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Between credulity and scepticism: envisaging the fourth estate in 21st-century science journalism

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The issue of human cloning has sparked a long-running scientific and political controversy, which has played out in books, films and news media for the better part of a century (Haran et al., 2008; Jensen, 2009). The recent controversy over human cloning has been framed by news coverage (e.g. Jensen and Weasel, 2006; Kitzinger and Williams, 2005), and ‘decoded’ by worldwide publics through the lens of particular cultural contexts (e.g. Hall, 1980; Jensen, in press b; Weasel and Jensen, 2005). Although human cloning for live birth has faced overwhelmingly negative reactions according to public opinion polling in numerous countries, ‘biomedical’ or ‘therapeutic’ cloning research has been much more positively perceived in both the US and Britain (Evans, 2002; Nisbet, 2004). Therapeutic cloning research is still legal in the US, despite a number of attempts by the then-Republican Congress and President from 2002 to 2004. Moreover this research has been granted dedicated funding by several individual states, including California and New Jersey. Meanwhile, the UK government has fully embraced this technology since late 2000, citing hopes for cures and possible long-term economic benefits. These biogovernmental outcomes are tied to the debate over therapeutic cloning that took place in the Anglo-American press in the years since Dolly the cloned sheep was introduced to the world as the first mammalian clone in 1997. In order to examine journalistic credulity and scepticism in the mediation of this issue, the present article adduces data from interviews with Anglo-American journalists ($n = 18$) covering the issue of therapeutic cloning.

Scientifically, therapeutic cloning combines the somatic cell nuclear transfer (SCNT) technology that created Dolly the sheep in Scotland (Wilmut et al., 1997)

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with the derivation of pluripotent stem cells from cloned embryos using techniques first developed in the US (Thomson et al., 1998). The hope is that together the two technologies could produce genetically identical embryos using a sample taken from an adult patient. From these embryos, stem cells could be harvested and utilized in medical therapies. The purpose of therapeutic cloning would be to avoid immune system rejection. However, the procedure destroys the embryos, a prospect that has drawn moral opposition in the US and Britain, especially from anti-abortion activists.

Therapeutic cloning has taken up a significant position within science news and Anglo-American politics over the last decade (Nerlich and Clarke, 2003: 44). It renewed an international debate over the ethical and social implications of allowing the destruction of early human embryos for medical research that had been largely dormant in the UK since 1990 (Mulkay, 1997). In the 2004 US presidential campaign, the issue of therapeutic cloning research received a remarkable level of attention. The keynote address at the Democratic National Convention and numerous mentions by narrowly defeated presidential candidate John Kerry served to raise the profile of therapeutic cloning on the media and political agenda.

In addition to these political developments, 2004 saw the publication of a keystone article in the flagship journal *Science* reporting the creation of cloned human embryos up to the 100-cell blastocyst stage, followed by the successful extraction of stem cells. Authored by South Korean Professor Hwang Woo-Suk et al. (2004), this article established that the goals of therapeutic cloning were technically achievable. The report was met by a storm of international commentary, controversy and soaring interest in the curative potential of therapeutic cloning. The subsequent scandal also exemplifies the problematic at the heart of the present article: the lack of scepticism in the contemporary practice of science journalism.

Published on 19 May 2005, Hwang's second article in *Science* reported the successful derivation of patient-specific stem cell lines from cloned embryos using SCNT:

Eleven [human embryonic stem cell] lines were established by somatic cell nuclear transfer (SCNT) of skin cells from patients with disease or injury into donated oocytes. (Hwang et al., 2005 [retracted]: 1777)

With this publication, Hwang's scientific symbolic capital was at an all-time high both in South Korea and abroad. Yet allegations of ethical improprieties and misconduct soon began to surface. In November 2005, Hwang's American collaborator Gerald Schatten indicated that Hwang was guilty of ethical lapses and technical mistakes. Subsequent revelations ultimately resulted in Hwang's spectacular public disgrace. By the end of 2005 there could be no doubt that Hwang's therapeutic cloning articles in *Science* were fraudulent. On 15 December 2005, Hwang finally admitted 'serious errors' in the two *Science*

articles and officially requested their retraction. At the end of 2005 and beginning of 2006, two Seoul National University investigations confirmed the fraud. Finally, in May 2006 criminal charges were filed against Hwang for fraud, embezzlement and violations of South Korea's recently instituted bioethics laws.

In the end, the Hwang scandal was a major setback for the science and hope of therapeutic cloning. It also raised as yet unanswered questions about the effectiveness of the press's reporting on Hwang's research, and the sufficiency of the venerable scientific peer review system. It is the failure of Anglo-American science journalism to temper its credulous coverage of Hwang's initial success and the myriad other permutations of utopian hype surrounding therapeutic cloning that is the subject of the present article. The unusually visible lack of journalistic scepticism evident in this episode occasions a renewed consideration of the contemporary relevance of long-standing theories and ideals regarding the role of the press as a watchdog defending the public interest. Below, the ideal of journalism as the fourth estate of government is briefly reviewed. This article draws on interview data from the crucial period in 2005 between the publishing of Hwang's second *Science* article in May and his public disgrace in December. Although this investigation is inspired by the Hwang scandal, the focus will be on the broader interplay between institutional norms and professional values in the practice of science journalism.

The fourth estate

Burke said there were Three Estates in Parliament; but, in the Reporters' Gallery yonder, there sat a Fourth Estate more important far than they all. It is ... a literal fact ... [that] Literature is our Parliament too. Printing ... is equivalent to Democracy.... Whoever can speak, speaking now to the whole nation, becomes a power, a branch of government, with inalienable weight in law-making, in all acts of authority.... The nation is governed by all that has tongue in the nation. (Carlyle, 1888 [1841]: 349–50)

The notion that the press could serve as a bulwark against excessive state power has long been promoted by political philosophers and journalists, who assigned the press a pivotal role in politics as a critical, independent defender of the public interest (Donohue et al., 1995). This 'Fourth Estate' status has been attributed to news publications by political philosophers from Milton to Bentham to Condorcet, and more recently Jürgen Habermas (1989). Indeed the press has long been envisioned as an independent pole of symbolic power in modern society, 'generally outside the direct control of the Church and the state' (Thompson, 1995: 53). John Stuart Mill (1859: 22), for example, commended 'the press as one of the securities against corrupt or tyrannical government'. Likewise, Milton (2006 [1644]: 27) inveighed against parliamentary

support for press censorship, declaring that ‘the cruse of truth must run no more oil, liberty of printing must be enthralled again’. Such philosophical visions of a powerful and autonomous press capable of challenging overbearing state power have clear echoes in contemporary theories of the public sphere such as Habermas’s (1989) account, or, in a much more limited manner, Thompson’s (2000) theory of ‘mediated visibility’.

Significantly, the notion of the press as a critical counter-force to state power still has purchase within the self-definitions of contemporary journalistic practice (Nelkin, 1990). Drummond (1938: 60) connects the fourth estate role with the more recent objectivity norm that first developed in the late 19th century:

The tradition of news-column fairness and impartiality in the selection and display of news must be maintained and strengthened if the press is to fulfil its urgent function in democratic government. (Drummond, 1938: 60–1)

He contends that a critical press is needed to ‘protect’ and ‘preserve’ the ‘free processes of democratic government’ (1938: 61). While such an ideal may be seldom realized in today’s science news coverage (Nelkin, 1990: 46), the press’s self-conception as the fourth estate is essential to the belief system governing journalism as a field of practice. Indeed, this ideal can be viewed as partly constitutive of the *illusio* of the journalistic field. French sociologist Pierre Bourdieu (1998b) developed the notion of *illusio* to denote the unquestioning belief in the intrinsic value of the capital (i.e. resources) at stake in a given field, as well as the naturalization of the rules that govern the acquisition of such capital.

Illusio is the fact of being caught up in and by the game [within a given field], of believing the game is ... worth the effort. (1998b: 76–7)

Failure of fourth estate science journalism

Despite continued discursive support by journalists for a mode of sceptical reporting that challenges powerful interests in society, previous research has shown the failure of Anglo-American press coverage of human cloning to fulfil a fourth estate role (Einsiedel et al., 2002; Jensen and Weasel, 2006; Kitzinger and Williams, 2005). For example, Gutteling et al.’s (2002: 111) study of elite UK newspaper coverage of biotechnology from 1973 to 1996 found that 51 percent of their sample employed the frame ‘progress/utility’, compared to only 2 percent using a ‘doom scenario’ frame. Edna Einsiedel et al. (2002) analysed frames, metaphors and other thematic content in elite European press coverage of the first 11 days of the Dolly story in 1997. They found that notions of ‘scientific progress’ were developed by framing Dolly’s birth as ‘a unique event, a surprise, a technological leap’ (Einsiedel et al., 2002: 340). Priest (2001) analysed coverage of the ethical controversy

surrounding human cloning in elite US newspapers ($n = 130$) from 1994 to 1997. Her qualitative analysis of this press content revealed that the debate was concentrated around reproductive cloning in a way that constructed the issue as a 'safe controversy' for the biotechnology industry (Priest, 2001). That is, the debate was limited to an 'abbreviated set' of ethical issues (also see Jensen, 2008c) unlikely to 'challenge existing institutional arrangements', thus constituting the human cloning controversy in the US as 'harmless to the status quo arrangement' within biotechnological development (Priest, 2001: 67).

In addition, multiple studies have shown media using more or less hyped conceptual metaphors such as 'Clones are crops', 'Cloning is abortion', and 'Cloning is mass production' to define reproductive and therapeutic cloning (Hellsten, 2000; Jensen and Weasel, 2006; Nerlich et al., 2000; Weasel and Jensen, 2005). Jensen (2008b) found that utopian hype was the dominant rhetorical pattern in elite UK press coverage of human cloning. Similarly, Kitzinger and Williams (2005: 737) showed that science fiction and other negative dystopian imagery was only used to develop straw arguments in the elite UK press, depicting opponents of human cloning as ignorantly basing their views on fictional accounts. This tactic was used to reinforce the uncritical promotion of therapeutic cloning and embryonic stem cell research. Given such previous research findings, the present study seeks to assess the level of commitment to the fourth estate ideal amongst contemporary Anglo-American science journalists. Moreover, to the extent that adherence to this professional ideal is expressed, I consider the reasons why this commitment largely failed to translate into critical journalistic content. Four meso-level theoretical explanations are postulated to explain this lack of critical journalism in coverage of therapeutic cloning.

Method

This study reports on the results of a 'grounded discourse analysis' of data from in-depth, semi-structured qualitative interviews with journalists writing about therapeutic cloning for influential newspapers and periodicals in the US and Britain ($n = 18$). Although they are subject to myriad institutional and external pressures, it is ultimately individual journalists that are the gatekeepers in the process of science news production. The interviews were aimed at opening a window into the inner workings of science news production. Interviews lasted from 27 minutes to 1 hour 45 minutes; they were digitally recorded and transcribed for analysis. Interview participants were selected based on past authorship of articles about therapeutic cloning in newspapers and periodicals. Unfortunately, despite multiple attempts to include them, no UK tabloid journalists replied to invitations to participate in this study. This is a major limitation, which is addressed in this study by limiting claims about UK tabloid news production.

Data analysis was undertaken using computer-aided qualitative data analysis software (viz. *Atlas.ti*). The analysis took place in two stages, first using the grounded theory coding framework (Glaser and Strauss, 1967; Jensen and Holliman, 2009; Strauss, 1987; Strauss and Corbin, 1998) and, second, layering on a more sociological discourse analysis based on the application of relevant social and political theory. The use of *Atlas.ti* facilitated the interplay between these two stages of analysis, the combination of which I have termed 'grounded discourse analysis' (also see Jensen, 2008b).

Results

As seen in the literature review above, previous studies of the content of elite UK press coverage of human cloning and embryonic stem cell research have clearly demonstrated a pattern of journalistic credulity and a failure to challenge hype surrounding the development of these biomedical technologies. Despite this pattern of research findings, most Anglo-American science journalists in the present research were at least rhetorically committed to the fourth estate ideal of science journalism performing a critical function:

We [science journalists] are here to be as critical of science as objectively – as critical of science as sports journalists are of sport and political journalists are of politicians. It's like – [as] science writers, we are not here as PR, you know. Science writing where people are just trying to explain ends up as a glorified PR job because science journalism is a different thing.... The definition of news is bringing up something that someone somewhere doesn't want to be printed.... And there should be far more emphasis on that objective criticism. (Science correspondent, elite UK newspaper, 2005)

Interestingly, in the above extract notions of fourth estate journalism were intermingled with the norm of objectivity. As above, the following British journalist also defines science journalism in opposition to uncritical or credulous promotion of science:

Science journalism.... What it isn't about: is it's not about cheerleading for science. (Science correspondent, elite UK newspaper, 2005)

A similar account is offered by a UK medical correspondent below, who attributes uncritical press coverage of science in part to scientists' tendency to hype their research to journalists:

A lot of the sensationalist coverage ... part of the problem is that scientists have a tendency to over talk.... You have to be by nature optimistic to go into science: you have to believe that what you are doing is exciting and you'll make a difference to go on.... And so scientists tend to be a little overly – I don't want to use the word hype ... but they do have a tendency to look on the bright side of their

technology and that it's going to deliver much more than it can. (Medical correspondent, elite UK news periodical, 2005)

Comments from American journalists during the qualitative interviews also indicated a more sceptical orientation towards the promissory science of therapeutic cloning:

The politics isn't the reality of what's going on in the field [of therapeutic cloning]. The reality is that there's a good chance that none of this shit is going to yield very many cures for anything. They ain't going to grow new brains out of those things [embryonic stem cells].... This whole issue is a joke that it has such high prominence. (Science correspondent, US newspaper, 2005)

At base, this sceptical disposition reflects a fourth estate or 'watchdog' model of journalism. The following extract delineates this professional commitment to acting as a public watchdog by questioning powerful institutions:

[Science] journalism has a lot of different roles.... The role that interests me the most, and I think a lot of reporters the most, is a more sort of 'watchdoggy' role.... There's a range of stories that can be done about science institutions: how well are they managing their funds? ... Are scientists disclosing where they're getting their money from? Is there any risk to the public?

You can't get to the truth with a capital T but you can at least do your homework so you're not just being a stenographer and writing down what people say in regards of accepting it on blind faith. (Science writer, US news periodical, 2005)

Interdicting journalistic scepticism: five limiting factors

These expressions of journalistic scepticism during the qualitative interviews would initially seem to suggest that Anglo-American science journalism has the potential to enact a fourth estate role in debates over controversial scientific issues such as therapeutic cloning. However, the paradoxical fact that scientific hype, not scepticism, dominated front-stage press content in this case (Jensen, 2008a) raises the emergent research question: why did these back-stage expressions of commitment to a fourth estate ideal fail to translate into sceptical press content? Champagne (2005: 50) points out that journalism is defined by an 'impossible autonomy'. Journalistic production is always strongly dictated by the social, especially political and economic, conditions in which it is organized. Below, some of the social conditions that limit the autonomy of journalists committed to a fourth estate ideal are identified. Although there are undoubtedly more, I limit my discussion to briefly outlining four key meso-level factors that may have skewed therapeutic cloning coverage

towards journalistic credulity and away from fourth estate ideals. These factors are:

- the inter-media agenda-setting effect (McCombs, 2005);
- organizational constraints on science journalists' independent judgements of newsworthiness (Bourdieu, 1998a; Champagne, 2005; Herman and Chomsky, 1988);
- personal pro-science biases; and;
- the agonistic pursuit of prominent (especially front-page) placement within the news publication for professional gain.

These four factors limit the autonomy of the journalistic field, reflecting the fact that 'journalists are caught up in structural processes which exert constraints on them such that their choices are totally pre-constrained' (Bourdieu, 2005: 45). The extract below is illustrative of the systematic process of journalistic compromise that occurs within news organizations between autonomous judgement and extrinsic concerns, foreshadowing some of the points to follow:

There are many stories that you don't write ... [because you think] 'I don't rate this study. It's not properly done. The results are implausible; therefore I'm not going to write it.' And a lot of the time you can do that, *but there are occasions when you can't*. If it's on the [news] agency wires [e.g. Reuters] and the news desk have seen it, and they think it's interesting, then they will press you to write it and you then have to make the best of it and try.

A classic example of this recently was where ... a [journal article] show[ed] that mobile phones were more dangerous if you are in the country than if you were in the town.... *I had to write it because everybody [at the other newspapers] was going to write it*. And I did point out [the flaws in the study] but of course the published version [of the article] didn't contain the final few paras that pointed out the study was untrustworthy. But, you know, it's not a perfect world. (Health editor, elite UK newspaper, 2005, emphasis added)

As seen in the above extract, the first reason that general expressions of commitment to fourth estate journalism by news workers may fail to translate into correspondingly critical or sceptical published news content is 'inter-media agenda setting', which refers to the influence of one news organization upon the news production process of another (McCombs, 2005). Indeed, concern about being 'scooped' on a story by another news organization can constitute sufficient newsworthiness to motivate coverage. 'Important news is thus news that is considered important by the whole of the media and picked up as such' (Champagne, 2005: 61). In a published interview, *New York Times* science editor Nicholas Wade noted that sometimes science journalists 'are asked to get a story at very short notice, such as late at night when the editors see the *Washington Post* has some story, and ask you to match it' (Gitschier, 2005: 280). This inter-media influence was described by one participant as a 'sheep mentality':

There is an undoubted sheep mentality among newspapers whereby ... sometimes stories are covered because you think other newspapers will cover them.... Another paper covering something gives it credibility so you end up going along.... Someone publishes a story and everyone else follows it the next day religiously without 'humming' and 'hah-ing' and being critical of it. (Science correspondent, elite UK newspaper, 2005)

In this vein, Bourdieu (2005: 44) points to the 'competitive struggle' between newspapers that 'steal each other's front page stories, editorials, and subjects'. However, Champagne (2005: 61) notes that 'prestigious' media outlets such as the 'serious' or elite press have greater 'consecrating power' in this context: 'Because they are read more, their stories are picked up more often by other outlets.' Kitzinger also identified this pattern in her review of risk reporting:

Media interest feeds off itself.... Once a critical mass of media interest builds up this is likely to spiral through different media outlets. (1999: 64)

The second major factor comprises funding and personnel limitations, as well as the fundamentally capitalist ethos of contemporary news organizations. These concerns are reflected in the particular organizational cultures that develop within newsrooms. In the case of therapeutic cloning, organizational culture and resource limitations restricted science journalists' ability to investigate and question the utopianism surrounding this issue. The centrality of such 'business' concerns within the news production process is summarized by the following UK journalist: 'Particularly on a UK newspaper, all journalists have the same job, which is to provide stories that interest our readers. Newspapers are a business. Our business is selling newspapers. We can't file stuff simply because it's worthy' (Science correspondent, elite UK newspaper, 2005). Indeed: 'news production finds itself caught in a production logic characterized principally by intense competition and speed' (Champagne, 2005: 53). A key example of the role of such organizational limitations on individual journalists' news judgement was cited by American science writer, who had planned to conduct an investigative report on therapeutic cloning:

Diseases like Parkinson's and Alzheimer's, they talk about using stem cells to treat them, but how would we actually do it? And [my editor and I] thought about looking at what had actually been done in the laboratory to get ... stem cells to form new pancreatic tissue that could be used for transfusion. And what we would have reported is not a hell of a lot has been done. I mean [cures] are the big goal, but if you actually look at what they've actually been able to do, it's almost nothing. And so we thought that would be a really useful 'process of science' story to give people a reality check. I mean, there are all these claims being thrown about, but let's go look at the Petri dish, as it were, to see what the goods are. (Science writer, US news periodical, 2005)

However cutbacks at her news organization prevented this science writer from undertaking this putative story:

But we never ended up doing [the story], just because ... the science news at [my news periodical] got cut back. But I think that that was the kind of story we didn't do enough of.... I thought it would be a great story. (Science writer, US news periodical, 2005)

This aborted journalistic venture is particularly noteworthy given that this interview took place in June 2005, before the Hwang scandal broke. If more of this kind of investigative reporting had actually taken place, it is possible that Hwang's fraud would have been uncovered sooner.

The third factor involves the pro-science bias expressed by many of the journalists interviewed for this study. The development of this personal bias, while not unusual in 'beat' reporting (Fishman, 1980), may have helped underwrite science journalists' reluctance to pursue critical or investigative reporting on the issue of therapeutic cloning, even while broadly endorsing the *illusio* of the press as fourth estate. For example, the following extracts are suggestive of underlying scientism on the part of Anglo-American science and medical journalists:

Extract 1

I tend to take the scientific point of view, probably to a greater extent than some readers would like me to. But I see myself as a kind of rationalist in a fairly irrational world. I'm not there to promote irrational ideas because there are tons of other people doing that job. So I tend to cling to science as a piece of driftwood in a wreckage to keep me afloat. (Health editor, elite UK press, 2005)

Extract 2

I am not a mystic. I'm accused of being a materialist in a lot of my interviews with right-wing people. And that's an insulting way to say you believe in reality. 'Guilty': I believe in reality. I don't believe in bogeymen and ghosts. And if you want me to try and tell my readers that there are bogeymen and ghosts, fuck you! That's not my job. (Science correspondent, US newspaper, 2005)

Hyped utopian press coverage of therapeutic cloning reflected significant strains of just this kind of scientism. However, the health editor in Extract 1 specifically connected his long-term commitment to scientific progress with his decision to redact his journalistic scepticism about utopian claims from any front stage press content:

Yes ... you have to take a kind of slightly sceptical view of the benefits [of therapeutic cloning]. But if you believe, as I do, that understanding more about something does generally lead to improvements in clinical practice, then you accept the general thesis that, in the long run, stem cells may be of value in the clinic. They may not be here in ten years or even twenty years, and they may not be as great as everybody says they are. But, in the past, learning more about how the body functions has led to better treatments and there is no reason to suppose that won't happen in the future too. So I suppose that is my credo and therefore although I might have doubts about some of the more outrageous claims I wouldn't necessarily write a story saying that they are exaggerated. (Health editor, elite UK press, 2005, italics added)

This journalist was satisfied that the hype over therapeutic cloning would yield funding for basic scientific research, which he believes will provide at least some limited long-term medical benefits for society. On this basis, he has self-censored and quarantined any personal or professional scepticism back-stage, thus limiting his readers' ability to render 'informed' consent on this issue.

Finally, journalistic hype was also driven by the agonistic pursuit of the professional milestone of front-page story placement within the newspaper. This factor is rooted in the competitive individualism evident in most newsrooms. Bourdieu identifies this competitiveness as a defining feature of the journalistic field:

Within the field of journalism, there is permanent competition to ... appropriate what is thought to secure readership, in other words, the earliest access to news, the 'scoop' ... and so on.... [This] has the effect, in fields of cultural production under commercial control, of producing uniformity, censorship and even conservatism. (2005: 44)

However, some participants justified the competitive quest for front-page placement as altruistically motivated by suggesting that it is an inherent social good to have science prominently displayed in the newspaper, regardless of the quality or veracity of the story's content. In the following extract, a British journalist explains that his science news department ran with the 'lesser' story of a British therapeutic cloning 'breakthrough' rather than the more significant Hwang breakthrough because it was more likely to get front-page coverage:

It was the angle that was most likely ... to ensure that the story got onto the front page.... If it had just been the Korean thing ... it wouldn't have been as highly placed in newspapers, on news bulletins and so on. And sometimes placement is just as important as what's actually written for a story's impact, if you see what I mean. (Science correspondent, elite UK newspaper, 2005)

Speaking more candidly, recently retired *Guardian* science editor Tim Radford (2006) indicated in an academic conference speech that therapeutic cloning hype was a natural outgrowth of the norms of the journalistic field:

People accuse us of grabbing headlines. What a ridiculous charge. Of course we were grabbing headlines [with the therapeutic cloning story]. That's our job [as science journalists]! ... The idea that I could turn a piece of science that no one had ever heard of or discussed before into something that would sit on the front page of *The Guardian* ... was an enticement never to be turned down. If there is a headline around, I would like to grab it, thank you very much.

Radford went on to point out that the utopian hype that he and other elite UK journalists employed was essential to the journalistic telos of achieving prominent story placement within the newspaper:

You don't grab headlines by describing embryo stem cell research as 'an expensive laboratory process based on technology guaranteed to lead to many years of frustration and very small flashes of enlightenment'. *That will not sit on the front page of anything.* If it offers hope to Christopher Reeve, that's what you go with; *because it's a clear, simple image and it's going to get published.* (Radford, 2006, italics added)

A UK Health Editor made a similar admission about the use of hype to achieve the paramount goal of prominent placement in the newspaper: 'Perhaps we do tend to overemphasize or hype things a bit. Sometimes [we] are just trying to get things in the paper' (Health editor, elite UK press, 2005, italics added). In addition to the fulfilment of their professional mission as journalists (Radford, 2006), 'grabbing headlines' in this manner certainly has an element of self-promotion. Symbolic and financial capital accrues to journalists featured on the front page of the newspaper, and this was no doubt a contributing (albeit unacknowledged) factor in journalistic hype surrounding therapeutic cloning. Indeed, the power of unseen commercial factors in driving the organizational and professional practice of contemporary journalism has been much theorized (e.g. Jensen, in press a; see also McManus, 1994).

Discussion

In the context of shifting relations between the sciences and society, the mediation of scientific controversies in the public sphere is a pressing concern (Holliman and Jensen, 2009; Jensen, in press b; Jensen and Wagoner, 2009). Returning to the original question of why journalists' expressions of commitment to a fourth estate ideal of professional scepticism failed to yield commensurate press content in the vast majority of therapeutic cloning news stories, the situation is succinctly summarized by Champagne (2005: 51):

The major contradiction within the operation of the journalistic field ... [is] that the journalistic practices that best conform to journalists' ethical codes are very simply not profitable. The journalist ideally wants to be a stalwart servant of the truth at any price, but he belongs to a paper that bears a price and is situated within the economic enterprise with its own exigencies.

In this vein, Leighley (2004) notes that 'one of the consequences of the melding of marketing and newsgathering is that journalists' personal influence on news content is reduced'. Thus, even journalists committed to journalistic professional norms such as 'objectivity' and a fourth estate ideal find their autonomy constrained by numerous factors stemming from the commercialization of news production (Bourdieu, 1998a, 2005; Hallin, 2000; McManus, 1995).

A century and a half ago John Stuart Mill (1859: 22) wrote, 'The time, it is to be hoped, is gone by, when any defence would be necessary of the "liberty of the press" as one of the securities against corrupt or tyrannical government.'

Participants from both the US and UK samples defined science journalism in broadly similar ‘fourth estate’ terms. Yet, given the limitations of contemporary commercial journalism seen in the present study, these fourth estate notions of the press are difficult to sustain. Thompson (2000) contends that the mere fact of making leaders and their actions visible serves a similar function in terms of fostering transparency and public accountability. However, mediated visibility is routinely manipulated by economically powerful institutions (Herman and Chomsky, 1988). Indeed Donahue et al. (1995) argue that the press predominantly acts as a ‘guard dog’, securing the interests of powerful institutions against possible threats, rather than a ‘watchdog’ protecting the public interest. Thus, despite the two deviant cases of journalistic scepticism explicated above, it must be acknowledged:

News content in the public sphere is not shaped by the classic vision of socially autonomous journalists acting as societal watchdogs. Instead, the influence of journalists appears largely beholden to the preferred meanings of their media organization, their news sources, and their geographic community’s power structure. (Berkowitz and TerKeurst, 1999: 130)

Overall, then, the failure of the Anglo-American press to critically investigate the fraudulent claims of former Professor Hwang and the extensive concomitant hype must be viewed as primarily institutional. The present data suggest that it is only in extraordinary organizational circumstances that journalists are able to transcend the hegemony of contemporary market-centred news production to challenge powerful institutions. Although the existence of some such challenges in the coverage of therapeutic cloning indicates that there will always be some fissures in the edifice of institutional control.

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