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## **Rhetoric, power and legitimacy: A critical analysis of the public policy disputes surrounding stem cell research in Australia (2005-6).**

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## **Abstract**

In December 2006, the Australian Parliament liberalized regulation governing stem cell research. This decision and preceding legislative review generated considerable public debate, which centred on objections to the deliberate creation and destruction of human embryos for research purposes. This paper draws on qualitative research conducted on the public debate surrounding this policy episode. The aim of this research was to examine how science and scientific knowledge is mobilized by participants in these debates to support their arguments. Data was collected from 109 newspaper opinion editorials as well as 23 in-depth interviews and examined using qualitative content and thematic analysis. Results of this analysis depict science as a rhetorical, moral and political resource that provides opportunities for participants to gain legitimacy, negotiate meaning and assert authority in the public domain. The mobilization of science in public discourse is discussed along with suggestions that are aimed at encouraging greater transparency and inclusiveness in public debates around contested science and emergent technologies.

## **1. Introduction**

Since embryonic stem cell (ESC) lines were first isolated from human blastocysts in 1998, following the first cloned mammal using somatic cell nuclear transfer (SCNT) a year earlier, the public debate around stem cell research has typically centred on the moral status of human embryos and the utility of stem cells. Opponents of stem cell research have generally argued that it is morally unconscionable to destroy human embryos for research while its advocates argue that the potential for substantial medical and therapeutic benefits outweighs such concerns. In response to this debate, many industrialized countries have enacted legislation to regulate the practices and techniques involved in stem cell research.

International reviews of regulation around this research suggest that while there is considerable variation in the permissibility of ESC research and SCNT (Gottweis, 2002; Jasanoff, 2005; Waldby & Salter, 2008; Walters, 2004), a high degree of cross-cultural uniformity exists in what is considered to be in need of regulation (Hauskeller, 2005). Generally speaking, regulatory regimes take into account both the welfare of human embryos and the duty to care for the sick and vulnerable (Banchoff, 2005; Gottweis, 2002). Whereas oversight of research with somatic or 'adult' stem cells (ASC) tends to fall within existing mechanisms that regulate research with human tissues and clinical trials (Wilson-Kovacs, Weber, & Hauskeller, 2009). This paper focuses on the public debates surrounding the regulation of ESC research and SCNT in Australia.

### *Policy Responses to Stem Cell Research in Australia*

Australia has taken a relatively liberal regulatory approach. In response to the reported successes in human ESC isolation and cloning experiments, the Australian Commonwealth and state governments sought to develop a nationally consistent legislative framework (Nicol, Chalmers, & Gogarty, 2002). After protracted public and parliamentary debate in 2001-2, the Australian Federal Parliament enacted the *Research Involving Human Embryos Act (2002b)* and the *Prohibition of Human Cloning Act (2002a)*. This legislation prohibited the use of SCNT for any purpose and only allowed research on surplus IVF embryos created prior to April 2002 (Nicol, et al., 2002). A three-year review was built into the legislation to consider the scope and operation of both Acts and to make recommendations for amendments (Legislation Review Committee, 2005a).

The LRC submitted its report in December 2005 making fifty six (56) recommendations (Legislation Review Committee, 2005b). The LRC advised maintaining the prohibition of SCNT for research purposes but recommended that the creation of SCNT embryos for research purposes be permitted (Cooper, 2006). All but one<sup>i</sup> of the LRC's recommendations were accepted by the Federal Government (Ankeny & Dodds, 2008; Harvey, 2008). In December 2006, the Federal Parliament enacted the *Prohibition of Human Cloning for Reproduction and the Regulation of Human Embryo Research Amendment Act (2006)*. These acts went into effect in June 2007 and most states have since enacted complimentary legislation to reflect the amendments. The legislative scheme will be reviewed again in 2010.

In the public debate surrounding these episodes, science is contested in talk surrounding the nature of human embryos and stem cells. These contests are also reflected in discourses that emphasize the need to care for the sick against those seeking to protect early-stage human life. The distinction between the two sets of discourses – the axiological talk about morals and values and the science talk about technical feasibility and utility – is often blurred and difficult to determine. Participants slip effortlessly between the two discourses because science, which is often *presented* in public debate as being value-neutral (Mooney, 2001), is laden with values (Proctor, 1991). Science thus provides a range of discursive resources that participants may draw upon in stating their values and positioning themselves effectively within a debate. Examination of these resources can thus provide important insights into how science is constructed and mobilized in public discourse. This paper, therefore, presents the results of empirical research that examined how science was mobilized in the claims participants used throughout the 2005-6 Australian stem cell policy episode to support their preferences.

## **2. Methods**

This study used qualitative methods to thematically analyze the descriptive and normative content of the ‘science claims’ used by participants during the 2005-6 stem cell policy episode in Australia. Evidence was sourced from 109 opinion editorial texts published in Australian newspapers and 23 semi-structured interviews with participants from the public debate. This data was examined using analytical categories constructed from themes identified in the extant philosophical, sociological and critical literatures relating to the fact-value distinction, the authority of science, legitimation and the use of rhetoric in policy contexts. Methods and justifications used in this study are detailed elsewhere<sup>ii</sup>.

Briefly, opinion editorials (or 'op-eds') were collected electronically from two nationally distributed and twelve major metropolitan newspapers using the Factiva database. Op-ed texts were analyzed using NVivo software for the presence of science claims and examined according to the contributor's declared policy position<sup>iii</sup>. Science claims were analyzed for descriptive and normative content relating to the nature and status of stem cells and/or human embryos and tissues using a focused discourse approach similar to Mulkey's (1997) analysis of embryo research debates in the UK. Interviewees were selected using purposive sampling techniques (Merriam, 1988) drawing both from the op-ed contributors and from those who provided public submissions and/or presentations during the legislative review process. All interviews were recorded using a digital recorder and transcribed into Microsoft Word for analysis. Both datasets were analyzed using thematic categories constructed from the extant literature and refined using iterative processes that allowed others to emerge from the data. Results of the op-eds and interviews are discussed separately<sup>iv</sup> with respect to the relevant literature under the two headings that follow and summarized in the conclusions.

### **3. Science as a Moral Discourse**

Of the fifty-six participants identified as op-ed contributors, twenty-six were categorized as policy advocates and twenty-five as policy opponents. The position of five was unclear<sup>v</sup>. Of the twenty-three interviewees, fourteen advocated the policy proposal while nine were opposed. Participants supporting either position drew on a relatively diverse, yet limited pool of science claims, which were categorized as having either implied a value proposition about the moral status of embryos (or human tissues) and/or the potential benefits of stem cell research. These claims were associated with the participants' policy position.

Thirty-nine of the fifty-six op-ed contributors were found to have made a claim about moral status. Twenty-two policy opponents made claims that implied that human embryos have relevant moral status while none were found to have made claims that implied otherwise. Eleven also made other claims that implied human tissues have no such moral status. In contrast, no policy advocates claimed that embryos have relevant moral status. Indeed, seventeen made claims that implied that embryos lacked the moral status that would protect them from use in research. Only two advocates implied that human tissues also lack moral status suggesting that the comparable moral significance of embryonic and non-embryonic sources of stem cells had greater relevance to the opponents' position. The total number of advocates making these types of claims was eighteen.

Similar associations were found in the claims made about the medical utility of stem cells. A total of forty-four op-ed contributors used these types of claims. All twenty-six policy advocates used a claim that implied that ESCs and/or SCNT have potential medical utility. Four also made claims that suggested that ASCs have potential utility. Three advocates suggested that ASCs do not have the potential of ESCs. On the other hand, thirteen opponents of the policy proposal claimed that ASCs have proven medical utility and also have greater potential for future applications than ESCs. Eighteen opponents used other claims that denied the potential utility of ESC/SCNT research.

Many different aspects of stem cells were drawn upon in support of the different utility claims. Emphasis of these aspects throughout the op-eds was, however, contingent upon the contributors' position and was often interrelated with other claims made about moral status.

Policy advocates tended to emphasize the pluripotency and specificity of ESCs whereas the opponents tended to draw more on the genetic, immunogenic and tumourgenetic properties of ESCs while also highlighting the specificity of ASCs. In all cases, these claims were invested with norms and values that reflected the participants' support of a particular position.

For example, claims about stem cell potency were laden with values that direct scientific research towards medical applications, rather than (just) epistemic science. Such claims implied that the real value of science is understood to lie not merely in the knowledge it generates but in its practical utility. When policy advocates used these claims, the concept of pluripotency was framed as a moral good, which manifest in the seriousness of the conditions that advocates claimed ESCs could treat. Throughout their op-eds, policy advocates such as Leslie Cannold from the University of Melbourne described these conditions as "untreatable" and "incurable". In doing so, the concept of pluripotency was invested with meaning that implied that cells with these properties are highly valuable.

The aim of embryonic stem-cell research is to gain knowledge about pluripotent cells, those capable of becoming any tissue in the body. Scientists are hopeful that such cells will help us develop treatments for incurable conditions such as motor neurone disease, Alzheimer's and the sorts of spinal cord injuries suffered by the late actor Christopher Reeve. [Leslie Cannold] *The Adelaide Advertiser*

On the other hand, claims about pluripotency appeared quite differently when used by policy opponents, who did not deny that ESCs were pluripotent, but instead, drew on other characteristics such as teratoma formation and host-against-graft immune responses to devalue the practical utility of these cells. As suggested by Michael Cassonova from the Australian Family Association in his op-ed, pluripotent cells are powerful, but ultimately



undesirable for treating patients. From this claim, he argued that ESCs have no such value as to justify more permissive laws:

Embryo stem cells are very potent, but also very unstable: they have a tendency to form teratomas, tumour-like masses that can include teeth, skin, hair and bone. That is not good for mouse brains or rats' knee joints. Beyond that, embryo stem cells have a tendency to accumulate mutations. And the problem of patients' bodies rejecting embryo stem cells is bigger than expected. [Michael Cassonova] *The Age (Melbourne)*

In response to the question over the permissibility of SCNT, policy advocates used these characteristics to argue for its necessity. Advocates argued that SCNT offered the possibility to create patient-specific cell lines that could, at least theoretically, circumvent known problems of transplanting ESCs into immunologically incompatible tissues. This type of claim was denied by policy opponents who argued that other alternatives exist by drawing attention to the demonstrated clinical utility of ASCs and ongoing research in different contexts. David van Gend from the Do No Harm campaign drew on evidence submitted to the LRC by Professor Alan Mackay-Sim to cast doubt on the purported value and necessity of ESCs and SCNT as “useless”, “dangerous”, “redundant and impractical”:

There are now 65 human diseases treated with adult stem cells, while embryo stem cells remain both useless and dangerous and, as even the Lockhart committee concedes, have not a single human application. If these safe and ethically uncomplicated adult stem cells from the back of your nose are as good as these scientists say, the whole case for cloning has been rendered, as Mackay-Sim told the Lockhart committee, “redundant and impractical”. [David van Gend] *The Courier Mail (Brisbane)*.

Talk about science in this context was thus a moral discourse. Any discussion of utility is explicitly moral because of judgments that are made about beneficence as a normative good (Beauchamp & Childress, 2001). As other scholars have noted, science is generally valued within modern societies for its practical usefulness, which often serves as a powerful moral argument

in science policymaking (Resnik, 1998), particularly when the potential health and medical benefits are significant and the supposed necessity of the research is pertinent (Callahan, 2003). These arguments are, in turn, countered with others that either dispute the potential for benefits and/or argue that the moral, social and/or economic costs are too high to justify the research.

The major issue that was associated with stem cell research in Australian debate was the creation and destruction of early human life. Arguments relating to these issues manifest in the claims participants used to describe the morphological, biological and genetic attributes of human and non-human animals and the moral significance that is attached to these features. These descriptions contained normative assumptions about the significance of certain biological characteristics as determinants of moral status. While these moral arguments were sometimes made explicit, they were more often implicit in how participants spoke about and described human embryos.

#### *Discursive Portrayals of the Embryo*

Rhetoric was frequently employed in statements made about the biological and technical aspects of stem cell research, which included descriptions of the embryos' size, shape and genomic composition as well as the processes in which they are created and destroyed.

Unsurprisingly, the rhetoric employed by policy advocates implied different meanings and claims about the moral significance of these attributes than that of the opponents. For example, human embryos were attributed with little to no moral status in statements made by

policy advocates such as Bob Turner and Joanne Knott who drew on aspects of foetal developmental to describe the embryo as a “tiny cluster of cells”:

It is this tiny cluster of cells, so small they can barely be seen under a microscope, and unfertilized by sperm, that opponents of SCNT focus on. Opponents of SCNT claim that this cluster of cells is a human being: we say it is human cellular material, and because this will never be implanted in a uterus, it can never develop into a human being. [Bob Turner and Joanne Knott] *The Australian*

Turner and Knott’s language devalued embryos as microscopic “cellular material” and contained unstated assumptions about the moral significance of intent. Very different assumptions underpinned the manner in which opponents of ESC research rejected the idea that the size and shape of embryos were morally relevant attributes. Their claims tended to imply that, despite their small size and ‘non-human’ shape, embryos are owed moral status due to other, more intrinsic attributes. For example, in the following op-ed, Angela Shanahan suggests that the genetic composition of human embryos was more important than their size and cellular organization:

The biological fact about this cluster of cells is that it is human, with an entire and unique genetic code. The embryo may indeed be only a potential person, but it is a unique human being. [Angela Shanahan] *The Australian*

Shanahan’s statement assumes that moral status is attached to an ‘intrinsic’ biological characteristic of the embryo – its ‘human’ genome – and to its potentiality. Implicit in this claim is an assumption about the moral relevance of genetics. Such claims humanize embryos by personifying them with human genetic characteristics. As noted elsewhere (Lynch, 2009; Mulkay, 1997; Parry, 2003; Williams, Kitzinger, & Henderson, 2003), use of these strategies attaches different meanings and ontological status to biological objects. Regardless of the status that is attributed to living entities, or to particular biological or social characteristics, the

use of science to support these claims is informed by norms that vary over time, across cultures and within communities (Lynn, 1998). When they come into conflict, norms that are used to justify moral arguments are contested, which played out in the Australian debate through the attribution of meaning and value to the objects of study in stem cell science.

### *The Manifestation of Social Values and Moral Norms*

The norms and ideals of science were a rhetorical resource that participants frequently used throughout the Australian debate to support their position. Prominent scientists drew on heavily on the rhetoric of science in debating the merits of ESC research. For example, opponents such as Professor Emeritus John Martin, who is a distinguished Australian scientist, employed the rhetoric of science to dismiss claims that supported the potential utility of SCNT as being scientifically unjustifiable, premature or outright fraudulent. To support this position in his op-eds, Martin drew on terms like “evidence”, “proof” and “experimental” to argue that SCNT research was technically untenable:

What is the evidence for any of these possibilities? There are no cell-based therapies for any disease that would warrant the preparation of human embryonic stem cells by somatic cell nuclear transfer. Proof of this as an approach has never been obtained from any experimental model of disease in animals. [John Martin] *Sydney Morning Herald*

The argument outlined in Martin’s statement asserts that a sufficient amount of evidence should exist before this research be allowed to proceed. Underlying this argument is an assumption that the burden of proof is high because embryos have the moral status of human persons. The argument also conceals assumptions about the moral status of non-human animals. In other words, judgments about the adequacy of existing research and the standards

of proof required to support further research were made on the basis of pre-formed judgments about the ontological status of human embryos, particularly those created using SCNT.

The use of scientific evidence to assess the potential costs and benefits of research and standards of proof requires moral judgments. Participants must form judgments about such things as a definition of what constitutes a benefit, the significance of those benefits, and what level of harm should be tolerated by whom before scientific research is considered un/acceptable (Hempel, 1965; Longino, 1990; Myrdal, 1969; Polanyi, 1962; Rudner, 1953). The use of scientific evidence to inform decisions about the meaning of research findings is, therefore, culturally-embedded with norms that are relative to the values and commitments of those who make these judgments (Laudan, 1984). As participants need to emphasize evidence that best supports their arguments, moral judgments must also inform decisions about which research findings to highlight, dispute and ignore.

So far, this study paints a picture of science that is heavily laden with norms and values when used in public discourse. The use of science claims in policy contexts is necessarily evaluative (Douglas, 2007; Putnam, 2002) because the objects and processes of science cannot be separated from the normative framework that supports it (Latour, 1993; Proctor, 1991). The genetic properties of embryos and the pluripotent characteristics of stem cells are examples of how socially constructed objects are invested with meanings that differ according to the context in which they are being used and by whom. Whether these objects are “dangerous”, “special”, “tiny”, or some other characteristic, is dependent upon the social actors who invest them with meaning and value.

In molding the meanings of scientific objects, science thus provided the discursive tools that positioned some participants in the Australian debate as righteous and others as immoral. They work to impose judgments on the necessity, justification and permissibility of ESC/SCNT research as well as on those who might benefit from it. Participants gained the moral 'high ground' by drawing on a range of theological, philosophical and political resources. Of these resources, science claims were prominent because the status of scientific knowledge is privileged with authority in public discourse.

#### **4. Legitimation and the Rhetorical Power of Science**

Science has rhetorical power that, when used effectively, is persuasive and can be mobilized in gathering support for a favoured position. Science has this power, in part, because of legitimation processes that privilege the moral and epistemic authority of science and scientific expertise. Similar to other contexts where participants form alliances with technical experts (Banchoff, 2005; Gottweis, 1998; Jasanoff, 2005), science was mobilized as a rhetorical resource that many participants in the Australian debate used to establish legitimacy and assert authority.

##### *The Legitimacy of Expertise*

At the commencement of each interview, participants were invited to provide backgrounds on themselves and their interests in the debate. In response, participants generally sought to present themselves as possessing some form of expertise. Any formal training or qualifications they had, especially in science, were emphasized and often in some detail. There was a

particular emphasis on the interviewees' professional background, which often distracted from their personal interests and moral concerns.

The two journalists interviewed in this study, for example, portrayed themselves as reporting on an important political or scientific issue, as mandated by their occupation. Both acknowledged their personal interests in the issue, but tended to draw more on the professional discourses of journalism when discussing their participation in the debate. One journalist who was opposed to the policy proposal acknowledged his personal interests as a Catholic father of a large family while framing his participation in terms of his extensive experience in journalism and as a political editor reporting on stories relevant to Australian politics. His "approach" to the debate was described objectively as if detached from it while nonetheless clearly stating his moral opposition to ESC research throughout his op-ed contributions.

I've been a political reporter for almost 30 years and when the stem cell debate came up, I approached it as a political story. It was the same when the Euthanasia debate came up 10 years ago. As a paper we covered it as a political story out of the Northern Territory. Obviously I am a Catholic father of nine and we haven't hidden that. Because of that what I write tends to be even more closely watched, at which I have no argument with but I have approached the regional stem cell debate and the latest one on the basis of a political story [Opponent A]

Others sought to avoid the moral issues concerning the embryo by focusing on other discourses. While this focus may have reflected genuine concerns for other social and moral issues, it also functioned as a form of legitimation. Some opponents denied that the moral status of embryos was relevant to their position and expressed sensitivity in discussing the issue. Opponent B, a practicing Catholic known to have strong moral views, objected to having his arguments framed in these terms and insisted that his concerns were strictly scientific:

I have personal views which are distinct and they are mine. I'm having these arguments based on the science. And I have made the arguments based on the science and I have constantly run up against 'oh you think such and such, we know where you are coming from', which is pretty irritating actually. [Opponent B]

During this interview, Opponent B maintained that his participation in the debate was purely professional.. Although the frustration expressed in above statement suggests that criticisms of his professional opinions as being biased by his moral views were taken very personally. Also, the emphasis on his role as a scientist suggests that his professional opinions were thought to count more than his personal views. Rhetorically separating the personal from the professional – the facts from the values – was a discursive resource that many participants used to establish their legitimacy as 'disinterested' experts. Its utilization suggested that some discourses, along with the professional norms, values and interests attached to them, were perceived to have greater legitimacy than others in the stem cell debate.

Policy advocates also drew distinctions between their personal and professional perspectives. When doing so, advocates often displaced themselves from the moral issues by reflecting on the personal views of opponents as a counterpoint to their own. Framing the issues in this way suggested that moral status was as not of primary importance to the policy advocates, but rather, one they responded to. Like the opponents interviewed in this study, however, the policy advocates made little recognition of the relationship between their moral perspectives of the embryo and their professional participation in the debate.

I am quite happy that some scientists don't share the same view as me of what the moral status of an embryo is. There are some scientists who wouldn't agree. My personal opinion is that an embryo has a potential for life but it can't have that potential realized until it is placed inside a uterus. It just can't have that potential realized. It's a special type of human cell but I don't see it as a human...I know a lot about this area and there are a lot of people talking who don't know a lot about the area and I wanted to demystify, and I don't know if educate is the right word, and



certainly not convert, but I wanted to clarify the science in the area and perhaps alleviate the concern of some people and hence why I have personally been very interested in participating in the debate. [Advocate A]

Advocate A is a scientist who, like others, expressed her personal interests in mobilizing her scientific knowledge and expertise to “inform” others about the science behind the debate. Her professional and personal interests in this instance were indistinguishable and clearly interrelated. However, participants’ personal and moral views were more often obscured by the discourses they used to contest the technical points of stem cell science. The rhetorical separation of personal and professional values, therefore, also suggests that while there was a perception that scientists may participate in public discourse as technicians, their ability to participate directly as individuals complete with personal interests in the moral debate was more limited.

How convincing participants were at maintaining these distinctions depended on how persuasive they were at deploying the rhetoric of science. This rhetoric dominates the practice of science and normatively reinforces the separation of objective knowledge from the subjective beliefs, values and ideals of social actors (Atkinson, 1999; Bazerman, 1997; Gilbert & Mulkay, 1984; Latour, 1987; Latour & Woolgar, 1979). The most successful rhetors in the Australian debate were those who deployed this rhetoric so effectively that it seemed like they were just ‘stating the facts’ and were not attempting to bias the debate towards their political and ideological preferences (Gross, 1990). Given their training in the specialist discourses of science, scientists were highly suited to this purpose.

### *Trust, Credibility and the Authority of Scientists*

As indicated in the op-ed analysis, the most prominent discourses in this debate, besides those surrounding the embryo, centred on the technical aspects of stem cell science and the comparable utility of different stem cell sources. Interviewees were asked to reflect on the contested claims about stem cell utility, and while the contestation of science was generally considered as unproblematic, there were competing perspectives about what was an appropriate use of scientific knowledge in a moral/political debate. Many questions were also raised about who had authority to 'speak for' science.

For many of the scientists interviewed, scientific knowledge was an essential prerequisite, as was a scientist's standing within the scientific community and the specificity of their expertise. In some instances, the seniority of a scientist could be weighed against the relevance of his or her expertise. In others, their expertise could be undermined by their professional status and institutional standing (or lack of it). The interviews ultimately revealed highly complex hierarchical arrangements between scientists that were often tacit, unclear and contestable:

I had several chats to XXX and he's fully entitled to his opinion and fully entitled to speak out on it if he strongly believes that, which he does, then you know he has every right to express that. What surprized me was that the XXX that I know basically cuts incompetent scientists off at their knees and for him to stand side by side with YYY, you know, I felt very disappointed because he is an extremely high quality, extremely highly respected scientist who has made very very important contributions to the area. Standing side by side with somebody who has really only, as ZZZ put it, you know, he's a junior low achiever. [Advocate B]

In this statement, Advocate B expressed respect for and acknowledged the authority of a senior colleague while simultaneously expressing a sense of betrayal for supporting another, more junior (and hence less credible) scientist who opposed the policy proposal. Scientists who

opposed ESC/SCNT research were criticized (by policy advocates) for their real and perceived religious commitments – a consideration which rarely factored as relevant for policy advocates, even where they had openly acknowledged their religious views. These commitments were often targeted in discrediting the opponents' technical claims, particularly where a scientist's professional reputation was beyond reproach:

I do not know of any scientists who are claiming that there will be no benefits from embryonic stem cell research apart from scientists who are totally religiously committed as their primary points of view. So to quote XXX who is a personal friend and a person who I respect as a scientist and ignore the fact that XXX has been for the whole of his life a totally dedicated and committed Roman Catholic who accepts the view of the Church on this subject is silly. Because XXX will himself agree that his views are primarily based on his religious faith rather than on his science. This is absolutely fine. You know and I don't have a problem with him having views like that. I do have a problem if he says 'I am taking this view as a scientist'. [Advocate B]

Again, in this statement Advocate B expresses respect for colleague XXX while objecting to a scientist contesting the claimed consensus of the scientific establishment on personal bases. At first, these dual discourses appear to conflict but nevertheless do work in discursively undermining the credibility of an opponent's counterclaims while maintaining hierarchical relationships within a discourse community. On the other hand, opponents of ESC/SCNT research used slightly different strategies in discursively diminishing the credibility or authority of prominent scientists supporting liberal policies:

Well you know that Australian Academic of Science and the Chief Scientist were asked to go and talk to parliament. Well what AAA would know about this simply eludes me totally. AAA is a botanist and biochemist, and a very distinguished one, but really knows nothing about this... There are very, very few people who are informed about this topic and BBB keeps getting up and presenting himself as the representative of the Australian Academy of Science and talking about this and I had to email him about this yesterday saying, 'well look, nobody has asked me'. I'm a Fellow of the Australian Academy of Science. There's been no consultation with the Academy of Science and there aren't many people in the Academy of Science who are really in any position to make any informed comment on this at all. And yet he is getting up there and speaking as if he was the representative. So who speaks? [Opponent B]

In this statement, Opponent B dismisses the expertise of Australia's Chief Scientist as being largely irrelevant and claims that stem cell scientists at the Australian Academy of Science failed to consult with the broader membership in publicly supporting the policy proposal. As such, it was implied that ESC supporters at the Academy could not claim authority to speak *on behalf of* the scientific community, alluding to an assumption that institutional decisions within science are, or least ought to be, consultative and democratic. While Opponent B clearly appears to have been frustrated by the representations of senior scientists supporting the policy proposal, his expressed concerns about the process of political representativeness may be seen as a strategic attempt to discursively delegitimize the delegated authority of appointed officeholders. Another strategy was to highlight possible economic interests of scientists supporting the policy proposal:

The lobbyists employed by the Australian Stem Cell Centre, the scientists not employed by the Australian Stem Cell Centre, eminent scientists who weighed in with a view that is not based in science so much as being based on a view about science in general. That is, the subtext for a lot of it seems to be that if the government wants to legislate about us doing science in this area that they will control and legislate about science in all areas. So it seems like its fear driven [Opponent C]

Scientists were framed in this statement by Opponent C as agenda-driven "lobbyists" who may not only have vested interests in pursuing more liberal legislation but may also hold fears of losing their autonomy if science is overly regulated. Such interests represent flaws in the character of 'good' scientists and thus might imply potential biases in their scientific judgments. This strategy may have been aimed at countering the criticisms targeted towards the perceived personal biases of opponents holding religious views. In this sense, scientists on both 'sides'

were calling into question the disinterestedness and impartiality of others using similar rhetorical tools that appealed to the character or ethos of scientists (Prelli, 1997).

Scientists are generally privileged with expert authority in policy contexts on the basis of their assumed impartiality and disinterestedness (Merton, 1942/1973). Suggesting that scientists have some sort of conflicting interest in a policy issue calls their credibility into question because it runs counter to the rhetorical norms of value-neutrality (Mitroff, 1974). Their credibility may easily be undermined because the source of bias can be situated with any social value – financial, ideological, political or personal. As the effective use of science claims is contingent upon one's trust in the character and credibility of those who use them (Carey, 1996), they work to contest the moral and epistemic authority of scientists.

#### *Contested Moral and Epistemic Authority*

Moral and epistemic authority was contested on three levels during the Australian debate. First was at the individual level, where participants entered public debate to speak about the moral and technical issues either for themselves or the institutions they claimed to represent. The second was at the macro-level of the social institution, where organizational 'actors' such as the ASCC and Anglican Church, entered the debate to speak for, or on behalf of, the institutional norms, values and ideals they ascribe to. The third was at the meta-level of epistemology where participants appealed to the epistemic and moral authority of science and religion.

Participants from across the debate drew on multiple epistemic and moral resources, often in heterogeneous ways. Some policy advocates drew on their religious beliefs in portraying the embryo as morally irrelevant, while some opponents drew on secular arguments in conferring

embryos with moral significance. Consistently, however, all drew on scientific resources to substantiate their moral arguments:

Those people see themselves as protecting human life but the question is 'when does human life begin' and for them, human life begins at conception. Now of course this view became powerfully underlined in the 19<sup>th</sup> century within the Roman Catholic Church with the development of embryology and being able to see the embryo under a microscope. But to my mind, while certainly a form of something living, it is not a human life. Embryonic life or what people now refer to as pre-embryonic life, whether that is accurate I don't know, but it's not a human foetus that's for sure. The apparatus for the human foetus begins at this 14 day stage with the development of the primitive streak. [Advocate E]

As an authoritative figure within the Anglican Church, Advocate E expressed an alternative view to the "Christian view" that is commonly presented in public discourse. Intertwined within this view were discourses drawn from multiple epistemic and moral resources, including both the advocate's knowledge of embryology and its historical influences on Roman Catholic doctrine. In doing so, the Church's authority was challenged by framing its position as a socially and historically constructed 'truth' and, as such, was open both to contest and change. Religious values, or lack thereof, thus did not appear as a determinant of participants' support or opposition to ESC research, which was likely to have been contingent upon more complex understandings of the epistemic, moral and social discourses in play and the participant's ability to shape them.

Most interviewees generally agreed that no one individual or institution could rightly claim moral authority in this debate. Some, however, felt that while science played an important technical role, it was inherently unable to address the moral issues that arose in the stem cell debate. Another authoritative figure within the Catholic Church who opposed ESC research suggested that while scientists should contribute to debate concerning the moral dimensions of

their work, their authority in areas of moral philosophy was weakened by nature of scientific inquiry:

Science will tell us at what stage a developing embryo or foetus or newborn child demonstrates capacities like perception sensation language some kind of rational thought. Those are questions that science can provide some information on. But it can't tell us what is the marker that really matters - that it's rationality that matters or sensation is what matters or just being a human organism is what matters. Those are essentially philosophical questions... There is only so much we can ask scientists to do. We can't expect them to do the philosophical or theological thinking. That said, one would hope and one should respect that scientists themselves always have a perspective and they come with a philosophy and theology of their own. Very often, even if there are differences between them and there is no single neutral perspective here that is somehow outside of human observation and experience, everyone brings their baggage with them to these issues and interprets the science they see with a certain mindset, which may evolve and change and be challenged and be radically undermined or converted in one way or another as time goes on. [Opponent D]

In this quote, science is portrayed as a source of descriptive knowledge with limited capacity to evaluate issues of moral significance. Opponent D asserts the authority of moral theology by portraying science as a social system with a specific epistemology that is ("one would hope") governed by its own values, beliefs and ideals which are open to change and contestation. Its neutrality is questioned and malleability of its terms and meanings is implied. Thus, science is not merely put on an equal footing with theology; it is rendered as entirely inadequate in addressing moral philosophical questions – a responsibility to be shared amongst other ways of knowing that may be better suited to this purpose.

Science and religion are both immensely powerful institutions with purportedly coherent sets of norms, values and ideals (Turner, 1997) that are reflected in the discursive strategies adopted by those who claim to represent or speak on their behalf. However, these values and ideals are not discrete and individuals may identify with the values of both at any one time and incorporate them into the language they use in public discourse (Weasel & Jensen, 2005). As

such, participants may draw upon a range of epistemic and ontological resources in formulating their perspectives, even if these conflict with the prevailing norms of a particular institution (Jasanoff, 2004). Hence, while there may be a rich heterogeneity in the discourses used by the individuals who actually engage in the stem cell debates, both in Australia and elsewhere, there will also be homogeneity at the institutional level where science policy issues are ultimately contested.

## **5. Conclusions**

This study examined the mobilization of science and scientific knowledge in public debates surrounding ESC research in Australia. The purpose of this study was to examine the space that science occupies in public contests over facts, values and 'evidence' and disagreements over who has legitimacy and authority to determine how major science policy issues are resolved. From this study, it is clear that science manifests as a discursive tool that provides participants with powerful political, moral and rhetorical resources. As discursive tools, science claims contain moral dimensions that are informed by the norms, values and ideals that shape the meaning of key terms and concepts that are used in debate. Science claims are political in that they provide participants with a source of legitimation to negotiate meaning, and are rhetorical in that, when used effectively, they are also persuasive.

In the public debate surrounding the Australian stem cell policy episode in 2005-6, science claims were a rhetorical means of achieving a desired moral outcome. Science claims allowed those opposed to the liberalization of Australia's stem cell policy to state their opposition in terms of the immorality of creating and destroying human embryos for research purposes. In



contrast, they allowed the policy advocates to position their arguments within the ethical framework of medicine and the moral good of pursuing outcomes associated with medical benefit. Science was mobilized as a reliable, valid and neutral source of knowledge, giving it a moral authority that worked to invest each position with truth and integrity. Through it, participants were able to draw on the authority of science to frame their arguments in ways that seemed more than simply a particular personal or religious perspective. Unsurprisingly, therefore, each 'side' accused the other of misconstruing scientific evidence and corrupting the truth with vested interests, political ideals and social values. Attacks upon the experts 'acting' for each side thereby challenged the legitimacy of their '*scientific*' authority and, by association, their moral authority.

The role of science in this policy episode, therefore, was not necessarily to inform, or even to persuade, but to win. This eristic use of scientific rhetoric raises questions about whether this is the role science ought to play in public discourse. Science plays an important rhetorical role as a means of exploring possible meanings and solutions to policy problems as well as helping to clarify and deepen public understandings of the issues at hand. However, the authority of science is misused when it utilized as means of silencing others and winning at all costs.

Such misuse is perhaps an inevitable outcome of policymaking processes that are set up within a win/lose framework, where interested parties can only either support or oppose a policy proposal. Disguising arguments that may actually be jurisdictional as questions over definition, quality and characteristics might also suit certain actors. Thus, moving away from this culture of argumentation might not serve the interests of those who have power to change it. However,

such frameworks are inherently inequitable and, in the long term, have the potential to greatly damage public trust in science. Alternative frameworks might consist of more deliberative forums where a much broader range of voices are included in the decision-making process. While such frameworks will undoubtedly also have their limitations, greater deliberation may widen the possible positions and outcomes that are available in resolving science policy issues and ultimately encourage a more open and enriched public debate.

Ankeny, R., & Dodds, S. (2008). Hearing community voices: public engagement in Australian human embryo research policy, 2005-2007. *New Genetics and Society*, 27(3), 217 - 232.

Atkinson, D. (1999). *Scientific Discourse in Sociohistorical Context: The Philosophical Transactions of the Royal Society of London*. Mahwah, NJ: Lawrence Erlbaum Associates.

Banchoff, T. (2005). Path dependence and value-driven issues: The comparative politics of stem cell research. *World Politics*, 57(2), 200-230.

Bazerman, C. (1997). Reporting the experiment: the changing account of scientific doings in the philosophical transactions of the Royal Society, 1665-1800. In R. A. Harris (Ed.), *Landmark Essays on Rhetoric of Science: Case Studies* (pp. 169-186). Mahwah, NJ: Hermagoras Press.

Beauchamp, T. L., & Childress, J. F. (2001). *Principles of Biomedical Ethics* (5th ed.). New York: Oxford University Press.

Callahan, D. (2003). *What Price Better Health? Hazards of the Research Imperative*. Berkeley, CA: University of California Press.

Carey, C. (1996). Rhetorical means of persuasion. In A. Rorty (Ed.), *Essays on Aristotle's Rhetoric* (pp. 399-415). Berkeley: University of California Press.

Commonwealth of Australia. (2002a). *Prohibition of Human Cloning Act* (Vol. 144, 2002). Canberra: The Parliament of the Commonwealth of Australia.

Commonwealth of Australia. (2002b). *Research Involving Human Embryos Act* (Vol. 145, 2002). Canberra: The Parliament of the Commonwealth of Australia.

Commonwealth of Australia. (2006). *Prohibition of Human Cloning for Reproduction and the Regulation of Human Embryo Research Amendment Act 2006* (Vol. 172, 2006). Canberra: The Parliament of the Commonwealth of Australia.

Cooper, D. (2006). The Lockhart Review: Where now for Australia? *Journal of Law and Medicine*, 14, 27-44.

Douglas, H. (2007). Rejecting the ideal of value-free science. In H. Kincaid, J. Dupre & A. Wylie (Eds.), *Value-Free Science? Ideals or Illusions* (pp. 120-139). New York: Oxford University Press.

Gilbert, G. N., & Mulkay, M. (1984). *Opening Pandora's Box: a sociological analysis of scientists' discourse*. London: Cambridge University Press.

Gottweis, H. (1998). *Governing Molecules. The Discursive Politics of Genetic Engineering in Europe and in the United States*. Cambridge, MA: MIT Press.

Gottweis, H. (2002). Stem cell policies in the United States and in Germany: between bioethics and regulation. *Policy Studies Journal*, 30(4), 444-469.

Gross, A. (1990). *The Rhetoric of Science*. Cambridge, MA: Harvard University Press.

Harvey, O. (2008). Regulating stem cell research and human cloning in an Australian context: The Lockhart Review. *New Genetics and Society*, 27(1), 33-42.

Hauskeller, C. (2005). Introduction. In W. Bender, C. Hauskeller & A. Manzei (Eds.), *Crossing Borders: Cultural, Religious and Political Differences Concerning Stem Cell Research* (pp. 9-24). Munster: Agenda Verlag.

Hempel, C. G. (1965). Science and human values *Aspects of Scientific Explanation and Other Essays in the Philosophy of Science* (Vol. 81-96). New York: Free Press.

Jasanoff, S. (2004). Ordering knowledge, ordering society. In S. Jasanoff (Ed.), *States of Knowledge: The Co-Production of Science and the Social Order* (pp. 13-45). London: Routledge.

Jasanoff, S. (2005). *Designs on Nature: Science and Democracy in Europe and the United States*. Princeton, NJ: Princeton University Press.

Latour, B. (1987). *Science in Action: How to Follow Scientists and Engineers Through Society*. Milton Keynes: Open University Press.

Latour, B. (1993). *We Have Never Been Modern*. Cambridge, MA: Harvard University Press.

- Latour, B., & Woolgar, S. (1979). *Laboratory Life: The Social Construction of Scientific Facts*. Beverly Hills, CA: Sage Publications.
- Laudan, L. (1984). *Science and Values*. Berkeley: University of California.
- Legislation Review Committee. (2005a). Issues Paper: Outline of Existing Legislation and Issues for Public Consultation. *Legislation Review of Australia's Prohibition of Human Cloning Act 2002 and Research Involving Human Embryos Act 2002* Retrieved 5 August 2005, from <http://www.lockhartreview.com.au/>
- Legislation Review Committee. (2005b). Prohibition of Human Cloning Act 2002 and the Research Involving Human Embryos Act 2002. *Reports* Retrieved 20 December 2005, from <http://www.lockhartreview.com.au/>
- Longino, H. (1990). *Science as Social Knowledge*. Princeton, NJ: Princeton University Press.
- Lynch, J. (2009). Stem cells and the embryo: biorhetoric and scientism in Congressional debate. *Public Understanding of Science*, 18(3), 309-324.
- Lynn, W. (1998). Animals, ethics and geography. In J. Wolch & J. Emel (Eds.), *Animal Geographies: Place, Politics and Identity in the Nature-Culture Borderlands* (pp. 280-298). London: Verso.
- Merriam, S. B. (1988). *Case Study Research in Education: A Qualitative Approach*. San Francisco, CA: Jossey-Bass Publishers.
- Merton, R. K. (1942/1973). The normative structure of science. In N. Stoner (Ed.), *The Sociology of Science* (Vol. 267-278). Chicago: Chicago University Press.
- Mitroff, I. (1974). Norms and counter-norms in a select group of the Apollo moon scientists: a case study of the ambivalence of scientists. *American Sociological Review*, 39(4), 579-595.
- Mooney, C. Z. (2001). The public clash of private values. In C. Z. Mooney (Ed.), *The Public Clash of Private Values: The Politics of Morality Policy* (pp. 3-18). New York: Chatham House.
- Mulkay, M. (1997). *The Embryo Research Debate: Science and the Politics of Reproduction*. Cambridge, UK: Cambridge University Press.
- Myrdal, G. (1969). *Objectivity in Social Research*. New York: Random House.
- Nicol, D., Chalmers, D., & Gogarty, B. (2002). Regulating biomedical advances: Embryonic stem cell research. *Macquarie Law Journal*, 2, 31-59.

- Parry, S. (2003). The politics of cloning: mapping the rhetorical convergence of embryos and stem cells in parliamentary debates. *New Genetics and Society*, 22(2), 145-168.
- Polanyi, M. (1962). *Personal Knowledge Towards a Post-Critical Philosophy*. Chicago: University of Chicago Press.
- Prelli, L. J. (1997). The rhetorical construction of scientific ethos. In R. A. Harris (Ed.), *Landmark essays on Rhetoric of Science: case studies* (pp. 87-104). Mahwah, NJ: Hermagoras Press.
- Proctor, R. N. (1991). *Value-Free Science*. Cambridge, MA: Harvard University Press.
- Putnam, H. (2002). *The Collapse of the Fact/Value Dichotomy and Other Essays*. Cambridge, UK: Harvard University Press.
- Resnik, D. B. (1998). *The Ethics of Science: An Introduction*. London/New York: Routledge.
- Rudner, R. (1953). The scientist qua scientist makes value judgments. *Philosophy of Science*, 20(1), 1-6.
- Turner, J. (1997). *The Institutional Order*. New York: Longman.
- Waldby, C., & Salter, B. (2008). Global governance in human embryonic stem cell science: standardisation and bioethics in research and patenting. *Studies in Ethics, Law and Technology*, 2(1), Article 12.
- Walters, L. (2004). Human embryonic stem cell research: an intercultural perspective. *Kennedy Institute of Ethics Journal*, 14(1), 3-39.
- Weasel, L. H., & Jensen, E. (2005). Language and values in the human cloning debate: a web-based survey of scientists and Christian fundamentalist pastors. *New Genetics and Society*, 24(1), 1-14.
- Wilberg, P. (2003). *Heidegger, Medicine and "Scientific Method"*. Sussex, UK: New Gnosis Publications.
- Williams, C., Kitzinger, J., & Henderson, L. (2003). Envisaging the embryo in stem cell research: rhetorical strategies and media reporting of the ethical debates. *Sociology of Health & Illness*, 25(7), 793-814.
- Wilson-Kovacs, D. M., Weber, S., & Hauskeller, C. (2009). Stem cells clinical trials for cardiac repair: regulation as practical accomplishment. *Sociology of Health & Illness*, in print.

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<sup>i</sup> The one recommendation rejected by the Parliament related to the creation of ‘human-animal’ (admixed) embryos.

<sup>ii</sup> See online supplementary material for methods

<sup>iii</sup> Participants were categorised as either ‘advocating’ or ‘opposing’ the policy proposal to liberalize the existing legislation governing stem cell research in Australia.

<sup>iv</sup> Op-ed quotes are transcribed verbatim and authors attributed respectively. However, interview texts have been de-identified and edited according to standards for using verbatim quotations in reporting qualitative research (Corden and Sainbury 2006). Some interview texts have also been censored where interviewees have made potentially defamatory comments about other participants.

<sup>v</sup> Four of these items were written by political analysts making broader commentary on Australian party politics without stating a position on the whether the legislation ought to be liberalized. The position in the other item was ambiguous due to the degree of sarcasm and false analogies employed by the author (between Saddam Hussein, capital punishment and human embryos).