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Understanding the complexity of British public attitudes towards human cloning

## **Abstract**

The ability of scientists to apply cloning technology to humans has provoked public discussion and media coverage. The present paper reports on a series of studies examining public attitudes to human cloning, bringing together a range of quantitative and qualitative methods to address this question. These included a nationally representative survey, an experimental vignette study, focus groups and analyses of media coverage. In all of the analyses therapeutic cloning was viewed more favourably than was reproductive cloning. However, while participants in the focus groups were generally negative about both forms of cloning, and this was also reflected in the media analyses, quantitative results showed more positive responses. In the quantitative research, therapeutic cloning was generally accepted when the benefits of such procedures were clear and although reproductive cloning was less accepted there was still substantial support. Participants in the focus groups only differentiated between therapeutic and reproductive cloning after the issue of therapeutic cloning was explicitly raised; initially they saw cloning as being reproductive cloning and saw no real benefits. Attitudes were shown to be related to underlying values related to scientific progress rather than to age, gender or education, and although there were a few differences in the quantitative data based on religious affiliation, these tended to be small effects. Likewise in the focus groups there was little direct appeal to religion but the main themes were 'interfering with nature' and the 'status of the embryo', with the latter being used more effectively to try to close down further discussion. In general there was a close correspondence between the media analysis and focus group responses, possibly demonstrating that much of the information and discourse in this area is drawn from media coverage or that the media reflect public discourse accurately.

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## **Introduction**

In the post-genomic era, the growing capability of scientists to apply cloning technology to human embryos has prompted widespread media reporting and discussion – most controversially over claims that a human clone had been born (e.g. Guardian, 2003). Although these claims were widely discredited, it is true that today the cloning of human genetic material can no longer be seen as the domain of science fiction. Unlike many other countries including the USA, the cloning of human cells has been legally sanctioned in the UK for the purposes of medical research ('therapeutic cloning'). However, at the same time, specific legislation has been developed to outlaw reproductive cloning, where a cloned human embryo is implanted and allowed to develop to full term (HMSO, 2001).

Cloning is the technique of creating an identical copy of an organism from its genetic material using the technique of cell nuclear replacement (MRC, 2002). A distinction is made - at least in law - between therapeutic or research cloning and reproductive cloning. The former harvests special cells called stem cells which, at the early embryonic stage of development, have a unique ability to divide and differentiate into a range of body tissues. As stem cells from a cloned embryo will be genetically compatible with their donor, their potential benefits lie in medical therapy for a range of diseases and degenerative conditions. In reproductive cloning, the same technique is used to create a human embryo that is then allowed to develop into a baby that is an identical genetic match to the donor.

Much of the controversy and debate surrounding human cloning for both therapeutic and reproductive purposes centres on moral and ethical issues around the creation of a human embryo. A key issue is under what circumstances, if any, can it be considered acceptable to end one life – that of the embryo - with the objective of saving another (Reiss, 2002). Exactly when in its development should a human embryo be accorded human rights and protection? This issue is hotly debated within ethical and religious contexts (for example, see McCarthy, 2003) and is unlikely ever to be resolved, although advisory bodies generally acknowledge that there are specific circumstances where using stem cells from human embryos can be justified by the potential health benefits arising from the research.

A subsidiary set of arguments around human cloning arises from the connections between therapeutic and reproductive cloning (Bowring, 2004). The reasoning behind what may be termed the 'slippery slope' argument is that advances on therapeutic applications of cloning will inevitably lead to reproductive cloning, regardless of its legal status.

A number of large scale surveys report positive attitudes among the public towards science and new scientific developments (Gaskell, Allum & Stares, 2003b; MORI, 2005) but the same sources typically reveal considerable public scepticism about the motivations of scientists, and about the science the application of new technologies. Certainly for genetic science there are particular public concerns about privacy, ethics and tampering with nature (Calnan, Montaner & Horne, 2005). There has been little research in the UK specifically considering the ways in which the public makes sense of cloning.

Calnan et al. (2005) surveyed members of the public in England and Wales about their attitudes to new health care technologies, science and trust in health care practitioners. A scenario on reproductive human cloning was used based on an infertile couple participating in a clinical trial to have a baby. Only 12 percent accepted that the couple should participate in the trial compared with 68 percent who rejected it. Other scenarios based on non-

embryonic stem cell therapy and genetic screening were received much more favourably, leading the authors to conclude that support for genetic technologies is heavily dependent on its stated purpose.

In 2005, an online survey by YouGov questioned over 2000 adults about cloning and embryo research (YouGov, 2005). A total of 66 percent agreed that 'the rights of the patient are more important than the embryo', with only 15 percent disagreeing with this statement. A majority of 58 percent endorsed the view that embryos are not really human beings from the moment of conception but believe that their use should be governed by law. Just over one quarter found therapeutic cloning acceptable using embryonic stem cells to treat disease, but a much lower proportion found it acceptable for cosmetic purposes. Approximately 6 in 10 people thought that scientists give too little thought to the moral issues involved.

A qualitative study using reconvened focus groups by the Wellcome Trust (1998) concluded that participants were overwhelmingly against cloning and that the provision of information about cloning did little to modify reactions of shock, concern and fear around the technology. While most of the participants were familiar with the idea of reproductive cloning they lacked any prior knowledge of therapeutic cloning.

Previous analyses of media coverage in this area have also highlighted the distinction made between therapeutic cloning as 'good' and reproductive cloning as 'bad' (Petersen, 2001) and also examined the types of rhetorical devices used in the debate surrounding the use of stem cells and contrasting views of future developments (Kitzinger and Williams, 2005).

While provoking strong opinions among many, public surveys and consultation exercises about human cloning show that attitudes vary according to its stated purpose, perceived utility and morality (e.g. Bates, Lynch, Bevan, & Condit, 2005; Gaskell, Allum, Bauer, Jackson, Howard & Lindsey, 2003a; Gaskell et al., 2003b; HFEA, 1998). It is often uncertain, however, to what extent public opinion is influenced by the media environment at any given time or the manner and context in which questions about human cloning are asked. How the potential harms and benefits of cloning are presented arguably has a direct impact on the level of public support found in opinion polls (Genetics and Public Policy Center, 2005). Public responses to human cloning must also be seen in the context of the current socio-political climate; for example, recent research indicates that although some types of scientist continue to be considered as valuable sources of scientific information and advice about science, there are growing public concerns that the independence of scientists may be compromised by the interests of their funders and the commercialisation of such funding (MORI, 2005). These concerns may well have been further intensified by the recent highly visible controversy around falsification of scientific data in this area (Wohn, 2006).

This brief overview of research exploring public perceptions and understandings of cloning depicts a somewhat fragmented set of findings largely derived from studies using single methods and ranging over a period of years over which there has been considerable developments both in the science and in the accompanying media coverage.

This paper reports multi-method research on public attitudes towards new genetic technologies in the UK. Drawing on both quantitative and qualitative data affords us a unique opportunity to investigate the nature, spread and strength of opinion among the British population and the resources and reasoning used by people to make judgements about this genetic technology. We are able to locate our empirical findings in the context of media

reporting of human cloning over the same time period, helping to provide a rounded and current picture of human cloning as a public issue.

## **Method**

The data reported here were collected as part of a large study on attitudes to genomics which comprised several separate elements. Data are reported from two quantitative pieces of work, a national survey and an experimental vignette study, and two qualitative elements, a focus group study and media analyses. Each of these pieces of work was conducted separately and there was no overlap in participants between the different pieces of work. The methods for each strand of work are described briefly below.

### *Survey*

Questions on human cloning were administered as self-completion items on the British Social Attitudes Survey, an annual survey of social and political attitudes in the UK that was conducted between June and September 2003. This yielded a nationally representative sample of approximately 2 500 adults aged 18 and above. The key questions in the survey for the purposes of this paper are four questions on attitudes to cloning for different purposes. The first three were on therapeutic cloning for different purposes and were preceded by a short preamble:

*You might have heard of something called human cloning. One type of cloning would be if a person's genes were copied exactly and used to make an embryo. Cells from the embryo could be used to supply the person with tissues or organs that would be a perfect match for them, meaning their body would not reject them. Do you think this should be allowed or not allowed for if a person ...?*

1. .. needs an organ transplant
2. .. needs treatment for Parkinson's Disease
3. .. is generally in good health and wants to live longer

We also asked one question on reproductive human cloning:

*Another type of human cloning might be used to treat a young couple who are infertile and cannot have a child. Suppose that the genes from one of them were copied exactly and used to make an embryo with exactly the same genetic make up as that parent. Do you think this should be allowed or not allowed ...?*

For further details about the design of this survey and the questions used see Park, Curtice, Thomson, Bromley & Phillips (2004) and in particular Sturgis, Cooper, Fife-Schaw & Shepherd (2004).

### *Vignette study*

Participants in the vignette study comprised 368 adult members of the British general public who were categorised as having either high or low trust in science. The study was carried out between May and September 2004. The groups were selected on the basis of agreement or disagreement with the item "Those in charge of new developments in genetic science cannot be trusted to act in society's interests". Participants completed a baseline questionnaire assessing demographic and attitudinal variables and were then randomly assigned to receive

one of four vignettes. The vignettes described either therapeutic or reproductive cloning and contained either arguments in favour of banning the technology outright or allowing it under regulated conditions. Thus the study had a two (therapeutic versus reproductive cloning) by two (arguments for banning or arguments for controlling the technology) between-subjects factorial design. Participants then completed follow-up questions on their attitudes towards the situation described in the vignette and cloning in general. For the present analysis the four items of interest are:

1. Cloning, as described, should be banned
2. Cloning, as described, should be allowed under certain circumstances
3. Cloning technology threatens the natural order of things
4. Cloning technology poses no threat to future generations

Response options ranged from 1 (strongly disagree) to 5 (strongly agree). The vignettes and the questionnaire are available from the authors on request.

### *Focus groups*

The focus group study was carried out between July 2004 and April 2005 and involved ten groups which (potentially) addressed the issue of cloning. Eight were conducted at six locations in England, Scotland and Wales with members of the general public who had no particular involvement or investment in genomics-related issues. Four addressed health-related technologies; four did not focus on specific applications. Group members were recruited by a fieldwork agency to reflect the demographic profile of the populations in the various group locations. Two additional focus group interviews were conducted with people affected by genetic disease, who were recruited through the Clinical Genetics Department of a London hospital. The eight general public groups consisted of 80 individuals and the two groups of people affected by genetic disease consisted of 12 individuals. Participants were paid an incentive of £35 to take part.

Each focus group was facilitated by two moderators, using an interview schedule which, among other issues, invited participants to identify the developments in (health-related) genetic technologies that they had heard about or encountered and to describe what they had heard, what their reactions have been and how they evaluate the acceptability of these technologies. In relation to cloning, if participants did not distinguish between reproductive and therapeutic cloning, the interviewers provided definitions of these technologies in line with the definitions outlined previously and then asked participants about their responses.

Interviews were transcribed, coded in terms of content using N-Vivo and then subjected to an integrative form of discourse analysis that attended to both relatively micro-level and macro-social features of talk (Wetherell, 1998) in order to identify the ways in which and the basis on which 'attitudes' and 'knowledges' relevant to cloning are constructed and worked with. However, space constraints mean that, in this paper, findings from the focus group studies are presented more as the outcome of a social constructionist version of thematic analysis (Joffé & Yardley, 2004) rather than in the level of detail normally expected in discourse analysis.

### *Media analyses*

A qualitative analysis of genomics-related texts was conducted on data drawn from newspaper articles from six UK newspapers (the *Times*, the *Guardian*, the *Daily Telegraph*,

the *Daily Mail*, the *Sun*, and the *Daily Mirror*) during a 3-month monitoring period (12 January – 11 April 2004, inclusive). Using the method of discourse analysis (broadly defined) this qualitative dataset was systematically analysed to identify central and recurring themes, constructions and understandings of genomics.

## **Results**

The following results are presented under two themes which emerged from the analysis of the different types of data: the distinction between cloning for therapeutic or reproductive ends and values and beliefs underlying attitudes to cloning. In each case, results are presented from different pieces of research in order to illustrate the contribution of each method to addressing these general issues; given space constraints, it is not possible to present all of the relevant findings from any one of the methods.

### *Therapeutic versus reproductive cloning*

Each of the data sets provides some insights into the nature of the distinction between therapeutic and reproductive cloning. The survey and experimental data show that the information provided around the purpose of cloning were clearly related to judgements of various applications. Interestingly the focus group discussions indicated that when people are left to their own devices they do not spontaneously differentiate these two facets. Both the focus group discussions and the media analysis show the use of the ‘slippery slope’ metaphor (Bowring, 2004) affords a way of framing considerations of therapeutic and reproductive cloning.

Analysis of the survey data suggests that obvious benefit is important for the attitudes the general public express towards therapeutic cloning. The purpose of such cloning research clearly had an impact on the attitudes people expressed. Survey respondents were strongly in favour of cloning where the benefits were clear (for an organ transplant or for Parkinson’s disease) but not where cloning was simply to prolong the life of a healthy individual (see Table 1). Although responses were more mixed when the application was reproductive, nonetheless a substantial number of people (38%) felt that it should definitely or probably be allowed (Table 1).

As in the survey, the respondents in the vignette study were more positive towards therapeutic cloning than they were towards reproductive cloning (Table 2). This was particularly true for the questions directly related to the form of cloning ‘as described’ in the vignette but was also apparent for the questions which asked about cloning without specifically referring to the vignette.

In contrast, explicit distinctions between reproductive and therapeutic cloning did not typically occur spontaneously within the focus group discussions, in line with analysis of earlier focus groups (Wellcome Trust, 1998). Often the initial discursive object was the generic concept of cloning, interpretable as reproductive cloning. The frequent references made to ‘Dolly the sheep’ suggest that reproductive cloning currently operates as the ‘default’ reference point for the generic concept. Participant discussion of therapeutic and reproductive cloning as separate technologies often only occurred when one of the focus group facilitators made the differentiation. Aside from early invocations of the discursive resources of ‘the status of the embryo’ and ‘interfering with nature’, discussions of the permissibility of cloning as both a generic and differentiated technology followed a utilitarian

ethical framework: their permissibility was negotiated in terms of their constructed costs and benefits.

Across the focus group discussions, reproductive cloning was routinely constructed as failing to provide widespread appreciable benefits or as yielding only the most obscure benefits for a very small number of individuals. The cloning of animals or humans was constructed as likely only to benefit individuals with morally questionable motives and/or with the financial means to secure the services of unscrupulous scientists. In conjunction with constructions of reproductive cloning as 'interfering with nature' and therefore as representing a potential cost, the constructed lack of general benefits of reproductive cloning warranted construction of it as an impermissible technology. The social undesirability of reproductive cloning was further evidenced by its invocation as a discursive resource in terms of being the implied end point in 'slippery slope' arguments against the permissibility of therapeutic cloning. Some of these features can be seen in the following extracts:

Archie Well, I think the trouble is once the science exists, you will never stop scientists pushing the envelope. They are... they are going to take it further and further. I mean, you talk about this idea of what Gabi said about, you know, there's allegedly been a child cloned in Italy. I'm quite sure there's been children cloned, quite certain of it, but you won't hear about it, you know.

Jocelyn You'll see a film about it.

Archie You'll probably find Michael Jackson's got several at Neverland.

(Focus Group 7)

Megan The government have already said 'yes' to the therapeutic cloning. We're already allowed to do that. The government decided for us that that's okay, which is a bit worrying, I think. I think we're the only European country that approved therapeutic cloning, I believe. It's one thing experimenting on embryos but also, it's a bit of a slippery slope into reproductive cloning, isn't it? That's the logical next step. Okay, they said 'Yes, that's wrong, everyone agrees, we're not going to clone a baby' but of course they will.

(Focus group 1)

In contrast to reproductive cloning, where the differentiation between the two technologies was made and where the link between therapeutic cloning and embryonic stem cell research was also made, therapeutic cloning was constructed as a permissible technology on the basis of its potential benefits to human health. The construction of therapeutic cloning as potentially contributing to the development of treatments for debilitating conditions, such as Alzheimer's disease and Parkinson's disease, warranted arguments in support of its permissibility. However, the construction of such treatments as unquestionable benefits was occasionally contested through the re-invocation of discourses of 'naturalness' and 'natural selection'. While the development of such treatments was constructed as desirable and beneficial on an individual level, they were occasionally constructed as not desirable and not beneficial on a collective level where they might result in increasing and increasingly aged populations. The potential benefits of therapeutic cloning and embryonic stem cell research were recast as potential costs in the context of global economic and environmental sustainability. The acceptance of therapeutic cloning on the basis of health benefits and resistance to acceptance on the grounds of interference with a natural process are evident in the extracts below:

Sophie So, then they're growing the stem cells...Is that the...? Which...which one is that?

Diana Therapeutic cloning.

Sophie Therapeutic. So, that's grown just for that. So, if you think about it, you're not reproducing. You're not messing about with another life. What you're doing is sustaining one that's here already. So, when you see how people suffer with it [Alzheimer's or Parkinson's] and what... Sorry. They don't suffer because, obviously, they don't know. It's the family and the grandchildren. I mean, you look at it like that and you think, 'Well, yes, if this was just to help them a little bit'

(Focus group 5)

Charlie Therapeutic [cloning], I can maybe understand it. If you get to that... and you...you do arrest it and it has to be at that stem cell stage...If you arrest the development, I can see the... Yes, I can see that.

Kerry But the population is just going to...if...if...if it is successful, what is going to happen to everybody that is actually on the planet and the planet? I mean, it's just going to...

Charlie I think if we go back 100 years...

Kerry There has to be a natural selection of people or animals.

(Focus group 5)

Human cloning also featured in the media data. The first major news story in the relevant time period of the data collection was the claim by the US fertility expert Dr Panos Zavos to have transferred a cloned human embryo into a woman. The second was the report in the journal *Science* (Hwang, Ryu, Park, Park, Lee, Koo et al., 2004) on the work of a Korean team led by Dr Woo Suk Hwang, which claimed to have extracted stem cells from cloned human blastocysts. While the coverage of the claim by Dr Zavos portrayed him as a maverick scientist, this latter story was much more scientifically credible. (Note that subsequently there has been controversy surrounding the work of Dr Hwang, who has been accused of scientific fraud, which led to his resignation in December 2005 (Wohn, 2006). However, at the time of the media analysis reported here, there was no suggestion that there might be problems with this stem cell research and hence this was not reflected in the media analysis.)

Analysis<sup>1</sup> of the reporting of research on human cloning revealed that the perceived agenda, motivations and credibility of individual scientists were key for the overall stance taken in media reports of human cloning work. At the same time questions of the purpose of cloning, the status of the embryo and the risks of such interventions in 'natural processes' were also significant framings for the media discourse. There was considerable ambivalence in the media reports with some articles containing both pro- and anti- representations. However, a moral contrast emerged across the articles between reproductive cloning being positioned as generally a bad thing and therapeutic cloning being generally good, although not without its risks for the future, as also found by Petersen (2001) in analysis of Australian media coverage. Both pro- and anti- positions were shored up by use of 'science' claims, and the contested status of the stem cell (as human life or as merely blastocyst) persisted as an important pivot point for the articulation of different discourses.

Media coverage of the Korean stem cell research generally emphasised the differences between therapeutic and reproductive cloning, partly portraying the difference in terms of current scientific ability to produce an embryo from a stem cell line. This locates the

difference as one of technique but a careful move is made in the quotation below to use the discourse of scientific precision which avoids the moral rhetoric of embryos as human. Indeed the 'big step' from stem cell line (and early blastocyst) closes down the possibility of such a moral challenge.

"Nobody has cloned a human here," said Donald Kennedy, a biologist and editor in chief of *Science*, which published the study today... "All they have done is create a stem cell line from an early blastocyst... To get from that to an embryo is a big step." (*Guardian*, Feb 13)

Media reports on claims of cloning drew clear and consistent distinctions between using cloning technology for reproductive purposes, exemplified by the Panos Zavos case and criticised by scientists and others as immoral, and for therapeutic purposes, exemplified by the Korean team which was presented as morally justified and offering significant benefits:

Cloning for reproductive purposes would...be wholly reprehensible...What good reason could anyone ever have for wishing to clone him or herself?...In fact the South Koreans have cloned an embryo with quite other reasons in mind. They wish to do further stem-cell research, which (it is hoped) will one day allow us to grow human cells that can be artificially stimulated into becoming special tissues...to replace those damaged in a disease process. (*Daily Telegraph*, Feb 13)

However, critics of cloning argued that this distinction was artificial and that, once therapeutic cloning is accepted, reproductive cloning would inevitably follow. The recurrent metaphor here, as in the focus groups, was the 'slippery slope' as implied in the *Daily Telegraph* headline on February 13<sup>th</sup> – 'Human cells cloned: babies next?' However, advocates for therapeutic cloning also invoked this metaphor more directly as a rhetorical resource that counters potential criticism:

The moral distinction between therapeutic and reproductive cloning boils down to the purpose for which the embryo is used...The distinction between therapeutic and reproductive cloning breaks down, because it is artificial. Once human cloning becomes accepted, it is perfectly conceivable that foetus farming and eugenics will follow. (*Daily Telegraph*, Feb 13)

There is, of course, the slippery slope argument, and it is certainly true that there have been many such slopes down which we have slipped, or joyously skied, in the past few decades. But unless we believe that we are not masters of our fate...this is not a slope we need slip down, at least with proper regulation. (*Daily Telegraph*, Feb 13)

### *Underlying values and beliefs*

Analysis of all the data sets indicated that attitudes towards cloning were underpinned by a variety of values and beliefs. Using the survey data, it is possible to examine the strength of relationship between these values and public attitudes in the context of other known influential variables such as age, gender and education. The focus group data reveal the significance at a micro-level of certain orientations towards 'the embryo' and 'interference with nature', themes that also emerge from the media analysis.

In order to examine the impact of underlying values on attitudes to cloning in the survey data, a single cloning attitude scale was calculated by summing the four cloning items, three therapeutic and one reproductive (Cronbach's alpha = .81). As part of the survey, there was also a series of six questions on values in relation to science. Factor analysis of these items yielded three factors: the first comprised three items concerning the effects of human intervention on nature and justification of the means to an end (alpha = .53); the second factor comprised two items associated with the risks and benefits of scientific intervention (alpha = .62) and the final factor was a single item focusing on public perceptions of the fragility of nature. In each case, responses were coded so that a positive value represented a pro-science stance.

A multiple regression was carried out predicting people's overall attitude towards human cloning using dummy variables for religious affiliation and entering the three science and nature values as continuous scores. Respondent gender, age and highest educational qualification were also included. The results of this regression are shown in Table 3. On the first step, gender, age, education and religion were entered. The results show that a positive attitude to human cloning is associated with younger age and men, whilst those with a higher level of education are least likely to have a favourable view of this technology. None of the variables for religious affiliation were statistically significant in the model. This contrasts with the finding that two of the three values items were significant in predicting attitude to human cloning; both were consistent with a more favourable attitude among those with values that can be characterised as pro-scientific intervention and human progress in the natural world.

### Values as resources

Whilst the survey data allowed for an examination of the relationship between specified value variables and people's attitudes, the 'open' approach of the focus groups allowed a range of values and beliefs to emerge in discussion. Participants used what we termed 'front-line' resources early in the discussion to frame their views. On the other hand, some formulations of views served as 'bottom-line' resources in that they closed down the possibility of further discussion on the issue for that individual and at times for the other participants interacting with that individual.

The issue of interference with nature and the status of the embryo – the two most frequently drawn upon 'values' or 'beliefs' – are discursive resources commonly invoked in arguments against the permissibility of cloning technologies *per se*. Typically, they are drawn upon early in such discussions and may be interpreted as means by which further discussions of the permissibility of cloning technologies may be closed down. Thus they may be interpreted as both 'front-line' and, potentially, 'bottom-line' rhetorical resources. An example of 'interfering with nature' talk is provided below:

- Archie            Is that not really what you're...what we're all talking about the fundamental problem of interfering with nature. There's always been that argument with science.
- Gabi              Yes, but they could spend the money on better things.
- Archie            Just leave things alone. You don't know what you're doing. You know, the Frankenstein thing. What...? You're interfering with nature. You're playing God.

(Focus group 7)

Although both of these positions could operate as ‘bottom lines’, ‘interfering with nature’ was not as robust in curtailing further discussion as invocations of the status of the embryo. Whilst an individual might indicate they were opposed to (or very cautious about) cloning on the basis that it was interfering with nature or that the embryo was actually a human life, the former was more frequently challenged by other participants. Typically, these contestations of cautions against ‘interfering with nature’ were based on the questioning of the historical and cultural stability of the concept of nature; nature itself was made a contested resource. Although the ‘interfering with nature’ trope did not prove to be an effective bottom-line resource, it was nonetheless highly resilient, recurring in reworked ways within and across the focus group discussions.

Although the more effective bottom line resource involving the invocation of the status of the embryo could be interpreted as part of broader religious beliefs, this resource was typically located within a framework of the sanctity of human life (rather than within *explicitly* religious frameworks), where the concept of human life extended as far back as the moment of conception. Examples of conversational turns in which the status of the embryo was invoked are provided below:

Paige            I think the major issue with stem cell research is where the stem cells come from, whether it’s taken from a fetus. They have banks of embryos which aren’t used from IVF treatment. That’s where they take them from and whether that’s morally right or wrong. That’s really the issue.  
(Focus group 2)

Megan            That’s absolutely fine if they take your own stem cells but taking embryonic stem cells I don’t think is right.  
 [ ]  
 Well, they’re experimenting on embryos at the moment to extract their stem cells and then the thing dies, basically.

Amy                Not fully-grown embryos.  
 Megan            It’s still human life, isn’t it?  
(Focus group 1)

Grace             I mean, if they could create something that is far removed from a human being, nothing to do with the sperm fertilising the egg or whatever, and it’s fine by me but that’s my issue that really.  
(Focus group 3)

Invocations of the status of the embryo and the sanctity of human life functioned to exempt speakers from further more complex discussions of the permissibility of cloning technologies and other embryological research.

The media analysis also indicated the centrality of values relating to the status of the embryo (Williams et al., 2003). In the media reports of the Korean stem cell research, critics of cloning argued that embryos were human beings and hence should be accorded the rights appropriate to human beings. Advocates of the technology, on the other hand, argued that embryos cannot be equated with human life as it is usually understood. For example:

Once the clones are created, they are dismembered and their cells used to grow (we hope) spare parts for treating patients. Clearly that is anything but “therapeutic” for the clone embryo. So the question should be: can we treat some people if the process involves killing others? [ ] But are embryos really human beings? Scientists admit human life begins at the embryo stage. The embryo has rights. Are all human beings equal, or are some more equal than others? (*Sun*, Feb 13)

However, for myself, I cannot truly consider an embryo a full member of the human race. I cannot mourn for its loss as for say, the death of a six year-old child, nor can I feel the same outrage at its deliberately induced demise as for an old lady brutally done to death in her own home [ ] Indeed, if anyone claimed to be able to do so, I should think him either a humbug or madman. (Opinion, *Daily Telegraph*, Feb 13)

In some cases, the distinction was made between embryos and blastocysts in order to try to overcome this problem:

To say that scientists have cloned human embryos is in itself misleading. We are talking about bundles of cells known as blastocysts which are far from being actual embryos. (*Daily Mail*, Feb 15)

The status of the embryo as ‘human’ is thus a powerful construction invoked both by focus group participants and by newspaper journalists and opinion writers when discussing research into cloning. In both cases, the construction of the embryo as a human being shuts off any acceptance of cloning. Moves to resist this foreclosure on acceptability generally involved repositioning embryos as something not human (as blastocysts).

The media accounts also drew on wider socio-political contexts. This served to discursively position cloning as an issue with nation-state dimensions. It also drew on familiar discourses of the role of the ‘moral right’ in preventing the advance of science in the USA and parallel religious movements in the UK which aim to have the same impact. The position in the UK on therapeutic cloning was contrasted with that in the USA, especially President Bush’s opposition on moral grounds. Advocates of the technology used the rhetorical strategy of linking opposition to the ‘moral right’ and to a wide ranging ‘anti-science’ position:

I am dismayed that any discussion of cloning inevitably becomes dominated by the doom mongers, often, conservative Christians who are anti-abortion, anti-IVF and anti-contraception. Those who accuse scientists of playing God invariably believe God belongs to them alone. They would deny the rest of us any choice over these matters. The Bush administration, for instance, has outlawed federal funding for stem-cell research. America, in its current incarnation, is a fundamentalist culture which also refuses to teach the theory of evolution in some of its schools. We are not such a culture. (*Daily Mail*, Feb 15)

The linking of this alliance between ‘conservative Christians’ and those who are ‘anti-science’ to characteristics of nation-state politics served to position the UK as forward thinking but as not immune to the risks that this constructed alliance was said to pose.

Religion

While religion might be expected to be a major issue in determining people's responses to human cloning (Evans, 2002), religious affiliation did not emerge from the various analyses as playing a major role. For example, as described earlier, religious affiliation did not play a significant role in the prediction of attitudes to cloning as assessed in the survey (Table 3).

Closer inspection of the survey data did, however, reveal some religious differences in the strength of responses to each of the four cloning items (Table 4). Roman Catholic respondents in particular were more negative about cloning for any of the purposes specified. One third held strongly negative views about human cloning for reproductive purposes and people of this denomination were approximately twice as likely as those with no religion to object to human cloning for medical purposes.

In the vignette study, there were no differences in attitude to cloning between participants who attended religious services on a regular basis and those who did not. Participants who regarded themselves as belonging to a particular religion were more likely to agree that cloning threatens the natural order of things (Mean=3.85, sd=1.08) than participants who did not (Mean=3.56, sd=1.19;  $t(344.22)=2.39$ ,  $p<.05$ ). However, these two groups did not differ on the other three attitudes to cloning items.

Religion was not specifically identified by participants in the focus groups to explain why they held certain views or offered particular opinions in the discussion about cloning. However, references to concerns about 'interfering with nature' or to the status of the embryo/the 'sanctity of life' were occasionally positioned in terms of a generic 'God' or could be understood as drawing on discourses and resources associated with religion and religious belief.

## **Discussion and conclusion**

Overall the research presents a complex picture of attitudes to and constructions of human cloning among the British public. It certainly does not present a uniform rejection of cloning in any form but rather presents a nuanced picture of variations across types of applications and differences in conclusions depending on the methods used.

The quantitative data from both the survey and vignette study are in line with previous surveys, which have shown more positive attitudes towards therapeutic than reproductive cloning (Calnan et al., 2005). The approval of reproductive cloning in the present study is rather higher than that found by Calnan et al. (2005), although differences in the questions asked and the way they were framed do not allow a direct comparison.

These results contrast with those from the focus groups where the participants were much more negative about cloning overall. This might partly be explained by the initial assumption within the groups that cloning referred to reproductive cloning and that they could see no real benefits from this type of procedure, while seeing many objections. However, even when the concept of therapeutic cloning was introduced, although this was accepted to a greater extent, reservations were still expressed. There are a number of possible reasons for these apparent discrepancies. One possibility is that the wording of the question in the survey '... to treat a young couple...', along with the positioning of this question following the three questions on therapeutic cloning, may have served to situate this question as one of medical treatment rather than emphasising the creation of a human being from cloning. Against this interpretation, the results from the vignette study, using a different question and context, also

yielded rather stronger approval for reproductive cloning than might be inferred from the focus groups.

It is noteworthy that the results of these focus groups in some respects chime well with those obtained in the Wellcome Trust groups some six years earlier (Wellcome Trust, 1998). Participants were generally negative about cloning, assumed that cloning meant reproductive cloning and also, whilst initially being more positive about therapeutic cloning, went on to express a range of reservations.

There are of course issues of how representative the samples are in the different studies reported. We can be confident of the sample from the British Social Attitudes survey being reasonably representative of the British public. However, as with all smaller scale qualitative research, the focus groups cannot be said to be truly representative but care was taken to ensure that group participants reflected the demographic profile of the group location and to avoid recruiting individuals who might have an explicit, identifiable agenda to pursue. The provision of financial incentives was also designed to draw a wide range of participants to the groups.

It is not necessarily surprising that the quantitative research and focus groups yielded different results in this case and it is of course not possible to say that one data source was 'correct'. The survey and the vignette study asked people to respond to relatively simple questions without the need to interact with other people who might have opposing views or the need to defend one's own views in public. Participants are sensitive to the presence or absence of cues provided by the research environment itself (Schwartz and Sudman, 1992; Houtkoop-Steenstra, 2000) and the predetermined and constrained response options in the quantitative research provides quite a different sense making context from the wide ranging discussion in focus groups. While the focus groups are useful for capturing the type of discourse in this context, the quantitative research yields both more representative data and may also reveal what people believe themselves but might find difficult to articulate in a public discussion. Using a variety of methods allows the examination of areas where there is good agreement between methods but also allows insights into areas of disagreement.

Both in relation to the comparison of therapeutic and reproductive cloning and other aspects of the analysis, there is a marked similarity between the types of discourse in the focus groups and the media analysis. This includes the use of similar phrases and rhetorical devices, e.g. 'the slippery slope' from therapeutic to reproductive cloning. This is not surprising since most of the information on cloning that members of the public will have encountered will have been obtained from the media (Miller & Riechert, 2000) and it supports the assertion by Petersen (2001) that the media coverage in this area is likely 'to exert a powerful influence on public responses'. Alternatively it can be interpreted as the media being well attuned to the nature of public beliefs/feelings in this area and reflecting these in the coverage.

Attitudes were shown to be related to underlying values related to scientific progress to a greater extent than to age, gender, education or religion. There were some differences in the quantitative data based on religious affiliation but overall religion was not closely related to the expressed attitudes. Likewise in the focus groups there was little direct appeal to religion, although the major rhetorical resources employed to object to cloning could be understood as drawing upon discourses associated with religion and religious belief.

The morality of cloning was very prominent across the different methods and this differs from other technological science developments which may simply be seen as amazing or unnecessary. Cloning, however, evokes consideration of what it is to be human, human identity, scientists losing their moral compass in pursuit of the fascinating. In discussion it was clear that certain claims or statements relating to the sanctity of nature and the status of the embryo were used to foreclose further discussion.

Overall the findings demonstrate the complexity of public views in this area. In many cases the findings from the different methods are complementary, offering either confirmation of a finding or providing more insight than would be possible if using a single method and, in those cases where there is less agreement, giving an insight into the complexity of the views held in this area.

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Table 1

Percentage of survey respondents saying that therapeutic and reproductive cloning should be allowed if ...

Questionnaire item	Definitely or probably allow	Definitely or probably <u>not</u> allow	Base
..a person needs an organ transplant	65	24	2599
.. needs treatment for Parkinson's Disease	65	24	2587
..is generally in good health and wants to live longer	15	74	2578
.. if a young couple are infertile and cannot have a child	38	48	2608

Source: British Social Attitudes Survey (2003)

Table 2

Attitudes to therapeutic and reproductive cloning from the vignette study (standard deviations shown in brackets).

<b>Item</b>	<b>Therapeutic cloning (n=183)</b>	<b>Reproductive cloning (n=181)</b>	<b>T value</b>
Cloning, as described, should be banned	2.85 (1.31)	3.55 (1.29)	5.10***
Cloning, as described, should be allowed under certain circumstances	3.63 (1.14)	2.94 (1.32)	5.30***
Cloning threatens the natural order of things	3.56 (1.18)	3.87 (1.08)	2.62**
Cloning poses no threat to future generations	2.41 (1.01)	2.16 (1.01)	2.36*

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001

Higher mean denotes greater agreement with the statement (i.e. more negative attitude)

Source: 'Attitudes to genomics' vignette studies (2004)

Table 3

Beta coefficients from a multiple regression predicting overall attitude to cloning from religion and scientific values, controlling for gender, age and education.

Variable	Beta
<b>Step 1</b>	
Age	-.07**
Gender	-.09***
Higher education	-.07**
No qualifications	.05
No religion	.06
Church of England	.10
Roman Catholic	-.03
Christian - Other	.03
Non-Christian	.01
<b>Step 2</b>	
Age	-.03
Gender	-.06*
Higher education	-.06*
No qualifications	.02
No religion	.04
Church of England	.07
Roman Catholic	-.03
Christian - Other	.04
Non-Christian	-.01
Values - human intervention	.26***
Values – benefits/risks	.13***
Values - nature robust	.01

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001

The dependent variable is coded so that higher values = more positive attitude to cloning

Source: British Social Attitudes Survey (2003)

Table 4

Percentage of survey respondents who think human cloning should ‘definitely’ or ‘probably’ not be allowed by religious affiliation.

<b>Religion</b>	<b>Organ Transplants</b>	<b>Healthy person lives longer</b>	<b>Treat Parkinson’s disease</b>	<b>Child for infertile couple</b>	<b>Base</b>
None	11	47	10	27	1129
Church of England	12	46	11	26	722
Roman Catholic	19	49	18	34	230
Other Christian	15	46	14	27	378
Non-Christian	14	44	13	26	97
All	13	47	12	27	2456

Source: British Social Attitudes Survey (2003)

## End note

1. Martha Augoustinos, Shona Crabb, and Amanda LeCouteur (2005). Representations of genomics in the UK: Media, interest groups, and Government texts. Report on media analysis.

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Running head: Attitudes to cloning

**Towards an understanding of British public attitudes towards human cloning**

## **Abstract**

The ability of scientists to apply cloning technology to humans has provoked public discussion and media coverage. The present paper reports on a series of studies examining public attitudes to human cloning, bringing together a range of quantitative and qualitative methods to address this question. These included a nationally representative survey, an experimental vignette study, focus groups and analyses of media coverage. In all of the analyses therapeutic cloning was viewed more favourably than was reproductive cloning. However, while participants in the focus groups were generally negative about both forms of cloning, and this was also reflected in the media analyses, quantitative results showed more positive responses. In the quantitative research, therapeutic cloning was generally accepted when the benefits of such procedures were clear and although reproductive cloning was less accepted there was still substantial support. Participants in the focus groups only differentiated between therapeutic and reproductive cloning after the issue of therapeutic cloning was explicitly raised; initially they saw cloning as being reproductive cloning and saw no real benefits. Attitudes were shown to be related to underlying values related to scientific progress rather than to age, gender or education, and although there were a few differences in the quantitative data based on religious affiliation, these tended to be small effects. Likewise in the focus groups there was little direct appeal to religion but the main themes were 'interfering with nature' and the 'status of the embryo', with the latter being used more effectively to try to close down further discussion. In general there was a close correspondence between the media analysis and focus group responses, possibly demonstrating the importance of media as a resource or that the media reflect public discourse accurately. However, focus group responses did not simply reflect media coverage.

**Abstract word count:** 293

**Keywords:** UK, human cloning, attitude, focus groups, media analysis, survey

**Full word count:** 10961

## Introduction

In the post-genomic era, the growing capability of scientists to apply cloning technology to human embryos has prompted widespread media reporting and discussion – most controversially over claims that a human clone had been born (e.g. Guardian, 2003). Although these claims were widely discredited, it is true that today the cloning of human genetic material can no longer be seen as the domain of science fiction. Unlike many other countries including the USA, the cloning of human cells has been legally sanctioned in the UK for the purposes of medical research ('therapeutic cloning'). However, at the same time, specific legislation has been developed to outlaw reproductive cloning, where a cloned human embryo is implanted and allowed to develop to full term (HMSO, 2001).

Cloning is the technique of creating an identical copy of an organism from its genetic material using the technique of cell nuclear replacement (MRC, 2002). A distinction is made - at least in law - between therapeutic or research cloning and reproductive cloning. The former harvests special cells called stem cells which, at the early embryonic stage of development, have a unique ability to divide and differentiate into a range of body tissues. As stem cells from a cloned embryo will be genetically compatible with their donor, their potential benefits lie in medical therapy for a range of diseases and degenerative conditions. In reproductive cloning, the same technique is used to create a human embryo that is then allowed to develop into a baby that is an identical genetic match to the donor.

The debate around human cloning has a long history (e.g. Warnock, 1984) but much of the more recent discussions have followed the cloning of Dolly the sheep (Wilmut et al., 1997), e.g. UK House of Commons Science and Technology Committee report (1997) and the consultation on *Cloning Issues in Reproduction, Science and Medicine* launched in 1998 by the Human Genetics Advisory Commission (HGAC) and the Human Fertilisation and Embryology Authority (HFEA) in the UK. This has been mirrored by international debates on this topic and in 2005 the vote by the United Nations for a non-binding ban on all forms of cloning, although this has not prevented research on therapeutic cloning in some countries, e.g. the UK.

Much of the controversy and debate surrounding human cloning for both therapeutic and reproductive purposes centres on moral and ethical issues around the creation of a human embryo. A key issue in the debate surrounding therapeutic cloning is under what circumstances, if any, can it be considered acceptable to end one life – that of the embryo - with the objective of saving another (Reiss, 2002). Clearly there are many different ways of conceptualising the value of human life at different stages and hence resolving such questions is far from straightforward. Exactly when in its development should a human embryo be accorded human rights and protection? This issue is hotly debated within ethical and religious contexts (for example, see McCarthy, 2003) and is unlikely ever to be resolved, although advisory bodies generally acknowledge that there are specific circumstances where using stem cells from human embryos can be justified by the potential health benefits arising from the research.

A subsidiary set of arguments around human cloning arises from the connections between therapeutic and reproductive cloning (Bowring, 2004). The reasoning behind what may be termed the 'slippery slope' argument is that advances on therapeutic applications of cloning will inevitably lead to reproductive cloning, regardless of its legal status.

A number of large scale surveys report positive attitudes among the public towards science and new scientific developments (Gaskell, Allum & Stares, 2003b; MORI, 2005) but the same sources typically reveal considerable public scepticism about the motivations of scientists, and about the science and the application of new technologies. Certainly for genetic science there are particular public concerns about privacy, ethics and tampering with nature (Calnan, Montaner & Horne, 2005).

Calnan et al. (2005) surveyed members of the public in England and Wales about their attitudes to new health care technologies, science and trust in health care practitioners. A scenario on reproductive human cloning was used based on an infertile couple participating in a clinical trial to have a baby. Only 12 percent accepted that the couple should participate in the trial compared with 68 percent who rejected it. Other scenarios based on non-embryonic stem cell therapy and genetic screening were received much more favourably, leading the authors to conclude that support for genetic technologies is heavily dependent on its stated purpose.

Bates et al. (2005) report that polls in the USA from 1998 to 2002 show that 66% to 90% of the American public indicated that embryonic, animal and human cloning were unacceptable. Likewise, Gaskell, Allum, Bauer, Jackson, Howard & Lindsey (2003a) found the usefulness of cloning human cells to be rated around the 'tend to agree' mark. Nisbet (2004) reviewed a number of public opinion polls in the USA and while cloning was generally not accepted the results were highly dependent upon the application; in a 1998 survey approval was highest for the application of 'infertility' with 33% approving and there was a 20% approval in a 2002 survey for the application 'infertile couples' (Nisbet, 2004). Other US surveys between 1997 and 2002 gave between 9 and 11% agreeing that the cloning of humans should be allowed, where the application was reproductive (Nisbet, 2004). Likewise, a 2001 survey gave 11% of people agreeing that reproductive cloning should be legal whereas 33% felt that it should be legal to clone humans for medical treatments (Nisbet, 2004). Surveys where it was explicit that the cloning would not result in the birth of a human being (but rather were for research or medical treatments) gave between 34% and 59% approving the application (Nisbet, 2004). Simpson and Edwards (2002) likewise comment on a Harris poll conducted in 2001, where 76% rejected reproductive cloning, as showing less objection than might be predicted from the positions taken by official organizations and investigators.

In 2005, an online survey in the UK by YouGov questioned over 2000 adults about cloning and embryo research (YouGov, 2005). A total of 66 percent agreed that 'the rights of the patient are more important than the embryo', with only 15 percent disagreeing with this statement. A majority of 58 percent endorsed the view that embryos are not really human beings from the moment of conception but believe that their use should be governed by law. Just over one quarter found therapeutic cloning acceptable using embryonic stem cells to treat disease, but a much lower proportion found it acceptable for cosmetic purposes. Approximately 6 in 10 people thought that scientists give too little thought to the moral issues involved.

A UK qualitative study using reconvened focus groups by the Wellcome Trust (1998) concluded that participants were overwhelmingly against cloning and that the provision of information about cloning did little to modify reactions of shock, concern and fear around the technology. While most of the participants were familiar with the idea of reproductive cloning they lacked any prior knowledge of therapeutic cloning.

Previous analyses of media coverage in this area have also highlighted the distinction made between therapeutic cloning as ‘good’ and reproductive cloning as ‘bad’ (Petersen, 2001) and also examined the types of rhetorical devices used in the debate surrounding the use of stem cells and contrasting views of future developments (Kitzinger and Williams, 2005). Media analysis on other genetic issues has shown differences in the construction of the ‘gay gene’ between the US media, where this was presented as good science and treated with caution optimism, and the UK media which presented the research as the ‘perils of the gay gene’ (Conrad and Markens, 2001). The media is expected to be a major source of public understanding of genetics and a strong influence on public discourse (Conrad, 2001), although neither Conrad (2001) nor Conrad and Markens (2001) empirically examined the relationship between media coverage and public understanding or attitude. Some have argued that the public receive an overly deterministic view of genetic science from the media (e.g. Nelkin and Lindee, 1995) but others have questioned the extent to which this impacts on the public (Condit, 1999; Bates, 2005). The interpretation of information in the media is far from a linear acceptance of the views expressed but rather the target audience interpret the information in complex ways and are active rather than passive in the ways in which they use media information (Condit, 1999). In addition to print and broadcast media, there are other sources in popular culture which may have an impact on public views, e.g. science fiction and movies (Biotechnology Australia, 2006). The present paper examines media coverage over the same period as the reported empirical studies of public attitudes but does not directly address the impact of media reporting on attitude but rather it seeks to present the media coverage as one form of resource upon which the public can draw in arriving at views on human cloning.

While provoking strong opinions among many, public surveys and consultation exercises about human cloning show that attitudes vary according to its stated purpose, perceived utility and morality (e.g. Bates, Lynch, Bevan, & Condit, 2005; Gaskell, Allum, Bauer, Jackson, Howard & Lindsey, 2003a; Gaskell et al., 2003b; HFEA, 1998). It is often uncertain, however, to what extent public opinion is influenced by the media environment at any given time or the manner and context in which questions about human cloning are asked. How the potential harms and benefits of cloning are presented arguably has a direct impact on the level of public support found in opinion polls (Genetics and Public Policy Center, 2005; Nisbet, 2004). Public responses to human cloning must also be seen in the context of the current socio-political climate; for example, recent research indicates that although some types of scientist continue to be considered as valuable sources of scientific information and advice about science, there are growing public concerns that the independence of scientists may be compromised by the interests of their funders and the commercialisation of such funding (MORI, 2005). Commercialisation has also been identified as one of the possible reasons for the ‘hying’ of genetic science in the media (Caulfield, 2004). These concerns may well have been further intensified by the recent highly visible controversy around falsification of scientific data in this area (Wohn, 2006).

This brief overview of research exploring public perceptions and understandings of cloning depicts a somewhat fragmented set of findings largely derived from studies using single methods and ranging over a period of years over which there has been considerable developments both in the science and in the accompanying media coverage.

This paper reports multi-method research on public attitudes towards new genetic technologies in the UK. Drawing on both quantitative and qualitative data affords us a unique opportunity to investigate the nature, spread and strength of opinion among the British

population and the resources and reasoning used by people to make judgements about this genetic technology. We are able to locate our empirical findings in the context of media reporting of human cloning over the same time period, helping to provide a rounded and current picture of human cloning as a public issue.

## **Method**

The data reported here were collected as part of a large study on attitudes to genomics which comprised several separate elements. Data are reported from two quantitative pieces of work, a national survey and an experimental vignette study, and two qualitative elements, a focus group study and media analyses. Each of these pieces of work was conducted separately and there was no overlap in participants between the different pieces of work. The methods for each strand of work are described briefly below.

### *Survey*

Questions on human cloning were administered as self-completion items on the British Social Attitudes Survey, an annual survey of social and political attitudes in the UK that was conducted between June and September 2003. This yielded a nationally representative sample of approximately 2500 adults aged 18 and above. The key questions in the survey for the purposes of this paper are four questions on attitudes to cloning for different purposes. The first three were on therapeutic cloning for different purposes and were preceded by a short preamble:

*You might have heard of something called human cloning. One type of cloning would be if a person's genes were copied exactly and used to make an embryo. Cells from the embryo could be used to supply the person with tissues or organs that would be a perfect match for them, meaning their body would not reject them. Do you think this should be allowed or not allowed for if a person ...?*

1. .. needs an organ transplant
2. .. needs treatment for Parkinson's Disease
3. .. is generally in good health and wants to live longer

We also asked one question on reproductive human cloning:

*Another type of human cloning might be used to treat a young couple who are infertile and cannot have a child. Suppose that the genes from one of them were copied exactly and used to make an embryo with exactly the same genetic make up as that parent. Do you think this should be allowed or not allowed ...?*

For further details about the design of this survey and the questions used see Park, Curtice, Thomson, Bromley & Phillips (2004) and in particular Sturgis, Cooper, Fife-Schaw & Shepherd (2004).

### *Vignette study*

Participants in the vignette study comprised 368 adult members of the British general public who were categorised as having either high or low trust in science. The study was carried out between May and September 2004. The groups were selected on the basis of agreement or disagreement with the item "Those in charge of new developments in genetic science cannot

be trusted to act in society's interests". Participants completed a baseline questionnaire assessing demographic and attitudinal variables and were then randomly assigned to receive one of four vignettes. Therapeutic cloning was described in the vignettes in the following way: 'One use of cloning involves taking special cells, called stem-cells, from cloned embryos. These cells could then be used to help treat disease in the person who donated their genetic material, for example, to grow replacement body tissues or organs.' Reproductive cloning was described as follows: 'One use of cloning involves placing the cloned embryo into a woman's womb so that it grows into a new human being.'

The vignettes described either therapeutic or reproductive cloning and contained either arguments in favour of banning the technology outright or allowing it under regulated conditions. Thus the study had a two (therapeutic versus reproductive cloning) by two (arguments for banning or arguments for controlling the technology) between-subjects factorial design. Participants then completed follow-up questions on their attitudes towards the situation described in the vignette and cloning in general. For the present analysis the four items of interest are:

1. Cloning, as described, should be banned
2. Cloning, as described, should be allowed under certain circumstances
3. Cloning technology threatens the natural order of things
4. Cloning technology poses no threat to future generations

Response options ranged from 1 (strongly disagree) to 5 (strongly agree). The vignettes and the questionnaire are available from the authors on request.

### *Focus groups*

The focus group study was carried out between July 2004 and April 2005 and involved ten groups which (potentially) addressed the issue of cloning. Eight were conducted at six locations in England, Scotland and Wales with members of the general public who had no particular involvement or investment in genomics-related issues. Four addressed health-related technologies; four did not focus on specific applications. Group members were recruited by a fieldwork agency to reflect the demographic profile of the populations in the various group locations. Two additional focus group interviews were conducted with people affected by genetic disease, who were recruited through the Clinical Genetics Department of a London hospital. The eight general public groups consisted of 80 individuals and the two groups of people affected by genetic disease consisted of 12 individuals. Participants were paid an incentive of £35 to take part.

Each focus group was facilitated by two moderators, using an interview schedule which, among other issues, invited participants to identify the developments in (health-related) genetic technologies that they had heard about or encountered and to describe what they had heard, what their reactions have been and how they evaluate the acceptability of these technologies. In relation to cloning, if participants did not distinguish between reproductive and therapeutic cloning, the interviewers provided definitions of these technologies in line with the definitions outlined previously and then asked participants about their responses.

Interviews were transcribed, coded in terms of content using N-Vivo and then subjected to an integrative form of discourse analysis that attended to both relatively micro-level and macro-social features of talk (Wetherell, 1998) in order to identify the ways in which and the basis on which 'attitudes' and 'knowledges' relevant to cloning are constructed and worked with.

However, space constraints mean that, in this paper, findings from the focus group studies are presented more as the outcome of a social constructionist version of thematic analysis (Joffé & Yardley, 2004) rather than in the level of detail normally expected in discourse analysis.

### *Media analyses*

A qualitative analysis of genomics-related texts was conducted on data drawn from newspaper articles from six UK newspapers (the *Times*, the *Guardian*, the *Daily Telegraph*, the *Daily Mail*, the *Sun*, and the *Daily Mirror*) during a 3-month monitoring period (12 January – 11 April 2004, inclusive). A total of 1340 articles were included in the analysis with the following split between the newspapers: *Times* 450, *Guardian* 447, *Daily Telegraph* 159, *Daily Mail* 108, *Sun* 94 and *Daily Mirror* 82. The analysis followed the same type of process as for the focus groups above and the results are presented in the same form as the outcome of a social constructionist version of thematic analysis (Joffé & Yardley, 2004) rather than in the level of detail normally expected in discourse analysis.

## **Results**

The following results are presented under two themes which emerged from the analysis of the different types of data: the distinction between cloning for therapeutic or reproductive ends and values and beliefs underlying attitudes to cloning. In each case, results are presented from different pieces of research in order to illustrate the contribution of each method to addressing these general issues; given space constraints, it is not possible to present all of the relevant findings from any one of the methods.

### *Therapeutic versus reproductive cloning*

Each of the data sets provides some insights into the nature of the distinction between therapeutic and reproductive cloning. The survey and experimental data show that the information provided around the purpose of cloning were clearly related to judgements of various applications. Interestingly the focus group discussions indicated that when people are left to their own devices they do not spontaneously differentiate these two facets. Both the focus group discussions and the media analysis show the use of the ‘slippery slope’ metaphor (Bowring, 2004) affords a way of framing considerations of therapeutic and reproductive cloning.

Analysis of the survey data suggests that obvious benefit is important for the attitudes the general public express towards therapeutic cloning. The purpose of such cloning research clearly had an impact on the attitudes people expressed. Survey respondents were strongly in favour of cloning where the benefits were clear (for an organ transplant or for Parkinson’s disease) but not where cloning was simply to prolong the life of a healthy individual (see Table 1). Although responses were more mixed when the application was reproductive, nonetheless a substantial number of people (38%) felt that it should definitely or probably be allowed (Table 1).

As in the survey, the respondents in the vignette study were more positive towards therapeutic cloning than they were towards reproductive cloning (Table 2). This was particularly true for the questions directly related to the form of cloning ‘as described’ in the vignette but was also apparent for the questions which asked about cloning without specifically referring to the vignette.

In contrast, explicit distinctions between reproductive and therapeutic cloning did not typically occur spontaneously within the focus group discussions, in line with analysis of earlier focus groups (Wellcome Trust, 1998). Often the initial discursive object was the generic concept of cloning, interpretable as reproductive cloning. The frequent references made to 'Dolly the sheep' suggest that reproductive cloning currently operates as the 'default' reference point for the generic concept. Participant discussion of therapeutic and reproductive cloning as separate technologies often only occurred when one of the focus group facilitators made the differentiation. Aside from early invocations of the discursive resources of 'the status of the embryo' and 'interfering with nature', discussions of the permissibility of cloning as both a generic and differentiated technology followed a utilitarian ethical framework: their permissibility was negotiated in terms of their constructed costs and benefits.

Across the focus group discussions, reproductive cloning was routinely constructed as failing to provide widespread appreciable benefits or as yielding only the most obscure benefits for a very small number of individuals. The cloning of animals or humans was constructed as likely only to benefit individuals with morally questionable motives and/or with the financial means to secure the services of unscrupulous scientists. In conjunction with constructions of reproductive cloning as 'interfering with nature' and therefore as representing a potential cost, the constructed lack of general benefits of reproductive cloning warranted construction of it as an impermissible technology. The social undesirability of reproductive cloning was further evidenced by its invocation as a discursive resource in terms of being the implied end point in 'slippery slope' arguments against the permissibility of therapeutic cloning. Some of these features can be seen in the following extracts:

Archie            Well, I think the trouble is once the science exists, you will never stop scientists pushing the envelope. They are...they are going to take it further and further. I mean, you talk about this idea of what Gabi said about, you know, there's allegedly been a child cloned in Italy. I'm quite sure there's been children cloned, quite certain of it, but you won't hear about it, you know.

Jocelyn        You'll see a film about it.

Archie            You'll probably find Michael Jackson's got several at Neverland.

(Focus Group 7)

Megan            The government have already said 'yes' to the therapeutic cloning. We're already allowed to do that. The government decided for us that that's okay, which is a bit worrying, I think. I think we're the only European country that approved therapeutic cloning, I believe. It's one thing experimenting on embryos but also, it's a bit of a slippery slope into reproductive cloning, isn't it? That's the logical next step. Okay, they said 'Yes, that's wrong, everyone agrees, we're not going to clone a baby' but of course they will.

(Focus group 1)

In contrast to reproductive cloning, where the differentiation between the two technologies was made and where the link between therapeutic cloning and embryonic stem cell research was also made, therapeutic cloning was constructed as a permissible technology on the basis of its potential benefits to human health. The construction of therapeutic cloning as potentially contributing to the development of treatments for debilitating conditions, such as Alzheimer's disease and Parkinson's disease, warranted arguments in support of its

permissibility. However, the construction of such treatments as unquestionable benefits was occasionally contested through the re-invocation of discourses of ‘naturalness’ and ‘natural selection’. While the development of such treatments was constructed as desirable and beneficial on an individual level, they were occasionally constructed as not desirable and not beneficial on a collective level where they might result in increasing and increasingly aged populations. The potential benefits of therapeutic cloning and embryonic stem cell research were recast as potential costs in the context of global economic and environmental sustainability. The acceptance of therapeutic cloning on the basis of health benefits and resistance to acceptance on the grounds of interference with a natural process are evident in the extracts below:

Sophie            So, then they’re growing the stem cells...Is that the...? Which...which one is that?  
Diana            Therapeutic cloning.  
Sophie            Therapeutic. So, that’s grown just for that. So, if you think about it, you’re not reproducing. You’re not messing about with another life. What you’re doing is sustaining one that’s here already. So, when you see how people suffer with it [Alzheimer’s or Parkinson’s] and what... Sorry. They don’t suffer because, obviously, they don’t know. It’s the family and the grandchildren. I mean, you look at it like that and you think, ‘Well, yes, if this was just to help them a little bit’

(Focus group 5)

Charlie            Therapeutic [cloning], I can maybe understand it. If you get to that... and you...you do arrest it and it has to be at that stem cell stage...If you arrest the development, I can see the... Yes, I can see that.  
Kerry            But the population is just going to...if...if...if it is successful, what is going to happen to everybody that is actually on the planet and the planet? I mean, it’s just going to...  
Charlie            I think if we go back 100 years...  
Kerry            There has to be a natural selection of people or animals.

(Focus group 5)

Human cloning also featured in the media data. The first major news story in the relevant time period of the data collection was the claim by the US fertility expert Dr Panos Zavos to have transferred a cloned human embryo into a woman. The second was the report in the journal *Science* (Hwang, Ryu, Park, Park, Lee, Koo et al., 2004) on the work of a Korean team led by Dr Woo Suk Hwang, which claimed to have extracted stem cells from cloned human blastocysts. While the coverage of the claim by Dr Zavos portrayed him as a maverick scientist, this latter story was much more scientifically credible. (Note that subsequently there has been controversy surrounding the work of Dr Hwang, who has been accused of scientific fraud, which led to his resignation in December 2005 (Wohn, 2006). However, at the time of the media analysis reported here, there was no suggestion that there might be problems with this stem cell research and hence this was not reflected in the media analysis.)

Analysis<sup>1</sup> of the reporting of research on human cloning revealed that the perceived agenda, motivations and credibility of individual scientists were key for the overall stance taken in media reports of human cloning work. At the same time questions of the purpose of cloning, the status of the embryo and the risks of such interventions in ‘natural processes’ were also significant framings for the media discourse. A number of articles contained both pro- and

anti- representations. However, a moral contrast emerged across the articles between reproductive cloning being positioned as generally a bad thing and therapeutic cloning being generally good, although not without its risks for the future, as also found by Petersen (2001) in analysis of Australian media coverage. Both pro- and anti- positions were shored up by use of 'science' claims, and the contested status of the stem cell (as human life or as merely blastocyst) persisted as an important pivot point for the articulation of different discourses.

Media coverage of the Korean stem cell research generally emphasised the differences between therapeutic and reproductive cloning, partly portraying the difference in terms of current scientific ability to produce an embryo from a stem cell line. This locates the difference as one of technique but a careful move is made in the quotation below to use the discourse of scientific precision which avoids the moral rhetoric of embryos as human. Indeed the 'big step' from stem cell line (and early blastocyst) closes down the possibility of such a moral challenge.

"Nobody has cloned a human here," said Donald Kennedy, a biologist and editor in chief of *Science*, which published the study today..."All they have done is create a stem cell line from an early blastocyst...To get from that to an embryo is a big step."  
(*Guardian*, Feb 13)

Media reports on claims of cloning drew clear and consistent distinctions between using cloning technology for reproductive purposes, exemplified by the Panos Zavos case and criticised by scientists and others as immoral, and for therapeutic purposes, exemplified by the Korean team which was presented as morally justified and offering significant benefits:

Cloning for reproductive purposes would...be wholly reprehensible...What good reason could anyone ever have for wishing to clone him or herself?...In fact the South Koreans have cloned an embryo with quite other reasons in mind. They wish to do further stem-cell research, which (it is hoped) will one day allow us to grow human cells that can be artificially stimulated into becoming special tissues...to replace those damaged in a disease process. (*Daily Telegraph*, Feb 13)

However, critics of cloning argued that this distinction was artificial and that, once therapeutic cloning is accepted, reproductive cloning would inevitably follow. The recurrent metaphor here, as in the focus groups, was the 'slippery slope' as implied in the *Daily Telegraph* headline on February 13<sup>th</sup> – 'Human cells cloned: babies next?' However, advocates for therapeutic cloning also invoked this metaphor more directly as a rhetorical resource that counters potential criticism:

The moral distinction between therapeutic and reproductive cloning boils down to the purpose for which the embryo is used...The distinction between therapeutic and reproductive cloning breaks down, because it is artificial. Once human cloning becomes accepted, it is perfectly conceivable that foetus farming and eugenics will follow. (*Daily Telegraph*, Feb 13)

There is, of course, the slippery slope argument, and it is certainly true that there have been many such slopes down which we have slipped, or joyously skied, in the past few decades. But unless we believe that we are not masters of our fate...this is not a slope we need slip down, at least with proper regulation. (*Daily Telegraph*, Feb 13)

### *Underlying values and beliefs*

Analysis of all the data sets indicated that attitudes towards cloning were underpinned by a variety of values and beliefs. Using the survey data, it is possible to examine the strength of relationship between these values and public attitudes in the context of other known influential variables such as age, gender and education. The focus group data reveal the significance at a micro-level of certain orientations towards 'the embryo' and 'interference with nature', themes that also emerge from the media analysis.

In order to examine the impact of underlying values on attitudes to cloning in the survey data, a single cloning attitude scale was calculated by summing the four cloning items, three therapeutic and one reproductive (Cronbach's alpha = .81). As part of the survey, there was also a series of six questions on values in relation to science. Factor analysis of these items yielded three factors: the first comprised three items concerning the effects of human intervention on nature and justification of the means to an end (alpha = .53); the second factor comprised two items associated with the risks and benefits of scientific intervention (alpha = .62) and the final factor was a single item focusing on public perceptions of the fragility of nature. In each case, responses were coded so that a positive value represented a pro-science stance.

A multiple regression was carried out predicting people's overall attitude towards human cloning using dummy variables for religious affiliation and entering the three science and nature values as continuous scores. Respondent gender, age and highest educational qualification were also included. The results of this regression are shown in Table 3. On the first step, gender, age, education and religion were entered. The results show that a positive attitude to human cloning is associated with younger age and men, whilst those with a higher level of education are least likely to have a favourable view of this technology. None of the variables for religious affiliation were statistically significant in the model. This contrasts with the finding that two of the three values items were significant in predicting attitude to human cloning; both were consistent with a more favourable attitude among those with values that can be characterised as pro-scientific intervention and human progress in the natural world.

### Values as resources

Whilst the survey data allowed for an examination of the relationship between specified value variables and people's attitudes, the 'open' approach of the focus groups allowed a range of values and beliefs to emerge in discussion. Participants used what we termed 'front-line' resources early in the discussion to frame their views. On the other hand, some formulations of views served as 'bottom-line' resources in that they closed down the possibility of further discussion on the issue for that individual and at times for the other participants interacting with that individual.

The issue of interference with nature and the status of the embryo – the two most frequently drawn upon 'values' or 'beliefs' – are discursive resources commonly invoked in arguments against the permissibility of cloning technologies *per se*. Typically, they are drawn upon early in such discussions and may be interpreted as means by which further discussions of the permissibility of cloning technologies may be closed down. Thus they may be interpreted as both 'front-line' and, potentially, 'bottom-line' rhetorical resources. An example of 'interfering with nature' talk is provided below:

- Gabi: Well on that same line I would say ‘Why are we cloning people when we can’t look after the people we’ve got on this earth?’, you know. Why...why are we bringing more children onto this earth when we’ve got, you know, thousands of twelve-year-old mothers in Britain and thousands starving across the world so I guess there’s lots of different things.
- Archie: Is that not really what you’re...what we’re all talking about the fundamental problem of interfering with nature. There’s always been that argument with science.
- Gabi: Yes, but they could spend the money on better things.
- Archie: Just leave things alone. You don’t know what you’re doing. You know, the Frankenstein thing. What...? You’re interfering with nature. You’re playing God.

(Focus group 7)

This reveals that Archie does invoke the ‘interfering with nature’ line himself. Gabi’s preceding turn shows how ‘cloning’ was routinely understood as reproductive cloning. Her location of cloning within a framework of problems of over-population provides the context for Archie’s comment as his ‘interfering with nature’ line is a reframing of Gabi’s question ‘Why are we cloning people when we can’t look after the people we’ve got on this earth?’.

Although both of these positions could operate as ‘bottom lines’, ‘interfering with nature’ was not as robust in curtailing further discussion as invocations of the status of the embryo. Whilst an individual might indicate they were opposed to (or very cautious about) cloning on the basis that it was interfering with nature or that the embryo was actually a human life, the former was more frequently challenged by other participants. Typically, these contestations of cautions against ‘interfering with nature’ were based on the questioning of the historical and cultural stability of the concept of nature; nature itself was made a contested resource. Although the ‘interfering with nature’ trope did not prove to be an effective bottom-line resource, it was nonetheless highly resilient, recurring in reworked ways within and across the focus group discussions.

Although the more effective bottom line resource involving the invocation of the status of the embryo could be interpreted as part of broader religious beliefs, this resource was typically located within a framework of the sanctity of human life (rather than within *explicitly* religious frameworks), where the concept of human life extended as far back as the moment of conception. Examples of conversational turns in which the status of the embryo was invoked are provided below:

- Paige: I think the major issue with stem cell research is where the stem cells come from, whether it’s taken from a fetus. They have banks of embryos which aren’t used from IVF treatment. That’s where they take them from and whether that’s morally right or wrong. That’s really the issue.

(Focus group 2)

- Megan: That’s absolutely fine if they take your own stem cells but taking embryonic stem cells I don’t think is right.  
[ ]

Well, they're experimenting on embryos at the moment to extract their stem cells and then the thing dies, basically.

Amy Not fully-grown embryos.

Megan It's still human life, isn't it?

(Focus group 1)

Grace This is what I'm saying. I do, so that's an issue with me. That's my worry. So, the minute the sperm and the egg meets and it's producing a...It's a life.

(Focus group 3)

Invocations of the status of the embryo and the sanctity of human life functioned to exempt speakers from further more complex discussions of the permissibility of cloning technologies and other embryological research.

The media analysis also indicated the centrality of values relating to the status of the embryo (Williams et al., 2003). In the media reports of the Korean stem cell research, critics of cloning argued that embryos were human beings and hence should be accorded the rights appropriate to human beings. Advocates of the technology, on the other hand, argued that embryos cannot be equated with human life as it is usually understood. For example:

Once the clones are created, they are dismembered and their cells used to grow (we hope) spare parts for treating patients. Clearly that is anything but "therapeutic" for the clone embryo. So the question should be: can we treat some people if the process involves killing others? [ ] But are embryos really human beings? Scientists admit human life begins at the embryo stage. The embryo has rights. Are all human beings equal, or are some more equal than others? (*Sun*, Feb 13)

However, for myself, I cannot truly consider an embryo a full member of the human race. I cannot mourn for its loss as for say, the death of a six year-old child, nor can I feel the same outrage at its deliberately induced demise as for an old lady brutally done to death in her own home [ ] Indeed, if anyone claimed to be able to do so, I should think him either a humbug or madman. (Opinion, *Daily Telegraph*, Feb 13)

In some cases, the distinction was made between embryos and blastocysts in order to try to overcome this problem:

To say that scientists have cloned human embryos is in itself misleading. We are talking about bundles of cells known as blastocysts which are far from being actual embryos. (*Daily Mail*, Feb 15)

The status of the embryo as 'human' is thus a powerful construction invoked both by focus group participants and by newspaper journalists and opinion writers when discussing research into cloning. In both cases, the construction of the embryo as a human being shuts off any acceptance of cloning. Moves to resist this foreclosure on acceptability generally involved repositioning embryos as something not human (as blastocysts).

The media accounts also drew on wider socio-political contexts. This served to discursively position cloning as an issue with nation-state dimensions. It also drew on familiar discourses of the role of the 'moral right' in preventing the advance of science in the USA and parallel religious movements in the UK which aim to have the same impact. The position in the UK

on therapeutic cloning was contrasted with that in the USA, especially President Bush's opposition on moral grounds. Advocates of the technology used the rhetorical strategy of linking opposition to the 'moral right' and to a wide ranging 'anti-science' position:

I am dismayed that any discussion of cloning inevitably becomes dominated by the doom-mongers, often, conservative Christians who are anti-abortion, anti-IVF and anti-contraception. Those who accuse scientists of playing God invariably believe God belongs to them alone. They would deny the rest of us any choice over these matters. The Bush administration, for instance, has outlawed federal funding for stem-cell research. America, in its current incarnation, is a fundamentalist culture which also refuses to teach the theory of evolution in some of its schools. We are not such a culture. (*Daily Mail*, Feb 15)

The linking of this alliance between 'conservative Christians' and those who are 'anti-science' to characteristics of nation-state politics served to position the UK as forward thinking but as not immune to the risks that this constructed alliance was said to pose.

### Religion

While religion might be expected to be a major issue in determining people's responses to human cloning (Evans, 2002), religious affiliation did not emerge from the various analyses as playing a major role. For example, as described earlier, religious affiliation did not play a significant role in the prediction of attitudes to cloning as assessed in the survey (Table 3).

Closer inspection of the survey data did, however, reveal some religious differences in the strength of responses to each of the four cloning items (Table 4). Roman Catholic respondents in particular were more negative about cloning for any of the purposes specified. One third held strongly negative views about human cloning for reproductive purposes and people of this denomination were approximately twice as likely as those with no religion to object to human cloning for medical purposes.

In the vignette study, there were no differences in attitude to cloning between participants who attended religious services on a regular basis and those who did not. Participants who regarded themselves as belonging to a particular religion were more likely to agree that cloning threatens the natural order of things (Mean=3.85, sd=1.08) than participants who did not (Mean=3.56, sd=1.19;  $t(344.22)=2.39$ ,  $p<.05$ ). However, these two groups did not differ on the other three attitudes to cloning items.

Religion was not specifically identified by participants in the focus groups to explain why they held certain views or offered particular opinions in the discussion about cloning. However, references to concerns about 'interfering with nature' or to the status of the embryo/the 'sanctity of life' were occasionally positioned in terms of a generic 'God' or could be understood as drawing on discourses and resources associated with religion and religious belief.

Religious positioning tended to be done quite subtly in the focus groups. For example, one of the more explicit positionings occurred in response to the quotation from Grace above. In this quotation, three times she claimed ownership of the view that life begins at conception ('This is what I'm saying...that's an issue with me. That's my worry'). In the turn that followed this, another participant responded by saying 'Sure. And I respect that as a...a

fundamental...I think it's a fundamental religious position'. In the subsequent turns, Grace did not resist this construction of her viewpoint as religiously-based and the implicit positioning of herself in religious terms.

## **Discussion and conclusion**

Overall the research presents a complex picture of attitudes to and constructions of human cloning among the British public. It certainly does not present a uniform rejection of cloning in any form but rather presents a nuanced picture of variations across types of applications and differences in conclusions depending on the methods used.

The quantitative data from both the survey and vignette study are in line with previous surveys, which have shown more positive attitudes towards therapeutic than reproductive cloning (Calnan et al., 2005). We find that respondents do discriminate across all the cloning items according to the stated purpose and in the survey perceive most negatively the option of cloning to prolong a healthy life and reproductive cloning was seen as more positive than this. It should be noted that the terms 'therapeutic' and 'reproductive' were not used in the survey items but rather the purpose of the cloning was explained.

The responses to reproductive cloning in the survey and vignette study may be interpreted as more positive than both the responses in the literature and more positive than the responses in the focus groups. The approval of reproductive cloning in the present study is certainly rather higher than that found in a UK sample by Calnan et al. (2005), although the acceptance of the reproductive application by Calnan et al. (2005) may have been reduced by the inclusion of the phrase 'the procedure entails genetically modifying one of the woman's eggs' in their short scenario. In the present survey, the reproductive cloning question came last after being preceded by three items on therapeutic cloning. The question wording, including as it does the term 'young infertile couple' probably helps elicit a more sympathetic response and we can interpret a certain amount of 'therapeutic drift' from earlier items on therapeutic cloning. Against this interpretation, the results from the vignette study, using a different question and context, also yielded what can be interpreted as a reasonably strong approval for reproductive cloning. The review of US surveys by Nisbet (2004) makes clear the variability of findings across different surveys, which will partly depend on wording of items and although the responses in the current survey tend to be more positive they are not entirely different from the range of values in the literature (Nisbet, 2004; Simpson and Edwards, 2002).

In the focus groups, the participants were much more negative about cloning overall than in the quantitative studies, replicating the findings from the focus groups reported by Wellcome Trust, 1998). This might partly be explained by the initial assumption within the groups that cloning referred to reproductive cloning and that they could see no real benefits from this type of procedure, while seeing many objections.

When therapeutic cloning was introduced in the focus groups this was accepted to a greater extent than was reproductive cloning, but reservations were still expressed. The focus group responses on therapeutic cloning would appear to be more negative than the survey/vignette study responses on therapeutic cloning. This could be because in the focus groups the discussions started with a negative conceptualisation of cloning as meaning reproductive cloning and then when therapeutic cloning was introduced it was interpreted against this initial negative position.

It is noteworthy that the results of these focus groups in some respects chime well with those obtained in the Wellcome Trust groups some six years earlier (Wellcome Trust, 1998). Participants were generally negative about cloning, assumed that cloning meant reproductive cloning and also, whilst initially being more positive about therapeutic cloning, went on to express a range of reservations.

There are of course issues of how representative the samples are in the different studies reported. We can be confident of the sample from the British Social Attitudes survey being reasonably representative of the British public. However, as with all smaller scale qualitative research, the focus groups cannot be said to be truly representative but care was taken to ensure that group participants reflected the demographic profile of the group location and to avoid recruiting individuals who might have an explicit, identifiable agenda to pursue. The provision of financial incentives was also designed to draw a wide range of participants to the groups.

It is not necessarily surprising that the quantitative research and focus groups yielded different results in this case and it is of course not possible to say that one data source was 'correct'. The survey and the vignette study asked people to respond to relatively simple questions without the need to interact with other people who might have opposing views or the need to defend one's own views in public. Participants are sensitive to the presence or absence of cues provided by the research environment itself (Schwartz and Sudman, 1992; Houtkoop-Steenstra, 2000) and the predetermined and constrained response options in the quantitative research provides quite a different sense making context from the wide ranging discussion in focus groups. While the focus groups are useful for capturing the type of discourse in this context, the quantitative research yields both more representative data and may also reveal what people believe themselves but might find difficult to articulate in a public discussion. Using a variety of methods allows the examination of areas where there is good agreement between methods but also allows insights into areas of disagreement.

The present results demonstrate the challenges of integrating qualitative and quantitative methods (for example, Brannen, 1992; Schreier & Fielding, 2001; Todd et al., 2004). We accept that, to some extent, the findings from the various studies could sometimes be regarded as juxtaposed rather than truly integrated, although integration can take a number of forms (Moran-Ellis, Alexander, Cronin, Dickinson, Fielding, Sleney and Thomas, 2006). However, achieving meaningful integration of data from studies with different epistemological positions is a considerable challenge and inevitably involves some tensions and narrative 'jaggedness'. It was not our intention to try to 'resolve' these partly because the focus of the paper is not methodological and partly because we believe that combining diverse approaches involves learning to live with these tensions for the sake of the more textured picture of the substantive topic that can be produced by a multi-method approach. We hope that this paper will act as a focus for continued discussion about the optimal ways of integrating qualitative and quantitative work and of responding to the epistemological and other tensions that can result from this process.

Both in relation to the comparison of therapeutic and reproductive cloning and other aspects of the analysis, there is a similarity between the types of discourse in the focus groups and the media analysis. This includes the use of similar phrases and rhetorical devices, e.g. 'the slippery slope' from therapeutic to reproductive cloning. This is not surprising since most of the information on cloning that members of the public will have encountered will have been obtained from the media (Miller & Riechert, 2000). Early in the focus groups, we asked what

they had learned and where they had learned this (and the media was by far the most frequently cited source) before going on to explore their responses to this information. Subsequent discussions may have oriented to media sources but these sources were identified by participants rather than by the researchers. The similarity of responses lends support to the assertion by Petersen (2001) that the media coverage in this area is likely 'to exert a powerful influence on public responses'. However, previous focus group research (Bates, 2005) and the research reported here present a more complex picture of the use by members of the public of the resources provided through the media (Condit, 1999). Commonalties may reflect the media being well attuned to the nature of public beliefs/feelings in this area and reflecting these in the coverage or of both the media and the public drawing on common sources of public discourse in this field. It should be noted that the focus group responses did not in all cases reflect the media coverage. For example, while there was substantial coverage of therapeutic cloning in the media this was not picked up in the focus groups until the topic was expressly introduced by the researchers. Also the examination of the media showed a range of views presented often within the same newspaper, and so a simple transmission of views from the media to the public is not really viable (cf Bates, 2005; Condit, 1999). Rather members of the public appear to draw upon the media and other public discourse but their views will be influenced by other factors such as more general attitudes and also by interactions with others.

When we are asking people to respond to therapeutic and reproductive cloning we are importing a scientific distinction and imposing that framing on people by asking their reaction to reproductive and therapeutic cloning (in the survey and vignettes). We clearly see that when we do this, people assess them differently. However, it may be that this distinction is much less relevant to people when left to their own devices. Here, the focus group work suggests people think of cloning as a fairly undifferentiated venture which largely coincides with the expert category of reproductive cloning. This may not be surprising and cannot be solely attributable to the coverage of these issues in the media. The term 'cloning' is generally used to mean producing a second organism identical to the first. For example the Compact Oxford English Dictionary of Current English (2005) defines the verb to clone as to 'make an identical copy of' and the noun clone as 'an organism produced asexually from one ancestor to which it is genetically identical'. Likewise popular culture has generally portrayed cloning as reproductive cloning (Biotechnology Australia, 2006). The concept of therapeutic cloning is a scientific construct which has not generally found its way into popular consciousness in the same way (reproductive) cloning has, despite a reasonable amount of media coverage as observed here.

Attitudes were shown to be related to underlying values related to scientific progress to a greater extent than to age, gender, education or religion. There were some differences in the quantitative data based on religious affiliation but overall religion was not closely related to the expressed attitudes. One possible reason for small explained variance attributable to religion is that people of all levels of religious commitment have values – around naturalness for example – that actually make religious belief peripheral. It also should be noted that the UK debate on cloning is not polarised by religion to the extent it is in the USA.

Likewise in the focus groups there was little direct appeal to religion, although the major rhetorical resources employed to object to cloning could be understood as drawing upon discourses associated with religion and religious belief. The lack of explicit invocation of religious factors in the focus groups as underlying expressed attitudes may well be related to participant wariness about explicitly positioning themselves as religious. To have done so

may have risked being positioned by others as judgemental, narrow-minded, fundamentalist or in terms of any of the other negative constructions of what it means to be (constructed as) religious within a largely secular cultural context in which religion is increasingly granted positive access to public discourse only in the garb of subjective 'spirituality' (Heelas et al., 2005). However, taken together with the survey/vignettes results it would appear that people are simply hiding their religious beliefs. The morality of cloning was very prominent across the different methods and this differs from other technological science developments which may simply be seen as amazing or unnecessary. Cloning, however, evokes consideration of what it is to be human, human identity, scientists losing their moral compass in pursuit of the fascinating. In discussion it was clear that certain claims or statements relating to the sanctity of nature and the status of the embryo were used in an attempt to foreclose further discussion and to position speakers as incontestable on the issue.

Overall the findings demonstrate that of public views in this area are far from simple. In many cases the findings from the different methods are complementary, offering either confirmation of a finding or providing more insight than would be possible if using a single method and, in those cases where there is less agreement, giving an insight into the complexity of the views held in this area.

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Table 1

Percentage of survey respondents saying that therapeutic and reproductive cloning should be allowed if ...

Questionnaire item	Definitely or probably allow	Definitely or probably <u>not</u> allow	Base
..a person needs an organ transplant	65	24	2599
.. needs treatment for Parkinson's Disease	65	24	2587
..is generally in good health and wants to live longer	15	74	2578
.. if a young couple are infertile and cannot have a child	38	48	2608

Source: British Social Attitudes Survey (2003)

Table 2

Attitudes to therapeutic and reproductive cloning from the vignette study (standard deviations shown in brackets).

<b>Item</b>	<b>Therapeutic cloning (n=183)</b>	<b>Reproductive cloning (n=181)</b>	<b>T value</b>
Cloning, as described, should be banned	2.85 (1.31)	3.55 (1.29)	5.10***
Cloning, as described, should be allowed under certain circumstances	3.63 (1.14)	2.94 (1.32)	5.30***
Cloning threatens the natural order of things	3.56 (1.18)	3.87 (1.08)	2.62**
Cloning poses no threat to future generations	2.41 (1.01)	2.16 (1.01)	2.36*

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Higher mean denotes greater agreement with the statement (i.e. more negative attitude)

Source: 'Attitudes to genomics' vignette studies (2004)

Table 3

Beta coefficients from a multiple regression predicting overall attitude to cloning from religion and scientific values, controlling for gender, age and education.

Variable	Beta
<b>Step 1</b>	
Age	-.07**
Gender	-.09***
Higher education	-.07**
No qualifications	.05
No religion	.06
Church of England	.10
Roman Catholic	-.03
Christian - Other	.03
Non-Christian	.01
<b>Step 2</b>	
Age	-.03
Gender	-.06*
Higher education	-.06*
No qualifications	.02
No religion	.04
Church of England	.07
Roman Catholic	-.03
Christian - Other	.04
Non-Christian	-.01
Values - human intervention	.26***
Values – benefits/risks	.13***
Values - nature robust	.01

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001

The dependent variable is coded so that higher values = more positive attitude to cloning

Source: British Social Attitudes Survey (2003)

Table 4

Percentage of survey respondents who think human cloning should ‘definitely’ not be allowed by religious affiliation.

<b>Religion</b>	<b>Organ Transplants</b>	<b>Healthy person lives longer</b>	<b>Treat Parkinson’s disease</b>	<b>Child for infertile couple</b>	<b>Base</b>
None	11	47	10	27	1129
Church of England	12	46	11	26	722
Roman Catholic	19	49	18	34	230
Other Christian	15	46	14	27	378
Non-Christian	14	44	13	26	97
All	13	47	12	27	2456

Source: British Social Attitudes Survey (2003)

## End note

1. Martha Augoustinos, Shona Crabb, and Amanda LeCouteur (2005). Representations of genomics in the UK: Media, interest groups, and Government texts. Report on media analysis.

## **Towards an understanding British public attitudes towards human cloning Responses to reviewers' comments**

The response to the each comment from the two reviewers is shown in bold after the reviewer's comment. The page numbers refer in all cases to the revised manuscript. We would like to thank the reviewers for their thoughtful and helpful comments and feel that the resulting revisions have produced a stronger paper.

### **Reviewer #1**

By bringing together results of four different studies (two quantitative: a national survey, and a vignette study; and two qualitative: one focus group and one media analysis project), this paper aims at filling a gap in research on public attitudes to human cloning in the UK. As the authors state on p 3, not much has been published on the way in which way the public makes sense of human cloning.

It is exactly this latter promise - granting insights into HOW the UK public makes sense of human cloning - that the current version of the paper does not keep. Whereas the authors obviously were concerned about establishing a balance between quantitative and qualitative methods (in a laudable attempt to shed light on public attitudes to human cloning from as many angles as possible), the main findings are not very helpful for understanding HOW the British public makes sense of human cloning.

**The implied promise in paragraph 5 of the Introduction has been removed. In fact our aims are explicitly stated in the last lines of the Introduction and they are to investigate (a) the nature, spread and strength of opinion among the British population and (b) the resources and reasoning used by people.**

For example, in the abstract the authors summarize that "quantitative results showed more positive responses" (than results of qualitative studies), and that respondents' willingness to accept a form of cloning depended on the motives of those who performed it, as well as on potential benefits for human health. On p. 7 they amend that "although responses were more mixed when the application was reproductive (as opposed to therapeutic cloning), nonetheless a substantial number of people (38%) felt that it should definitely or probably be allowed". The discussion of what could account for this relatively permissive approach to reproductive cloning from the side of the respondents of the national survey (as the authors accurately note, the approval of human reproductive cloning here is higher than in previous studies) remains unsatisfactory.

**There is now more literature included on survey findings in the Introduction (p 4 paragraph 3) which shows that the level in the present study is not so out of line with other studies (Discussion, p 16 paragraph 4).**

In addition, why did respondents in the focus groups, as opposed to the respondents in both quantitative studies, usually not distinguish between reproductive and therapeutic cloning? Could we infer from this that the difference between reproductive and therapeutic cloning does not really mean much to the respondents in the quantitative

studies (in the sense that the meaning did not go beyond different superficial labels and images)? If we came to this conclusion, how would this then affect the value of the data?

**The lack of distinction in the focus groups is now discussed in a new paragraph in the Discussion (p 18 paragraph 2). The issue of whether the quantitative responses were an artefact is now addressed in the Discussion (p 16 paragraph 2).**

The second paragraph on p 15 ("...Participants (in the focus groups) were generally negative about cloning, assumed that cloning meant reproductive cloning and also, whilst initially being more positive about therapeutic cloning, went on to express a range of reservations" could be read as a telling example of a discussion which is informed almost exclusively by media coverage of cloning (which was to a large extent driven by the birth of Dolly, and subsequent Frankenstein fears) and does not get to the deeper issue of what and how people think of the technique of cloning and its potential impacts (ethical, social, etc). I am not saying that this is the case - but it is certainly an issue worthy of discussion (even if only briefly) in the paper.

**To go further than we have done in our analysis of the qualitative data would require a paper that was exclusively focused on those data. While this may be something that we will pursue in the future, the present paper had broader aims which did not permit more detailed analysis within the confines imposed by the word limit. Having said this, we believe that the paper does address these issues. Although the reviewer refers to the summary in the Discussion there is more detail in the Results section.**

In addition, whereas it is highly interesting that religious affiliation - and degree of religiosity (p 14) - obviously does not account for much - if any - of the variance in attitudes towards human cloning, the authors did not discuss possible explanations for this phenomenon.

**The discussion on this has now been expanded (p 18 final paragraph ).**

The virtual absence of contextualization of the studies' findings in the larger field of debates on the topic of human cloning, as well as the absence of (attempts for) explanations of their findings probably points at a methodological problem. As the authors note in many places, both in the quantitative and in the qualitative studies, respondents' views on cloning were very similar to how the issue was portrayed in the media. The authors note in the abstract that "much of the information and discourse in this area is drawn from media coverage or that the media reflect public discourse accurately". This is very plausible. However, in addition to that, the striking similarities between citizens' views and media coverage of human cloning might have to do with the way in which questions were asked in surveys and focus groups. The authors address this problem briefly on p 4, but then they do not continue this path.

**Extra material has been added on the wider debates on human cloning (e.g. p 3 paragraph 3) and extra information has been added on the ways in which the questions were asked in the vignettes (p 7 paragraph 1), survey (p 16 paragraph 3 and 4) and focus groups (p 18 final paragraph).**

In their revisions the authors should include a brief section on what could be seen as particularly British in all four studies' results, in a European (see Eurobarometer etc) and global comparison.

**More information has now been added on the results from surveys in other countries (p 4 paragraph 3).**

Most of the data presented in the paper is both original and highly relevant for the readership of Social Science & Medicine. What is missing at this point is a meaningful convergence of the data, as well as a stronger contextualization of it in the debate on human cloning. A more substantial problematization of methodological issues would be desirable.

**There is now some extra consideration of this in the revised paper (p 17 final paragraph), along with the extra material in response to the previous point.**

3rd paragraph of introduction: The authors write that "A key issue is under what circumstances, if any, it can be considered acceptable to end one life - that of the embryo - with the objective of saving another". This sentence is confusing. First, this statement does not apply to reproductive cloning (here, no embryo would be destroyed); second, the sentence suggests that those two kinds of life (the one of the embryo and the one of the patient) are of the same value. Whereas some people would argue that this is the case and their viewpoint is perfectly legitimate, the authors should at least acknowledge that this is only one among several ways of conceiving of the value of different stages of human life. Furthermore, it is crucial that the authors note that the sentence does not apply to reproductive cloning.

**It is now made clear that this refers only to therapeutic cloning and the different views on this are now acknowledged (p 3 paragraph 4)**

P 5-6, description of vignette study: authors should inform the readers how "reproductive cloning" and "therapeutic cloning" were defined in this study

**This has been added into the Method section (p 7 paragraph 1).**

P7, last paragraph above headline "Results": the description of how media analysis was carried out is too rudimentary. The authors note that they used "the method of discourse analysis (broadly defined)"; however, there are many ways of doing discourse analysis. Did the authors employ a post-structuralist approach, or a structuralist one? Did their analysis entail word counts? According to which categories did they code the data? Etc (two or three additional sentences might be sufficient).

**The has now been modified to make the analysis clearer (p 8 paragraph 2).**

P9, penultimate paragraph: The authors note that "there was considerable ambivalence in the media reports with some articles containing both pro-and anti-representations." I suggest to explain what the authors mean with "ambivalence" here. Was it that those media reports tried to present both arguments against and in favor of therapeutic

cloning, or was it any other characteristic that made it "ambivalent" in the eyes of the authors?

**The word ambivalent has been removed since this was not clear.**

P11, quote at the end of the page: It would be interesting to know whether Archie talked about the "interfering with nature" argument upon his own initiative, and, more generally, in what particular context this argument came up. I suggest to simply add a bit more text in the beginning of the quote, or to summarize the discussion among focus group members preceding the quote presented in the paper.

**The extra quote has been included (p 13 top).**

P12, Grace's quote: It does not come out clearly what point Grace wants to make here, and why the authors selected this quote for the paper.

**This has been replaced by a different quote (p 14 top).**

P14, last paragraph (third below headline "discussion and conclusion"): The statement that "these results contrast with those from the focus groups where the participants were much more negative about cloning overall" is a bit confusing: I suggest to treat respondents' reactions to therapeutic and reproductive cloning separately here. In places where there was no differentiation made between the two (neither by the moderators, nor by the respondents), the authors should mention it explicitly.

**This has now been edited and the discussion of reproductive and therapeutic cloning presented separately (p 16 paragraph s 5 and 6).**

Lastly, the word "complexity" in the paper's title ("Attitudes to cloning: Understanding the complexity of British public attitudes towards human cloning") is misleading insofar as the authors rather demonstrate the complicatedness of the issue, not its complexity in the strict sense of the word. An attempt to understand the complexities of the matter would have entailed a more thorough discussion of the different findings of the various studies, as well as a more substantial discussion of possible reasons for differences in outcomes. Most importantly, it would have required a discussion of how different parameters that account for respondents' feelings and opinions do interact. However, this "problem" could be solved by choosing a different title.

**The title has been changed to remove the word complexity.**

## Reviewer #2

This paper represents an attempt to move beyond single methodologies for evaluating public attitudes and an attempt to expand the grounding for how individuals come to their understandings of human cloning. The authors should be applauded for this expansive scope. Nevertheless, before I can offer a fully positive recommendation, there are a number of topics that should be addressed.

1) The manuscript's aims are somewhat fuzzy. The last sentence of the abstract, the gap in the literature identified on page 4 (*i.e. It is often uncertain, however, to what extent public opinion is influenced by the media environment at any given time or the manner and context in which questions about human cloning are asked.*)

, and much of the conclusion indicate that the authors are concerned with the relationship among the media environment, public discussion, and public attitudes toward human cloning. Then again, the authors suggest on page 4 and in the first and last paragraphs of the conclusion that they are interested in the nature/spread/strength of public opinion and the resources and reasoning used by members of the public. Given that the authors spend more time developing media as a potential resource, the authors may wish to clarify their aims and provide greater focus for the reader.

**The role of the media analysis within the paper is now made clearer at a number of points in the revised manuscript but explicitly so on p 5 paragraph 1. It is not the intention in this paper to assess directly the impact of media on attitudes but rather to examine media coverage as one of the resources the public can draw upon.**

2) Regardless of the whether the revision chooses to focus on media itself or media and other resources for public reasoning, the authors will want to expand their literature base to account for previous research into public resources for discussing genetic technologies (including cloning). In particular, the authors may find Benjamin Bates's article in *Public Understanding of Science* helpful as well as work by Tim Caulfield on public attitudes to commercialization and Peter Conrad on genetic optimism as each addresses media and public culture's influence on public attitudes and beliefs.

**The sections on the media in the Introduction (p 5 paragraph 1) and Discussion (p 17 final paragraph) have been expanded.**

3) Methodologically, the authors likely have all of the information to address the following queries. The next few items are about reporting the methodology more completely.

a. Since the authors are exploring possible contributors to attitude formation, particularly media, in the survey section, it would be helpful to know if the British Social Attitudes Survey asked questions about media consumption/use. As a possible determinate or contributing factor, it seems necessary to ask the public about their media use to arrive at the conclusions offered at the end of the paper about this (potential) causality.

**Since the main point of the paper is not to assess the impact of media coverage on attitudes, the suggested analysis has not been included. The focus group members were asked about media use and this is included (p 17 final paragraph).**

b. As noted in the conclusion, it is possible that the different vignettes offered, especially the changes in language and value structure in the vignettes, contributed to different perceptions. As such, it would be helpful to know if the authors piloted these vignettes before the study to control for these. The authors may also want to include the vignettes as an appendix to the mss to demonstrate the cues given to the participants.

**The full vignettes have not been included because they are rather long but the relevant wording has now been included (p 7 paragraph 1).**

c. When describing the focus group methodology, the authors should include some sample questions/probes. The conclusion states that environmental and contextual cues are important to public discussion, making it necessary to know what these cues, provided by the researchers, were.

**On p 7, we described clearly the relevant areas addressed by the questions posed in the focus group discussions. The actual questions reflected these descriptions very closely. Standard probes were used (such as ‘What makes you say that?’ and ‘Could you say something more about that?’) and so we do not feel that readers would gain anything from having the probes specified and we would be reluctant to devote precious space to this.**

d. In the media analysis methods, it would be helpful to know more about the newspaper articles. What was the total N? Was the coverage balanced? (For instance, although six newspapers were read, there are no selections reported from the Times or the Daily Mirror, making it possible that they did not discuss cloning at all). And, most important, when the authors state that they used "the method of discourse analysis (Broadly defined)," what, exactly did they do? Did they use N-Vivo to parallel the focus group analysis? or hand-code? or was it a more impressionist form of discourse analysis. The authors should provide a little more detail here, including a citation or two to the proponent of whichever method of discourse analysis that they choose.

**The numbers of articles in each of the papers is now included, along with some more details of the analysis (p 8 paragraph 2).**

4) In the reporting, the authors tend to let the data "speak for itself" when talking about focus group and media items. The authors may be trusting the reader to find the tropes, metaphors, and the like without spoon-feeding, but the authors should provide a little more explanation to unpack what each item is saying. As currently written, there is a telling and then a showing of the theme, but less integration to make for an explanation of how the theme is deployed in the talk turn or media clip.

**The reviewer raises a very important point about the way in which the focus group data and media are presented to illustrate the analytic points. When the**

paper was being prepared, we recognised that the format used in the paper is not at all the standard one in discourse analytic work; there, the usual approach is to do what the reviewer asks for – that is to elaborate where exactly in the excerpt the work identified in the analysis is being carried out and how this is being done. However, to do this would take the paper well over the word limit and would make it appear unbalanced: it would read as a discourse analytic paper with some quantitative data almost as an aside. It should be noted that on p 8 (paragraph 1) we attempted to address any concern about the way the analysis of the focus group data is presented by stating that ‘space constraints mean that, in this paper, findings from the focus group studies are presented more as the outcome of a social constructionist version of thematic analysis (Joffé and Yardley, 2004) rather than in the level of detail normally expected in discourse analysis’. We believe that the paper has managed the challenges of presenting the discourse analyses in as practical a manner as possible.

5) The word "Religion" on page 13 should be underlined and moved to the next page as a section heading.

**This has been changed.**

6) The authors' conclusions may be accurate, but need additional support in the main text. There are two zones where this need becomes apparent.

a. The authors claim that there is a "marked similarity" between the types of discourse in the media and the focus groups. This is not currently demonstrated by the selected talk turn and clips. Different talk turns and clips could be counterpoised to make clear the marked similarities. Alternatively, the authors could code their data more quantitatively to show that the "slippery slope" metaphor (and the like) pop up frequently in both data sets.

**This has not been done and the emphasis on the similarity has been reduced in the revised a paper.**

b. The authors claim that moral arguments/arguments over human nature foreclose debate. The selections from the transcripts, however, do not show this. This could be easily resolved in the main text by noting what happened in the transcripts after one of these arguments was raised. If in the vast majority of cases the topic of discussion changed or a long silence occurred, the authors' claim would be justified, but the evidence needs to be made clear to the reader on this point.

**The reviewer highlights what we think is a lack of specificity in the analysis of invocations of the status of the embryo and interference with nature. We clearly state on p 12 (paragraph 4) that when ‘bottom-line resources’ were used in an individual’s talk about a certain issue, these ‘closed down the possibility of further discussion on the issue for that individual and at times for the other participants interacting with that individual’. This is the correct rendering of the function performed by bottom-line resources. They did not foreclose further discussion *per se* but rather they provided a resource by which individuals could exempt themselves from further discussion on a particular issue at an individual level. In functional terms, these resources served to position speakers as uncontestable on that issue, although the discussion on that issue often continued**

among other speakers (as is acknowledged on p 14 paragraph following the quiet). We cannot really illustrate this because it would involve providing a long extract in which the person who used the bottom-line resource was not challenged and no longer took part in the continuing discussion. Reviewer 2's statement that we have claimed that invocations of the status of the embryo and interference with nature 'foreclose debate' may be based on the overly-concise summary sentence at the end of p 19 paragraph 1. This has now been need to be elaborated.

Prepared for submission to: *Social Science and Medicine*

Running head: Attitudes to cloning

Towards an understanding of British public attitudes concerning human cloning

## **Abstract**

The ability of scientists to apply cloning technology to humans has provoked public discussion and media coverage. The present paper reports on a series of studies examining public attitudes to human cloning, bringing together a range of quantitative and qualitative methods to address this question. These included a nationally representative survey, an experimental vignette study, focus groups and analyses of media coverage. In all of the analyses therapeutic cloning was viewed more favourably than was reproductive cloning. However, while participants in the focus groups were generally negative about both forms of cloning, and this was also reflected in the media analyses, quantitative results showed more positive responses. In the quantitative research, therapeutic cloning was generally accepted when the benefits of such procedures were clear and although reproductive cloning was less accepted there was still substantial support. Participants in the focus groups only differentiated between therapeutic and reproductive cloning after the issue of therapeutic cloning was explicitly raised; initially they saw cloning as being reproductive cloning and saw no real benefits. Attitudes were shown to be related to underlying values related to scientific progress rather than to age, gender or education, and although there were a few differences in the quantitative data based on religious affiliation, these tended to be small effects. Likewise in the focus groups there was little direct appeal to religion but the main themes were 'interfering with nature' and the 'status of the embryo', with the latter being used more effectively to try to close down further discussion. In general there was a close correspondence between the media analysis and focus group responses, possibly demonstrating the importance of media as a resource or that the media reflect public discourse accurately. However, focus group responses did not simply reflect media coverage.

**Abstract word count:** 293

**Keywords:** UK, human cloning, attitude, focus groups, media analysis, survey

**Full word count:** 11102

## Introduction

In the post-genomic era, the growing capability of scientists to apply cloning technology to human embryos has prompted widespread media reporting and discussion – most controversially over claims that a human clone had been born (e.g. Guardian, 2003). Although these claims were widely discredited, it is true that today the cloning of human genetic material can no longer be seen as the domain of science fiction. Unlike many other countries, including the USA, the cloning of human cells has been legally sanctioned in the UK for the purposes of medical research ('therapeutic cloning'). However, at the same time, specific legislation has been developed to outlaw reproductive cloning, where a cloned human embryo is implanted and allowed to develop to full term (HMSO, 2001).

Cloning is the technique of creating an identical copy of an organism from its genetic material using the technique of cell nuclear replacement (MRC, 2002). A distinction is made - at least in law - between therapeutic or research cloning and reproductive cloning. The former harvests special cells called stem cells which, at the early embryonic stage of development, have a unique ability to divide and differentiate into a range of body tissues. As stem cells from a cloned embryo will be genetically compatible with their donor, their potential benefits lie in medical therapy for a range of diseases and degenerative conditions. In reproductive cloning, the same technique is used to create a human embryo that is then allowed to develop into a baby that is an identical genetic match to the donor.

The debate around human cloning has a long history (e.g. Warnock, 1984) but much of the more recent discussions have followed the cloning of Dolly the sheep (Wilmut et al., 1997), e.g. UK House of Commons Science and Technology Committee report (1997) and the consultation on *Cloning Issues in Reproduction, Science and Medicine* launched in 1998 by the Human Genetics Advisory Commission (HGAC) and the Human Fertilisation and Embryology Authority (HFEA) in the UK. This has been mirrored by international debates on this topic and in 2005 the vote by the United Nations for a non-binding ban on all forms of cloning, although this has not prevented research on therapeutic cloning in some countries, e.g. the UK.

Much of the controversy and debate surrounding human cloning for both therapeutic and reproductive purposes centres on moral and ethical issues around the creation of a human embryo. A key issue in the debate surrounding therapeutic cloning is under what circumstances, if any, can it be considered acceptable to end one life – that of the embryo - with the objective of saving another (Reiss, 2002)? Clearly there are many different ways of conceptualising the value of human life at different stages and hence resolving such questions is far from straightforward. Exactly when in its development should a human embryo be accorded human rights and protection? This issue is hotly debated within ethical and religious contexts (for example, see McCarthy, 2003) and is unlikely ever to be resolved, although advisory bodies generally acknowledge that there are specific circumstances where using stem cells from human embryos can be justified by the potential health benefits arising from the research.

A subsidiary set of arguments around human cloning arises from the potentially arbitrary nature of the distinction between therapeutic and reproductive cloning (Bowring, 2004). The reasoning behind what may be termed the 'slippery slope' argument is that advances on therapeutic applications of cloning will inevitably lead to reproductive cloning, regardless of its legal status.

A number of large scale surveys report positive attitudes among the public towards science and new scientific developments (Gaskell, Allum & Stares, 2003b; MORI, 2005) but the same sources typically reveal considerable public scepticism about the motivations of scientists, and about the science and the application of new technologies. Certainly for genetic science there are particular public concerns about privacy, ethics and tampering with nature (Calnan, Montaner & Horne, 2005).

Calnan et al. (2005) surveyed members of the public in England and Wales about their attitudes to new health care technologies, science and trust in health care practitioners. A scenario on reproductive human cloning was used based on an infertile couple participating in a clinical trial to have a baby. Only 12 percent accepted that the couple should participate in the trial compared with 68 percent who rejected it. Other scenarios based on non-embryonic stem cell therapy and genetic screening were received much more favourably, leading the authors to conclude that support for genetic technologies is heavily dependent on its stated purpose.

Bates et al. (2005) report that polls in the USA from 1998 to 2002 show that 66% to 90% of the American public indicated that embryonic, animal and human cloning were unacceptable. Likewise, Gaskell, Allum, Bauer, Jackson, Howard & Lindsey (2003a) found the usefulness of cloning human cells to be rated around the 'tend to agree' mark. Nisbet (2004) reviewed a number of public opinion polls in the USA and while cloning was generally not accepted the results were highly dependent upon the application; in a 1998 survey approval was highest for the application of 'infertility' with 33% approving and there was a 20% approval in a 2002 survey for the application 'infertile couples' (Nisbet, 2004). Other US surveys between 1997 and 2002 gave between 9 and 11% agreeing that the cloning of humans should be allowed, where the application was reproductive (Nisbet, 2004). Likewise, a 2001 survey gave 11% of people agreeing that reproductive cloning should be legal whereas 33% felt that it should be legal to clone humans for medical treatments (Nisbet, 2004). Surveys where it was explicit that the cloning would not result in the birth of a human being (but rather were for research or medical treatments) gave between 34% and 59% approving the application (Nisbet, 2004). Simpson and Edwards (2002) likewise comment on a Harris poll conducted in 2001, where 76% rejected reproductive cloning, as showing less objection than might be predicted from the positions taken by official organizations and investigators.

In 2005, an online survey in the UK by YouGov questioned over 2000 adults about cloning and embryo research (YouGov, 2005). A total of 66 percent agreed that 'the rights of the patient are more important than the embryo', with only 15 percent disagreeing with this statement. A majority of 58 percent endorsed the view that embryos are not really human beings from the moment of conception but believe that their use should be governed by law. Just over one quarter found therapeutic cloning acceptable using embryonic stem cells to treat disease, but a much lower proportion found it acceptable for cosmetic purposes. Approximately 6 in 10 people thought that scientists give too little thought to the moral issues involved.

A UK qualitative study by the Wellcome Trust (1998), using reconvened focus groups, concluded that participants were overwhelmingly against cloning and that the provision of information about cloning did little to modify reactions of shock, concern and fear around the technology. While most of the participants were familiar with the idea of reproductive cloning they lacked any prior knowledge of therapeutic cloning.

Previous analyses of media coverage in this area have also highlighted the distinction made between therapeutic cloning as ‘good’ and reproductive cloning as ‘bad’ (Petersen, 2001) and also examined the types of rhetorical devices used in the debate surrounding the use of stem cells and contrasting views of future developments (Kitzinger and Williams, 2005). Media analysis on other genetic issues has shown differences in the construction of the ‘gay gene’ between the US media, where this was presented as good science and treated with cautious optimism, and the UK media which presented the research as the ‘perils of the gay gene’ (Conrad and Markens, 2001). The media is expected to be a major source of public understanding of genetics and a strong influence on public discourse (Conrad, 2001), although neither Conrad (2001) nor Conrad and Markens (2001) empirically examined the relationship between media coverage and public understanding or attitude. Some have argued that the public receive an overly deterministic view of genetic science from the media (e.g. Nelkin and Lindee, 1995) but others have questioned the extent to which this impacts on the public (Condit, 1999; Bates, 2005). The interpretation of information in the media is far from a linear acceptance of the views expressed but rather the target audience interpret the information in complex ways and are active rather than passive in the ways in which they use media information (Condit, 1999). In addition to print and broadcast media, there are other sources in popular culture which may have an impact on public views, e.g. science fiction and movies (Biotechnology Australia, 2006).

While provoking strong opinions among many, public surveys and consultation exercises about human cloning show that attitudes vary according to its stated purpose, perceived utility and morality (e.g. Bates, Lynch, Bevan, & Condit, 2005; Gaskell, Allum, Bauer, Jackson, Howard & Lindsey, 2003a; Gaskell et al., 2003b; HFEA, 1998). It is often uncertain, however, to what extent public opinion is influenced by the media environment at any given time or the manner and context in which questions about human cloning are asked. How the potential harms and benefits of cloning are presented arguably has a direct impact on the level of public support found in opinion polls (Genetics and Public Policy Center, 2005; Nisbet, 2004). Public responses to human cloning must also be seen in the context of the current socio-political climate; for example, recent research indicates that although some types of scientist continue to be considered as valuable sources of scientific information and advice about science, there are growing public concerns that the independence of scientists may be compromised by the interests of their funders and the commercialisation of such funding (MORI, 2005). Commercialisation has also been identified as one of the possible reasons for the ‘hyping’ of genetic science in the media (Caulfield, 2004). These concerns may well have been further intensified by the recent highly visible controversy around falsification of scientific data in this area (Wohn, 2006).

This brief overview of research exploring public perceptions and understandings of cloning depicts a somewhat fragmented set of findings largely derived from studies using single methods and ranging over a period of years over which there have been considerable developments both in the science and in the accompanying media coverage.

This paper reports multi-method research on public attitudes towards new genetic technologies in the UK. Drawing on both quantitative and qualitative data affords us a unique opportunity to investigate the nature, spread and strength of opinion among the British population. In addition, the inclusion of an analysis of the media coverage of genetic technologies and cloning during the same period as the reported empirical studies of public attitudes enables us to juxtapose the media framings of cloning and related issues with the

views expressed by the participants in our study through the different methods. We consider the media coverage as one form of resource which the public may utilise in presenting their views on human cloning. In this respect we do not seek to draw a causal link rather, in line with Hansen (2006), we view the media as reflecting prevailing attitudes and discourses in circulation as well as constituting a set of resources upon which people may draw.

## **Method**

The data reported here were collected as part of a large study on attitudes to genomics which comprised several separate elements. Data are reported from two quantitative pieces of work, a national survey and an experimental vignette study, and two qualitative elements, a focus group study and media analyses. Each of these pieces of work was conducted separately and there was no overlap in participants between the different pieces of work. The methods for each strand of work are described briefly below.

### *Survey*

Questions on human cloning were administered as self-completion items on the British Social Attitudes Survey, an annual survey of social and political attitudes in the UK that was conducted between June and September 2003. This yielded a nationally representative sample of approximately 2500 adults aged 18 and above. The key questions in the survey for the purposes of this paper are four questions on attitudes to cloning for different purposes. The first three were on therapeutic cloning for different purposes and were preceded by a short preamble:

*You might have heard of something called human cloning. One type of cloning would be if a person's genes were copied exactly and used to make an embryo. Cells from the embryo could be used to supply the person with tissues or organs that would be a perfect match for them, meaning their body would not reject them. Do you think this should be allowed or not allowed for if a person ...?*

1. .. needs an organ transplant
2. .. needs treatment for Parkinson's Disease
3. .. is generally in good health and wants to live longer

We also asked one question on reproductive human cloning:

*Another type of human cloning might be used to treat a young couple who are infertile and cannot have a child. Suppose that the genes from one of them were copied exactly and used to make an embryo with exactly the same genetic make up as that parent. Do you think this should be allowed or not allowed ...?*

For further details about the design of this survey and the questions used see Park, Curtice, Thomson, Bromley & Phillips (2004) and in particular Sturgis, Cooper, Fife-Schaw & Shepherd (2004).

### *Vignette study*

Participants in the vignette study comprised 368 adult members of the British general public who were categorised as having either high or low trust in science. The study was carried out between May and September 2004. The groups were selected on the basis of agreement or

disagreement with the item “Those in charge of new developments in genetic science cannot be trusted to act in society’s interests”. Participants completed a baseline questionnaire assessing demographic and attitudinal variables and were then randomly assigned to receive one of four vignettes. Therapeutic cloning was described in the vignettes in the following way: ‘One use of cloning involves taking special cells, called stem-cells, from cloned embryos. These cells could then be used to help treat disease in the person who donated their genetic material, for example, to grow replacement body tissues or organs.’ Reproductive cloning was described as follows: ‘One use of cloning involves placing the cloned embryo into a woman’s womb so that it grows into a new human being.’

The vignettes described either therapeutic or reproductive cloning and contained either arguments in favour of banning the technology outright or allowing it under regulated conditions. Thus the study had a two (therapeutic versus reproductive cloning) by two (arguments for banning or arguments for controlling the technology) between-subjects factorial design. Participants then completed follow-up questions on their attitudes towards the situation described in the vignette and cloning in general. For the present analysis the four items of interest are:

1. Cloning, as described, should be banned
2. Cloning, as described, should be allowed under certain circumstances
3. Cloning technology threatens the natural order of things
4. Cloning technology poses no threat to future generations

Response options ranged from 1 (strongly disagree) to 5 (strongly agree). The vignettes and the questionnaire are available from the authors on request. As a manipulation check the information in the vignettes was not found to differ in terms of its believability, the extent to which it was new information, and the extent to which it was in conflict with what had previously been heard.

### *Focus groups*

The focus group study was carried out between July 2004 and April 2005 and involved ten groups which (potentially) addressed the issue of cloning. Eight were conducted at six locations in England, Scotland and Wales with members of the general public who had no particular involvement or investment in genomics-related issues. Four addressed health-related technologies; four did not focus on specific applications. Group members were recruited by a fieldwork agency to reflect the demographic profile of the populations in the various group locations. This resulted in focus groups that were consistently diverse in terms of gender, age and occupation; the ethnic diversity of the focus groups varied according to the group locations. Two additional focus group interviews were conducted with people affected by genetic disease, who were recruited through the Clinical Genetics Department of a London hospital; these were less diverse and in this case most participants were female. The eight general public groups consisted of 80 individuals and the two groups of people affected by genetic disease consisted of 12 individuals. Participants were paid an incentive of £35 to take part.

Each focus group was facilitated by two moderators, using an interview schedule which, among other issues, invited participants to identify the developments in (health-related) genetic technologies that they had heard about or encountered and to describe what they had heard, what their reactions have been and how they evaluate the acceptability of these technologies. In relation to cloning, if participants did not distinguish between reproductive

and therapeutic cloning, the interviewers provided definitions of these technologies in line with the definitions outlined previously and then asked participants about their responses.

Interviews were transcribed, coded in terms of content using N-Vivo and then subjected to an integrative form of discourse analysis that attended to both relatively micro-level and macro-social features of talk (Wetherell, 1998) in order to identify the ways in which and the basis on which 'attitudes' and 'knowledges' relevant to cloning are constructed and worked with. However, space constraints mean that, in this paper, findings from the focus group studies are presented more as the outcome of a social constructionist version of thematic analysis (Joffé & Yardley, 2004) rather than in the level of detail normally expected in discourse analysis.

### *Media analyses*

A qualitative analysis of genomics-related texts was conducted on data drawn from newspaper articles from six UK newspapers (the *Times*, the *Guardian*, the *Daily Telegraph*, the *Daily Mail*, the *Sun*, and the *Daily Mirror*) during a 3-month monitoring period (12 January – 11 April 2004, inclusive). A total of 1340 articles were included in the analysis with the following split between the newspapers: *Times* 450, *Guardian* 447, *Daily Telegraph* 159, *Daily Mail* 108, *Sun* 94 and *Daily Mirror* 82. The analysis followed the same type of process as for the focus groups above and the results are presented in the same form as the outcome of a social constructionist version of thematic analysis (Joffé & Yardley, 2004) rather than in the level of detail normally expected in discourse analysis.

## **Results**

The following results are presented under two themes which emerged from the analysis of the different types of data: the distinction between cloning for therapeutic or reproductive ends and values and beliefs underlying attitudes to cloning. In each case, results are presented from different pieces of research in order to illustrate the contribution of each method to addressing these general issues; given space constraints, it is not possible to present all of the relevant findings from any one of the methods.

### *Therapeutic versus reproductive cloning*

Each of the data sets provides some insights into the nature of the distinction between therapeutic and reproductive cloning. The survey and experimental data show that the information provided around the purpose of cloning were clearly related to judgements of various applications. Interestingly the focus group discussions indicated that when people are left to their own devices they do not spontaneously differentiate these two facets. Both the focus group discussions and the media analysis show the use of the 'slippery slope' metaphor (Bowring, 2004) affords a way of framing considerations of therapeutic and reproductive cloning.

Analysis of the survey data suggests that obvious benefit is important for the attitudes the general public express towards therapeutic cloning. The purpose of such cloning research clearly had an impact on the attitudes people expressed. Survey respondents were strongly in favour of cloning where the benefits were clear (for an organ transplant or for Parkinson's disease) but not where cloning was simply to prolong the life of a healthy individual (see Table 1). Although responses were more mixed when the application was reproductive,

nonetheless a substantial number of people (38%) felt that it should definitely or probably be allowed (Table 1).

As in the survey, the respondents in the vignette study were more positive towards therapeutic cloning than they were towards reproductive cloning (Table 2). This was particularly true for the questions directly related to the form of cloning 'as described' in the vignette but was also apparent for the questions which asked about cloning without specifically referring to the vignette.

In contrast, explicit distinctions between reproductive and therapeutic cloning did not typically occur spontaneously within the focus group discussions, in line with analysis of earlier focus groups (Wellcome Trust, 1998). Often the initial discursive object was the generic concept of cloning, interpretable as reproductive cloning. The frequent references made to 'Dolly the sheep' suggest that reproductive cloning currently operates as the 'default' reference point for the generic concept. Participant discussion of therapeutic and reproductive cloning as separate technologies often only occurred when one of the focus group facilitators made the differentiation. Aside from early invocations of the discursive resources of 'the status of the embryo' and 'interfering with nature', discussions of the permissibility of cloning as both a generic and differentiated technology followed a utilitarian ethical framework: their permissibility was negotiated in terms of their constructed costs and benefits.

Across the focus group discussions, reproductive cloning was routinely constructed as failing to provide widespread appreciable benefits or as yielding only the most obscure benefits for a very small number of individuals. The cloning of animals or humans was constructed as likely only to benefit individuals with morally questionable motives and/or with the financial means to secure the services of unscrupulous scientists. In conjunction with constructions of reproductive cloning as 'interfering with nature' and therefore as representing a potential cost, the constructed lack of general benefits of reproductive cloning warranted construction of it as an impermissible technology. The social undesirability of reproductive cloning was further evidenced by its invocation as a discursive resource in terms of being the implied end point in 'slippery slope' arguments against the permissibility of therapeutic cloning. Some of these features can be seen in the following extracts:

Archie            Well, I think the trouble is once the science exists, you will never stop scientists pushing the envelope. They are...they are going to take it further and further. I mean, you talk about this idea of what Gabi said about, you know, there's allegedly been a child cloned in Italy. I'm quite sure there's been children cloned, quite certain of it, but you won't hear about it, you know.

Jocelyn        You'll see a film about it.

Archie        You'll probably find Michael Jackson's got several at Neverland.

(Focus Group 7)

Megan        The government have already said 'yes' to the therapeutic cloning. We're already allowed to do that. The government decided for us that that's okay, which is a bit worrying, I think. I think we're the only European country that approved therapeutic cloning, I believe. It's one thing experimenting on embryos but also, it's a bit of a slippery slope into reproductive cloning, isn't it? That's the logical next step. Okay, they said 'Yes, that's wrong, everyone agrees, we're not going to clone a baby' but of course they will.

(Focus group 1)

In contrast to reproductive cloning, where the differentiation between the two technologies was made and where the link between therapeutic cloning and embryonic stem cell research was also made, therapeutic cloning was constructed as a permissible technology on the basis of its potential benefits to human health. The construction of therapeutic cloning as potentially contributing to the development of treatments for debilitating conditions, such as Alzheimer's disease and Parkinson's disease, warranted arguments in support of its permissibility. However, the construction of such treatments as unquestionable benefits was occasionally contested through the re-invocation of discourses of 'naturalness' and 'natural selection'. While the development of such treatments was constructed as desirable and beneficial on an individual level, they were occasionally constructed as not desirable and not beneficial on a collective level where they might result in increasing and increasingly aged populations. The potential benefits of therapeutic cloning and embryonic stem cell research were recast as potential costs in the context of global economic and environmental sustainability. The acceptance of therapeutic cloning on the basis of health benefits and resistance to acceptance on the grounds of interference with a natural process are evident in the extracts below:

- Sophie            So, then they're growing the stem cells...Is that the...? Which...which one is that?
- Diana            Therapeutic cloning.
- Sophie            Therapeutic. So, that's grown just for that. So, if you think about it, you're not reproducing. You're not messing about with another life. What you're doing is sustaining one that's here already. So, when you see how people suffer with it [Alzheimer's or Parkinson's] and what... Sorry. They don't suffer because, obviously, they don't know. It's the family and the grandchildren. I mean, you look at it like that and you think, 'Well, yes, if this was just to help them a little bit'

(Focus group 5)

- Charlie            Therapeutic [cloning], I can maybe understand it. If you get to that... and you...you do arrest it and it has to be at that stem cell stage...If you arrest the development, I can see the... Yes, I can see that.
- Kerry            But the population is just going to...if...if...if it is successful, what is going to happen to everybody that is actually on the planet and the planet? I mean, it's just going to...
- Charlie            I think if we go back 100 years...
- Kerry            There has to be a natural selection of people or animals.

(Focus group 5)

Human cloning also featured in the media data. The first major news story in the relevant time period of the data collection was the claim by the US fertility expert Dr Panos Zavos to have transferred a cloned human embryo into a woman. The second was the report in the journal *Science* (Hwang, Ryu, Park, Park, Lee, Koo et al., 2004) on the work of a Korean team led by Dr Woo Suk Hwang, which claimed to have extracted stem cells from cloned human blastocysts. While the coverage of the claim by Dr Zavos portrayed him as a maverick scientist, this latter story was much more scientifically credible. (Note that subsequently there has been controversy surrounding the work of Dr Hwang, who has been accused of scientific fraud, which led to his resignation in December 2005 (Wohn, 2006). However, at the time of

the media analysis reported here, there was no suggestion that there might be problems with this stem cell research and hence this was not reflected in the media analysis.)

Analysis<sup>1</sup> of the reporting of research on human cloning revealed that the perceived agenda, motivations and credibility of individual scientists were key for the overall stance taken in media reports of human cloning work. At the same time questions of the purpose of cloning, the status of the embryo and the risks of such interventions in 'natural processes' were also significant framings for the media discourse. A number of articles contained both pro- and anti- representations. However, a moral contrast emerged across the articles between reproductive cloning being positioned as generally a bad thing and therapeutic cloning being generally good, although not without its risks for the future, as also found by Petersen (2001) in analysis of Australian media coverage. Both pro- and anti- positions were shored up by use of 'science' claims, and the contested status of the stem cell (as human life or as merely blastocyst) persisted as an important pivot point for the articulation of different discourses.

Media coverage of the Korean stem cell research generally emphasised the differences between therapeutic and reproductive cloning, partly portraying the difference in terms of current scientific ability to produce an embryo from a stem cell line. This locates the difference as one of technique but a careful move is made in the quotation below to use the discourse of scientific precision which avoids the moral rhetoric of embryos as human beings. Indeed the 'big step' from stem cell line (and early blastocyst) closes down the possibility of such a moral challenge.

"Nobody has cloned a human here," said Donald Kennedy, a biologist and editor in chief of *Science*, which published the study today..."All they have done is create a stem cell line from an early blastocyst...To get from that to an embryo is a big step."  
(*Guardian*, Feb 13)

Media reports on claims of cloning drew clear and consistent distinctions between using cloning technology for reproductive purposes, exemplified by the Panos Zavos case and criticised by scientists and others as immoral, and for therapeutic purposes, exemplified by the Korean team which was presented as morally justified and offering significant benefits:

Cloning for reproductive purposes would...be wholly reprehensible...What good reason could anyone ever have for wishing to clone him or herself?...In fact the South Koreans have cloned an embryo with quite other reasons in mind. They wish to do further stem-cell research, which (it is hoped) will one day allow us to grow human cells that can be artificially stimulated into becoming special tissues...to replace those damaged in a disease process. (*Daily Telegraph*, Feb 13)

However, critics of cloning argued that this distinction was artificial and that, once therapeutic cloning is accepted, reproductive cloning would inevitably follow. The recurrent metaphor here, as in the focus groups, was the 'slippery slope' as implied in the *Daily Telegraph* headline on February 13<sup>th</sup> – 'Human cells cloned: babies next?' However, advocates for therapeutic cloning also invoked this metaphor more directly as a rhetorical resource that counters potential criticism:

The moral distinction between therapeutic and reproductive cloning boils down to the purpose for which the embryo is used...The distinction between therapeutic and reproductive cloning breaks down, because it is artificial. Once human cloning becomes

accepted, it is perfectly conceivable that foetus farming and eugenics will follow. (*Daily Telegraph*, Feb 13)

There is, of course, the slippery slope argument, and it is certainly true that there have been many such slopes down which we have slipped, or joyously skied, in the past few decades. But unless we believe that we are not masters of our fate...this is not a slope we need slip down, at least with proper regulation. (*Daily Telegraph*, Feb 13)

### *Underlying values and beliefs*

Analysis of all the data sets indicated that attitudes towards cloning were underpinned by a variety of values and beliefs. Using the survey data, it is possible to examine the strength of relationship between these values and public attitudes in the context of other known influential variables such as age, gender and education. The focus group data reveal the significance at a micro-level of certain orientations towards 'the embryo' and 'interference with nature', themes that also emerge from the media analysis.

In order to examine the impact of underlying values on attitudes to cloning in the survey data, a single cloning attitude scale was calculated by summing the four cloning items, three therapeutic and one reproductive (Cronbach's  $\alpha = .81$ ). As part of the survey, there was also a series of six questions on values in relation to science. Factor analysis of these items yielded three factors: the first comprised three items concerning the effects of human intervention on nature and justification of the means to an end ( $\alpha = .53$ ); the second factor comprised two items associated with the risks and benefits of scientific intervention ( $\alpha = .62$ ) and the final factor was a single item focusing on public perceptions of the fragility of nature. In each case, responses were coded so that a positive value represented a pro-science stance.

A multiple regression was carried out predicting people's overall attitude towards human cloning using dummy variables for religious affiliation and entering the three science and nature values as continuous scores. Respondent gender, age and highest educational qualification were also included. The results of this regression are shown in Table 3. On the first step, gender, age, education and religion were entered. The results show that a positive attitude to human cloning is associated with younger age and men, whilst those with a higher level of education are least likely to have a favourable view of this technology. None of the variables for religious affiliation were statistically significant in the model. This contrasts with the finding that two of the three values items were significant in predicting attitude to human cloning; both were consistent with a more favourable attitude among those with values that can be characterised as pro-scientific intervention and human progress in the natural world.

### Values as resources

Whilst the survey data allowed for an examination of the relationship between specified value variables and people's attitudes, the 'open' approach of the focus groups allowed a range of values and beliefs to emerge in discussion. Participants used what we termed 'front-line' resources early in the discussion to frame their views. On the other hand, some formulations of views served as 'bottom-line' resources in that they closed down the possibility of further discussion on the issue for that individual and at times for the other participants interacting with that individual.

The issue of interference with nature and the status of the embryo – the two most frequently drawn upon ‘values’ or ‘beliefs’ – are discursive resources commonly invoked in arguments against the permissibility of cloning technologies *per se*. Typically, they are drawn upon early in such discussions and may be interpreted as means by which further discussions of the permissibility of cloning technologies may be closed down. Thus they may be interpreted as both ‘front-line’ and, potentially, ‘bottom-line’ rhetorical resources. An example of ‘interfering with nature’ talk is provided below:

- Gabi: Well on that same line I would say ‘Why are we cloning people when we can’t look after the people we’ve got on this earth?’, you know. Why...why are we bringing more children onto this earth when we’ve got, you know, thousands of twelve-year-old mothers in Britain and thousands starving across the world so I guess there’s lots of different things.
- Archie Is that not really what you’re...what we’re all talking about the fundamental problem of interfering with nature. There’s always been that argument with science.
- Gabi Yes, but they could spend the money on better things.
- Archie Just leave things alone. You don’t know what you’re doing. You know, the Frankenstein thing. What...? You’re interfering with nature. You’re playing God.

(Focus group 7)

This reveals that Archie does invoke the ‘interfering with nature’ line himself. Gabi’s preceding turn shows how ‘cloning’ was routinely understood as reproductive cloning. Her location of cloning within a framework of problems of over-population provides the context for Archie’s comment as his ‘interfering with nature’ line is a reframing of Gabi’s question ‘Why are we cloning people when we can’t look after the people we’ve got on this earth?’.

Although both of these positions could operate as ‘bottom lines’, ‘interfering with nature’ was not as robust in curtailing further discussion as invocations of the status of the embryo. Whilst an individual might indicate they were opposed to (or very cautious about) cloning on the basis that it was interfering with nature or that the embryo was actually a human life, the former was more frequently challenged by other participants. Typically, these contestations of cautions against ‘interfering with nature’ were based on the questioning of the historical and cultural stability of the concept of nature; nature itself was made a contested resource. Although the ‘interfering with nature’ trope did not prove to be an effective bottom-line resource, it was nonetheless highly resilient, recurring in reworked ways within and across the focus group discussions.

Although the more effective bottom line resource involving the invocation of the status of the embryo could be interpreted as part of broader religious beliefs, this resource was typically located within a framework of the sanctity of human life (rather than within *explicitly* religious frameworks), where the concept of human life extended as far back as the moment of conception. Examples of conversational turns in which the status of the embryo was invoked are provided below:

- Paige I think the major issue with stem cell research is where the stem cells come from, whether it’s taken from a fetus. They have banks of embryos which

aren't used from IVF treatment. That's where they take them from and whether that's morally right or wrong. That's really the issue.

(Focus group 2)

Megan That's absolutely fine if they take your own stem cells but taking embryonic stem cells I don't think is right.

[ ]

Well, they're experimenting on embryos at the moment to extract their stem cells and then the thing dies, basically.

Amy Not fully-grown embryos.

Megan It's still human life, isn't it?

(Focus group 1)

Grace This is what I'm saying. I do, so that's an issue with me. That's my worry. So, the minute the sperm and the egg meets and it's producing a...It's a life.

(Focus group 3)

Invocations of the status of the embryo and the sanctity of human life functioned to exempt speakers from further more complex discussions of the permissibility of cloning technologies and other embryological research.

The media analysis also indicated the centrality of values relating to the status of the embryo (Williams et al., 2003). In the media reports of the Korean stem cell research, critics of cloning argued that embryos were human beings and hence should be accorded the rights appropriate to human beings. Advocates of the technology, on the other hand, argued that embryos cannot be equated with human life as it is usually understood. For example:

Once the clones are created, they are dismembered and their cells used to grow (we hope) spare parts for treating patients. Clearly that is anything but "therapeutic" for the clone embryo. So the question should be: can we treat some people if the process involves killing others? [ ] But are embryos really human beings? Scientists admit human life begins at the embryo stage. The embryo has rights. Are all human beings equal, or are some more equal than others? (*Sun*, Feb 13)

However, for myself, I cannot truly consider an embryo a full member of the human race. I cannot mourn for its loss as for say, the death of a six year-old child, nor can I feel the same outrage at its deliberately induced demise as for an old lady brutally done to death in her own home [ ] Indeed, if anyone claimed to be able to do so, I should think him either a humbug or madman. (Opinion, *Daily Telegraph*, Feb 13)

In some cases, the distinction was made between embryos and blastocysts in order to try to overcome this problem:

To say that scientists have cloned human embryos is in itself misleading. We are talking about bundles of cells known as blastocysts which are far from being actual embryos. (*Daily Mail*, Feb 15)

The status of the embryo as 'human' is thus a powerful construction invoked both by focus group participants and by newspaper journalists and opinion writers when discussing research into cloning. In both cases, the construction of the embryo as a human being shuts off any

acceptance of cloning. Moves to resist this foreclosure on acceptability generally involved repositioning embryos as something not human (as blastocysts).

The media accounts also drew on wider socio-political contexts. This served to discursively position cloning as an issue with nation-state dimensions. It also drew on familiar discourses of the role of the 'moral right' in preventing the advance of science in the USA and parallel religious movements in the UK which aim to have the same impact. The position in the UK on therapeutic cloning was contrasted with that in the USA, especially President Bush's opposition on moral grounds. Advocates of the technology used the rhetorical strategy of linking opposition to the 'moral right' and to a wide ranging 'anti-science' position:

I am dismayed that any discussion of cloning inevitably becomes dominated by the doom-mongers, often, conservative Christians who are anti-abortion, anti-IVF and anti-contraception. Those who accuse scientists of playing God invariably believe God belongs to them alone. They would deny the rest of us any choice over these matters. The Bush administration, for instance, has outlawed federal funding for stem-cell research. America, in its current incarnation, is a fundamentalist culture which also refuses to teach the theory of evolution in some of its schools. We are not such a culture. (*Daily Mail*, Feb 15)

The linking of this alliance between 'conservative Christians' and those who are 'anti-science' to characteristics of nation-state politics served to position the UK as forward thinking but as not immune to the risks that this constructed alliance was said to pose.

### Religion

While religion might be expected to be a major issue in determining people's responses to human cloning (Evans, 2002), religious affiliation did not emerge from the various analyses as playing a major role. For example, as described earlier, religious affiliation did not play a significant role in the prediction of attitudes to cloning as assessed in the survey (Table 3).

Closer inspection of the survey data did, however, reveal some religious differences in the strength of responses to each of the four cloning items (Table 4). Roman Catholic respondents in particular were more negative about cloning for any of the purposes specified. One third held strongly negative views about human cloning for reproductive purposes and people of this denomination were approximately twice as likely as those with no religion to object to human cloning for medical purposes.

In the vignette study, there were no differences in attitude to cloning between participants who attended religious services on a regular basis and those who did not. Participants who regarded themselves as belonging to a particular religion were more likely to agree that cloning threatens the natural order of things (Mean=3.85, sd=1.08) than participants who did not (Mean=3.56, sd=1.19;  $t(344.22)=2.39$ ,  $p<.05$ ). However, these two groups did not differ on the other three attitudes to cloning items.

Religion was not specifically identified by participants in the focus groups to explain why they held certain views or offered particular opinions in the discussion about cloning. However, references to concerns about 'interfering with nature' or to the status of the embryo/the 'sanctity of life' were occasionally positioned in terms of a generic 'God' or

could be understood as drawing on discourses and resources associated with religion and religious belief.

Religious positioning tended to be done quite subtly in the focus groups. For example, one of the more explicit positionings occurred in response to the quotation from Grace above. In this quotation, three times she claimed ownership of the view that life begins at conception ('This is what I'm saying...that's an issue with me. That's my worry'). In the turn that followed this, another participant responded by saying 'Sure. And I respect that as a...a fundamental...I think it's a fundamental religious position'. In the subsequent turns, Grace did not resist this construction of her viewpoint as religiously-based and the implicit positioning of herself in religious terms.

## **Discussion and conclusion**

Overall the research presents a complex picture of attitudes to and constructions of human cloning among the British public. It certainly does not present a uniform rejection of cloning in any form but rather presents a nuanced picture of variations across types of applications and differences in conclusions depending on the methods used.

The quantitative data from both the survey and vignette study are in line with previous surveys, which have shown more positive attitudes towards therapeutic than reproductive cloning (Calnan et al., 2005). We find that respondents do discriminate across all the cloning items according to the stated purpose and in the survey perceive most negatively the option of cloning to prolong a healthy life and reproductive cloning was seen as more positive than this. It should be noted that the terms 'therapeutic' and 'reproductive' were not used in the survey items but rather the purpose of the cloning was explained.

The responses to reproductive cloning in the survey and vignette study may be interpreted as more positive than both the responses in the literature and more positive than the responses in the focus groups. The approval of reproductive cloning in the present study is certainly rather higher than that found in a UK sample by Calnan et al. (2005), although the acceptance of the reproductive application by Calnan et al. (2005) may have been reduced by the inclusion of the phrase 'the procedure entails genetically modifying one of the woman's eggs' in their short scenario. In the present survey, the reproductive cloning question came last after being preceded by three items on therapeutic cloning. The question wording, including as it does the term 'young infertile couple' probably helps elicit a more sympathetic response and we can interpret a certain amount of 'therapeutic drift' from earlier items on therapeutic cloning. Against this interpretation, the results from the vignette study, using a different question and context, also yielded what can be interpreted as a reasonably strong approval for reproductive cloning. The review of US surveys by Nisbet (2004) makes clear the variability of findings across different surveys, which will partly depend on wording of items and although the responses in the current survey tend to be more positive they are not entirely different from the range of values in the literature (Nisbet, 2004; Simpson and Edwards, 2002).

In the focus groups, the participants were much more negative about cloning overall than in the quantitative studies, replicating the findings from the focus groups reported by Wellcome Trust, 1998). This might partly be explained by the initial assumption within the groups that cloning referred to reproductive cloning and that they could see no real benefits from this type of procedure, while seeing many objections.

When therapeutic cloning was introduced in the focus groups this was accepted to a greater extent than was reproductive cloning, but reservations were still expressed. The focus group responses on therapeutic cloning would appear to be more negative than the survey/vignette study responses on therapeutic cloning. This could be because in the focus groups the discussions started with a negative conceptualisation of cloning as meaning reproductive cloning and then when therapeutic cloning was introduced it was interpreted against this initial negative position.

It is noteworthy that the results of these focus groups in some respects chime well with those obtained in the Wellcome Trust groups some six years earlier (Wellcome Trust, 1998). Participants were generally negative about cloning, assumed that cloning meant reproductive cloning and also, whilst initially being more positive about therapeutic cloning, went on to express a range of reservations.

There are of course issues of how representative the samples are in the different studies reported. We can be confident of the sample from the British Social Attitudes survey being reasonably representative of the British public. However, as with all smaller scale qualitative research, the focus groups cannot be said to be truly representative but care was taken to ensure that group participants reflected the demographic profile of the group location and to avoid recruiting individuals who might have an explicit, identifiable agenda to pursue. The provision of financial incentives was also designed to draw a wide range of participants to the groups.

It is not necessarily surprising that the quantitative research and focus groups yielded different results in this case and it is of course not possible to say that one data source was 'correct'. The survey and the vignette study asked people to respond to relatively simple questions without the need to interact with other people who might have opposing views or the need to defend one's own views in public. Participants are sensitive to the presence or absence of cues provided by the research environment itself (Schwartz and Sudman, 1992; Houtkoop-Steenstra, 2000) and the predetermined and constrained response options in the quantitative research provides quite a different sense making context from the wide ranging discussion in focus groups. While the focus groups are useful for capturing the type of discourse in this context, the quantitative research yields both more representative data and may also reveal what people believe themselves but might find difficult to articulate in a public discussion. Using a variety of methods allows the examination of areas where there is good agreement between methods but also allows insights into areas of disagreement.

The present results demonstrate the challenges of integrating qualitative and quantitative methods (for example, Brannen, 1992; Schreier & Fielding, 2001; Todd et al., 2004). We accept that, to some extent, the findings from the various studies could sometimes be regarded as juxtaposed rather than truly integrated, although integration can take a number of forms (Moran-Ellis, Alexander, Cronin, Dickinson, Fielding, Sleney and Thomas, 2006). However, achieving meaningful integration of data from studies with different epistemological positions is a considerable challenge and inevitably involves some tensions and narrative 'jaggedness'. It was not our intention to try to 'resolve' these partly because the focus of the paper is not methodological and partly because we believe that combining diverse approaches involves learning to live with these tensions for the sake of the more textured picture of the substantive topic that can be produced by a multi-method approach. We hope that this paper will act as a focus for continued discussion about the optimal ways of

integrating qualitative and quantitative work and of responding to the epistemological and other tensions that can result from this process.

Both in relation to the comparison of therapeutic and reproductive cloning and other aspects of the analysis, there is a similarity between the types of discourse in the focus groups and the media analysis. This includes the use of similar phrases and rhetorical devices, e.g. 'the slippery slope' from therapeutic to reproductive cloning. This is not surprising since most of the information on cloning that members of the public will have encountered will have been obtained from the media (Miller & Riechert, 2000). Early in the focus groups, we asked what they had learned and where they had learned this (and the media was by far the most frequently cited source) before going on to explore their responses to this information. Subsequent discussions may have oriented to media sources but these sources were identified by participants rather than by the researchers. The similarity of responses lends support to the assertion by Petersen (2001) that the media coverage in this area is likely 'to exert a powerful influence on public responses'. However, previous focus group research (Bates, 2005) and the research reported here present a more complex picture of the use by members of the public of the resources provided through the media (Condit, 1999). Commonalities may reflect the media being well attuned to the nature of public beliefs/feelings in this area and reflecting these in the coverage or of both the media and the public drawing on common sources of public discourse in this field. It should be noted that the focus group responses did not in all cases reflect the media coverage. For example, while there was substantial coverage of therapeutic cloning in the media this was not picked up in the focus groups until the topic was expressly introduced by the researchers. Also the examination of the media showed a range of views presented often within the same newspaper, and so a simple transmission of views from the media to the public is not really viable (cf Bates, 2005; Condit, 1999). Rather members of the public appear to draw upon the media and other public discourse but their views will be influenced by other factors such as more general attitudes and also by interactions with others.

When we are asking people to respond to therapeutic and reproductive cloning we are importing a scientific distinction and imposing that framing on people by asking their reaction to reproductive and therapeutic cloning (in the survey and vignettes). We clearly see that when we do this, people assess them differently. However, it may be that this distinction is much less relevant to people when left to their own devices. Here, the focus group work suggests people think of cloning as a fairly undifferentiated venture which largely coincides with the expert category of reproductive cloning. This may not be surprising and cannot be solely attributable to the coverage of these issues in the media. The term 'cloning' is generally used to mean producing a second organism identical to the first. For example the Compact Oxford English Dictionary of Current English (2005) defines the verb to clone as to 'make an identical copy of' and the noun clone as 'an organism produced asexually from one ancestor to which it is genetically identical'. Likewise popular culture has generally portrayed cloning as reproductive cloning (Biotechnology Australia, 2006). The concept of therapeutic cloning is a scientific construct which has not generally found its way into popular consciousness in the same way (reproductive) cloning has, despite a reasonable amount of media coverage as observed here.

Attitudes were shown to be related to underlying values related to scientific progress to a greater extent than to age, gender, education or religion. There were some differences in the quantitative data based on religious affiliation but overall religion was not closely related to the expressed attitudes. One possible reason for small explained variance attributable to

religion is that people of all levels of religious commitment have values – around naturalness for example – that actually make religious belief peripheral. It also should be noted that the UK debate on cloning is not polarised by religion to the extent it is in the USA.

Likewise in the focus groups there was little direct appeal to religion, although the major rhetorical resources employed to object to cloning could be understood as drawing upon discourses associated with religion and religious belief. The lack of explicit invocation of religious factors in the focus groups as underlying expressed attitudes may well be related to participant wariness about explicitly positioning themselves as religious. To have done so may have risked being positioned by others as judgemental, narrow-minded, fundamentalist or in terms of any of the other negative constructions of what it means to be (constructed as) religious within a largely secular cultural context in which religion is increasingly granted positive access to public discourse only in the garb of subjective ‘spirituality’ (Heelas et al., 2005). However, taken together with the survey/vignettes results it would appear that people are simply hiding their religious beliefs. The question of the morality of cloning was very prominent across the different methods and this differs from other technological science developments which may simply be seen as amazing or unnecessary. Cloning, however, evokes consideration of what it is to be human, human identity, scientists losing their moral compass in pursuit of the fascinating. In discussion it was clear that certain claims or statements relating to the sanctity of nature and the status of the embryo were used in an attempt to foreclose further discussion and to position speakers as incontestable on the issue. This is not to say that they foreclosed further discussion *per se* but rather they provided a resource by which individuals could exempt themselves from further discussion on a particular issue at an individual level. In functional terms, these resources served to position speakers as incontestable on that issue, although the discussion on that issue often continued among other speakers.

Overall the findings demonstrate that of public views in this area are far from simple. In many cases the findings from the different methods are complementary, offering either confirmation of a finding or providing more insight than would be possible if using a single method and, in those cases where there is less agreement, giving an insight into the complexity of the views held in this area.

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Table 1

Percentage of survey respondents saying that therapeutic and reproductive cloning should be allowed if ...

Questionnaire item	Definitely or probably allow	Definitely or probably <u>not</u> allow	Base
..a person needs an organ transplant	65	24	2599
.. needs treatment for Parkinson's Disease	65	24	2587
..is generally in good health and wants to live longer	15	74	2578
.. if a young couple are infertile and cannot have a child	38	48	2608

Source: British Social Attitudes Survey (2003)

Table 2

Attitudes to therapeutic and reproductive cloning from the vignette study (standard deviations shown in brackets).

<b>Item</b>	<b>Therapeutic cloning (n=183)</b>	<b>Reproductive cloning (n=181)</b>	<b>T value</b>
Cloning, as described, should be banned	2.85 (1.31)	3.55 (1.29)	5.10***
Cloning, as described, should be allowed under certain circumstances	3.63 (1.14)	2.94 (1.32)	5.30***
Cloning threatens the natural order of things	3.56 (1.18)	3.87 (1.08)	2.62**
Cloning poses no threat to future generations	2.41 (1.01)	2.16 (1.01)	2.36*

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Higher mean denotes greater agreement with the statement (i.e. more negative attitude)

Source: 'Attitudes to genomics' vignette studies (2004)

Table 3

Beta coefficients from a multiple regression predicting overall attitude to cloning from religion and scientific values, controlling for gender, age and education.

Variable	Beta
<b>Step 1</b>	
Age	-.07**
Gender	-.09***
Higher education	-.07**
No qualifications	.05
No religion	.06
Church of England	.10
Roman Catholic	-.03
Christian - Other	.03
Non-Christian	.01
<b>Step 2</b>	
Age	-.03
Gender	-.06*
Higher education	-.06*
No qualifications	.02
No religion	.04
Church of England	.07
Roman Catholic	-.03
Christian - Other	.04
Non-Christian	-.01
Values - human intervention	.26***
Values – benefits/risks	.13***
Values - nature robust	.01

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001

The dependent variable is coded so that higher values = more positive attitude to cloning

Source: British Social Attitudes Survey (2003)

Table 4

Percentage of survey respondents who think human cloning should ‘definitely’ not be allowed by religious affiliation.

<b>Religion</b>	<b>Organ Transplants</b>	<b>Healthy person lives longer</b>	<b>Treat Parkinson’s disease</b>	<b>Child for infertile couple</b>	<b>Base</b>
None	11	47	10	27	1129
Church of England	12	46	11	26	722
Roman Catholic	19	49	18	34	230
Other Christian	15	46	14	27	378
Non-Christian	14	44	13	26	97
<i>All</i>	<i>13</i>	<i>47</i>	<i>12</i>	<i>27</i>	<i>2456</i>

Source: British Social Attitudes Survey (2003)

## End note

1. Martha Augoustinos, Shona Crabb, and Amanda LeCouteur (2005). Representations of genomics in the UK: Media, interest groups, and Government texts. Report on media analysis.

## **Towards an understanding of British public attitudes concerning human cloning Responses to reviewers' comments**

The response to each comment from the two reviewers is shown in bold after the reviewer's comment. The page numbers refer in all cases to the second revision of the manuscript.

### **Editor**

Some more detail on the focus group sessions would also be helpful - we presumed that each group had a mix of participants in terms of age, gender etc but this is not explicit.

**Some further detail on the composition of the focus groups has now been added (p. 7, first paragraph after subheading 'Focus groups').**

### **Reviewer #1**

P 3, first sentence in last para: „A subsidiary set of arguments around human cloning arises from the connections between therapeutic and reproductive cloning": the word „connections" is not very precise here. If I remember correctly, Bowring (to whom the authors refer here) argued that the distinction between the two is somewhat arbitrary and will not be able to be policed effectively (the authors rightly refer to the slippery slope argument in the next sentence; all I suggest here is to find a better way to represent this approach than speaking of "connections" - it's too vague).

**'Connections' has now been changed to 'potentially arbitrary nature of the distinction' in line with the referee's suggestion (p. 3, last paragraph).**

P 11, 2nd para: "moral rhetoric of embryos as human". Maybe say "human beings", or "potential persons" instead of "human" here... "Human" does not mean much in this particular context. When you cut off a finger it is also human, but an embryo has an additional quality to it

**'Beings' has now been added (p. 11, paragraph 3).**

P19, 6th line from top: What do the authors mean with their statement that "the morality of cloning was very prominent across the different methods..."? Do they mean "the question of morality"? But even if that is the case, I suggest to be more specific.

**'Question of' has now been added into this phrase (p. 19, paragraph 2).**

A purely aesthetic remark at the end: I am happy that the authors decided to delete the word „complexity" in the title; however, they might also consider working around using the word "towards" twice.

**The title has been changed with the second 'towards' now 'concerning'.**

## **Reviewer #2**

In re Concern 1: Although the authors have added considerable verbiage, their retention of all of the problematic passages retains original fuzziness between media as causal influence and media as resource. In fact, the additional verbiage actually makes the main intention fuzzier. If the intention of the manuscript is indeed the last sentence of the first paragraph on page five, the authors may want to revise this section to delete the problematic passages and move this sentence to the end of the section, thus giving it prominence and allowing the reader to see clearly that this is the point.

**As suggested, the sentence has been moved to the end of the Introduction to form part of the aims of the paper and therefore giving it more prominence (p. 5, final paragraph). It has also been expanded to make the point more clearly.**

In re Concern 3b: The authors' statement that readers can request the full vignettes addresses part of the concern. However, there still is no address to whether the vignettes were piloted to control for different perceptions that could be encoded in the messages because of their language and/or value structure. This is a simple question of a manipulation check to determine no undue influence because of structure rather than content. If the authors have this evidence, a simple statement that a manipulation check was performed and that the vignette's language/structure was not the cause of difference but that the content was the cause is sufficient. If they do not, this is a limitation that should be noted. This limitation could be addressed in one or two sentences in the discussion and conclusion section.

**The method section now includes a sentence on the checks made on the comparability of the vignettes (p. 7, end of paragraph following bullet points).**

In re Concern 4: This is an editor's call. My preference would be to give a little extra space to this paper so that the authors could present some analysis (a sentence or two per selection for a total of 14 to 28 sentences) to explain their qualitative data rather than relying on the interested reader to figure it out. Perhaps some space could be saved elsewhere by trimming back the overly long conclusion. Or the editor may prefer to allow the "social constructionist version of thematic analysis" even though the construction is less clear than it could be were traditional methods to be used.

**This has not been changed.**

In re Concern 6b: The wording in the reply to the reviewer is much more clear than the wording presented in the paper. Perhaps this wording could be used instead of the that which appears in the revision. In addition, the authors appear to recognize the difficulty in the main text. Nevertheless, they retain their self-described "overly concise summary sentence" on page 19. This overly concise statement still needs to be elaborated, and has not yet been.

**Part of the wording from the original reply to the referee has now been added to the paper as suggested (p. 9, end of paragraph 2).**