where fatigue is an issue. *The potential benefits are enormous*' (September 14<sup>th</sup>, 2004, our emphasis).

As for the merits of Modafinil in relation to ADHD, another article in the *Daily Mail* a year later (20<sup>th</sup> December, 2005) -- this time with the attention grabbing headline 'Anti-sleep drug can calm down little Barts' - opens in the following fashion:

Research shows that Provigil can have a dramatic effect on behaviour and attention span in children with Attention Deficit Hyperactivity Disorder (ADHD).

The article, however, in a variant on the theme of medical expertise, concludes with a quote from a representative of the ADHD information service, Andrea Bilbow, who states that: 'the "stay awake" pill had already been tested on adults with ADHD and seemed to work well...If it proves to have few side-effects, then it is obviously going to be a useful treatment.' <sup>3</sup>

Beyond this condition specific coverage, however, it was possible to discern other more amorphous, nebulous, references made in the press to notions of ‘excessive’ sleepiness or an ‘inability to stay awake’ as the clinical target or referent for this drug. The *Daily Mail* (September 14<sup>th</sup>, 2004), for example, informs its readers that ‘doctors say Provigil (also known as Modafinil) – now licensed for use in the UK for the treatment of *excessive sleepiness* – is *great news for patients plagued by the inability to stay awake*’. Provigil, the reader is told, repeating the medical mantra, ‘can can change people’s lives. Patients who have been living in *a fog of sleepiness* for years find that in a few days the clock has been turned back and they’re able to live a normal life again’ (our emphases).

There is then, as these extracts clearly show, precious little in this newspaper coverage that is critical or even cautious of this expanding list of clinical conditions for which Modafinil is currently prescribed or potentially applicable. The guiding template, instead, seems to be a matter-of-fact or upbeat style of reportage, about the clinical benefits of this drug, aided and abetted by personal testimonies, the latest findings from clinical trials and/or the views of this or that sleep expert. At most what one gets here in the way of critical coverage are occasional qualified comments such as ‘Provigil has revolutionised the treatment of narcolepsy *but* cannot be used indiscriminately. It may causes over-excitement or irritability’ (*Times*, September 8<sup>th</sup>, 2003) or a lone, dissenting if not ‘maverick’ voice, cast in these very terms, such as John Mortimer, whose polemical piece in the *Daily Mail*, (November 14<sup>th</sup>, 2002) is comically entitled: ‘A pill to help my memory? Forget it!’ Modafinil, he notes:

...a drug once used for sleeping sickness (sic), can – so Professor Robins of Cambridge University has discovered – sharpen short-term memory and help problem-solving and planning.

But forgetfulness, Mortimer protests, can be ‘a great excuse’ or ‘alibi’. ‘How terrible it would be’, then, ‘if the usual excuse of forgetting met with: “Well take a large dose of Modafinil and come back when you’ve remembered”’. And suppose, ‘in a moment of weakness, that we took the medicine?’, he continues:

How painful, how unbearably overcrowded our minds would become...So let us keep the clouds of unknowing where we can hide the past, lit by only occasional shafts of memory.

Whilst Mortimer provides something of a lone or dissenting voice as far as the clinical merits of Modafinil are concerned, he is nevertheless in good company when it comes to media concerns over the use of this drug for non-clinical reasons or non-medical purposes.

(ii) *Lifestyle choices: flexible workers and party people;*

Another key concern articulated and conveyed in this press coverage of Modafinil, pertains to the potential of the drug to blur the boundaries between the aforementioned ‘legitimate’ treatment of medical conditions and its uses and abuses as a (lifestyle) drug of choice.

Again we see this articulated in the press in a variety of ways. The *Daily Mail* (January 5<sup>th</sup> 2004), for example, in a brief article on the drug, notes

how ‘critics fear this could lead to the use of Provigil being extended to healthy people who are simply short of sleep’. ‘Patients with demanding careers and lifestyles’, the reader is told, are ‘already beginning to ask for Provigil’. The *Times*, in a spate of articles in 2004 and 2005, articulate and amplify similar concerns. The *Sunday Times* (July 4<sup>th</sup> 2004), for instance, carried a story (in the ‘Home News’ section of the paper) proclaiming in the headline that ‘Downtime is over as pill offers 24-hour living’. ‘A pill that helps users feel wide awake after long periods without sleep’, it states, ‘is being tipped as *the latest lifestyle “wonder drug” to hit Britain*’ (our emphasis). The article then proceeds to use the situation in America to raise concerns in the UK:

...the pill has been credited with fuelling the rise of the ‘24-hour society’ by helping truckers, students, night-clubbers and international travellers stay awake through the night or cope with jet lag. The drug has achieved sales of £250m a year.

Now the same thing may happen here. The Medicines and Healthcare products Regulatory Agency has quietly decided to loosen the tight restrictions governing who can be prescribed Provigil.

American users, the reader is told, ‘describe in enthusiastic terms how the pill has enabled them to stay awake without the jitteriness and anxiety brought about by large doses of caffeine’. As such, it is claimed, the drug could ‘undergo the “Viagra phenomenon”, in which its main use would be to *enhance lifestyles rather than treat medical conditions*’ (our emphasis).

Various expert viewpoints are then drawn into the picture, this time sounding a strong note of concern and caution about the potential uptake of this drug. Professor Martha Farah, for example, director of the centre for cognitive neuroscience at the University of Pennsylvania, is quoted as saying that Provigil had already accelerated America's trend to becoming a 24-7 society and would do the same in Europe. 'This drug enables us to be even more workaholic and obsessed with accomplishments and productivity', she says, 'It takes away the natural checks on that tendency – like needing to go to bed' (*Sunday Times*, 4<sup>th</sup> July, 2004).

This particular article is also notable for the way in which it draws the manufacturers of Modafinil, Cephalon Inc. into the picture. On the one hand, it is noted, how: 'Cephalon, the company behind Provigil, says it is horrified at the lifestyle "abuse" of its drug'. On the other hand readers are informed that:

Cephalon's earlier marketing told a different story. Two years ago it was reprimanded by the Food and Drugs Administration -- America's regulatory body – for the 'dissemination of false or misleading promotional materials for Provigil' (*Sunday Times*, 4<sup>th</sup> July, 2004).

Two further stories in the *Times* underline these concerns. In the first, which appeared in the 'Features' section of the paper (July 27<sup>th</sup>, 2004), it is noted how, in the U.S., Provigil is 'largely used for non-medical reasons – to sustain a party or business lifestyle without apparent penalties'. Provigil, the article continues: '*...blurs the line between treating a medical condition and a lifestyle choice*' (our emphasis), noting moreover, through a direct quote from Professor Jim Horne, (of

the Sleep Research Centre at Loughborough University), that ‘we don’t know the long-term effects of using drugs to stay awake longer’. ‘What we do know’, Horne says, ‘is that there are powerful mechanisms for sleep and no natural ways to override them, so it’s a potentially dangerous thing to do’.

The second article, a year later (July 2<sup>nd</sup> 2005), in the ‘Features: Body & Soul’ section of the newspaper, provides something of a curtain raiser for a *Times* sponsored event at the Science Museum’s Dana Centre entitled ‘Night Creatures’. The key question this article poses if not answers is whether or not we ‘really want to stay up all night?’ Increasingly, the article notes, ‘especially in America, people are resorting to the new “stay-awake” drug Provigil, which promises six or seven hours of alertness with no problems falling asleep afterwards’. ‘But is this the right way to deal with the issue?’ the article asks:

Drawing an analogy with food, are we indulging in a form of ‘*somorexia*’, a deluded and unhealthy belief that we can do without sleep...Or is the whole notion that our 24/7 lifestyle is creating a nationwide sleep-debt itself a delusion?

The problem however, the article concedes, in somewhat pessimistic tones, is that:

...there is little chance of turning back the clock on our open-all-night society. We have expanding demands on our time and increasing numbers of people do shift work. Hence the attraction of Provigil, a drug originally licensed to treat narcolepsy...Its sales

have rocketed in the past two years, from \$300 million to \$600 million (£166 to £322 million).

A further variant on this type of coverage concerned a more specific focus on Internet access to this drug. The *Independent* (April 18<sup>th</sup>, 2006), for example, in a Features section article entitled ‘My pills.co.uk’, ran a story alerting us to the fact that ‘some of the world’s best selling prescription drugs are not simply being taken by the sick but are also being used as “lifestyle medications”’ through the Internet. The ease of availability of virtually every kind of drug over the Internet, readers are told, has meant that ‘many people are now simply *bypassing their doctor* and *self-prescribing* medicines which they hope will improve their looks, job performance or prowess in the bedroom rather than treat a specific condition or disease’ (our emphases). There is even, the article warns, a ‘darker side to the “lifestyle drugs” industry’, in which ‘many drugs sold online are fakes that at best will not have the effect and at worst could kill’. Provigil is then drawn into the picture, alongside other drugs such as Prozac, Ritalin, Viagra and the statin Lipitor, noting how strict regulations on prescribing Provigil were eased two years ago, and how ‘clubbers are using it to keep partying through the night, while businessmen are buying it to help them through long days in the office, and students are taking it to keep revising’. Doctors, it adds, have ‘warned that the drug can be psychologically addictive and can induce headaches and nausea’.

Not all articles, however, appeared to share these concerns, or at the very least seemed happy to endorse more widespread usage of the drug beyond any immediate clinical concerns. An article in the *Times* (August 15<sup>th</sup>, 2005), for example, entitled ‘The pill that’s a wake up call’ (again by a

medical doctor in the ‘Features’ section of the paper), proclaimed in unqualified fashion, that:

Judges who fall asleep on the bench, Cabinet ministers who can’t keep awake at public functions, and MPs who nod off in front of the television cameras in the House of Commons would all present a more alert and intelligent face to the world, and the cameras, if they took a small dose of Provigil (Modafinil) before their appearance.

But ‘most importantly’, the article goes on to state, echoing the aforementioned theme of accident reduction or prevention:

...lives would be saved on the roads, especially motorways, if long-distance drivers, whether in giant trucks or Minis, not only had regular rests but took the occasional Provigil tablet when there was any danger of them dropping off.

Modafinil then, as this press coverage suggests, is indeed construed and constructed as a somewhat ‘controversial’ drug, precisely because of its appeal to a wide range of potential users and abusers in the name of work or play, productivity or pleasure. There is, however, another potential market for the drug that looms large in this press coverage, one that takes us far beyond the realms of civil society.

*(iii) Military operations: sleep as a ‘commodity’ of war;*

Military uses or deployments of Provigil also featured in our newspaper sample, particularly in the more ‘serious’ papers. As with medical uses of

the drug, some of this coverage adopted a rather matter-of-fact style of reporting, often in the context of a broader discussion of the drug and its potential applications. An article in the *Daily Mail* (January 5<sup>th</sup> 2004), for example, informs its readers of a ‘study of military helicopter pilots’ which ‘showed that the drug helped them stay alert and remain capable of performing complex tasks for almost two days without sleep’, without passing any significant comment.

Other stories, however, chose instead to frame Provigil in terms of broader coverage of the problems of sleep deprivation for the military and the various efforts, both actual and on the horizon, to combat it. The *Guardian* (29<sup>th</sup> July 2004), for example, in an article entitled ‘Wired awake: Soldiers in the field go for days without rest’, notes how dealing with sleep deprivation is a ‘perennial problem for the military’, before drawing upon various military experts in the field to comment on this problem. ‘While drugs to combat sleepiness have their risks’, Greg Belensky (from the Walter Reed Army Institute of Research in Silver Spring, Maryland) states, ‘so too does deploying troops who aren’t sufficiently rested’. Belensky’s team, the reader is told, has ‘studied the effects of caffeine, speed and Provigil...on troops kept awake for up to 85 hours’. Readers are also informed of other cutting edge developments, such as research conducted by Ruth Benca at the University of Wisconsin, Madison, funded by the US Department of Defence, which hopes, through investigation of the ‘biological secrets’ that allow migrating birds to exist on little or no sleep, to develop ‘not simply stimulants that keep you awake, but drugs that go a long way to *removing* the need for sleep’ (our emphasis). Efforts are also underway at Belensky’s lab, the reader is told, to:

*...turn sleep into a commodity of war, much like bullets and fuel.*

In the next few months, troops will go on exercises wearing wristwatches that carefully monitor how much sleep they get...

The wristwatches will also give advice on what stimulants, if any, should be taken, depending on the mission ahead. “The idea is to *turn sleep into an item of logistic supply*”, says Belensky. “We want to *treat it like fuel – how much do people have, how long will it last them, and when do we need to fill them up again*”, he says (our emphases).

In this way, then, a variety of scenarios are rehearsed which provide, in effect, speculations on the future of sleep not simply for the military but for us all as these developments catch hold or take off.

Particular flashpoints could also be discerned in this coverage. Perhaps the most striking illustration of this occurred in a spate of further *Guardian* articles in July 2004, couched in something of an investigative style designed to shock the reader. A headline on the first page of the *Guardian* (July 29<sup>th</sup>), for example, read: ‘Provigil is a drug able to keep pilots and combat troops awake for days. Now *The Guardian* can reveal the MoD bought thousands of pills in advance of the Iraq war’. The MoD, the article reports:

...admitted to buying more than 24,000 Provigil pills, which are licensed in Britain only to help people with rare sleeping disorders shrug off daytime sleepiness. Experts say the new drug could be used ‘off licence’ to keep pilots and special forces troops awake on little sleep.

‘Military interest in Provigil’, the reader is told, ‘is fuelled by a desire to find alternatives to existing stimulants used to keep troops awake’, noting how ‘The US military has stepped up research into Provigil since the 1990s’.

Continuing this line of investigative style journalism, another article in the paper the following day (30<sup>th</sup> July 2004), by the same reporter in the ‘Home pages’ section, reveals that scientists at Qinteg, the MoD’s main research contractor, are ‘preparing to publish research into the potential military uses of Provigil’ with the results due to be discussed in detail in October at the European Sleep Research Society meeting in Prague. ‘Yesterday’, the article continues, (presumably in response to the previous day’s story), ‘the MoD said that the armed forces were not issued or prescribed Provigil or any other stimulants for operation or training purposes, adding that military stocks of Provigil were used only to treat those with narcolepsy and other rare sleep disorders’. The article concludes, however, by noting how ‘military forces around the world have been investigating Provigil as a means of keeping fatigued troops sharp in combat, since the early 90s’, including recommendations by French military researchers on the use of Provigil for missions lasting 24 hours without sleep. A short letter in the ‘Comment & Analysis’ section of the paper duly follows, bearing the contentious title ‘Letters: Generals claim adds insult to injury’. In it Vice Admiral Ian Jenkins (Surgeon General, Ministry of Defence), reiterates that: ‘The MoD does not use Provigil for performance-enhancing purposes’.

What we see here, then, in this newspaper coverage of Modafinil and the military, are a range of both real and imagined future scenarios which enable the press once again to rehearse a series of developments and

debates, concerns and anxieties about the uses and abuses of this drug, both on and off the battlefield. This includes the ‘leaky’ or ‘hybrid’ matter of the soldier’s body itself, which is increasingly being reworked or reconfigured through a series of cyborg couplings or human-machine fusions (cf. Haraway 1990, Gray 1995), thereby turning sleep into a ‘commodity of war’ -- see also Ben-Ari (2003) on this theme.

(iv) *(Un)Fair competition? The race to get ahead;*

The fourth and final theme in our sample, widely reported upon across all newspapers, concerned the use of Modafinil in sport. Much of this coverage centred around the controversial case of the US 100 and 200 metres sprinter Kelli White, whose use of Modafinil proved to be the first test-case of its kind for the International Association of Athletics Federation (IAAF). This indeed was the only story covered by all the newspapers in our sample.

We see this unfolding drama, for example, very clearly in a spate of articles in the *Times*, in 2003, which report how White tested positive for Modafinil at the 2003 World Championships in Paris, and how controversy followed, not simply over the reason for White’s use of this drug (a self-proclaimed case of narcolepsy) but whether or not Modafinil was in fact, or should be, classified as a ‘banned substance’ for IAAF purposes. In one article, bearing the header ‘White’s second positive test serves only to muddy the waters’ (*Times*, November 13<sup>th</sup>, 2003, ‘Sport’ section), for instance, we are told that:

Within a fortnight of the World Championships, Robert Wagner, White's agent, handed a 25-page statement to Lunquist [chairman of the IAAF medical commission] which argued that Modafinil could not be considered a banned substance. Later that month, Cephalon, the worldwide manufacturer of the drug, sent a submission to Dick Pound, chief executive of Wada [World Anti-Doping Authority]. Paul Blake, senior vice-president of Cephalon, argued that Modafinil was not a stimulant, but a 'wake-promoter' and could not be related to any stimulant on the list. 'It is a separate pharmacological entity', Blake said.

A subsequent article in the *Guardian* (May 19<sup>th</sup>, 2005), however, cast in more confessional tones, reveals how White, in coming clean to the World Anti-Doping Agency (Wada) at a hearing in Montreal, experimented with a 'cocktail of banned substances':

'I was offered a lot of things and asked to test them to see if I responded better to certain products', she said. 'I was like a guinea pig. I tried a lot of stimulants and Modafinil suited me perfectly. The same for tetrahydrogestrinone (THG), which helped put on muscle very quickly'.

As for White's claim to be suffering from narcolepsy, this, the reader is informed, was simply a 'cover story': "I never suffered from narcolepsy", White said. "I never even knew the word existed until a few hours after the announcement of my positive test".

Whilst White is singled out for sustained press attention here, coverage also extended to reports of other athletes implicated in this controversy.

The *Sun*, (January 1<sup>st</sup> 2004), for example, ran a story entitled ‘Track ace Kelli fails test No. 2’ in which it is reported that ‘Now the US Olympic Committee have revealed White is one of seven athletes who failed drugs tests last summer’. ‘All seven athletes’, the *Sun* notes, ‘are challenging the results. If Modafinil use is proved, it results in disqualification at the event at which a positive test occurred – but no suspension’.

Modafinil, then, may very well be regarded as the latest in a long list of drugs and substances banned for use in sport, raising once again the spectre of unfair advantage. It is nonetheless, as White’s particular story clearly attests, instructive on a number of further counts, not least in terms of: (i) bogus appeals to medical conditions as (il)legitimate grounds for using this drug; (ii) the ensuing IAAF, WADA and USADA deliberations as to whether or not Modafinil was in fact a ‘banned substance’, and perhaps most importantly of all; (iii) the role of the pharmaceutical industry itself in this critical test case. In reporting on these issues, therefore, the press again provide an effective vehicle for the articulation of a broader series of moral concerns and agendas regarding the potential uses and abuses of this drug in the competition or race to get ahead.

### **Discussion and concluding remarks**

This study has been primarily concerned with discourses and debates on Provigil/Modafinil in the British national press. Further work, as such, is clearly needed not simply in terms of the social construction of this drug in other types of media, both new and old, but in relation to questions of audience reception/response as well as the specific cultures and institutional arrangements involved in the production of newsworthy

stories in this domain. Our data nonetheless, returning to the questions posed at the beginning of this paper, are instructive on a number of counts and at a number of different levels.

In terms of the content of newspaper coverage, constructions of Modafinil in the press, as we have seen, cluster around four key themes pertaining to the medical, lifestyle, military and sporting uses and abuses of the drug -- with greatest coverage accorded to the latter theme (see Table 1), due to a particular scandal emerging in 2003 concerning the use of the drug (see Table 2). Whilst medical uses of Provigil, in this respect, are largely portrayed in unproblematic, uncritical terms – proclaiming it something of a ‘wonder drug’ for the treatment of a growing list of medical conditions -- other non-medical uses are a source of considerable press concern, if not outright condemnation, particularly as a lifestyle drug of choice or as performance enhancer. The concern here seems to be the manner in which Modafinil, like Viagra before it, serves to further blur the lines between treatment and enhancement (itself of course a socially constructed and contested division): the latest expression indeed of on-going social and ethical debates in relation to a variety of new medical technologies (Rose 2007, Miller and Wilsdon 2006, Brown and Webster 2004, Parens 1998). Military deployments of Modafinil also receive critical coverage, though tempered somewhat by an acknowledgement that sleep deprivation is a real problem in certain (sustained) military operations, and that whilst drugs to combat sleep(iness) have their risks, so too do sleepy soldiers in combat. To the extent, moreover, that reportage of these military deployments provide an opportunity for the press to rehearse a series of current concerns and future scenarios regarding the fate of sleep in ‘24/7 society’ (Moore Ede 1993), then they serve to further draw the reader into the story line

turning sleep into a matter of public concern. The press, as such, are active constructors and arbitrators in these debates, thereby helping raise both the profile of this new drug and the problem of sleep(iness) in the public's mind.

So what then does this tell us about the relationship between medicine, the media and the pharmaceutical industry? Certainly the 'textual link' between people in society has never been more evident; everything these days, it seems, is mediated in one way or another by the media, though not all mediation is 'textual' of course. But does this, as Kroll-Smith (2003) implies in his musings on the social construction of sleepiness in the media, provide an opportunity to critique the more pedestrian or prosaic versions of the medicalisation thesis in terms of medicine's attempts to capture public problems? Is what we are seeing here, in other words, a more or less clear-cut case of 'Direct-to-Patient' medicalisation on the part of the media, bypassing the doctor in the process? Well, yes and no. Certainly the news has become a key way, if not *the* key way, of mediating a pharmaceutical to the public, particularly in countries such as Britain where DTCA is not permitted. To the extent, furthermore, that what is conveyed is 'news', it is likely to be treated more seriously or credibly by readers than a full-page glossy add in a magazine for this or that Big Pharma product<sup>4</sup>. To the extent, however, that journalists regularly draw on sleep experts and doctors of various sorts as sources of authority and expertise, and to the extent that the traditional doctor-patient relationship is itself sometimes used as a media template or framing device for these stories (including calls for patients to visit their doctor if they are 'excessively sleepy' or suffering from particular sleep 'problems' or 'pathologies'), then the degree to which these media constructions can truly be regarded as 'extra institutional' forms of

‘rhetorical authority’ and/or bypassing the doctor is open to question. At most, it seems, the traditional doctor-patient relationship and the institutional authority of medicine is being ‘reworked’ or ‘reconfigured’ rather than replaced or bypassed altogether in and through this newspaper coverage. The media, in short, may play a variety of roles in relation to both doctors and drugs.

This press coverage of Provigil also, however, alerts us to the *limits* of a solely or strictly medicalised interpretation of these issues, at least as far as the media are concerned. To the extent, indeed, that press concerns about the potential uptake of this drug cluster or centre around its actual or potential non-medical uses and abuses, then what we see here is the articulation or amplification of a series of cultural anxieties about the *pharmaceuticalisation* rather than the medicalisation of alertness, sleepiness and everyday/night life. Pharmaceuticalisation, in this sense, refers to the transformation of human conditions, capacities or capabilities into pharmaceutical matters of treatment or enhancement. As such it overlaps with but extends far beyond the realms of the medical or the medicalised and serves to further blur the boundaries between treatment and enhancement. In praising and/or criticising these developments, however, the media may (inadvertently) contribute to them, diffusing information and raising awareness of pharmaceutical products in the public’s mind, thereby facilitating their potential uptake in everyday/night life. Media coverage of pharmaceuticals, in short, may have paradoxical, or at the very least unintended, consequences.

Here we arrive at the final question posed at the beginning of this paper as to what all this tells us about the (bio)politics of alertness and the governance of sleepy bodies in contemporary culture? Why precisely

would society want to regulate or govern sleepiness and alertness in this way? Who benefits? Again, of course, this is a question which takes us far beyond the realms of the medical or the medicalised to broader questions about the role of pharmaceuticals in society. One evocative or provocative answer to these questions comes in the shape of Agger's (2004, 1989) musings on 'Fast Capitalism'<sup>5</sup>. Capitalism, Agger argues, has appreciably *speeded up* since Marx's time, and even since the post World War II period (see also Gleick (2000) and Virilio (1986) on this theme). The key words here are '*acceleration*' and '*instantaneity*'. The rate of 'communicating, writing, connecting, shopping, browsing, surfing, and working has increased', Agger (2004: 3) proclaims, particularly since the advent of communication technologies and the Internet. Boundaries of all sorts, as a consequence, have become blurred or broken down.

'Nothing today', it seems, is 'off limits to the culture industries and other industries that colonize not only our waking hours but also our dreaming' (2004: 3). The adjective *fast*, in this way, is intended to modify our sense of capitalism in two main ways: first, through the compression of time (cf. Harvey 1989 and Giddens 1991) as the 'pace of everyday life quickens in order to meet certain economic imperatives and to achieve control'; second, through the 'erosion of boundaries, which are *effaced by a social order bent on denying people private space and time*' (Agger 2004: 3-4, our emphasis).

Nothing, to repeat, is off limit in the 24/7 era of *fast* capitalism. Sleep or sleepiness, as such, becomes a 'problem', or at least a potential problem, in need of a solution in an increasingly time-hungry, incessant culture: a quick fix technical solution, in the case of Modafinil, which amounts to a further colonization of the body and everyday/night life through pharmacological means. To the extent, moreover, that sleep represents an

attempt to ‘slow down’ (cf. Honoré 2004) or ‘opt out’ of society, albeit temporarily or periodically -- cf. Schwartz’s (1970) notion of sleep as a ‘periodic remission’ from society -- then our ‘ways of escape’ are effectively closing down or diminishing in the 24/7 era of ‘fast’ capitalism where achievement is prized, alertness is emphasized and vigilance is valorised. Modafinil, indeed, is simply the first of a new wave of drugs, including CX717 currently in trial, that provide the pharmacological means to prolong, promote and police our wakefulness, fuelling claims (rightly or wrongly) that sooner or later we will be able to pharmacologically or genetically ‘switch’ or ‘turn sleep off’ altogether (Lawton 2006: 34).

These issues in turn raise related questions of ‘pharmacological Calvinism’ (Conrad 2007, Klerman 1972): the Puritan, disciplined, ascetic belief, that is to say, that we need to work hard in order to achieve a valued goal or objective rather than take drugs or medications as a short-cut to success. To the extent that drugs such as Modafinil *embody* the Protestant work ethic (cf. Weber 1930), or at the very least display an ‘elective affinity’ to it, providing us with the pharmacological *means* to remain alert, sharpen concentration, boost cognition and work even harder at the things we value, then the very notion of pharmaceutical Calvinism takes on potentially troubling new dimensions<sup>6</sup>. Expressed more broadly, what this amounts to perhaps is yet another prime expression or glimpse of our (future) ‘neurochemical selves’ (Rose 2003) and of the intimate or inextricable links now forged between what Rose (2007) has appositely termed ‘somatic ethics’ (ethics that accord a central place to corporeal, bodily existence) and the ‘spirit of biocapital’; developments that carry profound implications for who we are and who we want to be.

In *reporting* on these developments and *rehearsing* these dilemmas, discourses and debates, the press, in effect, are not simply alerting us to the pharmacological fortunes of this new drug, but providing us with a potent preview or portent of what may one day, for better or worse, through biotechnological tampering or tinkering of various kinds, become a society in which sleep is rendered *optional* or *obsolete*. Only time will tell...

## NOTES

1. These terms Modafinil and Provigil will be used interchangeably throughout the paper and reflect, in large part, their usage in the British newspaper sources surveyed.

2. Dates of first loading for newspapers on the LN database were as follows: *The Guardian* 1984, *The Times* 1985, *The Independent* 1988, *The Mail* 1992, *The Mirror* 1995, *The Sun* 2000.

3. Cephalon's supplemental New Drug Application (sNDA) to market Modafinil (under the brand name Sparlon) for the treatment of ADHD in children and adolescents was finally rejected by the FDA in August 2006.

4. Thanks to one of the anonymous referees for drawing this point to our attention.

5. Thanks to one of the anonymous referees for highlighting this source.

6. At the time of writing, the *Times Higher Education Supplement* has just published a full page feature on the use of Provigil and other so-called 'smart drugs' in academia: a growing trend in the global academic community, it is suggested, in a time squeezed, performance pressured, results-driven culture such as ours (Tysome 2007; see also Bee 2007 and Martin 2007). This in turn suggests that press concerns over the uses and abuses of Modafinil in relation to wakefulness are now being joined by, if not eclipsed by, concerns over its cognitive/brain-boosting qualities as a 'smart drug', particularly in educational contexts but also more widely in society at large.

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## References

- Abraham, J. (1995) *Science, Politics and the Pharmaceutical Industry: Controversy and Bias in Drug Regulation*. London: UCL Press.
- Abraham, J. and Lewis, G (2002) Citizenship, medical expertise and the regulatory state in Europe. *Sociology*. 36, 1: 67-88.
- Agger, B. (2004) *Speeding Up Fast Capitalism*. London: Paradigm Publishers.
- Agger, B. (1989) *Fast Capitalism: A Critical Theory of Significance*. Urbana: Illinois Press.
- Bee, P. (2007) Smart drugs for straight As. *Timesonline* (14<sup>th</sup> May).  
<http://www.timesonline.co.uk>
- Ben-Ari, E. (2003) Sleep and night time combat in contemporary armed forces: technology, knowledge and the enhancement of the soldier's body, in B. Steger and L. Brunt (eds.) *Night-time and Sleep in Asia and the West: Exploring the Dark Side of Life*. London: Routledge Curzon.
- Blech, J. (2006) *Inventing Disease and Pushing Pills*. London: Routledge.
- Britten, N. (1996) Lay views of drugs and medicines: orthodox and unorthodox accounts, in Williams S.J. and Calnan, M. (eds.) *Modern Medicine: Lay Perspectives and Experiences*. London: UCL Press.
- Britten, N., Stevenson, F., Gafaranga, J., Barry, C. and Bradley, C. (2004) The expression of aversion to medicines in general practice consultations. *Social Science and Medicine* 59: 1495-1503.
- Brown, N and Webster, A (2004) *New Medical Technologies and Society: Reordering Life*. Cambridge: Polity Press.
- Bury, M. and Gabe, J. (1990) Hooked? Media response to tranquillizer dependence, in Abbott, P. and Payne, G. (eds.) *New Directions in the Sociology of Health*. London: Falmer.
- Busfield, J. (2003) Globalization and the pharmaceutical industry revisited, *International Journal of Health Services*, 33, 3: 581-603.

Cohen, S (1983) Current attitudes towards benzodiazepines: Trial by the media. *Journal of Psychoactive Drugs*. 15: 109-13.

Conrad, P. (2007) *The Medicalisation of Society*. Baltimore: Johns Hopkins University Press.

Entwhistle, V and Sheldon, T. (1999) The picture of health? Media coverage of the health service, in Franklin, B. (ed.) *Social Policy, the Media and Misrepresentation*. London: Routledge.

Fenton, N, Bryman, A. and Deacon, D (1998) *Mediating Social Science*. London: Sage.

Fox, N.J., Ward, K.J, and O'Rourke, A.J. (2005) The 'Expert Patient': Empowerment or medical dominance? *Social Science and Medicine*. 60 (6): 1299-309.

Gabe, J. and Bury, M. (1996a) Risking tranquillizer use: Cultural and lay dimensions, in Williams, S.J. and Calnan, M. (eds.) *Modern Medicine: Lay Perspectives and Experiences*. London: UCL Press.

Gabe, J and Lipshitz-Phillips, S. (1982) Evil necessity? The meaning of benzodiazepine use for women patients from one general practice. *Sociology of Health and Illness*, 4: 201-9.

Gleik, J. (2000) *Faster: the Acceleration of Just About Everything*. London: Abacus.

Giddens, A. (1991) *Modernity and Self-Identity*. Cambridge: Polity Press.

Gray, C.H. (2002) *Cyborg Citizen*. London: Routledge.

Gray, C.H. (1995) *The Cyborg Handbook*. London: Routledge.

Haraway, D. (1990) *Simians, Cyborgs and Women*. London: Free Association Press.

Harding, G and Taylor, K. (1997) Responding to change: the case of community pharmacy in Britain, *Sociology of Health and Illness* 19, 5: 547-60

Harvey, D (1989) *The Conditions of Postmodernity*. Oxford: Blackwell.

- Honoré, C. (2004) *In Praise of Slowness: How a World Wide Movement is Challenging the Cult of Speed*. London: Orion Books.
- Klernman, G. (1972) Psychotropic hedonism vs. pharmacological Calvinism. *Hastings Centre Report*. 2 (4): 1-3.
- Kroll-Smith, S. (2003) Popular media and ‘excessive daytime sleepiness’: a study of rhetorical authority in medical sociology. *Sociology of Health & Illness*. 25, 6: 625-43.
- Law, J. (2006) *Big Pharma*. London: Constable.
- Lawton, G. (2006) Get up and go. *New Scientist*. 18<sup>th</sup> February: 34-38.
- Martin, N. (2007) Intelligence drugs could be as ‘common as coffee’. *Telegraph* online (19<sup>th</sup> April). <http://www.telegraph.co.uk>
- Moore-Ede, (1993) *The 24/7 Society: The Risks, Costs and Consequences of a World That Never Stops*. London: Piatkus.
- Moynihan, R., Health, I and Henry, D (2002) Selling sickness: the pharmaceutical industry and disease mongering. *British Medical Journal*. 324 (13 April): 886-91.
- Miller, P. and Wilsdon, J. (eds.) (2006) *Better Humans? The Politics of Human Enhancement and Life Extension*. London: Demos.
- Nelkin, D. (1995) *Selling Science: How the Press Covers Science and Technology*. New York: W.H. Freeman.
- Parens, E. (ed.) (1998) *Enhancing Human Traits: Social and Ethical Implications/* Washington D.C.: Georgetown University Press.
- Potter, J. (1996) *Representing Reality: Discourse, Rhetoric and Social Construction*. London: Sage.
- Rose, N. (2007) *The Politics of Life Itself: Biomedicine, Power and Subjectivity in the Twenty-First Century*. Princeton, N.J.: Princeton University Press.
- Rose, N. (2002) Neurochemical selves. *Society*. 41, (1): 46-59.

Schwartz, B. (1970) Notes on the sociology of sleep. *Sociological Quarterly*. 11: 485-99.

Seale, C. (2002) *Media and Health*. London: Sage.

Stevenson, F., Britten, N., Barry, C., Bradley, C. and Barber, N. (2002) Perceptions of legitimacy: The influence on medicine taking and prescribing. *Health* 6, 1: 85-104.

Tysome, T. (2007) Pills provide brain boost for academics. *Times Higher Education Supplement*. June 29<sup>th</sup>: 6-7.

Virilio, P. (1986) *Speed and Politics: An Essay on Dromology* Transl. M. Polizotti. New York: Semiotext(e).

Weber, M. (1930) *The Protestant Ethic and the Spirit of Capitalism*. London: Allen and Unwin

Wolpe, P.R. (2002) Treatment, enhancement, and the ethics of neurotherpaies. *Brain and Cognition*. 50: 387-95.

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**TABLE 1: PRESS COVARGE OF KEY THEMES BY  
NEWSPAPER\***

Paper/ Theme	Times	Guardian	Independent	Mirror	Mail	Sun	(sub) Total
Medical	7		3		6	1	17
Lifestyle	5		2		2		9
Military		4			1		5
Competition	10	11	6	3	2	1	33
(sub) Total	22	15	11	3	11	2	64

**TABLE 2: PRESS COVERAGE OF KEY THEMES BY YEAR\***

Year/ Theme	'98	'99	2000	'01	'02	'03	'04	'05	'06	(sub) Total
Medical	2				1	2	6	4	2	17
Lifestyle							4	3	2	9
Military							5			5
Competition						25	7	1		33
(sub) Total	2				1	27	22	8	4	64

\* Figures in both Tables 1 & 2 exceed the total article count (54) given that two or more themes may appear in any one article.