UNIVERSITY OF CALGARY

Clonesequences: Social Representations of Cloning Risks and Benefits.

by

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled " Clonesequences: Social Representations of Cloning Risks and Benefits " submitted by Grace Reid in partial fulfilment of the requirements of the degree of Master of Arts.

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Abstract

The media is bursting with sexy stories about the genetic revolution. It has stirred excitement about the discovery of genes for diseases such as cancer, but it has also roused fears about new biomedical applications such as cloning. Since Dolly the sheep, cloning stories have become more frequent, raising questions about whether or how such extreme representations in the public sphere have changed.

This thesis uses content analysis and focus group methodologies to investigate social representations of cloning both in the media and public perceptions. *Where and how do these representations meet and diverge? What are the nature of the rhetorical debates on cloning?* Through media and public representations, the author investigates the framing of cloning risks and benefits and explores how these utilitarian concerns are weighed against moral considerations. This thesis suggests that such representations provide important indicators of social values which need to be considered in policy decisions.

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List of Symbols, Abbreviations and Nomenclature

- ACT Advanced Cell Technology
- IVF In Vitro Fertilization
- SA Social Amplification

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Chapter One: Introduction

In February 1997, Dolly the sheep hijacked the media's attention. She had four legs, two perky ears and a silky white coat; by all accounts she was a normal sheep, except for the fact that her mother was also her time-aged twin. Dolly was a clone. She was not the first cloned animal, but she was the first clone produced by nuclear transfer (Kolata, 1998).

Months earlier, scientists at the Roslin Institute removed an adult cell from the mammary gland of a six-year-old ewe. They detached the cell's nucleus, which contained genetic information, and injected the nucleus into a donor egg cell whose inner contents were purged. Scientists then used a jolt of electricity to trigger the egg cell's division and development into an embryo. The resulting embryo was placed in a surrogate lamb, which gave birth to the famous Dolly on July 5, 1996 (Wilmut, Schnieke, McWhir, Kind, & Campbell, 1997). News of Dolly's birth was leaked to the media before the scientific account of her creation could be published in the academic journal of *Nature*. Media coverage of Dolly centered around the fear that the nuclear transfer technique would be used to clone humans—a fear that would be revisited nearly four years later in 2002.

In 2001, Advanced Cell Technology (ACT) announced that it had successfully used nuclear transfer to clone a human embryo, even though the embryo stopped dividing at the sixth cell stage (Mitchell, 2001, p. A1). If the cells had continued to divide, ACT claimed the resulting embryo would not have been used for reproductive purposes, but rather for therapeutic purposes, such as curing spinal cord injuries. While experts criticized ACT's results because they were not published in a scientific journal, ACT's embryo encouraged the media to revisit the concern of human cloning. The embryo was a pressing reminder that human cloning, beyond the sixth cell stage, was coming...and news of a successful human clone did come at the end of 2002.

During the holiday lull, between Christmas and New Years 2002, Bridgett Boissellier, a woman with wiry, orange hair and stained teeth, called a meeting of the world press. Boissellier was best known for her affiliation with the sensational Raelian cult that believes extraterrestrials genetically engineered humans. However, on December 27, she was acting as scientific director for a human cloning company called Clonaid. Rejecting the tradition of publishing scientific discoveries in peer-reviewed journals, Boissellier held a news conference at a beachfront Holiday Inn in Florida (Goddard, 2002, p. A1). Using Oscar-worthy theatrics, Boissellier announced that Clonaid used nuclear transfer cloning technology to create the first human clone. She claimed that the seven-pound baby girl, Eve, was born by caesarian section to an infertile couple on December 26. "The parents are happy. I hope you will remember that when you talk about this baby—not like a monster, like some result of something that is disgusting" (Wordsworth, 2002, p. A1). Boissellier went on to say that she was unable to disclose the location of the birth or offer any scientific proof. Regardless, the world media embraced Boissellier's announcement and baby Eve made headlines of skepticism and horror all over the world for two weeks.

Today, over a year later, Clonaid has still failed to produce any evidence of a cloned child. As a result, the scientific community generally accepts Clonaid's claim as a scientific hoax staged to gain publicity for Clonaid's affiliated Raelian cult.

Together Dolly the sheep, ACT's six-cell embryo and baby Eve represent significant milestones in the history of animal cloning and human therapeutic/ reproductive cloning. The media framed the events of Dolly the sheep and ACT's embryo in discourses of science, while news of baby Eve was cast in the realm of science fiction. Together, these two competing and complementary discourses, science and science fiction, feed social representations about cloning (Nerlich, Clarke, & Dingwall, 1999).

Research Questions:

The goal of this thesis is to explore social representations of cloning risks and benefits. The theory of social representations argues that when a group is presented with an abstract social object, the group collectively uses processes of communication to turn the abstract social object into a notion they can understand. This new public understanding is a social representation (Moscovici, 2001a). Researchers have studied the creation of social representations for a diverse number of social objects: psychoanalysis,

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mental illness, social identity, and biotechnology to name a few (Moscovici, 1976; Jodlet, 1991; Duveen, 2001b; Wagner et al., 2002). Only recently has it been suggested that social representations of technical risk would be a rich area of study (Joffe, 2003).

Traditionally, risk has been defined scientifically as the probability of a risk event occurring multiplied by the magnitude of possible consequences (Kasperson, 1992, p.155). However, social theorists, like Beck (1992), argue that technical definitions are no longer adequate to address the new and accelerating risks brought on by science and technology.

According to Beck, new risks escape perception of the senses, are impossible to scientifically calculate, and impact people across the globe as well as future generations. The harm associated with these risks swells beyond direct physical consequences; they have the potential to generate indirect effects such as anti-technology attitudes, increased insurance costs, and the erosion of public trust in institutions that manage risks. The most alarming element of new risks, however, is that they leave everyone equally susceptible. There is no escape (Beck, 1992).

Beck goes on to say that in order to evaluate and define this new dimension of risk, scientific knowledge of risk must be tempered with public rationality. "Scientific rationality without social rationality remains empty, but social rationality without scientific rationality remains blind "(Beck, 1992, p. 30). In line with Beck's agenda to legitimate public rationality, the theory of social representations allows researchers to tap public understandings of risks—as well as their corollary, public understandings of benefits.

Accordingly, social representations studies use public or social definitions of risks and benefits, rather than the scientific definitions (risk event times magnitude of possible consequences). This thesis utilizes Douglas' (1994) definition of risk, which classifies *risk* as danger of future negative damage. Expanding Douglas's definition, this thesis divides "damage" into categories of physical, psychological, financial, and moral damage. In comparison, this thesis identifies *benefits* as the possibility of future physical, psychological, financial or moral gains that are positive. Using these definitions of risks and benefits, this thesis examines risks and benefits associated with cloning. The term *cloning* is the process of genetically duplicating an organism, such as a plant, animal or human (Silver, 1997, 110). While there are several ways that organisms can be genetically duplicated, the most modern is the nuclear transfer technique, which produced Dolly the sheep. This thesis is concerned with cloning of animals and humans, regardless of whether the cloning is done using the nuclear transfer procedure or another technique.

Although animal cloning is an all-encompassing category used to describe animal cloning for all purposes, experts have divided human cloning into two categories: therapeutic and reproductive cloning. These two categories are distinguished largely by scientist's motivation for cloning humans. *Therapeutic cloning* involves cloning a human embryo for the purpose of extracting stem cells, which can then grow into organs or cells to treat diseases (Trounson, 2002); *reproductive cloning* is cloning for the purpose of creating a living child (Green, 2002, p. 477). ACT's six-cell embryo was an attempt at therapeutic cloning, while baby Eve, if she existed, would be a product of reproductive cloning. To date, there is no successful scientific documentation of either therapeutic or reproductive cloning. However, scientists at Seoul National University recently claimed they cloned an embryo that reached the blastocyst stage before they terminated it (Evenson, 2004, p. A15). This could mean that human cloning is just around the corner.

This thesis examines social representations of risks and benefits associated with animal cloning as well as human therapeutic and reproductive cloning. It aims to explore and explain differences/similarities between representations of these three cloning types.

Representations of these three cloning types are examined in two domains: media and public discussion. In order to study social representations in these two domains, two distinct methodologies are employed. A content analysis of *Globe and Mail* articles about cloning examines media representations of cloning risks and benefits from 1996, when Dolly was cloned, through to 2002, the birth of baby Eve. To complements this, focus groups with the Calgarians survey public discussions about cloning risks and benefits. Findings for the two domains are then compared and analyzed. Ultimately, this thesis will answer the following research questions:

- What are the social representations of animal/human cloning risks and benefits?
- How do social representations in the media meet with and diverge from those in the public discussions?
- What accounts for the similarities and differences between media and public representations?

Significance of Research

The understanding of social representations is important as there are currently no laws regulating cloning in Canada. Industrialized countries around the world rushed to create laws and regulations to prevent human cloning after Dolly was cloned in 1997. Today many countries have agreed to ban reproductive cloning, but countries differ on their regulation of therapeutic cloning. Ireland and Germany have banned both types of cloning, while Britain, Singapore and Israel chose to ban reproductive cloning and still allow therapeutic cloning (Caulfield, 2003, p. A15).

Canada, however, has yet to regulate either type of cloning. The Canadian government is currently on its third attempt to legislate human cloning. The government introduced Bill C-13, called the Assisted Human Reproduction Act, on May 9, 2002. If passed, this bill will ban both reproductive and therapeutic cloning (Caulfield, 2003, p.20). In October 2003, the Canadian House of Commons passed the bill by 149-109 votes. This means that the bill is approximately three-quarters of the way through the legislative process, however it still must pass through the Senate before it becomes law. This must happen before the current government calls an election or the process will begin again, meaning that the bill must return to the House of Commons for approval (*Canadian ART Bill to be Reintroduced*, 2004).

In the meantime, Canada continues to debate the boundaries of cloning legislation in Canada. Individuals like Canada Research Chair in Health Law, Tim Caulfield, are lobbying for Bill C-13 to be amended so it allows therapeutic cloning. Caulfield argues from position of public opinions. He uses public opinion studies, which show Canadians' support for therapeutic cloning, to persuade the Canadian government to amend Bill C-13 in favour of therapeutic cloning (Caulfield, 2003, p. A15; Caulfield et al., 2003). Taking into consideration Caulfield's work, studies such as this thesis have an important role to play in creating and influencing public policy.

Increased knowledge about social representations of cloning will allow for clearer channels of communication between the public and policy makers, and vice versa. The public needs to understand risks and benefits associated with cloning, so they can have valuable input into decisions such as public policy that affect their lives. Experts and decision-makers also need to understand public positions on risks and benefits as well as the values that underlie their choices and positions. Risk communication must be a twoway process if there is to be effective policy on controversial technologies such as human cloning.

Pattern of Inquiry

Chapter two acknowledges that traditionally literature has focused on risks, while ignoring benefits. Consequently, this chapter overviews the risk literature with the goal of extending it to study risks and benefits. It first examines Beck's (1992) claim that society is becoming a risk society. It then overviews traditional risk perception paradigms and suggests that the social representations theory offers a viable alternative for understanding risks as well as benefits. *Chapter three* describes the focus group and content analysis methodologies, which were chosen to explore social representations of cloning risks and benefits. The goal of the content analysis is to explore social representations in public discussion. *Chapter five and six* use the theoretical framework of social representations to analyze the focus group and content analysis findings. *Chapter seven* compares how the focus group results meet with and diverge from the content analysis results and offers explanations for similarities and differences between findings in the two domains. It concludes by exploring the implications these findings have for public policy in Canada.

Chapter Two: Literature Review

Acknowledging that today's technology is quickly manufacturing risks and benefits, there is need for a comprehensive approach to studying not only risks, but also benefits. Traditionally the literature has focused largely on risk to the exclusion of benefits. Consequently, this chapter does not draw much attention to the benefits of technology. Instead, it overviews the risk literature that this thesis will use to examine risks as well as benefits.

This chapter begins by examining the notion of a risk society. It then reviews the traditional risk perception paradigms: cognitive, cultural and the social amplification (SA) of risk. It overviews the evolution of these models as well as their failure to account for the complex nature of risk. This chapter then offers social representations theory as a much-needed alternative to the traditional risk perception paradigm. Following the overview of social representations theory, pertinent studies that employ social representations theory to explore public perceptions of biotechnology are reviewed.

Risk Society

Social theorist Beck begins his book, *Risk Society* (1992), by describing three stages of modernization (Figure 1). The first stage is feudal society, which Beck calls pre-modernity. The second phase is industrial society, also known as simple modernity. The final stage of modernization is still industrial but it is a risk society. According to Beck (1992), risk society is an era when technological risks overshadow technological benefits. Beck refers to this stage as late modernity or reflexive modernization.



Figure 1: Stages of Modernization (Beck, 1992)

Beck spends little time discussing feudal society or pre-modernity because society has already advanced beyond this stage of modernization. Instead, the focus of Beck's book is the transformation from today's industrial society into a risk society. Beck (1992) stresses this transition because he believes that society today is in the midst of this experience. He writes, "We are eye witnesses—as subjects and objects—of a break within modernity, which is freeing itself from the contours of classic industrial society and forging a new form—the (industrial) 'risk society''' (p. 9). In other words, Beck believes society is no longer firmly planted in simple modernity nor has it completely evolved into risk society; the world sits in the in-between stage as it amalgamates into a risk society. For Beck the transition from simple modernity into a risk society is marked primarily by the conversion from a wealth distributing society to a risk distributing society.

Beck argues that today's society is concerned with distributing wealth in order to achieve the goal of equality (Beck, 1992, p.20). It is true that modern technology increases goods and wealth, but, for the most part, only industrialized nations reap the fruits of technology. Wealth is not distributed very far; starvation in third world countries is proof that society has failed to accomplish equality. Consequently Beck's argument that today's world is trying to achieve equality remains pertinent. Beck, however, is realistic in his argument that as society advances into risk society, the goal of society shifts to safety. This is because the distribution of wealth or "goods" is joined by the distribution of risks or "bads" (p. 20). Technology is creating not only wealth, but also risks. In risk society, or what Giddens (1990) terms reflexive modernization, people reflect back on their trust in science in light of the fact that science and technology are creating risk. They strive understand technological risk in order to achieve the goal of safety.

The concept of risk has existed since the beginning of time, but Beck argues that in the risk society, science and industrial development create "a set of risks and hazards, the likes of which we have never previously faced" (p. 2). Beck makes six differentiations between former risks and the new risks of risk society. (Table 1).

OLD Risks	NEW Risks
 Associated with Nature Local Perceptible to the Senses Easier to Calculate Class–Specific Hazards Latent side effects 	 Associated with Technology Global Dangers/ Outlast Generations Escape Perception Incalculable Boomerang Hazards Central Importance

Table 1: Distinctions between Old Risks and New Risks.

The first differentiation between old and new risks is that nature created the old risks, while technology creates the new risks (Beck, 1992). In pre-modern or feudal society, the laws of nature governed risks such as tornados, diseases, and miscarriages. In modern society, technology eliminates or controls many of these natural risks. But it also creates new risks. For example, while pesticides benefit society by limiting the natural risk of crop failure, they also produce health and environmental risks (p. 21).

Another distinction is that old risks tend to affect people locally whereas the new risks affect people globally and even future generations (Beck, 1992, p. 2). An example of this is global warming. The main offenders of global warming live in industrialized societies, yet global warming impacts people in third world countries as well as future generations. The new risks know no boundaries.

Thirdly, old risks are perceptible to the senses, while new risks escape perception (Beck, 1992, p. 21). For example, old risks such as a pack of wolves or a flood could be detected by the senses of touch, smell and sight. These perceptible risks continue to exist in risk society, but they are coupled with risks that escape perceptions. Examples of new risks that are impossible to identify by our five senses are carbon monoxide or E. *coli*.

A fourth difference between old and new risks is calculability (Beck, 1992, p.2). The old risks are easier to calculate and predict, but the new risks are too complex to calculate. It would be impossible to find a mathematical equation to calculate the complexity of a new risk such as nuclear war. There are too many organizations and people involved with nuclear weapons to ever predict how these agents will interact, what actions they will take, and what the consequences of their actions will be. New risks are too complicated to quantify.

Another criterion is that old risks tend to be class-specific, but new risks affect everyone equally (Beck, 1992, p. 35-46). In today's society many risks, such as garbage dumps or jails, still affect people in poverty-stricken neighbourhoods while wealthy individuals can afford to live elsewhere. In risk society, however, risks become so vast that everyone will be targeted. Even those people who profit from the technology are affected. Beck calls this the boomerang effect because risk bounces back and affects those who created and profited from the technology that made the risk (Beck, 1992, p. 37).

Beck's final distinction between old and new risks is that old risks are thought of as latent side effects, while new risks take on a central importance (1992, p. 34). This has already happened with DDTs. According to the Sierra Club of Canada (1998), DDTs were pesticides that killed budworm insects. However, exposure to DDTs has been linked to breast cancer as well as low-grade symptoms such as headaches, dizziness, nausea, and mental confusion. These health risks took on a central importance and overshadowed the benefits of DDTs. DDT pesticides were banned in both Canada and the United States in 1998 (p.1-4).

According to Beck these six distinctions set the risks of risk society apart from other stages of modernization. While the examples above demonstrate that some of today's technological risks have entered the domain of a risk society, the world still has many risks, such as tornados and earthquakes, that fall into the category of old risks. Beck is accurate in his assessment that society has not yet transformed into a risk society where the new risks outweigh the benefits in importance. It is therefore logical, as neither risks nor benefits have yet taken on the role of central importance, to study both risks and benefits. This next section overviews the social science risk paradigms that will be extended to study benefits.

Risk Perception

Risk perception research looks at how people define and understand risks. This tradition of studying risk has had a relatively short history, but it has evolved quickly since its conception in the mid-1980s. In the 1980s, risk perception research was a one-way/top-down model built on the message transmission paradigm. The experts defined risk technically according to the probability of a risk event occurring multiplied by the magnitude of possible consequences (Kasperson, 1992, p.155). Risk judgments of the public, however, differed drastically from the experts' technical risk analysis. Experts saw the public's risk perceptions as intuitive and unsystematic (Leiss, 1994, p.132).

Leiss (1994) says that this conflict between the public and the experts' risk perceptions was problematic. Experts would declare the risks of nuclear energy power as relatively low, but the public saw these same risks as high. It was difficult for the experts to understand why the public seemed so outraged over these low-level risks. As a result, the goal of risk perception research during this period was to correct the public's "irrational" perception of risk and draw it more in line with the "rational" risk analysis of the experts. (p. 132).

Today, however, risk perception research has evolved into a two-way model. This model recognizes that natural sciences are ill-equipped to deal with Beck's new dimension of risk (Beck 1992, p.59).

Three main problems exist with science (Cohen, 1992, p.218-219). The first is the contradiction embedded in science—society looks to science to resolve the issue of risk, yet it is that same science that is responsible for creating the technologies that have increased risk today.

The second problem is that scientists often differ in their risk estimates. Two experts may use the same science but due to the complexity of calculating risks, they recommend opposite courses of action for managing risks. Frequently, these experts will not change or compromise their opinion even when they are aware of conflicting opinions from other equally qualified experts (Cohen, 1992, p. 218). An example of this can be seen in the Chernobyl crisis:

The most striking feature of this affair was the inability of the authorities, despite decades of intense effort, to form even an approximate consensus on the significance of the emissions from the accident, and thus the scale of the affected area, and the extent of necessary remedial or preventative measures (Turner & Wynne 1992, p.128).

When experts, like those involved in the Chernobyl accident, fail to reach a consensus, society is left to decipher whose science is more accurate.

A final problem with science is that expert opinions can be bought. In the past, industry and other organizations have paid experts to give favourable risk estimates that support their own agendas. This practice continues to flourish today in the court system where the prosecution and defense hire experts to testify on their behalf.

In order to combat these problems of science, the two-way model suggests that the public's perception of risk be adopted as another legitimate perspective for evaluating and defining risk (Leiss, 1994, p. 133). This means that the public's perception of risk is no longer viewed as irrational. The public is seen to make both logical and predictable risk judgments. As a result, it has become important to understand the public's positions on risks and the values that underlie their choices. It is important to note that this two-way model does not claim that the public is more accurate than the experts in their perceptions of risk. Rather, it suggests that neither public nor experts can offer a complete picture of risk alone. "Scientific rationality without social rationality remains empty, but social rationality without scientific rationality remains blind "(Beck, 1992, p. 30). In other words, it is necessary to combine both public and expert notions of risk for a more balanced and overall understanding of risk.

Before society can combine the two, however, it needs to recognize the very different values and assumptions that underlie these two discourses. To do this, risk perception research is necessary. It strives to understand principles that guide both public and experts' attitudes towards risk.

Traditionally, risk perception research has followed two theoretical frameworks: cognitive and cultural. Each of these frames offer unique contributions to risk perception research. However, neither can account for the full and complex picture of risk perception.

Cognitive Risk Frame

This approach to risk perception comes from cognitive and behavioural psychology. There are many cognitive theories, but the dominant one is the psychometric paradigm, which emerged in the late 1970s and 1980s. It focuses on the cognitive processes in risk judgments and ignores the social context in which people make these risk judgments (Turner & Wynne, 1992, p. 112).

According to Otway (1992), the initial goal of this paradigm was to discover and document cognitive limitations in the public's ability to understand technical estimates of risk (p.223). Consequently, the public was found to have several cognitive "limitations" including optimistic bias, availability bias, and the predisposition to overestimate small probability events.

The optimistic bias is defined as "the tendency for people to report that they are less likely than others to experience negative events and more likely than others to experience positive events" (Helweg-Larsen et al., 2001, p. 74). Svenson (1981)

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conducted a survey research study and found that 90 per cent of motorists believed they were better than the average driver. This finding supports the "it won't happen to me" perception of risk.

A second cognitive limitation is the availability bias. People tend to estimate the likelihood of a risk event occurring based on the ease with which they can retrieve information about the risk from memory (Kahnemen & Tversky, 1982) Researchers found that people saw sensational events, such as fires and homicides, as high risk because they were frequently reported in the news and, therefore, easy to recall. In comparison, less sensational events such as breast cancer and diabetes, which did not make front-page news, were seen to be relatively small risks. In actuality, diabetes and breast cancer kill two times more people than fires and homicides (Combs & Slovic, 1979), demonstrating the availability bias.

A third limitation is that people tend to overestimate small probability events. In the 1980s, Tylenol was linked to cyanide poisonings. As a result, people stopped buying Tylenol even though their risk of being poisoned was next to zero (Viscusi, 1991). The Tylenol risk event demonstrates the public's limitation for perceiving small probability events as low risk.

The emergence of the two-way model in risk perception moved the focus of the psychometric paradigm away from the public's cognitive limitations. Instead it tried to understand the public's risk judgments and why they view some risks as a higher threat than others.

The psychometric approach argues that people make risk judgments based on the characteristics of a risk. For example if a risk such air pollution has the characteristic of being involuntary, then it may be perceived as a bigger risk than smoking, which is voluntary. While Starr (1969) is credited with this idea, the work of Slovic, Lichtenstein and Fischhoff make up the bulk of psychometric research (Turner & Wynne 1992, p. 114). Their key studies are overviewed in *The Perception of Risk* (Slovic, 2000).

Slovic and his colleagues investigated the differences between expert and public preferences of risk. They quickly realized that lay people rate risks based on dimensions beyond scientific analysis. As a result, the group borrowed from personality theory and tried to identify the personality or characteristics of risk that people use to make risk preferences (Slovic, 2000, p.xxii).

They asked people to use different risk characteristics to rate diverse risks such as smoking and fireworks. Examples of the characteristics included whether the risk was voluntary/involuntary, familiar/ unfamiliar to the person exposed, known/unknown to controllable/ science. uncontrollable. immediate/ delayed effects. and certainty/uncertainty of death (Turner & Wynne, 1992, p.114) This large domain of characteristics was later narrowed, through factor analysis, to only two characteristics the degree to which a risk was understood and the degree to which it was dreaded or feared (Slovic, 1992, p.121). Consequently, a risk could be plotted for its rating on these two characteristics. Examples of risks that were rated high on the dimensions of unfamiliarity and dread were DNA technology, nuclear weapons and radioactive wastes (Slovic, 1992, p.123).

The work of Slovic's team has been criticized on several accounts. Critics, such as Otway (1992), argue that cognitive characteristics of risks do not exist in people's heads. He says that researchers, like Slovic et al., create characteristics of risk to simplify the complex process of risk perception. These characteristics of risk are only theoretical constructs, which have no foundation in reality. Otway argues that they exist only as long as theories, such as the psychometric paradigm, continue to define them as meaningful (p.124). Despite this criticism, researchers today seem to widely embrace Slovic's principles, such as the attribute of familiarity and unfamiliarity.

A second criticism of Slovic and his colleagues is their use of survey methods. This limits them to providing participants with characteristics of perceived risk rather than allowing respondents to provide them (Slovic, 1992, p. 137). Several studies have attempted to alleviate this criticism by employing diverse methodologies such as free word association or interviews (Shultz, Weidemann & Gray, 2000). These studies had findings similar to Slovic et al's studies.

A final criticism of psychometric research is that its results are difficult to repeat. Depending on the set of risk events used in a study, questions asked, types of people questioned, and type of analysis used, two researchers could come out with different findings to the same question.

Despite this and other criticisms, however, the psychometric frame has been most useful in demonstrating that there is a rational pattern underlying how the public makes risk judgments. This is important because it validates the two-way communication model wherein the public's perception of risk is valued just as much as the experts.

Cultural Risk Frame

The cultural frame argues that risks are socially constructed and that a society actively selects risks for attention according to the principles of their society (Turner & Wynne, 1992, p. 119).

Douglas, an anthropologist, spearheaded the movement of applying cultural theory to risk communication. In her book, *Purity and Danger* (1966), she investigates Jewish dietary restrictions as an illustration. Douglas tries to explain why Jews will not eat animals such as pigs. She discards medical as well as economic explanations and concludes that they refuse to eat pork in order to reinforce their religious beliefs. She argues that Jews see eating pigs as a risk because the book of Leviticus condemns it (p.41). This reflects the basic principle of cultural theory which says that social groups select their risks according to which risk will strengthen the moral, political or religious order that is essential to their society (Rayner, 1992, p. 87).

Douglas' seminal book was followed by *Natural Symbols* (1970). In this book, she divided society into four visions of social life according to two variables of group and grid (Figure 1). *Group* represents the range of social interactions and *grid* represents the measure of constraining classifications, such as age or race, within a social unit (Rayner, 1992, p.87). Douglas combined high and low levels of the grid/group dimensions to create four societies: hierarchal (high group/high grid), egalitarian (high group/low grid), market (low group/low grid), and stratified (low group/high grid).



Figure 2: Grid/ Group Societies (Rayner, 1992, p.89)

Hierarchal society exists when an authority, such as a state or church, controls all aspects of life. *Egalitarian society* has no strong leader and as a result, the different groups in society are in constant dispute. *Market society* is characterized by strong competition. Lastly, *stratified society* is composed of people who are alienated and unable to participate in society (Rayner, 1992, p.88). Douglas argued that people fall into one of these four societies, and it shapes their particular worldview.

Douglas, however, did not take this argument one step further to explain how grid/group analysis shapes people's views of risk. It was Thompson, in 1978, who first linked grid/group societies to preferences for risks in his paper about nuclear energy (Rayner, 1992, p.91). His paper was published in 1982 and Douglas released her book, *Risk and Culture*, later that year. *Risk and Culture* replicated Thompson's argument that grid/group analysis can be applied to risk. Like Thompson, Douglas suggested that the society a person lives in determines how he or she selects, accepts and manages risks. However, while Thompson proposed a fifth society, Douglas argued that the four societies could be reduced to two types: hierarchal/market versus egalitarian (Rayner, 1992, p.91).

Douglas used the United States environmental movement, which she characterizes as completely egalitarian, as evidence that grid/group shapes people's views of risk (Steinberg & Palley, 1984, 314). This idea that the entire environmental movement is egalitarian was later criticized. Rayner (1992) pointed out that while some groups like the Sierra Club seem to be egalitarian, other organizations like the Natural Defense Council are more market oriented. Regardless, Douglas argued that people living in market and hierarchal societies make risk judgments rationally by weighing costs and benefits, but egalitarian groups, such as environmental organizations, make risk judgments irrationally—they create fears about nature and technology to resolve their own organizational problems (Rayner, 1992, p.91).

Despite Douglas' work with the environmental movement, it is difficult to see any group that falls only into one of Douglas' categories. It is more likely that a group is composed of a combination of her categories. And even if one were to agree that a group could fall solely into one of these categories, there are always exceptions to the rules. Cultural theory, however, does not allow for these exceptions. It locks individuals into the world view of their cultural group and argues that they cannot think independently or go against the grain, thus becoming a form of cultural determinism (Rayner, 1992, p.106).

Another criticism of cultural theory is its choice of methodology, which comes from anthropology. Cultural theory studies social groups in their natural settings. This produces rich data, but is limited in its application. This method also encourages researcher bias. It is possible that cultural theory researchers inadvertently record only the risk behaviours that are characteristic of a certain society and ignore others. And lastly, challengers of this theory question whether its small-scale group findings can be applied to large, diverse political cultures (Turner & Wynne 1992, p.121).

Despite these criticisms, cultural theory has been essential to the study of risk perceptions. It has demonstrated that culture does influence people's risk perceptions. The only question now is how much influence culture has and what other factors influence risk perception.

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Social Amplification Model of Risk

The cognitive and cultural frames of risk are different pieces in the risk perception puzzle. The cognitive frame enhances knowledge about the values and attitudes that underlie risk perception, whereas the cultural frame accounts for how an individual's society can influence his or her view of risk. However standing alone, the cognitive and cultural frames of risk are inadequate. A framework is needed to account for the multidimensional picture of risk perception. The SA theory of risk is still theoretically underdeveloped, but offers more possibilities in accounting for the complex process of risk perception in ways that cognitive and cultural theory by themselves are unable to.

According to SA theory, risk events have direct consequences. These direct consequences include injury, death, and environmental damage, which happen to people regardless of their social conception of risk. People use direct consequences to make judgments about risks. However, people's initial risk judgments can be amplified or attenuated through interaction with psychological, social, cultural, and institutional processes. This amplification or attenuation of risk judgments causes a ripple effect of direct consequences into secondary consequences that can be both positive and negative. Financial gain or rising insurance costs are both examples of secondary consequences (Kasperson et al., 2000, p. 237-241).

To make this clearer, it is necessary to look at a fictional account of a risk event. Pretend a man has flesh-eating disease. The direct consequence would be the man's death. A woman who hears of the man's death might see the risk of flesh-eating disease as relatively high. This initial risk judgment, however, could be decreased through the cultural process of communicating. For example, a doctor could tell the woman that her chances of getting flesh-eating disease are relatively small. If the woman feels the doctor is credible, she may alter her initial risk opinion to believe the risk of contracting flesh-eating disease is low. In turn, she may renew her trust in the medical profession. This trust would be a secondary consequence.

Now, imagine for a second that the doctor never talked to the woman. Instead, the woman saw an article on the man's death in the newspaper. The article is a sensational account of the death with a headline that reads "Killer Bug Eats Man Alive." It is possible that this cultural media process could amplify the woman's original risk judgment. She may now estimate that it is unlikely she will escape the risk of flesheating disease. As a result, she could decide to take out life insurance and this action would be the secondary consequence.

To date, several studies have used the theory of SA. An example is the doctoral dissertation done by Burns (1990). Burns chose a set of 128 risks for his study, ranging from handguns and lightning to smoking. He then collected four clusters of data on each risk: media coverage, a rating of direct physical consequences by risk experts, public perceptions of the event (based on psychometric theory), and estimates of the risk's ability to spur the public into action or social mobilization. Then, two panels of citizens, with knowledge of social amplification, got together and used a summary of media information to score the risk events in terms of estimated socioeconomic and political effects. The results were calculated by several statistical procedures (Kasperson, 1992, p.169).

Burns had four major findings. The first and most significant finding confirmed social amplification theory. The data demonstrated that media, cultural and social groups, institutions, and individuals influenced how people view risk. A second finding was that society responded rationally to risks. That is, people perceived the magnitude of a risk based on characteristics such as the extent of human exposure or the amount of media coverage. Burns also found that heavy media reporting resulted in greater activism. However, other than creating dread, the media had no effect on risk perceptions once the physical consequences of the event were controlled.

Studies like Burn's have demonstrated that SA offers valuable insight into the notion of risk. SA theory tries to broadly account for cultural, social and individual influences of the more general risk experience. It provides many rich opportunities to look at the complex and inter-dependent factors that contribute to what we might call a social or public understanding of risk in general and also in particular risks.

Regardless of the contributions of SA, this theory has faced a firing squad of criticism. Many people, such as Rayner (1988), have questioned whether the framework of SA is testable and whether it allows for predictions or hypotheses (p.165). In response

to this criticism. Kasperson (1992) has said that while SA cannot be tested in a positivist sense, it illustrates its usefulness " by demonstrating its analytic strength and insights in interpreting social responses to risk difficult to explain by competing and often narrower approaches" (p. 165).

A second criticism of SA is that it fails to equally balance the role of the individual and social influences on risk perception (Rip, 1988, p.195). Critics argue that it concentrates more on the individual (Kasperson, 1992, p.165). For example, it tends to focus more on an individual's cognitive process of characterizing risks according to factors such as how dreaded or how familiar the risk is and place less importance on the social role of institutions in influencing risk perception. However, recent studies have used SA to study solely the role of cultural institutions in amplifying/attenuating risk (Petts et al. 2000; Leschine, 2002). It seems unrealistic to expect SA to equally balance individual and social influences, particularly when there are some cases where individual influences are more predominant than social influences, and vice versa.

Rip has also argued that SA focuses more on amplified, rather than attenuated, consequences (p. 193). This seems likely for two reasons: 1) parties, such as risk managers or government, are more concerned about risk events being blown out of proportion than risk events that receive little or no attention 2) it is harder to study a risk event that is attenuated. However, there has been concern about risks, such as the AIDS epidemic in Africa, which are overlooked. To acknowledge that amplification is just as important as attenuation, Kasperson changed the theory's name to *Social Amplification and Attenuation Theory* in more recent publications (Kasperson et al., 2001, p. 35). Despite this, much empirical research continues to focus on the amplification of risk.

A third criticism is that SA simply states that amplification and attenuation take place, but it does not give a detailed account of how the amplification/attenuation process occurs. It fails to suggest the steps that might be involved in amplification/attenuation.

A final criticism of SA is that the very concepts of amplification and attenuation appear flawed. SA implies that there is an objective risk that can act as a base line to which public risk judgments can be compared to determine if they have been amplified or attenuated. However, SA does not state what constitutes absolute risk. It would be possible to use expert risk judgments as the baseline for SA, thereby arguing that risk judgments are amplified or attenuated if they differ from expert estimates of risk. This measurement, however, reinforces the archaic attitude that expert risk estimates are valid while public perceptions of risk are irrational. In fact, any base line measurement implies by its very nature that the public distorts risk judgments through amplification and attenuation. Therefore, the SA theory would be more fruitful if it explored the construction of risk rather than the amplification and attenuation of risk. In this way, it would legitimate public perceptions of risk.

In conclusion, SA has been criticized for its failure as a testable, predictable theory as well as its failure to equally balance the role of the individual and social influences on risk. Additionally, empirical SA studies focus more on amplified than attenuated consequences. SA also neglects to offer any mechanism by which amplification or attenuation occurs. Lastly, the very SA terminology, *amplification* and *attenuation*, implies that public risk judgments are distorted and irrational. These criticisms suggest that while SA may be the most comprehensive risk perception model, it is still inadequate. A new means of exploring risk is needed.

Recently social representations theory has answered the challenge of offering a more comprehensive theoretical approach to risk. While it does not eliminate all of the problems of the cognitive, cultural or SA paradigm, social representation theory embodies a different and more inclusive approach to risk research.

Towards a Social Representations Theory of Risk

There has been a recent attempt to challenge the traditional risk perception model with the theory of social representations (Bauer & Gaskell, 1999; Joffe, 2003). Joffe's (2003) main argument for employing social representation theory in the study of risk was that risk perception models have been traditionally focused on static, intrapersonal processes that view human thinking in a linear manner. This argument may hold true for the cognitive risk paradigm; however Joffe ignored efforts by the cultural and social amplification models to study interpersonal and cultural influences on risk perception. Consequently, Joffe's justification for using social representations to study risk is flawed.

Bauer and Gaskell's (1999) rationale for using social representation theory was more compelling. Bauer and Gaskell used the theory to explore the risks associated with biotechnology. They wrote, "We were persuaded that the conceptual richness of this theory was better suited to characterizing the evolution of content, structure and functions of the voices and images of public concern, in response to challenging developments in genetic engineering and modern biotechnology" (p. 163). This section will review the underpinnings of social representations as well as its merit as a theory of risks and benefits.

"Social representations are said to reveal themselves with greater clarity in times of crisis or upheaval of thought" (Moscovici, 1984). A new social object, such as technology, generates stress, which results in a crisis or upheaval of thought generating a crisis that must be coped with at both a material and symbolic level (Wagner and Kronberger, 2001). The scientific community and politicians engage in *material coping*. This is the process of using scientific material, such as theories and methodologies, to understand the risks associated with a new technology. Through this scientific understanding the experts assert the appropriate means of managing the risk, which often takes the form of regulation. Equally important to material coping is symbolic coping. *Symbolic coping* is the way lay people use symbols to understand social objects, particularly new technologies. This use of symbols effectively constitutes the creation of social representation¹. (p.148).

The concept of social representation was introduced by Moscovici in his 1961 book *La Psychanalyse: Son image et son public*. Moscovici looked at how three distinct subcultures of French society turned the unfamiliar concept of psychoanalysis into a familiar social representation (as cited in Duveen, 2001a, p.3). According to Moscovici (2001b), social representation theory is a social psychological framework that studies the making of the familiar. The theory argues that when groups are presented with an

¹ It should be noted that in future work Wagner, Kronberger, & Seifert (2002) make several distinctions between symbolic coping and social representations. These distinctions will not be reviewed here as the merit of their argument is not in the distinctions between symbolic and social representations, but rather in their claim that there are two ways people cope with new social objects: material and symbolic coping.

unfamiliar social object, they use processes of communication to collectively elaborate the social object into the realm of the familiar (p. 37).

A social object can be virtually any abstract idea. Social representation research has studied how abstract ideas such as childhood, cities, and the human body become social representations via processes of communications (Farr, 1987, p.347). The theory of social representations is particularly useful for explaining how social objects such as scientific processes or ideas are made into common sense knowledge. "In other words common sense no longer circulates from below to on high, but from on high to below; it is no longer the point of departure, but the point of arrival." (Moscovici 2001a, p. 67) This thesis hopes to use social representations to explore how the scientific social objects, risks and benefits, reach the destination of common sense knowledge. The purpose is not to see how people use social representations to distort scientific view of risk and benefits, but rather to legitimate people's risk and benefit representations as an alternative form of knowledge.

Moscovici argues that there are two communication processes which people use to create legitimate social representation: anchoring and objectification. *Anchoring* is the process whereby a group compares an unfamiliar social object against preexisting societal categories to determine how the object is similar and how it differs (Wagner et al. 1999, p. 97). An example of anchoring can be seen in Jodelet's study (1991) of mental illnesses, where respondents compare the social object of mental illness with the familiar categories of idiots or tramps. The social object of mental illness took on the characteristics of the pre-existing categories where it was similar; where it was different, the categories were adjusted to account for the discrepancies. Through this comparison, the group named the unfamiliar social object and thus performed the mechanism of anchoring.

The second communicative process whereby representations are created is *objectifying*. This mechanism creates meaning by placing social objects in a social group's present reality. "Perceived at first in a purely intellectual, remote universe, it [the social object] then appears before our eyes, physical and accessible" (Moscovici 2001a, p. 49). In other words, a group typically constructs an icon, metaphor or symbol, which

comes to signify the social object. An example of the objectifying phenomena can be seen in Jodelet's (1991) mental illness study where villagers use the images of souring milk to objectify the concept of mental illness. It is through this course of objectifying that a social object, such as mental illness, becomes familiar. Wagner and Kronberger (2001) argue that the process of objectifying is often difficult to distinguish from anchoring. Consequently, they suggest that the two be thought of as "two poles of a continuously evolving process" (p. 151).

This creation of social representations through anchoring and objectifying takes place both through the media and interpersonal interaction (Wagner et al., 1999, p. 98). Once representations exist, the very media and interpersonal interaction that created them, maintain them. "Because we elaborate them together and evoke them frequently, social representations become deeply embedded in our cultural fabric." (Deaux & Philogène, 2001, p.5) Although they are deeply embedded in our culture, these representations are not static. Social representations are constantly being redefined and changed. It is this dynamic nature that distinguishes social representations from its ancestor theory, collective representations, created by the sociologist Emile Durkheim (Moscovici, 2001a p. 30-32).

Moscovici claims that social representations are crucial in order for communication to occur. It is only once a social object becomes familiar that people can have conversations with implied meanings. Social representations eliminate the need for people in the same group to describe what constitutes a social object or how they anchor and objectify it because other group members share the same understanding. Of course, communication across social groups may be inhibited by the fact that various groups anchor and objectify social objects differently according to their cultural context.

This theory of social representations is useful in its ability to account for public perceptions of risks and benefits, regardless of the fact that few studies have applied the theory to this domain. Social representation theory argues that the study of public representations of risk is just as important as the study of expert notions of risk. It suggests that there are two ways of coping with unfamiliar social objects: symbolic as well as material coping. The theory suggests that the public's symbolic coping, by means of creating social representations, is different but equal to the expert's process of material coping (Wagenr & Kronberger, 2001). Through this genuine regard for public representation, social representations theory achieves a two way model similar to the cognitive and cultural paradigms.

Another accomplishment of social representations is that, unlike SA, it offers to explain mechanisms by which risks and benefits are constructed. SA argues that risks perceptions are amplified and attenuated, but it fails to explain the processes that allowed for amplification and attenuation. In contrast, social representations explains not just that people construct risks and benefits, but how people use the constructs of anchoring and objectifying to conceptualize risks and benefits. Like cognitive models, these constructs also help social representations theory explain why risks are constructed in certain ways.

While social representations theory manages to legitimate public understandings of risk and create mechanisms by which risks and benefits are constructed and explained, it does not fully achieve a balance between individual and cultural influences. While SA is criticized for concentrating more on individual influences, social representations theory traditionally concentrates more on social influences. Social representation's spotlight on cultural influences is best demonstrated by Moscovici's argument that social representations are created and maintained by the media and interpersonal relationships. However, more recent research (Jovchelovitch, 1999 as cited in Bauer & Gaskell's, 1999) argues representations are the crossroads between the individual and society. In other words, representations are contained, not only in communication, but also in individual minds. This implies that individual cognitions play a role in constructing social representations. This belief has been adopted in methodological approaches to social representations, with social representations research methods attempting to overcome dichotomies between individual and social (Wagner et al., 1999, p100). Researchers combine methodologies that research individual influences (self report, word association), with methodologies that study social influences (content analyses and focus group). In this way, social representation research can embrace both individual and cultural influences.
Despite social representation's ability to overcome breaks between individual and social, it has yet to overcome the criticism that it is not a predictive, testable theory (Potter & Edwards, 1999 as cited in Joffe, 2003). SA shares in this criticism, as do many models in the social sciences. To many researchers, non-predictive models appear flawed. However, Joffe (2003) argued that while logical positivism is useful for testing certain confined hypotheses about risk, the social representations approach attempts to understand and explain the complexity of risk perception.

The theory of social representations has demonstrated its value as an explanatory framework in several studies. Of particular interest to this thesis are two studies (Wagner et al., 2002; Einsiedel et al., 2002) which used social representations theory to explore public understanding of biotechnology as social objects. The Wagner et al. study (2002) employed open-ended surveys, focus groups, and interviews to understand social representations of biotechnology across 10 European countries. The findings concluded that while there are differences in social representation across countries, all countries anchored the social object of biotechnology against the familiar category of nature and used metaphors and images to objectify it. Both proponents and opponents of biotechnology used the nature comparison. Proponents saw biotechnology as conquering nature. They objectified it by using war metaphors where biotechnology is seen as the weapon to conquer elements of nature, such as world hunger or disease.

In comparison, participants who were against biotechnology also anchored biotechnology to nature. However, they did not see biotechnology surmounting nature, but rather interfering with nature. They saw this interference happen in three ways: it upsets the balance and harmony of nature, it leads to humankind becoming denaturalized and it upsets the natural social order. The idea of biotechnology upsetting the balance of nature was objectified when people gave nature human characteristics. Examples can be seen in participants' phrases such as biotechnology "harming nature," and nature will eventually "take revenge" (p. 269). In comparison, the idea that biotechnology is causing humans to become denaturalized was objectified through images of "designer babies and "spare parts" (p.269) Lastly, the final theme of threat to the natural social order was objectified through metaphors of Hitler and the *Brave New World*. Wagner et al. argued

that through this anchoring, nature becomes the good and unnatural becomes the bad. They suggested that anchoring and objectifying helped people create a socially shared truth, which allowed them to cope with the ambiguities surrounding new technology. Wagner et al.'s study was most useful in offering a broad overview of biotechnology representations; however, it fails to offer precision in its measurement of specific biotechnology applications such as cloning.

Einsiedel et al. (2002) used the theory of social representations to analyze one aspect of biotechnology—cloning. The study analyzed newspaper coverage of Dolly the sheep over a period of 11 days across Canada and 11 European countries. The overall findings of the study were that the nuclear transfer technique used on Dolly was anchored to human cloning and was objectified through news frames, humour and iconography.

Frames are the storyline by which a news story is packaged. Two main frames that ran through the media coverage were the predominant frame of "doom", coupled by the less significant "progress" frame. The doom frame was characterized with metaphoric imagery that represented threats *to identity:* "The singular individual is put into question by genetic copy machines." *Crossing of natural boundaries* was a second theme: "Compared with man, God is just a beginner." Finally the frame of *runaway science* was illustrated by "Human Frankensteins" (p. 331-332)

In contrast, the progress frame largely ignored metaphors and discussed progress directly in terms of health and economic benefits as well as the creative and successful side of science. Beyond frames, humour such as puns ("Are 'Ewe' ready") were also used to objectify nuclear transfer (p. 336). The third was objectification through photos of an "innocent-looking" Dolly the sheep (p. 338). In conclusion, the authors argued that it was through this combined anchoring and objectifying that the cloning of Dolly became familiar and associated with society's ideal vision of "technological prowess" (p. 340).

The Einsiedel et al. study is useful in understanding social representations of Dolly's nuclear transfer cloning in 1997. However, because social representations are dynamic and changing, this thesis' research can be used to explore if and how social representations of cloning have changed since 1997. This thesis will build on the Einsiedel and et al. study by researching social representations, not only of Dolly the

sheep but, more broadly, animal, reproductive and therapeutic cloning. It will ask the question of whether and how the representations differ for these three cloning types. Furthermore, this thesis will focus specifically on the risks and benefits associated with cloning, rather than cloning in a broader context. Finally, this thesis will expand the domain of social representations beyond media, researched in Einsiedel and et al., to look at representations in public discussions. In order to study representations in the media and interpersonal communication, this thesis will employ both a content analysis and focus group methodology. In doing so, this thesis will illustrate that social representations offers a valid and comprehensive approach to the study of cloning risks and benefits.

Summary

The literature generally has overlooked benefits to focus on the study of risks. Consequently, the risk perception paradigms must be called upon to study both risks and benefits. Traditionally, the cognitive, cultural, and SA paradigms of risk have been popular in the study of risk perception. Only recently has the social representations approach been suggested as a viable alternative. The approach argues that people engage in processes of communication to turn abstract scientific ideas into tangible understandings, called social representations. Similar to the cognitive and cultural approach, social representations legitimates public understandings of risk and benefits. It also proposes two constructs, anchoring and objectifying, which help explain how and why people construct understandings of risks. Overall, social representations offers an interesting explanatory framework for the study of risks and benefits.

Chapter Three: Methodology

Researchers using the theory of social representations have employed virtually every methodology known to social sciences (Breakwell and Canter, 1993 as cited in Bauer & Gaskell, 1999). This thesis uses a content analysis and focus groups to research social representations. These methodologies are particularly appropriate as social representations are both created and maintained by the media and interpersonal communications (Wagner et al., 1999, p. 98). The following chapter will overview the content analysis and focus group methodology.

Content Analysis

History of Content Analysis

There was evidence of sophisticated analysis of religious texts as early as 1744 (Carney, 1974, p. 27). However, the explicit content analysis method only emerged two centuries later in 1926 when journalism students at Columbia University used the technique to study American newspapers (Berelson, 1952, p.22). Soon after, Harold Lasswell used content analyses to examine propaganda during World War II (Carney, 1974, p. 28). In 1952, Berelson wrote the book, *Content Analysis in Communication Research*. In his book, he detailed the content analysis technique and with its circulation came widespread attention to the methodology. Today, content analysis is employed by scholars across diverse disciplines and the technique has been expanded to not only analyze print, but to analyze also broadcast and Internet media (Riffe, Lacy, & Fico, 1998 p. 3).

In *Content Analysis in Communication Research*, Berelson made the first attempt to define the term as "a research technique for the objective, systematic, and quantitative description of the manifest communication" (1953, p. 18). This means that the researcher used clearly defined rules to consistently categorize surface messages in communication material in order to create a statistical summary of data across time. Authors, however, have since challenged this definition arguing among other things that it limits content analysis to quantitative measurements as well as manifest content (Gunter, 2000, p. 56). Qualitative measurements allow for richness in data interpretation not permitted by quantitative data. Consequently this content analysis will employ both qualitative and quantitative measures.

Sampling

The goal of this analysis was to understand media representations of cloning risks and benefits and explore how these representations changed over time. It would, however, be too time consuming to analyze all the print, broadcast and Internet media about cloning for the purposes of this thesis. As such, print media, specifically newspapers, were chosen because it is easier to access newspapers than archives of broadcast and Internet news (Rife, Lacy & Fico, 1999, p.100-101).

Once the decision to use newspapers was made, the study needed to be further narrowed to a manageable size. Consequently, Canada's longest running national newspaper, the *Globe and Mail*, was selected for study. The *Globe and Mail* was chosen because research (Einsiedel, 1990; Evans, Krippendorf, Yoon, Posluszny & Thomas, 1990; Pellechia, 1997) suggests that in terms of at least the topics covered, the agenda of science stories is similar in the local and national press. One difference is that the prestige press frequently have more reporter-originated stories. For these reasons, the Globe and Mail was chosen.

Globe and Mail articles on cloning were accessed via the Globe and Mail CD-Rom. Cloning articles published in years 1996-2002 were selected for analysis. The start date of 1996 was chosen because articles about cloning were virtually nonexistent in the years prior to 1996. With the dates of 1996-2002 agreed upon, the next step was to enter subjects such as cloning, biotechnologies, medical ethics, embryos, genetics, stem cells and reproductive technologies into the search engine. The hits were then narrowed down to include only clippings that were about cloning. Articles mentioning cloned funds or computers referred to as clones were not included. Similarly, articles (such as those on research guidelines or Britain's anti-science climate) which only discussed cloning in passing were not used as part of the content analysis. Stories about stem cells were only included if they discussed removing stem cells from cloned embryos, rather than adult stem cells. Editorials and columns were also weeded out, as they were opinion pieces, not hard news. In addition, articles less than 200 words were eliminated, as they were judged too short to offer comprehensive insight into the coverage of cloning in the media. Lastly, every second article was coded to establish a manageable sample size. These exclusions produced a sample size of 64 articles from 1996-2002. The text of the 64 articles acted as a measurable unit to be analyzed. However, for the purposes of this study, the accompanying photos were not. The decision to exclude photos was made largely to meet time constraints.

Coding Articles

To begin the analysis of the 64 articles, all articles were thoroughly read in order to create categories that would answer the research question, *What are the media representations of cloning risks and benefits found in the Globe and Mail from 1996-*2002? According to Berelson, "...the production of relevant categories is limited only by the analyst's imagination in stating the problem for investigation and designing categories to understand the problem" (1952, p.149). This quotation, which is over 50 years old, still resonates today. Creating the categories is the easy part. The challenge is to create operational definitions which clearly classify the type of data that should be included in each category. If others do not accept your category descriptions, then your findings will be rejected (Berger, 2000, p.76). Table 2 shows a list of the categories generated to understand the research question. Table 2: Sample Coding Sheet

- Story Identification (ID) Number: 1
- Story day (month/day/year): 03/07/96
- Section: A10

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- Headline: "Method found to clone sheep, researchers say"
- Type of cloning: animal cloning (sheep)
- Subject: Scientific discovery
- Focus: It is the first time nuclear transfer method has been done on mammal.
- Risks or Benefits in Headlines: None
- Risk or Benefit mentioned first in text: Benefit-husbandry
- Risks mentioned in text (sources):
 - 1. Animal Cloning Risk-NUMBER OF FAILED ATTEMPTS TO GET ONE

SUCCESSFUL CLONE: (source: commercial scientist)

- Five out of 250 embryos survived to grow into lambs. Of the 5, only 2 lived past 10 days
- Benefits mentioned in text (sources):
 - 2. Animal Cloning Benefit-HUSBUNDRY (source: commercial scientist)
 - "The researchers said their [cloning] method could be used to produce uniformly alike animals that produce genetically manipulated meat and milk on factory farms."
 - 3. Animal Cloning Benefit-HEALTHCARE PRODUCT (source: commercial scientist)
 - Drugs: It would allow for more accurate gene manipulation to alter sheep/goat milk to produce proteins, which will cure disease
 - Health Foods: Technique could be used to manipulate cows to produce low fat milk

The first category on the coding sheet is simply the *Story ID number*, meaning that the 64 articles in the sample size were identified in order of occurrence with an ID from 1-64. Next is *Story date*, this is the date in which the article being coded appeared in the *Globe and Mail*. The third category is *Section*, which indicates where the article appeared in the paper (i.e. A1, B2.). Subsequently there is the category, which records the article's headline. The fifth category distinguishes the type of cloning discussed in the article—plant, gene, embryo, animal, or human. *Subject* classifies the story into stories about scientific discoveries, investment, regulation, or entertainment. The category called *Focus* is a sentence summary of the article. The next category organizes headlines according to whether they mentioned risks, benefits, both risks and benefits, or neither

- risks nor benefits. The term *risk* was used broadly to include future financial, physical, psychological, or ethical damage resulting from all types of cloning. Benefits were defined as future financial, physical, psychological, or ethical gains triggered by cloning. If the headline did identify either a risk or a benefit, the type of risk or benefit was also listed in the *Risks or benefits in headline* category. The tenth and eleventh categories list all the different risks and benefits mentioned in the text. These categories also identify whether each risk or benefit is an embryo/animal/human cloning risk/benefit and document the source of the risk/benefit claim. Types of sources include academic scientists, government scientists, commercial scientists, ethicists, theologians, farmers and politicians. Together these were the categories designed to answer the research question.

Analyzing Data

Once the data was entered into the categories, the principles of extensiveness, frequency, headline importance, placement, emotion and specificity were used to determine the main risk and benefit themes for the three types of cloning-animal, body part, and human. The principle of extensiveness dictates that a risk or benefit is more likely to be a main theme if it is cited across several articles instead of just one. Frequency is the rule that a risk or benefit mentioned multiple times in one article is more significant than a risk or benefit mentioned only once in an article. The criterion of headline importance states that a risk or benefit holds more importance if it is mentioned in the headline rather than the text of the article. The principle of *placement* says that the earlier the risk or benefit is mentioned in the story, the more likely it should be considered a main theme. *Emotion* is the idea that more weight is given to a risk or benefit, which sources discuss passionately or intensely. Lastly, according to specificity a risk or benefit with detailed examples carries more influence than one with general examples. For example, if an article mentions the benefits of cloning a specific organ (e.g. cloning a lung may cure cystic fibrosis), the benefit is seen to be more significant than if the article had simply said cloned organs cure disease. Together, extensiveness, frequency, headline importance, placement, emotion and specificity established the main

risk and benefit themes². Once the main themes were agreed upon, the articles were then re-read to determine how the main themes were objectified—that is, made more explicit and understandable. Finally, segments of the text were chosen to illustrate the different ways the risks and benefits were objectified. The content analysis findings can be found in the following chapter.

Focus Groups

History of Focus Groups

The focus group tradition began with Robert Merton in 1941 (Morrison, 1998, p.7). Merton was a professor of sociology at Columbia University. He and his colleague Paul Lazarsfeld were using group interviews to aid the war effort of World War II. Merton and Lazarfeld conducted group interviews for diverse purposes such as developing propaganda for the home front as well as investigating feelings of racial segregation in the army (Morgan, 1998, p.38).

It was during the course of this research that Merton became frustrated with the group interview process. Merton felt that the interviewer was using leading questions to bias the findings. As such, Merton suggested that participants, rather than the interviewer, should guide the group discussion. He took this idea and developed it into an article for *American Journal of Sociology* in 1946 and later into a 1956 book called the *Focused Interview* (Morrison, 1998, p. 139). This book gave way to the distinction between group interviews and focus groups.

...Focus groups are distinguished from the broader category of group interviews by the explicit use of group interaction to generate data. Instead of asking questions of each person in turn, focus group researchers encourage participants to talk to one another, asking questions, exchanging anecdotes, and commenting on each other's experiences and points of view (Barbour and Kitzinger, 1999, p.4)

 $^{^{2}}$ It is important to note that each theme was not assigned a number weighting in terms of these six principles. Rather the researcher considered these principles for each theme and determined the main themes based on a qualitative assessment.

It is this interactive quality that makes focus groups so appropriate for understanding how people collectively create social representations. However, despite this interactive quality, the focus group methodology was slow to catch on in the field of social sciences.

Commercial practitioners, on the other hand, popularized the focus group methodology in the 1950s, and it was only in the 1980s that focus groups returned to the domain of social sciences (Morgan, 1998, p.39-42). Today, focus groups are increasingly seen as a valuable research tool.

The Decision to use Focus Groups

According to Krueger, focus groups are most useful when a researcher is trying to understand people's opinions on a certain topic as well as what influences people's opinions—these influences and opinions should emerge from the group's discussion (Krueger, p.24). Bearing this in mind, it was decided that focus groups were the most appropriate method for this research study.

The objective of the focus groups was to explore the general public's social representations about the risks and benefits of cloning as well as the influences behind risk/benefit judgments. In order to meet these objectives, the researcher and a professional moderator began careful planning of their focus groups.

Number of Focus Groups

Three focus groups with three different groups of people were held on January 9, 13, and 14, 2003. Traditionally, focus group studies consist of anywhere between three and over 50 groups (Barbour & Kitzinger, 1999, p.7). The decision to have three focus groups was made not only to meet time and budget constraints, but also because it allowed for the topic to be adequately explored with a reasonable number of diverse opinions expressed.

Telephone Recruitment

For each group, a research agency randomly recruited participants from a public list, via telephone. The decision to recruit random participants meant that telephone numbers used were randomly generated. While this approach might start with a randomly

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generated sample, refusals and the small number of participants resulted in an imbalance (e.g. too many people over 60 or mostly women), requiring further demographic sorting by the recruiter. This recruitment process is not perfect by any means. Certain age groups and cultural groups simply do not take part in focus groups. However, the assumption in having these randomly recruited focus groups was that participants represent their own personal views and not the views of any societal grouping. See Appendix A for biographies of focus group participants.

Exclusion of People with Prior Genomic Knowledge

The only exception to this random recruitment was that people who had personal or financial interest in genomic research were not invited to participate in the focus groups. The recruitment guide (Appendix B) screened these individuals out.

Explaining the Study to Participants

During the telephone recruitment, participants were told that the purpose of the study was to understand members of the public's opinions on genomic research. Examples of genomic research, such as healthier and more nutritious food and personalized medicines, were then described to each participant in case they were not familiar with the term genomic research. It is important to note that although the focus groups discussed solely the topic of cloning, cloning was not given as an example of genomic research. This was a deliberate decision in order that participants would not research the issue of cloning prior to the focus groups. The researcher was interested in participants who had knowledge levels that had not been primed prior to the discussion.

Mailed Invitation and Consent Form

Once an individual agreed to participate in the focus groups on genomic research, the recruiting agency requested the participant's address so that an official invitation could be mailed to the participant. The invitation (Appendix C) was mailed the following day in conjunction with a consent form (Appendix D) which participants were asked to sign and bring to the focus group.

Focus Group Location

Participants were then called a few days prior to the focus group meeting to remind them of the date and location as well as to confirm their attendance. The focus groups were held on three separate evenings, between 7-9pm, in three different areas of Calgary. Participants were asked to attend the focus group that was located closest to their residence in Calgary. The focus groups were held at hotels in the SW, NW and SE areas of Calgary. The hotels were chosen because they were centrally located, easy to find, and safe. It was also thought that a hotel meeting room, unlike traditional focus group rooms with two-way mirrors, would put the participants at ease and ensure they felt comfortable enough to share their opinions. The rooms were large enough to accommodate the participants, but still small enough to encourage intimacy and group cohesion.

Focus Group Size

Twelve people were recruited for each of the focus groups. The recommended number of participants for market research focus groups is between 10-12 (Morgan, 1998, p. 71-74), however, this number is too large for exploration of most topics in academic research. Focus groups with more than ten people are often too large to allow all participants adequate time to share their insights and opinions on complex topics. As such, researchers suggest groups with 6-8 people. (Barbour & Kitzinger, 1999; Krueger & Casey 2000). This number is sufficient to account for the rich and dynamic group interactions that make focus group methodology helpful to investigate values, beliefs, preferences as well as to explore how people see the world (Vaughn, Schumm, & Sinagub, 1996, p. 50).

To get this ideal group size of 6-8, participants were over recruited. Twelve people were recruited in anticipation of the three to four people who were expected not to attend. The hope was that the final group would consist of approximately 8 people. Unfortunately, recruiting is a tricky and unpredictable game, as such, numbers varied for each of the focus groups. There were 7 participants for the first group, 12 for the second and 11 for the third. The fact that two of the groups were larger than expected made it particularly challenging for the moderator and the researcher.

Facilitation

The professional moderator was the same for each of the three groups. When participants arrived at the first focus group session, the moderator welcomed participants and collected their signed consent forms (see Appendix E for initial moderator's guide). She then introduced herself. Next, she went on to overview the goal of the focus groups. The moderator then explained that because the area of genomic research is so large, the discussion would focus on one particular area of genomic research—cloning. Finally the moderator set the ground rules and explained the format of the focus group.

The moderator began the discussion by asking participants to introduce themselves and tell the group what they would be doing if they were not there attending the focus group. This served as an icebreaker, which both set participants at ease as well as promoted group sharing.

After each participant had a chance to respond to the warm-up question, the discussion of the first group centered around three open-ended questions: "What areas of cloning are you aware of?", "What are your primary sources of information about cloning?", "What are your hopes and concerns³ for cloning?". One by one the moderator asked each question and the participants had a couple minutes to brainstorm their response on a notepad which was provided for them. The participants then shared their answers and the moderator recorded their ideas on a flipchart for all to see.

The moderator ensured that all participants had an equal opportunity to contribute to the discussion. She consistently nodded and used value neutral responses such as "OK" and "Uh huh" to encourage all participants. The moderator also used pauses as well as probes to elicit further information from the participants. In addition to this, the moderator was particularly skillful at deflecting participants' questions about the

³ The researcher chose to use the words "hopes and concerns" rather than "risks and benefits" because "hopes and concerns" are much broader, all encompassing terms. For example, concerns can include moral apprehension about scientists playing God, while risks do not traditionally include these moral elements.

science of cloning back to other members of the focus group. This was important, as the goal of the focus group was to understand the public's existing knowledge about cloning.

To conclude the focus group, the moderator asked participants to look back over the flipchart discussion summary posted on the wall. She then asked if there was anything participants felt had been missed in their discussion of cloning. Most participants answered "no." However, the moderator gave those who answered "yes" an opportunity to add their comments to the discussion. The focus group lasted two hours with a break for coffee and refreshments.

Adjusting the Moderator Guide

The first focus group was a learning experience. The goal of the third question "What are your hopes and concerns for cloning?" was to explore hopes and concerns for different areas of cloning. However, the participants of the first focus group chose to exclusively discuss their hopes and concerns associated with one type of cloning—the cloning of complete human beings. This was an interesting finding in itself, because it was an indication of where the public's interest lies. Nonetheless, the purpose of the focus group was to understand participants' hopes and concerns for animal, body part, and human cloning. The researcher was interested in understanding the public's potential continuum of acceptance. *Would animal cloning for pharmaceuticals be considered acceptable, while human cloning for reproductive purposes is considered unacceptable? And if so, why?* In order to explore these interests, the moderator's guide had to be restructured, following the first focus group, to ensure this focus group objective would be met.

The moderator's guide was adjusted to include additional questions. In the new moderator's guide, the first two questions remained the same as the original guide. However the question about hopes and concerns was asked separately for three different areas of cloning: animal, body part, and human cloning. The moderator also asked them their position on each type of cloning.

The questions for the second moderator's guide were as follows:

- 1. What are the different areas of cloning you are aware of?
- 2. What are your primary sources of information on cloning?
- 3. What are your hopes and concerns for animal cloning?
- 4. What is your position on animal cloning and why?
- 5. What are your hopes and concerns for body part cloning?
- 6. What is your position on body part cloning and why?
- 7. What are your hopes and concerns for human cloning?
- 8. What is your position on human cloning and why?

While five questions were added, the rest of the moderator's guide, such as the introduction and wrap up, remained the same for the second and third focus group. The discussions from all three focus groups were tape-recorded and transcribed.

At the end of all three focus groups, the moderator thanked the groups for their participation. She then reminded them to collect the \$50 incentive that the telephone recruiter had promised them for their participation. The moderator also urged them to take home an information package as well as to sign a consent form for a 15-20 minute telephone follow-up interview that would take place in 2-4 weeks (See Appendix F telephone interview consent form).

Information Package

Each participant received a reading package (See Appendix G for letter outlining the items included in the reading package). The goal of the package was to present individuals with a broad picture of key issues surrounding the topic of cloning. The package was collected from a variety of sources such as books, newspapers, websites, and cartoons, and it presented diverse perspectives on cloning. *Diverse* was defined as presenting reading material in favour of cloning as well as material against cloning. There were also articles that were neutral in their coverage of cloning. Ultimately, the reading package was designed to be easily understood by lay audiences. The package served two purposes. The first was to answer a number of questions that participants had raised during the focus groups. The second was to provide participants with new information, so that the researcher could understand, through the follow-up phone interview, if and how new information alters the public's perceptions of cloning.

Follow-up Interview

The researcher conducted 10-minute follow-up telephone interviews approximately three weeks following the individual's focus group participation. The follow-up interview was not only important for understanding the impact of new information, it also allowed participants to voice points of view that might have been silenced in the group (Mitchell, 1999 p. 37). All 27 participants took part in the telephone interview. They were asked the following questions:

- 1. "How was your experience in the focus group?"
- 2. "Did you have a chance to read the information package?"
 ➢ If No, "Why not?"
 ➢ If Yes, continue to question 3.
- 3. Did the package provide you with new information about cloning?
 ➢ If No, proceed to question 4.
 - > If Yes, "What new information did you learn?" continue to question 4.
- 4. Have you talked with people about cloning since the focus group?
 - If No for both question 3 and 4, "That's all the questions I have, Thank you for your participation."
 - > If no for only question 4, go to question five.
 - If Yes, "Did the people you talked to raise any new ideas about cloning that weren't mentioned in your focus group? And if so what were they?" continue to question 4.

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5. Did the new information you learned from either package or the people you talked to after the focus group cause you to rethink some of your initial ideas or opinions about cloning?

> If No, "That's all the questions I have, Thank you for your participation."

> If Yes, "In what way did your original opinions change?"

This concept of testing the impact of new information on a participant's opinion came from a Wellcome Trust study (1998). The Wellcome Trust did focus groups on cloning in the United Kingdom; however, their research design was slightly different from this one. In order to test the impact of new information, Wellcome Trust researchers spent the last half hour of their focus groups educating participants on cloning technology. They then reconvened the focus groups one to four weeks later to see if and how participants' opinions on cloning had changed. The study found that exposure to factual information did not modify participants' initial concerns about human cloning. It did, however, increase the amount of concern associated with body part cloning (p. 4-5).

In light of these findings, the researcher of this thesis study also felt it was important to understand the impact of new information on opinion change. They chose to use the reading package and follow-up interview as a more convenient and economical alternative to the United Kingdom study follow-up focus groups.

Additional Questions for Participants in First Focus Group

In addition to the above follow-up interview questions, participants in the first focus groups were asked an additional three questions that were not asked in the first group, but had been added to the moderator's guide in the second and third focus groups. These additional interview questions were to allow for comparability in the analysis across all three focus groups. These questions were:

- 1. What is your position on animal cloning and why?
- 2. What is your position on tissue and animal cloning and why?
- 3. What is your position on human cloning and why?

The answers to these questions as well as those above were tape recorded and transcribed. The interviewer also took notes on the participants' responses. The analysis of these follow-up interviews will be described after an overview of the focus group data analysis.

Analyzing the Focus Group and Telephone Interview Data

It is important to note that the transcripts for each focus group and the corresponding phone interview were first analyzed separately. To begin, each line of the January 9th focus group and telephone interview transcripts were numbered, so that after analysis it could be determined where the line came from originally. Then a computer document was created for the focus group. The document contained sections for hopes associated with body part, animal and human cloning. It also contained sections for concerns associated with each type of cloning. Focus group members' comments were then compiled into each of the appropriate sections. For example, the researcher placed all the comments relating to animal cloning concerns under the animal cloning concern category. Next, the researcher grouped like comments together within each section, until themes of hopes and concerns emerged for each section. Quotes that did not fit into any particular theme were moved to a miscellaneous category within that section. The researcher constantly rearranged quotes in each section until she felt that it accurately reflected the main hope and concern themes discussed for each type of cloning. It was only after this point that the researcher moved on to repeat the process above for the other two focus groups.

Once the themes of hopes and concerns were identified for each focus group, the researcher looked at all three focus groups to determine the main themes raised across focus groups. The researcher used the principles of *frequency*, *specificity*, *emotion* and *extensiveness* to determine the main hopes and concerns⁴. Krueger and Casey (2000) state that *frequency* is the idea that concerns and hopes mentioned more often may be more

⁴ Once again, it is important to note that each theme was not assigned a number weighting in terms of these four principles. Rather the researcher considered these principles for each theme and determined the main themes based on a qualitative weighting of these principles.

important than those mentioned only once. Specificity is the idea that concerns and hopes with detailed examples carry more weight than those with general examples. An example of this can be seen in the third focus group when the moderator asked the question "What are your hopes for body part cloning?" One person answered that he hoped body part cloning would benefit society. Another participant said she would like to see body part cloning cure Parkinson's disease because her mother is suffering from the disease. According to the specificity principle, the second hope would hold more weight than the first because it is precise. *Emotion* is the third predictor of importance. This is the idea that more weight is given to hopes and concerns, which participants discuss passionately or intensely. Lastly *extensiveness* is the law that hopes and concerns mentioned by several people or across focus groups are more important than those only discussed by one person or one focus group (p.136). In addition to *frequency*, specificity, emotion and extensiveness, hopes and concerns were also considered to be more significant if participants used them as their main justification for their position when they were asked, "What is your position on cloning and Why?" Using the above principles, the researcher determined themes of hopes and concerns that were important across all three focus groups. The researcher then reviewed these main themes looking for how participants objectified each type of hope or concern. She then selected quotes that best illustrated the objectification. The focus group findings can be found in chapter five.

Summary

The content analysis methodology was selected to explore media representations of the risks and benefits associated with cloning. A sample of 64 *Globe and Mail* articles about cloning was coded from 1996 through to 2002. The data generated a statistical summary of how the *Globe and Mail* presented cloning risks and benefits during this time period and showed how its coverage changed over time. Using the principles of *extensiveness*, *frequency, headline importance*, and *immediacy* the main themes of risks and benefits were established. Finally, examples were chosen to illustrate how the *Globe and Mail* objectified these main themes.

To complement the content analysis, the researcher conducted focus groups in order to explore social representations of the risks and benefits of cloning. Three focus groups were held on January 9, 13, 14, 2003. Twelve people from the general public were randomly recruited to participate in each focus group. However, the actual turnout was less than 12 people for each group—there were 7 in the first, 12 in the second and 10 in the final group. The participants were asked to identify different areas of cloning, state their sources of cloning information, discuss their hopes and concerns for different types of cloning as well as identify their positions on the various types of cloning. The focus group, participants were given an information package and asked to participate in a follow-up phone interview in order to test the impact of new information on opinion change. The data from the focus groups as well as the phone interviews were both transcribed. The comments were then grouped into main themes of hopes and concerns and specific comments were chosen to illustrate how participants objectified each of the themes.

Chapter Four: Cloning in a National Newspaper

The content analysis was designed to examine social representations of the risks and benefits associated with cloning. *Globe and Mail* articles about cloning were coded from 1996, the year before Dolly was born, through to 2002. The coding paid particular attention to which risks and benefits were most prominent and how those risks and benefits were anchored and objectified in the news coverage. Anchoring is the process of comparing a new social object against an existing social object to determine how it is the same and different (Wagner et al. 1999, p. 97). Objectification is the use of devices, such as icons and metaphors, to explain a new social object (Moscovici 2001a, p. 49). Both processes of anchoring and objectifying help the public turn unfamiliar social objects into familiar social representations.

This chapter begins by reviewing previous media studies on cloning and then moves on to report the findings of this thesis' content analysis. First, it presents the overall pattern of cloning coverage from 1996-2002. It then reports the key risks and benefits that the Globe and Mail identified for each type of cloning. Next, this chapter provides examples of how these risks and benefits are both anchored and objectified. Finally, this chapter concludes by examining the *Globe and Mail*'s benefit/ risk ratio for each type of cloning.

Previous Media Studies on Cloning

There has been a great deal of analyses done on media coverage of biotechnology across Europe, the United States, and Canada (Durant, Bauer, & Gaskell, 1998; Gaskell & Bauer, 2001; Nisbet & Lewenstein 2002). Studies show that media attention to biotech issues has steadily increased across all three regions. However, this section will pay particular attention to increases in media coverage relating to one specific application of biotechnology, cloning.

An analysis of elite U.S newspaper coverage for the years 1994-1997 examined how the event of Dolly the sheep shifted media discourse, beyond commercial interests, to consider the previously ignored ethical implications of biotechnology (Priest, 2001). The study maintained it was the combination of three factors in the Dolly story that brought ethical issues of human cloning into the media spotlight: professional journalistic practices, cultural context and lack of institutional interest. According to the study, reporters in the Dolly story were driven by the journalistic principle of objectivity (which often means presenting opposite viewpoints) and because there were no competing scientific discourses, ethics was often juxtaposed with science (p.106). The news coverage debated whether it was ethically right to use cloning technology to clone humans. This debate caused academic scientists, ethicists, and theologians to dominate the headlines, rather than commercial interests which had traditionally been quoted in biotech news (p. 102). The second reason ethics entered the media discourse was because human cloning challenged the societal value of individuality (p.104). The final reason for the focus on ethics was because at that time nobody in the biotech industry had interest in reproductive cloning (p. 107). The lack of commercial interest allowed ethicists an opportunity to dominate the media coverage. The study concluded by suggesting that these three factors (journalistic principle, cultural context and lack of commercial interest) combined to create a new public space for ethical debate.

Another study by Einsiedel et al. (2002) also looked at media coverage of Dolly the Sheep. Unlike the Priest study, Einsiedel et al. focused primarily on the 11 days following the announcement of Dolly's birth. This study used the theoretical framework of social representations to examine media coverage across 11 European countries and Canada. Similar to the Priest study, Einsiedel et al. found that Dolly the sheep evoked moral outrage at the prospect of human cloning. The Dolly story was anchored to human cloning and objectified through imagery, humour, themes and descriptions of the scientific procedures involved in the making of Dolly. In the end, Einsiedel et al. argued that social representations of Dolly helped to familiarize society with a "new dimension of our technological prowess" (p.340).

Both the Priest and Einsiedel et al. studies looked at cloning in its early stages. More recently, Williams, Kitzinger and Henderson conducted a media analysis surrounding two news events about therapeutic cloning in the United Kingdom press and television news (2003). The study found that the media presented therapeutic cloning as a controversy between proponents (scientists, labour politicians and patients) and opponents (religious spokespeople, conservative politicians, and anti-abortionists). The study then overviewed rhetorical strategies by opponents and proponents of therapeutic cloning. Both sides used metaphors and personification to gain support. They also presented different images of the embryo to promote their position. For example, proponents emphasized the size and non-human nature of embryos, whereas opponents focused instead the embryo's humanity and individuality. Beyond analyzing rhetorical strategies of sources, this study found that the media coverage ignored the possibility that therapeutic cloning may prove unsuccessful or unsafe. The researchers concluded that media are not adequate fora to develop an inclusive public democratic debate around therapeutic cloning.

While all three studies offer insight into how cloning is portrayed in the media, they do not explore how different types of cloning have emerged since Dolly the sheep. This thesis examines the media coverage of animal, body part, and human cloning over an extended period of time. Unlike previous studies, it also explores how the risks and benefits of these types of cloning are presented in the media.

Overall Trends

Articles about cloning were collected by entering search terms into a *Globe and Mail* search engine. Hits were then downsized to include only news clippings about the medical term cloning. Editorials and columns were eliminated, as they were opinion pieces. Articles less than 200 words were also excluded from the sample. Every second article was then coded to create a total sample size of 64 articles from 1996-2002 (Table 3).



Table 3: Number of Stories per Year in Globe and Mail Sample

Articles were coded as animal, body part, human or other cloning. Stories which were about two types of cloning were counted in two sections. In total, there were only three stories about other types of cloning. The number of articles about animal (26), body part (22) and human cloning (23), however, were fairly equal across the six-year time frame. With that in mind, certain years saw large numbers of articles about one particular type of cloning, while other years saw none. The following section overviews the dips and climbs of the three cloning types (Table 4).

Table 4: Types of Cloning Stories by Time



In 1996 there was only one cloning article coded, but that number increased the following year. On February 24, 1997 the *Globe and Mail* ran a front-page story with a headline that proclaimed, "Adult Mammal Cloned Successfully" (Kolata, p. A1). That adult mammal was Dolly the sheep, and her birth kick-started a steady stream of animal cloning coverage. The majority of cloning stories in 1997 were follow-up stories about the scientific, medical and financial impact of Dolly.

In 1998 the number of cloning stories began to decline. It was the start of a downward spiral for cloning stories. The 1998 media coverage was marked by a move, beyond Dolly follow-up stories, to focus on the cloning of other animals such as mice and cows. Several articles were also about human cloning, warning that it was imminent.

In 1999, the number of cloning articles dwindled even further. The majority of these stories were again about animal cloning, while stories about human cloning disappeared. Headlines talked about scientists successfully cloning goats and mice. They also discussed the possibility of cloning extinct and endangered species.

In 2000, the number of cloning stories remained consistent with six stories. Britain's effort to create legislation which would allow body part cloning generated an increase in stories about body part cloning. Consequently, animal cloning stories, which had been the dominant type of story up to this point, shared the media spotlight with stories about body part cloning.

In the year 2001, the downward trend in cloning stories ended. Cloning stories reached an all-time peak. While stories about animal cloning remained consistent in frequency and content, human and body part cloning stories increased. The increase in human cloning stories was triggered by Dr. Severino Antinori's announcement that he planned to clone children for infertile couples (Associated Press, 2001 p. A8). In comparison to the one event that caused an increase in human cloning stories, there were two events that caused an increase in body part cloning stories. The first was Canada's decision to follow Britain's attempt to legislate body part cloning (Clark, 2001 p. A5). The second event was that ACT, a U.S. company, announced that it had successfully cloned an embryo to the six-cell stage. ACT said the purpose of the embryo cloning was to extract stem cells that could be grown into tissues and organs (Mitchell, 2001, p. A1).

This event, in conjunction with Canada's debate about legislating body part cloning, accounted for the sharp rise in body part cloning stories. Together, the increase in body part and human cloning stories accounted for the overall surge in cloning stories for 2001.

The year 2002 brought only a trivial decline in articles about cloning. Stories about animal cloning stories continued to take a back seat, while human and body part cloning made up the majority of these articles. The start of 2002 saw few articles about human cloning. However, in December, Clonaid's announcement that it had produced the first human clone (Galloway, 2002, p. A1) revived the number of articles about human cloning to a total of eight. Body part cloning, on the other hand, consistently dominated the headlines of 2002, as the debate about how Canada should legislate body part cloning continued.

Without further analysis, it is difficult to predict whether 2003 saw a rise or decline in media coverage. The history of media coverage in the *Globe and Mail* has been very much event triggered. Events such as Dolly's birth, Antinori's plan to clone children, Britain's move to legislate body part cloning, ACT cloning a human embryo, Canada's effort to legislate body part cloning, and Clonaid all sparked periods of high volume media coverage.

In all likelihood, the year 2003 saw a large numbers of stories about cloning. This is because the birth of baby Eve, which was still in the forefront of media coverage at the beginning of 2003, was likely enough to sustain the elevated level of media coverage that was characteristic of 2001 and 2002.

Benefits of Animal Cloning (Table 5)

Table 5: Key Animal Cloning Benefits

- Health products such as pharmaceuticals
- Xenotransplants
- Advancing Animal husbandry
- Cloning endangered/ extinct animals.

The *Globe and Mail* articles introduced 10 themes for animal cloning benefits. However, the majority of those themes were not mentioned in more than one article. For this reason, only the four benefits mentioned above constituted a main theme.⁵

Of the four benefits, the most prominent benefit was the hope that animal cloning would lead to the production of pharmaceuticals. This benefit was routinely mentioned in 1997 when Dolly was cloned. Ian Wilmut, the scientist who cloned Dolly, claimed that the nuclear transfer technique could be used to produce pharmaceuticals. He explained that animals such as goats could be genetically engineered to produce proteins in their milk that could cure diseases. Once these animals are engineered, Wilmut said that they could be cloned to ensure that large amounts of pharmaceuticals would be available. Following 1997, the mention of this benefit became sporadic. Nevertheless between 1996 and 2002, the benefit of pharmaceuticals was implied in three headlines that mentioned the medical benefits of animal cloning. For example, one headline read, "Cloning takes leap forward: New technique could spur medical advances; scientists say" (Fox, 1998, p. A1). The lead then went on to say how the technology used to create cloned mice "might offer new ways to make valuable drugs." This pharmaceutical benefit was also cited in the text of 11 different articles. The articles anchored this benefit to a medical cure and used images⁶, metaphors and puns to objectify this benefit.

Globe and Mail articles habitually listed specific diseases that could be cured by pharmaceuticals produced from cloned animals. Journalists were most likely to mention cystic fibrosis, hemophilia, and Parkinson's. The writers would often describe in detail the intense symptoms of the diseases: "The brains of Parkinson's patients stop producing a chemical called dopamine. Victims get tremors, develop problems moving and eventually die" (Fox, 1998, p. A1). This journalist went on to suggest that people with Parkinson's could be cured by cloned animals genetically engineered to produce human dopamine. This allowed readers to mentally visualize diseases like Parkinson's that could potentially be cured through animal cloning.

⁵ See Appendix H for complete list of "animal cloning" benefit and risk themes found in the *Globe and Mail.*

Additional ways of objectifying the benefit were metaphors. These literary devices often compared cloned animals to drug factories. Using a metaphor, one journalist wrote, "The cloned rabbits may be able to serve as 'drug factories' to produce products such as certain proteins and enzymes in their milk" (Cash, 2002, p. A5). Literary techniques, such as this one, allowed readers to envision a drug factory as a means of comprehending the benefit of pharmaceuticals produced by cloned animals.

The final way the Globe and Mail objectified the benefit of pharmaceuticals was via puns. Articles denoted animals that produce pharmaceuticals as "pharm animals" (e.g. Strauss, 1997, p. A8). The pun replaced the word "farm" with the "pharm" short for "pharmaceutical." In doing so, the play on words pointed out that farm animals are becoming pharmaceutical animals.

The second largest benefit was that cloning would lead to xenotransplants or the use of animal organs for human transplants. This benefit was discussed a couple of times each year starting in 1997. Over the entire sample period, two headlines and eight stories raised the benefit of xenotransplantation. Xenotransplantation is the process of genetically engineering animals, usually pigs, so that their organs will not be rejected by the human immune system in an animal to human organ transplant. Once the animals have been genetically engineered, the animals are then cloned to supply usable animal organs to the many humans who need transplants. The *Globe and* Mail anchored this xenotransplant benefit to the category of medical cure and objectified the benefit through images of long waiting lists and cloned organs, as well as witty references to the childhood game, *This Little Pig Went to Market*.

Several *Globe and Mail* articles made the benefit of xenotransplants real by evoking poignant images of organ donor shortages. One article explained that the number of patients needing transplants outnumber the number of donors available "by a ratio of 20 to 1". The article then said that xenotransplants are "the only near term solution to solving the worldwide organ crisis shortage" (Radford, 2000, p. A2). Another reporter

⁶ It should be noted that no photos were analyzed for this content analysis; as a result, the term *images* refers to mental images conjured by readers interpreting the text.

wrote that the "incentive to harvest animal organs for human use grows along with transplant waiting lists" (Abraham, 2002a, p. A1).

In addition to images of long waiting lists, journalists also generated images of specific pig organs that could be transplanted into patients in need. For example, one journalist wrote that researchers "could use cloning to alter the proteins on the surfaces of pig organs, like the liver and heart, making the pig organs more like human organs. Then they could transplant those organs into humans" (Kolata, 1997, p. A1). Mentions of specific organs like the liver and heart, rather than general references to organs, allowed readers to make more concrete the benefit of xenotransplants.

The final way journalists objectified the benefit was through references to the childhood game, *This Little Pig went to Market*. Editors alluded to this game in a headline: "...Firm that created Dolly seeks approval to send swine to market as organ donors for humans" (Radford, 2000, p. A2). It was also mentioned in a lead that said, "The Scottish firm that cloned Dolly the Sheep announced yesterday that it is a step closer to bringing its pig creations to the medical market" (Abraham, 2002a, p. A1). Through references to the familiar childhood game, journalists made the benefit of xenotransplants more familiar for their readers.

The next benefit theme was that cloning would be used to breed animals for husbandry purposes. This benefit was mentioned most in 1997 when Dolly was cloned. Ian Wilmut claimed he was primarily interested in the nuclear transfer technique used to create Dolly as a tool for animal husbandry. Following 1997, the benefit of animal husbandry was seldom discussed in *Globe and Mail* articles. Even so, the husbandry benefit was still highlighted in a total of two headlines and seven stories from 1996-2002. Journalists anchored the benefit to the category of animal breeding techniques and objectified through images, a pun, and the story of Margo II.

The benefit of husbandry was made perceptible through concrete examples of food that could be produced via cloned animals. One journalist wrote, "Cloning could be used to make multiple copies of animals that are especially good at producing milk and meat" (Kolata, 1997, p. A1). By naming specific food products, such as milk and beef, journalists helped readers visualize the abstract benefit of husbandry. Beyond images,

one editor used a metaphor to objectify the benefit of husbandry. The headline read, "Milking genes for all their worth: When a farmer's record-breaking cow died unexpectedly, science found a way to bring her back" (Immen, 2001, p. A3).

In this same article, the journalist used another means to objectify the benefit of husbandry—the empathy technique. The article was about a cow, Margo II, cloned from a world-record-holding milk cow. The farmer who owns Margo II described the animal with such warmth and emotion. He is quoted as saying, "She is very lovable...When you're milking her, she turns and looks directly at you. That's rare in a milk cow" (Immen, 2001, p. A3). Through quotations like this, readers begin to empathize with Margo II and understand that Margo II would never have existed without cloning. Consequently, lovable Margo II makes real and important the benefit of cloning for husbandry purposes.

The final theme worth mentioning was the benefit that extinct and endangered species could be revived through cloning. This benefit was most often discussed in 1999. However, across the 1996-2002 time period it was mentioned in one headline and six articles. This benefit was anchored to the category of environmental preservation and objectified through images of extinct and endangered animals, and metaphors.

Articles about cloning extinct or endangered animals frequently cited a specific animal to be brought back. The extinct wooly mammoth, endangered panda, and extinct Spanish mountain goat were just a few of the animals cited. Beyond naming specific animals, many articles provided colorful and detailed descriptions of these extinct or endangered specimens. For example, one article talked about bringing back the Australian Tasmanian tiger, a marsupial wolf. The article described the tiger as having long "tapering stripes on its body". It also said that the tiger "grew two meters in length, including a long rigid tail" (Reuters News Agency, 1999, p. A2). Descriptions of animals, such as the Tasmanian tiger, allowed readers to clearly envision the benefit of cloning extinct and endangered animals.

In addition to images, journalists also used metaphors as an objectifying technique. One article described laboratories, designed to preserve DNA of extinct and endangered animals as, "frozen zoos" or "20 century 'Noah's arks'" (Crockfort, 1999, p.

R4). While a laboratory that preserves DNA is a foreign concept to most people, a zoo or Noah's ark is something that the average person can understand. The Noah's ark metaphor was taken a step further in another story about a cloned ox. The cloned ox was named "Noah" (Associated Press, 2001, p. A20), a likely reference to a Noah's ark rescue.

Risks of Animal Cloning (Table 6)

Table 6: Key Animal Cloning Risks

• Genetic defects

Twelve different risks for animal cloning were mentioned in the *Globe and Mail* during the designated timeframe. *However only the risk of genetic abnormalities constituted a main theme*. This risk was raised regularly between1996-2002. It was highlighted in five headlines and was also cited in 21 articles. It was also mentioned several times in each of the 21 articles. The risk of genetic defects was anchored to past experiments with cloned animals as well as some standard of "normal." It was then objectified through examples of abnormalities, statistics, images of Dolly's abnormalities and a metaphor.

Journalists frequently provided specific examples of abnormalities. Articles catalogued long lists of genetic defects: enlarged hearts, obesity, cancer, breathing troubles, and premature aging to name a few. The lead of one article painted an emotionally disturbing picture; it read, "They're often so fat they endanger their surrogate mothers while in the womb. They're prone to breathing troubles and dying young. Now scientists have found that cloned creatures also suffer a range of other problems invisible to the human eye" (Abraham, 2001, p. A3).

Of all the genetic defects mentioned, miscarriages and stillbirths were the most common examples—they were directly referenced in one headline and 11 articles. Statistics were used to indicate the severity of miscarriages and stillbirths. Journalists usually cited the number of attempts it takes to produce a healthy clone. Their favourite statistic, while the number varied from one article to the next, was the number of attempts needed to produce Dolly the sheep. Articles reported that it took scientists anywhere from just over "200 tries" (Reuters News Agency, 1998, p. A13) to as many as "400 tries" (Kolata, 1998, p. A17) to produce Dolly. Regardless of the conflicting figures, these statistics gave readers an appreciation for the large numbers of miscarriages and stillbirths involved in cloning.

Beyond statistics, journalists also used unsettling images of Dolly aging prematurely to help readers grasp the severity of genetic defects:

Dolly, the poster mammal for cloning, is suffering a disease of the old at an unusually young age, stoking fears that cloned creatures will never be healthy. The cloned Finn Dorset sheep was trotted out in 1997, a symbol of scientific chutzpah and sophistication. But yesterday, the five-year old limped back into the limelight: Her handlers confirmed that the most famous of her flock has arthritis in her left hind leg, hip and knee (Abraham, 2002b, p. A1).

This article was just one of many that used Dolly's aging to objectify the risks of genetic defects in cloned animals.

Examples of abnormalities, statistics, and images of Dolly growing old were the most standard means of familiarizing readers with the risk of genetic defects. However, one journalist stepped beyond these techniques by using the metaphor of genetic misfits for cloned animals. The journalist wrote, "...there have always been troubling signs that cloned animals—sheep, mice, cows, goats and pigs—constitute a barnyard of genetic misfits" (Abraham, 2002b, p. A1).

Benefits Versus Risks: Balanced Coverage of Animal Cloning

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From1996-2002, the benefits and risks were evenly balanced in the headlines at a ratio of 11:12. As for the text, the researcher coded each risk or benefit once for each article, even if it was mentioned several times within the article. This produced a ratio in the text of 50 instances of benefits verses 36 instances of risks, suggesting that articles were slightly more likely to communicate benefits of animal cloning. Further to this, the *Globe and Mail* presented four main themes for animal cloning benefits (pharmaceuticals, xenotransplants, advances in animal husbandry, and cloning

endangered/ extinct animals) compared to the one theme for animal cloning risks (genetic defects). While these statistics suggests that articles were more pro animal cloning, it is important to consider the criteria of frequency, emotion and specificity.

Animal cloning benefits had elements of the frequency, specificity and emotion, however no other risk embraced all three elements like the risk of genetic abnormalities. In terms of frequency, the risk of abnormalities was mentioned numerous times in each article. In fact, whole articles were designated to discussing genetic defects in cloned animals (Abraham, 2001, p. A3; Abraham 2002b, p. A1).

In addition, articles listed specific examples of genetic defects from miscarriages and breathing problems. They also painted very emotional pictures of sick clones with abnormalities. One disturbing image included cloned mice which appeared healthy, but carried genetic glitches. The journalist wrote, "While such abnormalities were not severe enough to result in miscarriages or still births, scientists suspect that these defects could wreak havoc with organs and even trigger foul-ups in the brain later in life" (Abraham, 2001, p. A3).

Further to emotional images, there were also several quotes which conveyed emotion. Ian Wilmut, creator of Dolly, said, "Sadly, it seems one of the other outcomes from this will be that some of the cloned animals will prove to be more vulnerable to some diseases." He went on to say how "very disappointed" this leaves him (Abraham 2002b, p. A1). Together, these instances of frequency, specificity and emotion suggest that, despite the benefit/risk ratio and number of themes, the *Globe and Mail's* coverage of genetic abnormalities seems to have tipped the coverage of benefits and risks closer to balance.

Benefits of Body Part Cloning (Table 7)

Table 7: Key Body Part Cloning Benefits

- Improving health through:
- 1. Increased organs available for transplant
- 2. Cured diseases.

Stories about body part cloning did not fully enter the media scene until 2001. Once it was there the Globe and Mail identified only one benefit of body part cloning the benefit of improving quality of health. It proposed two ways in which body part cloning would improve health. It suggested that body part cloning would not only increase the number of organs available for organ transplants, but also cure diseases. These benefits were also contained in a number of headlines. For example: "The Man who aims to cheat death" (Leblanc, 2001, p. A1) and "Paralyzed man hopes cloning will yield cells to regenerate spine" (Lunman, 2001, p. A5). This health benefit was also cited in 26 articles between 1996 and 2002. The Globe and Mail anchored this benefit to the category of "medical cure" and objectified it primarily through mental images, metaphors, similes and patient narratives.

Most articles depicted images of cloned organs and tissues as well as images of cured diseases. The articles conjured up a wide spectrum of specific organs and tissues that body part cloning could produce, most common being heart and liver, but other more obscure tissues such as eyeballs and cartilage were also cited. Articles also made frequent reference to specific diseases (e.g. Parkinson's disease, diabetes, heart disease, and Alzheimer's) as potentially curable.

The *Globe and Mail* also employed metaphors to familiarize its readers with the benefits of body part cloning. The most recurrent ones were farming metaphors such as, "cloning embryos in order to harvest human tissues for transplant" (Abraham, 1999, p. A9). Along the same lines, the lead of another article read, "The technology used to make three generations of cloned mice might...make possible organ farms for transplants..." (Fox, 1998, p. A1).

Journalists generally used metaphors to assist readers in understanding the new scientific notion of stem cells. One journalist paraphrased an academic scientist who hoped that "...huge banks of frozen stem cells could be established, each tissue-typed in the same way that organ donors now are" (Foss, 1998, p. A1). The financial metaphor referring to "deposits" and "withdrawals" again brought the reader to familiar terrain.

Further to these metaphors, some journalists described stem cells as "the blank slates of the human body" (McIlroy, 2001, p. A7) or "the key to research that could one

day allow doctors to repair bodily organs..." (Laghi, 2002, p. A1) The latter comparison of stem cells to a key was a popular simile in 2001 and 2002.

The final way that articles helped readers to understand the benefits of body part cloning was by supplying a compassionate and emotional portrait of a patient who stood to benefit from body part cloning. Surprisingly, this means of objectifying was only employed in three articles, but was very effective when used. The most compelling patient was Dr. Judson Somerville, who volunteered his skin cells for the ACT human cloning experiment that produced the six-cell cloned embryo (Lunman, 2001, p. A5; Reuter News Agency, 2001, p. A5). Somerville became an unlikely spokesperson for body part cloning after a cycling accident left him paralyzed in 1990. The article suggested that by means of body part cloning, Somerville might one day find a cure to his spinal injury and walk again. Somerville himself seemed to recognize the importance of providing the public with an example of someone they could identify with and be sympathetic to. "I think people need to see a face, a human being, " he said, "I'm willing to take that risk to make the world a better place" (Lunman, 2001, p. A5). Somerville took the risk and by doing so he allowed readers to see first-hand the potential impact of body part cloning. Patients, like Somerville, in conjunction with images and metaphors helped readers objectify the benefit of improving health via body part cloning.

Risks of Body Part Cloning (Table 8)

Table 8: Key Body Part Cloning Risks

• Creating life only to destroy it.

Although the *Globe and Mail* identified nine different risks associated with body part cloning, most risks were referred to in just one or two articles⁷. *The only risk repeated persistently across articles was the risk of creating life to destroy it.* The process of body part cloning involves the removal of stem cells from a cloned

⁷ See Appendix H for complete list of "body part cloning" benefit and risk themes found in the *Globe and Mail.*

embryo; the removal terminates the embryo. In this way, critics argue that the body part cloning process is disrespectful to human life because it creates life to destroy it. This risk was frequently mentioned in 2001 and 2002. It was directly cited in three headlines and alluded to in five headlines that discussed the ethical risks of body part cloning. Examples of headlines include "Don't allow embryo cloning, anti-abortion leaders urge" (Clark, 2001, p. A5) and "Define legal status of embryos, Manning tells Ottawa" (Laghi, 2001, p. A4). This risk was also addressed in 11 articles. This risk was most commonly anchored to the topic of abortion and objectified by means of influential sources and metaphors.

Sources such as religious leaders and anti-abortion groups were the main spokespeople for this risk. Their quotations were laden with emotional overtones. One article quoted Pope John Paul saying, "Every medical procedure performed on the human person is subject to limits: not just the limits of what is technically possible, but also limits determined by respect for human nature itself." The Pope then went on to say that body part cloning is morally unacceptable because it disrespects human life by creating it only to destroy it (Reuters News Agency, 2000, p. A10). Having authoritative figures like the Pope say that body part cloning makes a mockery of human life, validates the ethical risk in some readers' eyes.

Journalists not only used sources to help readers appreciate the risks of human cloning, they also used metaphors. One article paraphrased anti-abortion groups saying, "Embryos are human beings, not lab rats" (McIlroy, 2001, p. A7). This passionate metaphor stressed that embryos are equivalent to human beings. It also implied that the creation of embryos to destroy them, rendered human embryos no better than lab rats. Another metaphor was found in an article on May 10, 2002. The front-page story quoted a politician who said, "We're opening the box, to where you're actually taking human life and using it for research, and by doing that you're destroying it" (Anderssen, 2002, p. A1). This metaphor equates the destruction of human life with the opening of Pandora's box⁸. In addition to the Pandora's box

⁸ In Greek mythology, Pandora was the first mortal woman. She opened a box that released human evils.
metaphor, the "harvesting" metaphors, mentioned above, were also frequently used to objectify the risk of creating life to destroy it. Journalists wrote, "Stem-cell research presents a dilemma because embryos are destroyed when the stem cells are harvested" (Honey, 2002, p. A3). Again this metaphor compared the removal of stem cells to the harvesting of crops. Metaphors allowed readers to link the abstract risk to objects they understood: lab rats, Pandora's box, and harvesting crops. Metaphors and influential sources were the two ways the risk of creating life to destroy it was objectified.

Benefits Versus Risks: Balanced Coverage of Body Part Cloning

Across the 1996-2002 time frame, the *Globe and Mail* raised almost the same numbers of benefits and risks. The result was 13 benefits/ 9 risks mentioned in headlines and 31 benefits/ 27 risks cited in the text of the articles. The articles alternated between discussing benefits first and discussing risks first. In addition, the *Globe and Mail* raised only one significant theme for both body part cloning benefits and risks. These quantitative assessments suggest that journalists presented a fairly balanced overview of the benefits and risks associated with body part cloning.

Beyond numbers, there was no significant difference in specificity and emotion for the coverage of risks and benefits. It is notable, however, that journalists frequently used emotion to convey both the benefits and risks of body part cloning. For the benefits, one journalist painted a touching picture of a patient, Somerville, as a doctor and a religious man with two young daughters. Somerville, who was hoping that body part cloning would cure his spinal cord injury, served as a emotional spokesperson for body part cloning (Lunman, 2001, p. A5). As for the risks of body part cloning, one journalist used forceful language to convey the emotion of the situation. "Leaders of the antiabortion movement ...attacked the federal government..." for even considering cloning embryos (Clark, 2001, A8). The use of the word "attacked" was very powerful. The fact that both risk and benefit statements employed emotion, to relatively equal degrees, suggests again that the *Globe and Mail* presented a fairly balanced picture of body part cloning.

Benefits of Human Cloning (Table 9)

Table 9: Key Human Cloning Benefits

• Cloning children for infertile couples.

The *Globe and Mail* discussed 11 different benefits for human cloning, but most were only mentioned in one article⁹. Cloning children for infertile couples was the most frequently mentioned benefit. This benefit was mentioned most frequently in 1998 and continued to be raised sporadically leading up to the year 2002. In total, the benefit of cloning for infertile couples was cited in one headline and nine articles from 1996-2002. It was anchored to the category of reproductive technology and objectified via the numbers of couples waiting to clone a child.

Articles frequently generated images in reader's minds of infertile couples hoping to clone a child. While no journalists interviewed infertile couples, in vitro fertilization (IVF) doctors were constantly citing couples that hoped to clone a genetically related child (Reuter News Agency, 1998, p. A13). Fertility doctor Severino Antinori said he had "600 to 700 couples" waiting to clone a child (Barrett, 2001, p. A20). Later that year, Antinori said "1,300 American couples and another 200 in Italy" were interest in cloning (Walton, 2001, p. A4). These numbers helped readers to envision people who would benefit from infertility cloning.

The twist is that while IVF doctors attempted to make infertility cloning a benefit, journalists and other sources counteracted their attempts. Other sources presented cloning children for infertility purposes as a risk. This risk will be discussed further in the following section.

⁹ See Appendix J for complete list of "human cloning" benefit and risk themes found in the *Globe and Mail*.

Risks of Human Cloning (Table 10)

Table 10: Key Human Cloning Risks

- Ethics.
- Genetic abnormalities
- Infertile couples cloning children

Thirteen different types of human cloning risks were mentioned in the *Globe and Mail.* However, there were only three main risk themes because the other themes were cited in only one article. *Of the three, the leading risk was general ethical concern about human cloning.* "General ethics" was used for terms that did not mention specific concerns. This general ethical risk was mentioned in two headlines and the text of seven articles.

This risk was anchored to the notion of evil and its significance was conveyed largely through zealous sources. It was predictably religious leaders or ethicists who raised this general ethical concern. An article on March 10, 2001 paraphrased the Vatican depicting human cloning as "grotesque" (Barrett, p. A20). Another article quoted the Vatican saying that it is an "expression of brutal mentality, devoid of any humane or ethical considerations" ("Cloning files snatched in Korean," 2002, p. A1). It was via commanding sources, such as the Vatican, that the general ethical risk of human cloning was recognized.

One source used an analogy to objectify the ethical risks. A religious bioethicist said, "Those who made the atomic bomb went ahead in spite of knowing about its terrible destruction. But that doesn't mean that it was the best choice for humanity" (Barrett, 2001, p. A20). For the most part, it was sources such as this bioethicist that substantiated the ethical risk of human cloning.

The next risk was concern that cloning would result in genetically abnormal children. Although this risk was not referenced in headlines, it was mentioned in nine articles between 1996-2002. This risk was first identified in 1998. For the most part, journalists anchored the risk to genetically deformed animal clones. They objectified it by

citing the genetic abnormalities found in cloned animals. One journalist wrote, "...it is premature to practise in people what has so often been fouled up in animals" (Abraham & Ibbitson, 2001, p. A1). Another article quoted Ian Wilmut saying, " Expect the same outcome in animals as in other species: late abortions, dead children, and surviving but abnormal children" (Saunders, 2002, p. A4). Through disturbing images of genetic defects in cloned animals, journalists assisted readers in comprehending the potential for genetic defects in human clones.

Journalists also anchored this risk to the category of science fiction. In this case, they objectified the risk of abnormalities in human clones through the images of "deformed" or "monster" babies. One example of this can be seen in the quote of a commercial scientist who clones animals. He said, "To my view, the immorality of human cloning is that to refine the technique we would have to make ...a number of deformed babies..." (Fox, 1998, p. A1). Another image was from an IVF scientist who said, "...We're cloning a human being now; we're not trying to create a Dolly. You don't want to create a monster" (Barrett, 2001, p. A20). These frightening visuals objectified the risk of genetic defects in clones.

The final theme was concern that cloning would be used to produce children for infertile couples. Articles frequently coupled the hope that children would be cloned for infertile couples with concern. During the time frame of this study it was mentioned in three headlines and four articles. It was particularly widespread in 2001. The risk of infertility cloning was anchored to the category of mad science. It was objectified by discrediting scientists, using metaphors, and omitting any mention of cloning for infertility.

The articles conveyed the risk of cloning children by undermining the reputation and motives of scientists hoping to clone children. One journalist wrote, "Mr. Zavo's credentials have also been questioned...he claims on one of his websites to be a member of the prestigious American Society for Reproductive Medicine, a claim the society says is untrue..." (Barrett, 2001, p. A20) Another article quoted an ethicist who said, "This scheme is loony...we're dupes for taking it seriously" (Abraham & Ibbitson, 2001, p. A1). Yet a third article read, "Italian medical authorities warn that Antinori risks losing his medical license if he clones a human." (Walton, 2001, p. A4) Statements, such as these, disgraced the various scientists who hope to clone children. Through this shaming, articles reinforced the danger of having unqualified people cloning children.

Metaphors were the second way articles mustered fear of infertility cloning. One headline read, "Cloning proponent 'clearly unhinged,' scientist says: Plans to copy adult humans to help infertile couples evokes repulsion in experts" (Reuters News Agency, 1998 p. A13). In another article, the reporter wrote, "The plan has come under heavy fire from mainstream scientists and from religious groups." This war metaphor was clearly an allusion to lines drawn between opponents and proponents, suggesting that cloning proponents were on the fringe (Barrett, 2001, p. A20). The most powerful and emotional metaphor, however, appear on following Clonaid's announcement that it had cloned Baby Eve. A leading Canadian health policy analyst said:

Unbelievably, this [announcement] is coming from the worst imaginable place, almost—it's one step away from learning that Saddam Hussein has decided to clone himself—and it could have a really negative effect on shaping our rational understanding of the benefits and detriments of this technology (Saunders, 2002, p. A4).

The third and final way articles objectified the concern was by omitting any mention of infertility cloning. In the year 2002, cloning for infertility purposes was virtually unheard of in the *Globe and Mail*. This was surprising as Clonaid announced it had cloned a child for an infertile couple in December 2002 (Galloway, 2002, p. A1). The Clonaid event, however, was not pitched as hope for infertile couples. In fact, only one of five articles even mentioned that the child had been produced for an infertile couple. In all probability, journalists deliberately omitted this fact, to ensure that nobody would see cloning a human child as a benefit.

Benefits Versus Risks: Coverage Favours Human Cloning Risks

Overall, the media coverage was extremely critical of human cloning. The headlines presented 2 instances of benefits and 13 instances of risks. As for the text, the researcher coded each risk or benefit once for each article, even if it was mentioned several times within the article. This produced the finding that articles were also more

likely to present risks over benefits. From 1996-2002, the *Globe and Mail* had 25 instances of benefits and 63 instances of risks for human cloning in the text of their articles.

In addition, the *Globe and Mail* presented only one main theme for human cloning benefits (cloning children for infertile couples) compared to three themes for human cloning risks (ethics, genetic abnormalities, infertile couples cloning children). Further to this, the articles were more likely to place human cloning risks earlier than benefits in the story. These numbers suggest that the *Globe and* Mail coverage was very much against human cloning.

In addition to quantitative assessments, the quality of arguments against human cloning were much more passionate. Sources often came across as angry. For example, in a surprising turn of events, a spokesperson for a pro-cloning group criticized the Raelians for their attempt to commercialize the sale of cloned children. He "accused the Raelians of 'defrauding the parents of dying children' with promises of resurrection and of trying to dupe gay couples with false promises of cloned offspring" (Koring, 2001, p. A10). This was just one of the many infuriated sources that spoke out against human cloning. The passion, with which these sources condemned human cloning, contributed to the *Globe and Mail's* anti human cloning coverage.

Summary

The announcement of Dolly's birth generated a huge increase in media stories about cloning. Interest decreased over the next three years followed by a spike in 2001. This surge was caused by an increase in stories about body part and human cloning. Journalists and expert sources in the *Globe and Mail* media coverage identified a variety of benefits and risks for animal, body part and human cloning (Table 11). For the most part, benefits were anchored to the category of medical cure, while risks were anchored to a number of categories including previous unsuccessful animal cloning experiments, abortions, evil, and mad science. Both risks and benefits were objectified using techniques such as images, metaphors, statistics and humour. Overall, the *Globe and Mail* presented a fairly balance picture of the risks and benefits for animal and body part cloning. However, when it came to human cloning, the *Globe and Mail* coverage was very much against the idea.

TYPE OF CLONING	KEY BENEFITS	KEY RISKS	
ANIMAL	 Pharmaceuticals Xenotransplants Advancing animal husbandry Cloning endangered/ extinct animals. 	Genetic defects	
BODY PART	 Improving health care through: Increased the number of organs available for transplant Cured diseases 	• Creating life only to destroy it	
HUMAN	• Cloning children for infertile couples	 Ethics Genetic abnormalities Infertile couples cloning children 	

Table 11: Significant Benefits and Risks found in the Globe and Mail.

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Chapter Five: Cloning in Public Perception

While the content analysis was designed to explore social representations created and maintained in the media, focus groups were held to examine social representations of cloning created and maintained in interpersonal conversations. Three focus groups were carried out with randomly recruited members of the general public in Calgary. The researcher wanted to understand participants' social representations of the risks and benefits associated with cloning. The majority of focus group time was spent discussing people's hopes and concerns for animal, body part, and human cloning. The focus group discussions were transcribed and analyzed to identify the key hopes and concerns raised by focus group members. The researcher then looked to see how participants objectified and anchored these hopes and concerns. The process of *objectifying* uses devices such as images and metaphors to illustrate risks and benefits (Wagner et al. 1999, p. 97), whereas *anchoring* compares risks and benefits against already existing social objects (Moscovici 2001a, p. 49).

This chapter begins by reviewing existing public perception studies on cloning. It subsequently reports the findings of this thesis' focus groups, starting with where focus group members got their information on cloning. Next, it overviews key hopes and concerns that participants identified for each type of cloning. It also provides examples of how these hopes and concerns were anchored and objectified. This chapter then presents participants' positions for each type of cloning and explores the impact of new information on these positions.

Existing Public Perception Research

In 1998, Wellcome Trust, an organization that supports research in the United Kingdom, funded a study to explore the public's perceptions of therapeutic and reproductive cloning. The study consisted of ten focus groups, each a cross-section of the United Kingdom population. The focus groups met initially so researchers could explore participants' existing knowledge of cloning. At the end of this first meeting, researchers spent a half hour giving participants scientific information about cloning. The groups

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were then reconvened one to four weeks later, so researchers could study the impact of increased scientific information on public perceptions about cloning.

The Wellcome Trust focus groups found that participants were predominantly against reproductive cloning. People saw reproductive cloning as closely linked to genetic engineering and they framed it in fear narratives taken from pop culture. Additional information did not alter people's opinions on reproductive cloning. In comparison, participants initially perceived therapeutic cloning to be a valuable advancement for medicine. As participants received more information, however, they began to raise concerns about the regulation of therapeutic cloning as well as the motives of scientists wishing to conduct therapeutic cloning. The Wellcome trust study concluded by suggesting that the public's mistrust in scientific endeavors is a major barrier to creating policy on human cloning.

While the Wellcome Trust study explored attitudes towards cloning in the United Kingdom, no focus groups had previously been held to examine Canadians' opinions about cloning. There were, however, Canadian surveys done (*Globe and Mail*, June 16, 2000, A2), with the most recent being conducted by Leger Marketing in January 2003. The study consisted of telephone interviews with a representative sample of 1,500 English and French speaking Canadians. The study found that while a large majority (84%) of Canadians were against reproductive cloning, a majority (53%) was also for therapeutic cloning. The survey did not get into the reasons behind Canadians' opinions on cloning. Consequently, this thesis used a focus group methodology to take a more indepth look at Canadians' perceptions about cloning. More specifically these focus groups examined the public's social representations of the risks and benefits associated with cloning.

Sources of Cloning Knowledge

Focus group members said that the media are their main source of information on cloning. The term *media* was used broadly to cover a range of sources from news to pop culture. Above and beyond media, virtually all participants also considered other people to be a source of cloning information. Twenty-five out of twenty-nine participants said

they discussed the topic of cloning with other people within the last month. This finding was different from those of the Wellcome Trust focus groups in the United Kingdom, where participants found it difficult to engage friends and family in discussions about cloning (1998, p.20). The difference can likely be explained by the fact that, just two weeks prior to the Calgary focus groups, Clonaid's announcement was a hot topic in the media.

Participants of the Calgary focus groups said the topic of cloning came up around the water cooler at work, in the coffee shop, and even at home. One mother explained that she just had a conversation with her 12-year-old son who wanted to send his minime¹⁰ to school in his place (focus group, January 13, 2003). This was a very powerful example that it is media as well as other people that act as springboards for cloning information.

The findings of the Calgary focus groups suggest that the media and other people are doing a good job providing the public with information on cloning. Focus group participants had a fairly extensive knowledge of different types of cloning. All three groups identified without prompting: body part, animal and human cloning. While participants were unsure about the exact science behind different types of cloning, they were more than capable of identifying intelligent hopes and concerns for the three types of cloning.

Hopes for Animal Cloning (Table 12)

Table 12: Key Hopes for Animal Cloning

- Increasing scientific/medical knowledge
- Perfecting cloning technology on animals before it is used on humans
- Cloning endangered/ extinct animals

¹⁰ Mini-me is a clone of the Dr. Evil character in the Austin Powers movie.

In total the three focus groups made 69 comments about their hopes for animal cloning and identified 10 different hopes for animal cloning¹¹. The primary hopes mentioned included: the hope that animal cloning would expand scientific/medical knowledge, the hope that animal cloning would allow us to perfect the technique of cloning before it is used on humans, and lastly, the hope that endangered/extinct animals would be cloned. Once again, participants used the system of anchoring and objectifying to turn these unfamiliar risks into familiar social representations.

The most frequently mentioned hope for animal cloning was that it would lead to scientific or medical breakthroughs for both animals and humans. Participants across all three focus groups made 13 comments regarding this hope for scientific/medical advancements. Focus group members anchored this hope to scientific progress and objectified this hope through the images of specific, rather than general, mysteries and disease they hoped animal cloning would eliminate. For example, one person hoped that "animal cloning would help distinguish between nurture and nature" (focus group, January 14, 2003). Another woman made the comment that she hoped animal cloning would allow us "to rid [animals] of certain diseases like mad cow disease or hoof and mouth disease which are very prevalent in European countries, more so than here" (focus group, January 14, 2003).

The second largest theme was the wish that cloning technology be perfected on animals before it is used on humans. Participants made 13 comments on this concern, but it was only raised in two of the three focus groups. This hope was anchored to the societal belief that it is okay to experiment on animals, but it is not okay to experiment on humans. Many people believed that animals can be harmed to serve the greater human good. To objectify this hope for animal cloning first, focus group members pictured images of deformed animal clones as well as deformed human clones to objectify this concern. They then decided that images of crippled animals are more acceptable than crippled humans. Outside of images, one participant used a metaphor to objectify the hope. She said that animal cloning is the stepping-stone to human cloning (focus group,

¹¹ See Appendix K for complete list of themes for participants' hopes and concerns about animal cloning.

January 13, 2003). Another participant used humour to objectify. He said, "People are more comfortable with a dog being cloned than a person...although if you were a dog, you might have some concerns" (focus group, January 13, 2003). This gentleman, along with others in the focus group, felt that because society is more comfortable with the prospect of cloning animals, scientists should master the cloning technology on animals before moving to humans.

The final theme worth mentioning was the desire to clone animals that are either endangered or extinct. There were a total of 12 comments made to this effect across two focus groups. People anchored this hope for cloned endangered/ extinct animals to science fiction and objectified it through images of dinosaurs. "You know the Jurassic Park thing," said one man who hoped that dinosaurs would be cloned (focus group, January 9, 2003). The "Jurassic Park thing" the man referred to is a movie about scientists who clone dinosaurs. The movie's plot is about creating a theme park where people can visit once-extinct dinosaurs. The fact that Jurassic Park was mentioned in all three focus groups suggests that science fiction references helped participants to objectify this concern.

Of course some participants remembered more than the plot of the *Jurassic Park* movie, they remembered the ending and the message behind the movie. At the end of *Jurassic Park*, the cloned dinosaurs escape from their cages and eat the humans. For most, the movie served as a warning to those who might tamper with nature. Some focus group members echoed this warning. They saw cloning of any type of animal, extinct or not, as a concern, worrying about the potential environmental impact. Consequently this concern is discussed further in the following section, *Concerns about Animal Cloning*.

Regardless of those concerned about the environmental impact of cloning, cloning endangered/extinct animals still remained a hope for many. Along with this, the hope that cloning would lead to scientific/medical advancements, and the hope that cloning would be done on animals first were the top three themes. All three themes for animal cloning were made real through images, metaphors and humour, as well as references to the science fiction thriller, *Jurassic Park*.

Concerns about Animal Cloning (Table 13)

Table 13: Key Animal Cloning Concerns

- Genetic defects
- Environmental impact

Overall, the three focus groups made an almost equal number of comments about animal cloning concerns (64 comments) as they did hopes (69 comments). However participants expressed slightly more themes of concerns about animal cloning than they did for hopes (the total number of concern themes for animal cloning was 12, in contrast to 10 hope themes). The two main concerns raised were that cloned animals would have abnormalities as well as the concern that animal cloning would have a negative impact on the environment.

Of the two concerns, participants seemed most perturbed by the idea that animal cloning could result in animals with genetic defects. This concern was discussed in all three focus groups with a total of 14 statements made on the topic. Similar to the Globe and Mail, participants anchored their concern to past animal experiments and some standard of "normal." They objectified this concern predominantly through what they saw as upsetting news about Dolly the sheep's abnormalities. One participant said, "I know that there have been problems with Dolly. Dolly apparently was initially fine, but now she's aging prematurely" (focus group, January 14, 2003). Another lady said that she thought Dolly had some organ damage (focus group, January 13, 2003). Someone else remembered the "hundreds and hundreds out of I don't know how many attempts before they even get one [Dolly] clone" (focus group, January 14, 2003). Finally, a lady predicted that Dolly would die earlier than sheep that were conceived through normal sexual reproduction (focus group, January 14, 2003). Ironically this woman's premonition came true just a month later. Dolly died in February 2003. In the follow-up interviews weeks later, another lady talked about Dolly's death to illustrate her concern about genetic defects (phone interview, February 20, 2003). These specific and emotional of an abnormal Dolly were the most common way participants objectified the concern about genetic abnormalities.

There was one lady, however, who veered from news of Dolly and instead shared a story with the group to illustrate her concern. The woman talked sadly about her prize show dog that was supposed to be bred a year and half ago. The lady was thankful that the dog was never bred because she had recently discovered it suffered from arthritis. The woman was upset and horrified at the possibility that her dog could have passed this unknown arthritis down to the next generation. The woman used this story to warn focus group members that one can never be sure about genetic traits or more importantly, abnormalities passed on through cloning (focus group, January 13, 2003). This personal narrative combined with the news event of Dolly with genetic defects, helped facilitate participants' understandings of the scientific risks of genetic abnormalities in cloned animals.

The second concern participants introduced was the idea that cloning animals, particularly those endangered or extinct, would have a harmful effect on the environment. This concern was raised in two of the three focus groups and participants generated a total of 17 comments on the topic. Most participants anchored this concern to the category of environmental destruction. They worried that cloning would upset the balance of nature. These participants were passionate about their belief that animals were meant to be extinct; consequently, they felt it is not a scientist's place to meddle with nature. One man objectified his concern by comparing the cloning of extinct animals to the breeding and release of Australian rabbits:

The one other concept is that if you have one [cloned] breed that is so successful, there's the indirect effect on other breeds...We see this with the rabbits being released in Australia. You get a side effect from rabbits. The rabbits were very successful, but what did they do to the rest of the native population? (focus group, January 13, 2003)

Analogies such as this, were the main ways people objectified this concern. The environmental concern, combined with concern about abnormalities in cloned animals, comprised the main themes for animal cloning concerns.

Positions on Animal Cloning

The time spent on hopes and concerns was fairly equal across all three focus groups, as were the number of themes for both hopes and concerns. There was also no notable difference in the emotion or specificity of their comments for hope and concerns. This is best reflected in the fact that the focus group participants seemed divided on animal cloning. Out of a total of 29 people, eight people were for and eight people were against animal cloning.

The main reason people gave for being in favour of animal cloning was that they hoped it would lead to scientific or medical advances. As for the anti-animal cloning group, three people said they were worried that "once the [cloning] technology is developed and refined, the jump from cloning animals to cloning humans is pretty small" (focus group, January 14, 2003). Other participants who were against animal cloning said it was because they felt there was no good reason for it or they wanted more information about it. However, three participants did not explain the reason for their opposition to animal cloning.

Six people were for animal cloning in certain situations, but against it in others. These people, for example, would support animal cloning if it was for purposes such as scientific advances, cloning endangered species, or eradicating animal/human diseases. However these same people would be against animal cloning if it was for what they considered to be an unjustifiable reason—they gave the example of pet cloning.

The next segment of people was the five who felt that their opinions did not matter because human cloning was already happening. These people did not express their opinions.

The final category of participants included two people who were simply unsure about where they stood on the issue of animal cloning.

Hopes for Body Part Cloning (Table 14)

Table 14: Key Body Part Cloning Hopes

- Extending life through:
- Cloned organs for transplant
- Cured diseases and injuries.

On the whole, focus group members made 83 comments regarding their hopes for body part cloning, identifying only four themes¹². However, three of these themes were discussed by just one person. *Thus, participants only identified one main hope for body part cloning—they wanted to see it extend people's life expectancies*. Participants were very passionate and specific in their comments regarding this hope. In fact, close to nine in ten of the overall 83 comments in total were made about hopes for body part cloning.

Participants believed that body part cloning could extend people's natural life expectancies in two ways: increasing the number of organs available for transplant as well as curing diseases and injuries. Participants recognized that cloning organisms would not only solve the organ donor shortage and cure disease; it would help eliminate the risk of organ rejection. The belief expressed was that if a man clones an organ or tissue from himself, it will not be rejected because it is an exact match to his body.

Reflecting the media coverage, participants anchored this hope to the category of medical cure and objectified it through images, personal stories and war metaphors. They most frequently used images of specific organs they wanted cloned to objectify the benefit of extending life. They conjured pictures of everything from cloned eyes and kidneys to skin for burn victims. One lady even jokingly envisioned cloned breasts replacing breast implants (focus group, January 14, 2003). Participants also visualized many specific diseases and injuries they hoped body part cloning would cure. They pictured growing brain cells to replace the brain cells damaged by diseases such as Parkinson's. They also envisioned cloning new spinal cords for quadriplegics. For other

diseases, such as diabetes and osteoporosis, participants did not know exactly which body parts needed to be cloned in order to cure them. They simply saw the image of a disease that could potentially be cured by body part cloning.

As well as images of cloned organs and cured disease, participants also used personal stories to ground the abstract concept of benefits in real experiences. One participant said, "I had a former employee of mine who died on the 2nd of January, 35-years-old waiting for a lung transplant with two small kids, so I'm 100 percent in favour of cloning whole organs and parts" (focus group, January 14, 2003). Another man shared the following story:

As far as body parts go...I happen to be in a strange situation where I have a bad heart. It has been bad for 10 years. Can they do a transplant on me? No. Could they genetically engineer me a heart or clone me a heart? Would they be able to solve my problem by cloning? It's possible. In that situation...I don't have a problem with doing it that way (focus group, January 14, 2003).

Through heartbreaking stories like these, focus group members objectified their hopes for extending life.

The third way participants understood their hope for extending life expectancies was through war metaphors. One gentleman used the battle term "reinforcements" when he referred to cloned organs (focus group, January 13, 2003). Another lady said, " Body part cloning is a weapon that should be used to combat sickness" (follow-up phone interview, January 28, 2003) War metaphors such as these, in conjunction with the more frequently employed images and personal experiences, helped participants to objectify their hope for extending life. Through both the objectifying and anchoring mechanisms, focus group members fashioned social representations of the benefits linked to body part cloning.

¹² See Appendix K for complete list of themes for focus group members' hopes and concerns about body part cloning.

Concerns about Body Part Cloning (Table 15)

Table 15: Key Body Part Cloning Concerns

- Unethical process of body part cloning
- Only rich people will have access to cloned body parts
- Prolonging life through body part cloning

When first asked to talk about concerns for body part cloning, several participants responded they had none at all. However, after a couple of minutes of brainstorming the group made 114 comments about their concerns for body part cloning. These comments generated eight themes. The number of comments for each theme ranged from 1-37 comments, with an average of 8 comments per theme. The top three themes were concerns about the process of cloning body parts, concern about who would have access to the cloned tissues and organs, and lastly concern about the ethics of prolonging life.

While it was obvious that participants liked the idea of cloning tissues and organs, they were concerned about how tissues and organs would be scientifically cloned. Participants did not understand the science behind body part cloning and as a result, they spent a great deal of time discussing how organs might be cloned. They made a total of 27 comments regarding their concern about the process of body part cloning.

Sometimes this risk was anchored to absurdity and objectified through humour. Participants joked about all the weird and wacky ways organs could be cloned. One woman developed a news event into a joke when she said, "I'm very interested in seeing what will happen with body part cloning, but I don't know if I want my next ear growing on the back of a mouse" (focus group, January 13, 2003). Another participant wondered where the cloned organs would be stored; he asked facetiously if people would store their cloned organs in the freezer next to the wedding cake (focus group, January 13, 2003). Rounds of piercing snickers and chuckles followed his comment.

The laughter, however, was quickly replaced by a more somber tone as participants became concerned that the body part cloning process would involve taking organs from living clones. In this situation, participants anchored the risk to violation of human rights. The harvesting prospect was not only seen to violate the principle that all beings should be treated with respect. Participants described science fiction images to objectify this concern about the harvesting process. A young man said:

I mean, I can see shades of *Coma*¹³, you know. Let's create clones for harvesting body parts rather than cloning just the organs themselves. To me that's not ethical, so I can't see them going there. At least I hope that they wouldn't go there (focus group, January 14, 2003).

Several other participants echoed this science fiction image in their comments.

People frequently used the term "harvesting" in their discussion of collecting body parts from living clones. This term was used metaphorically to compare the removal of organs from cloned bodies to the removal of crops from fields. It was the main metaphor used by focus group members. One lady switched from the farming metaphor to a mechanical one, arguing that taking organs from cloned humans reduces "clones to nothing more than vending machines that spit out packaged organs" (follow-up phone interview, January 28, 2003).

Participants' second body part cloning concern was over who would have access to cloned body parts. Many people were concerned that only the rich would have access to body part cloning. In total, 37 comments were made regarding the access concern. This concern was only discussed in the second and third focus groups. It is likely, however, that the first focus group would have raised this concern as well if the revised moderator's guide, which specifically asks about concerns for body part cloning, had been used. That said, all participants in the second and third focus groups debated whether or not poor people would have access to cloned tissues and organs.

Participants anchored this risk to a capitalistic venture and most frequently employed the icon of money to objectify their concern:

I think that there's just a big dollar sign over top of this. I can't help it, but that's just the way history is. It's just money, money, money, greed, greed, greed, and that's what it is. That's how I see it. I don't know. I hope I'm wrong (focus group, January 13, 2003).

¹³ Coma is a 1978 movie about a doctor who discovers patients in her hospital are having "complications" during routine operations and ending up in comas. These coma patients are then sent to an institute where their bodies are harvested for parts.

Beyond images of dollar signs, participants also objectified their concern about access through metaphors.

Several participants argued that body part cloning could be compared to technologies such as computers that were expensive when they first reached the market, but became more affordable as they turned commonplace. One gentleman equated body part cloning to the calculator:

...I remember the first calculator I bought when I was a child; it could only add, subtract and multiply, and it was \$125. Well, you can get them now for \$5. Technology does change. It does become cheaper (focus group, January 13, 2003).

These analogies helped other focus group members understand that while body part cloning may be limited to the rich at first, it will eventually be affordable to all. In this way, metaphors, such as this one, not only objectified concerns about access it also helped to alleviate concern.

The final theme worth mentioning for body part cloning concerns is the ethical issue of prolonging life. This concern was raised across all three focus groups. Altogether the groups made 19 comments about the ethics of prolonging life. Participants felt body part cloning violates the laws of nature by extending natural life expectancies. For the most part, they anchored this concern to the indignity of growing old.

One focus group member objectified this concern through humour. She said, "I don't want my mother in law to live to be 120" (focus group, January 13, 2003). While participants laughed at the amusing comment, they more often objectified their concern through stories with a more somber tone. One man sadly talked about visiting the nursing home where his wife works:

Ninety per cent of these people considerably wish they wouldn't get up in the morning...you ask them how their day is going and they say, "Well, this damn body got me again this morning, I guess I'm going to have to live another day" (focus group, January 13, 2003).

The man went on to ask the other focus group members if it is really wise to use body part cloning to prolong lives, such as these ones. People shook their heads to indicate it was not a good idea. While several focus group participants had personal stories to share, others used the image of "old people rotting in nursing homes" (focus groups, January 13, 2003) to objectify their concerns. These images, humour, as well as personal stories provided more concrete ways to talk about concern regarding the prolongation of life. Along with this concern, the process of human cloning as well as access to cloned tissues and organs were the top three concerns focus groups had about body part cloning. Participants anchored and objectified these concerns to create meaningful social representations of the concerns associated with body part cloning.

Position on Body Part Cloning

The groups made more comments about their concerns for body part cloning than their hopes for it. There were 114 concern comments compared to the 83 hope comments. When asked about their positions on body part cloning however, it seemed participants' hopes for extending human life weighed more heavily than any concerns they may have raised. Most participants were in favour of body part cloning. This was not entirely surprising as participants were very emotional (they told very moving stories about people who could potentially be cured by body part cloning) and specific (they talked about the precise body parts they wanted to clone and precise diseases they wanted to cure) in their hopes for body part cloning. Similar support for body part cloning was also found in the Wellcome Trust focus groups (1998) and the Leger Marketing survey (2003, p. 6).

In the Calgary focus groups, 17 out of 29 participants said without hesitation that they were in favour of body part cloning and the main reason for their positions was to increase the numbers of organs available for transplant as well as to cure disease. One participant summed up his group's outlook best when he said, "I'm in favour of body part cloning. After all, who knows? I may need some one day" (focus group, January 14, 2003).

Six people were only willing to accept body part cloning under certain conditions. Examples of these conditions include, "I'm in favour if there are controls, but against it if there aren't" (follow-up phone interview, February 1, 2003) and "I'm for it if you can just clone the organs, but against it if you have to harvest the organs from a human clone" (follow-up phone interview, February 2, 2003) In other words, these people were in favour of body part cloning under certain circumstances, but against it in others.

Two participants were unsure about the prospect of body part cloning. These two people said that they were uncertain about the manner in which body parts would be cloned. They reiterated their concern that organs would be harvested from full-grown clones.

The one remaining participant said that he was firmly against body part cloning. While unable to articulate a precise reason, he seemed firm in his conviction that body part cloning was wrong.

Hopes for Human Cloning (Table 16)

Table 16: Key Human Cloning Hopes

• Genetically engineering people impervious to diseases

The majority of participants made it forcefully clear that they had no hopes for human cloning. A participant in the first focus group said, "I don't think this group is really hoping for human cloning" (focus group, January 9, 2003). Participants in the other groups echoed this statement. Another person said, "…on the whole scale of things, I can't really see a whole lot of benefits to cloning entire human beings" (focus group, January 13, 2003). Despite these claims, the group did manage to make 57 comments about their hopes for human cloning (only slightly less than the 73 for body part cloning and 69 for animal cloning) and raised nine different thematic categories.¹⁴ However, for the most part these hopes were essentially concerns rephrased as hopes.

Some of the themes included the hope that human cloning would not be done. Participants also suggested that if human cloning were to be done, they hoped there would be some unexpected positive side effect such as a scientific breakthrough. Another

¹⁴ See Appendix M for complete list of themes for participants' hopes and concerns about human cloning.

hope was that human cloning would be regulated; still another was that religion would be part of the debate on whether or not to clone humans. One group also mentioned the hope for the removal of incentives, such as money, which motivate people to do human cloning. Despite this fairly large list of hopes, none of these themes were mentioned in more than one focus group.

As a result, there was only one main theme. *This was the hope that human cloning would result in genetically engineered people who no longer have genetic defects or diseases.* Participants believed genetic engineering would eliminate genetic defects and inherited diseases. They anchored this hope to a type of medical cure. Images of specific diseases, such as Multiple Sclerosis, Downs Syndrome and AIDS, helped participants objectify this hope. One person also used a metaphor. She hoped cloning would lead to the "weeding out of genetic defects" (focus group, January 9, 2003). In total, participants in two focus groups made 17 comments about their hopes for genetic engineering. These comments were interesting because they showed that participants perceived genetic engineering to be closely linked to human cloning. This connection between genetic engineering and human cloning was also experienced by participants in the United Kingdom focus groups on cloning (Wellcome Trust, 1998, p. 13).

Concerns about Human Cloning (Table 17)

Table 17: Key Human Cloning Concerns

- Evil motives for human cloning
- Clones treated as second-class citizens
- Clones will not be the same as the originals
- Human cloning won't be controlled
- Clones will not have souls
- Environmental impact
- "Playing God."

Participants had a lot of anxiety about the idea of human cloning. Several participants commented on the significance of their concerns about human cloning when compared to the other types of cloning. One memorable participant sat virtually silent, absorbing the human cloning debate, until the moderator finally asked him if he had any

concerns he would like to contribute. At this point, the young man lurched forward in his chair and exclaimed, "I had a few, but after listening to everyone else I have a whole lot more!" (focus group, January 9, 2003). This comment was best illustrated by the fact that participants made 296 comments about their concerns for human cloning. This number was considerable when compared to the number of concern comments for animal or body part cloning (Table 18).



Table 18: Number of "Concern" Comments ParticipantsMade for Different Types of Cloning

Not only did people make a lot more comments about their unease associated with human cloning, they also raised far more themes of concern than they did with the other types of cloning. Overall, they raised 21 different themes for human cloning concerns. This is a significant increase from the 12 themes for animal cloning and the 8 themes for body part cloning. Beyond numbers, their "concern" arguments were much more passionate, often angry, than their "hope" arguments.

The largest concern theme was fear about the motives behind human cloning. There was a substantial total of 79 comments made on this topic. The discussion began with all three focus groups asking the question, "Why would you even want to search in the direction of human cloning?" (focus group, January 9, 2003). It was not long after participants asked the question "Why?" that they began to speculate about the motives behind human cloning. Most participants anchored this concern to evil. They envisioned evil motives such as cloning for narcissistic reasons or cloning to produce a master race. Participants were insistent that scientific endeavors should be used for good rather than evil.

Participants across all three focus groups objectified their concern about misuse through analogies that compared human cloning to weapons. One upset participant said, "We're worried about weapons of mass destruction getting in the wrong hands, but what about cloning?" (focus group, January 13, 2003). Another suggested:

It is very similar to the good intentions of the scientists that were originally looking at nuclear research prior to World War 2. It could have been used and is used for good things, but it can also be used for very destructive things—that's where my fears are when you look at cloning entire human beings (focus group, January 14, 2003).

Beyond war analogies, participants labeled scientists doing human cloning as "crazies."

When participants talked about situations where technology would be exploited, they never claimed that scientists would wrongly use the technology. Instead they attributed the misuse to a fringe group. Two of the focus groups affectionately named this group the "crackpots" or "crazies". For example, one person made the comment that "scientists develop the skills necessary to do this [cloning] sort of thing, and then the crackpots pick it up" (focus group, January 9, 2003). To which another participant replied, "Like choosing the lesser of two evils. I'd rather have scientists doing it than these crazies" (focus group, January 9, 2003). Images such as these, helped participants understanding their concerns in two ways. First, the separation of "good" scientists and "crazies" allowed participants to retain their trust in scientists to use cloning technology responsibly, while still maintaining their fear that "crackpots" could use it for immoral or evil purposes. This finding was in direct contrast with the Wellcome Trust focus groups where participants perceived scientists as "always wanting to take a another step, but with disregard for any potential negative consequences that might result" (1998, p.36). Secondly, these

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labels helped participants objectify their concern about the misuse of cloning technology.

Over and above metaphors, science fiction images of Hitler clones were also employed universally by all three focus groups to objectify their concerns about evil misuse of cloning technology. The groups talked with anger about the possibility that cloning would be used to recreate Hitler or his master race. This scenario came from *Boys from Brazil* (1978), a movie about a scientist who tries to clone several Adolph Hitlers. To complement these images of Hitler clones, some participants made jokes to objectify their concern about abuse of the cloning technology.

People were very creative and humourous in the different ways they imagined that human cloning technology would be exploited. Some envisioned bizarre scenarios such as Osama Bin Laden cloning himself to avoid capture (focus group, January 9, 2003). Another mentioned Michael Jackson as being just vain enough to try cloning himself, to which another participant asked sarcastically, "Well, would he come back with another nose?" (focus group, January 9, 2003). These witty scenarios not only put a lighthearted spin on the discussion; it also helped participants to objectify their apprehension. Together, metaphors, images from *Boys from Brazil* and dark humour gave participants insight into their concern about cloning technology being misused.

Following misuse of cloning technology, the second largest theme was concern about the rights of clones. This concern was mentioned in all three focus groups and a total of 39 comments were made about it. Participants were bothered and upset by the idea that clones would be treated as less than human. They anchored this concern to a violation of human rights. They believed that it is immoral to treat clones differently from humans produced through sexual reproduction.

The focus groups objectified this concern through images of clones treated as slaves who are not afforded hopes, dreams and aspirations. Participants again pulled these images from science fiction. The most frequently cited science fiction thriller was Aldous Huxley's book, *Brave New World* (1932). *Brave New World* is a novel about clones being mass-produced as drones, which are afforded little freedom. Participants felt that scenarios from this book as well as other science fiction movies and thrillers were

representative of how clones' rights could be abused. References to science fiction were the most popular way participants objectified the risk that clones would be oppressed, however participants also employed the occasional metaphor.

A handful of people equated clones with the outcasts of society. An example can be seen in the statement of a woman who sadly said, "I feel sorry for any clone because they'll be treated as some freak, but the truth is they're just another human being, who happens to be genetically identical to another" (focus group, January 13, 2003). Images such as this one demonstrate the group's concern about the threat to a clearly valued principle of equality.

The third theme was concern that people conducting human cloning experiments expect clones to be identical to the original. All three focus groups raised this concern and generated a total of 32 comments on the issue. Participants anchored this concern to the nature/nurture debate. They recognized that, even though a clone may look the same as another human being, it is still a unique individual capable of unique thought and behaviour. Focus group members perceived the differences between the clone and the original person as natural and to be expected. Their concern, however, was that those doing human cloning do not understand that "who you are by the time a person is cloned is not just the collection of genes; it's the collection of experiences" (focus group, January 13, 2003). While many indicated a recognition that there will be differences between the clone and the cloned, still, participants worried that human cloners have the unnatural expectation for the clone to be the same as the original—in this way they anchor their concern to nature. Having anchored their concern to nature, focus group members then used images of their own clones, metaphors and the occasional story to objectify their belief that differences between clones and the original are natural.

Participants repeatedly objectified their concerns by envisioning how their own clones would differ from them. One man said, "If they made a clone, he wouldn't be me, right, because the content of an individual is not just his or her framework" (focus group, January 13, 2003). In addition to images of themselves as clones, participants also compared clones to identical twins. They argued that people doing human cloning should not expect clones to be the same as the people from whom they are cloned, when even

identical twins are different from each other. Twins, for example, often have different personalities, friends and careers. Lastly, participants objectified their concern through personal stories that tried to explain that differences are what make us human:

We talk about would it be the same person? I look at my father, my son, and myself and there are huge similarities—physical characteristics, some strengths and an awful lot of the annoying traits...Yet it isn't the same person. The experiences we went through and the environment made us all different and it would be the same for a clone (focus group, January 13, 2003).

Together personal stories, images of how participants' own clones would differ from themselves, and recognition of differences even among identical twins objectified participants concern that it is unnatural to expect clones to be the same as the original person.

The next major concern related to lack of control over this technology and the concern was anchored to the category of regulation. Participants in the first and second group made 31 comments about regulation. While these two groups raised the topic of regulation as a concern, the second focus group discussed it as a hope. Participants in the second group made eight comments about their hope that human cloning would be regulated. The combined discussion about regulation consisted of 39 comments across three focus groups.

Participants discussed whether or not human cloning is currently controlled, who will control it, whether it can be controlled and how will it be controlled. Participants acknowledged the fact that legislation regarding human cloning does not exist in Canada. To illustrate this point, one participant used a metaphor, which likened human cloning to science fiction. He said, "They assumed that it [human cloning] would remain science fiction, so they [the government] never really set anything up to stop it" (focus group, January 9, 2003). After everyone in the group agreed that human cloning was currently not regulated in Canada, the conversation usually turned to address the fact that participants did not trust the government to regulate cloning. This lack of trust was best objectified through humour. One participant argued that the government could hardly be relied upon to regulate cloning because the government is only concerned with getting

votes at election time, to which another participant responded, "They might be able to clone people who will vote for them" (focus group, January 9, 2003). The room erupted with laughter. Following the discussion of trust, two groups discussed whether or not the government has the ability to oversee cloning. One person claimed that the government did have the ability to regulate cloning and he objectified his point by giving a recent news example. The man talked about the US government raiding Clonaid's lab in the US looking for evidence that Clonaid had violated the Federal Drug Association's authority over human cloning (focus group, January 9, 2003). This current event was the final example of participants objectifying their concern about human cloning regulations.

A fifth theme was the metaphysical debate over whether or not a clone has a soul or a spirit. All three focus groups made a total of 17 comments on this concern. Many focus group members worried that clones would not have souls and would be incomplete. One participant compared a clone missing its soul to a clone missing its other half (focus group, January 14, 2003). Another person equated a clone without a soul to an empty vacuum (focus group, January 14, 2003). These analogies gave participants concrete ways to understand the elusive risk of a cloned person without a soul.

The next human cloning theme was participants' anxiety about the impact human cloning would have on the environment. There were thirteen comments made on this topic and it was raised in all three focus groups. Participants anchored this concern to nature. They felt that human cloning upsets the balance of nature, or as one participant put it, "It doesn't allow nature to run its course" (focus group, January 9, 2003). Beyond anchoring, participants also objectified their concern through distressing images of overpopulation. One man said, "You know, we've managed to overrun the whole planet as is ...why on earth must we spend all the money to make a few more people? It boggles the imagination" (focus group, January 13, 2003). Several other participants envisioned similar images of overpopulation. They predicted that this overpopulation would lead to hunger and disease. Through these images, participants were able to represent the risk of negative environmental impacts.

The final area of concern was that human cloning is playing God. They saw attempts by humans to clone life as "unnatural". Participants used strong verbs such as "playing," "tampering" and "manipulating" to indicate their belief that it is irresponsible for humans to create life. Focus groups objectified their concern through metaphors, which suggested that people who clone humans are "playing God." Examples of these metaphors include: "It concerns me to see science taking on the role of God" (focus group, January 13, 2003), "It's not human to create another person" (focus group, January 14, 2003), and "...it's against God. It's not God's will—they're tampering" (focus group, January 9, 2003). Playing God metaphors echoed across all three groups.

Positions on Human Cloning

As suggested by the 296 emotional comments made in response to concerns about human cloning, the majority of participants were completely opposed to the idea of human cloning, a finding that was consistent with the United Kingdom focus groups (Wellcome Trust, 1998, p. 13).

The 18 people against human cloning gave various explanations for their position. The most common reason was that they could not see a good reason for human cloning. However, others said no to human cloning because they were worried about overpopulation, genetic defects, and misuse of technology. Regardless of different rationales for their positions, the one thing these participants could agree on was their disgust for human cloning.

The next group of people was the seven who saw human cloning as inevitable. All but one of these people made it very clear that they would prefer human cloning did not happen, but they knew it would. Consequently, these individuals preferred to see human cloning regulated rather than taking place underground.

Three focus group participants were undecided about where they stood on the issue of human cloning. One of these individuals did not give a clear reason for uncertainty. Another participant said he needed more information in order to reach a decision on human cloning. And the final person in this category was concerned about the motivation behind human cloning.

The one and only person who was in favour of human cloning supported it because he associated it with genetic engineering. This gentleman hoped that cloning would somehow genetically engineer people to be invincible against diseases such as AIDS. Parenthetically, cloning and genetic engineering are two different technologies, but perception makes for reality.

Cloning Hierarchy

A review of the participants' positions on the various types of cloning indicated that there was a hierarchy in their level of acceptance. They seemed most willing to accept body part cloning and second to that, animal cloning but they were completely unable to accept human cloning. This is best illustrated in Table 19, which shows people's positions on animal, body part, and human cloning. Looking specifically at the "pro" bar, the highest number of "pro" positions was for body part cloning. That bar continually declined until it reached an all time low for human cloning. In comparison, the "against" positions did the exact opposite—they began to rise as the "pro" positions dropped. This is suggests a hierarchy of acceptance.





This hierarchy of acceptability seems to reflect the fact that participants see body part cloning as the easiest to accept because it does not involve the cloning of a complete organism. Animal cloning would be second in this acceptability spectrum, while human cloning was judged as least acceptable.

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Impact of More Information on Cloning Opinions

As mentioned above, a major theme of the focus groups was the public's call for more information about cloning. The desire to have more information was mentioned by 23 out of 29 participants. In order to help meet the public's need for more information, the researcher provided participants with an information package after the focus group. Interestingly, in a follow-up interview three weeks later, the majority of people revealed that they had not thoroughly read the information package.

In one follow-up phone interview, a gentleman said he did not read the package just two seconds after making the statement, "I just don't have enough information to make these decisions. I wonder if I would change my position if I had more information?" (follow-up phone interview, January 2, 2003). This person had the information; he did not read it. Participants said that while they had had good intentions to read the information package, they had simply been too busy.

Regardless of the fact that the many participants didn't read the information package, 24 out of 29 people did talk to other people about cloning following the focus group. Their conversations were mainly about what they had discussed in the focus groups, but that usually lead to sharing of opinions about cloning.

When asked if the information package or discussions with others had provided them new information about cloning, most people said, "no" they had learned more about cloning in the focus group.

A smaller group of eight people said that while they learned new information after the focus group, it did not change their opinions on cloning. In fact, three of the eight said that new information about the process of body part cloning caused them to be even more certain of their pro body part cloning position.

This suggests that the new information presented by other members in the focus group did impact people's position. However after the participants gave their opinions in the focus group, additional information such as the reading package or discussions with others did not cause opinion change. Conversely, it caused some people to become more certain of their opinions.

Summary

The main sources for this cloning information were the media as well as discussion with other people. Focus group participants had a fairly extensive knowledge of the different types of cloning. They identified a diverse set of hopes and concerns for each type of cloning (Table 20). Participants anchored benefits to categories such as scientific progress, medical cures, and science fiction. Risks, on the other hand, were anchored to a variety of categories including normal, evil, human rights violation, control, and God. Further to anchoring, participants also used images, metaphors, personal stories to objectify risks and benefits. Anchoring and objectifying helped participants formed meaningful social representations of hopes and concerns.

TYPE OF CLONING	KEY HOPES	KEY CONCERNS	
ANIMAL	 Increasing scientific/ medical knowledge. Perfecting Cloning Technology on animals before it is used on humans Cloning endangered/ extinct animals 	 Genetic defects Environmental impact 	
BODY PART	 Extending life through: Cloned organs for transplant Cured diseases and injuries 	 Unethical process of body part cloning Only rich people will have access to cloned body parts Prolonging life through body part cloning 	
HUMAN	 Genetically engineering people who are impervious to diseases. 	 Evil motives for human cloning Clones treated as second-class citizens Clones will not be the same as the originals Human cloning will not be controlled. Clones will not have souls. Environmental impact "Plaving God." 	

Table 20: Significant Hopes and Concerns Raised in the Focus Groups

Overall, participants tended to be divided on their positions for animal cloning. Their hopes and concerns seemed to weigh equally into their decision about human cloning. In comparison, participants were very much in favour of body part cloning because they believed it would extend human life. They did have concerns about body part cloning, however these concerns did not sway their favorable outlook on body part cloning. As for human cloning, participants had virtually no hopes, but a lot of concerns. They were passionately against human cloning. New information raised by other participants in the focus group discussions seemed to have some influence on these positions. However, once participants had decided on their positions in the focus group, additional information such as the reading package or talking to others did not alter their positions. The next chapter will analyze the content analysis and focus group findings.

Chapter Six – Conclusion

The goal of this thesis was to explore social representations of the risks and benefits associated with animal, body part, and human cloning. Social representations are the public's collective understandings of an abstract social object (Moscovici, 2001). Social representations are created and maintained in the media as well as interpersonal discussion (Wagner et al., 1999, p. 98). Consequently, this thesis used methodologies to examine social representations in these two domains. A content analysis of *Globe and Mail* articles about cloning examined media representations of cloning risks and benefits from 1996 through to 2002. Then, in January 2003, focus groups with Calgarians surveyed social representations in public discourse. This chapter will review the main risk and benefit themes found in the two domains, and examine how these risks and benefits embrace characteristics of a new paradigm. It will then overview social representations found in the *Globe and Mail* and focus groups, and subsequently offer explanations as to why representations differ across the two domains.

Key Cloning Risks and Benefits

The *Globe and Mail* and the focus group participants sometimes identified the same risks and benefits for each type of cloning, but more often they raised very different issues (Table 21). Both groups listed medical improvements as a benefit of animal cloning. Although the *Globe and Mail* discussed specific medical benefits, such as pharmaceuticals and xenotransplants, the focus groups discussed medical benefits more broadly. Both groups also hoped that endangered and extinct animals would be cloned and shared concerns that animal cloning would lead to genetic defects. In terms of body part and human cloning, the only points the two domains agreed on were that superior health care is a benefit of body part cloning and that there is ethical risk associated with human cloning, focus group participants listed specific ethical issues: evil use of cloning technology, discrimination against clones, clones without souls, and playing God.

	KEY BENEFITS		KEY RISKS	
	CONTENT ANALYSIS	FOCUS GROUPS	CONTENT ANALYSIS	FOCUS GROUPS
ANIMAL CLONING	 Pharmaceuticals Xenotransplants Advancing animal husbandry Cloning endangered/ extinct animals 	 Increasing scientific/ medical knowledge Perfecting cloning technology on animals before it is used on humans Cloning endangered/ extinct animals 	• Genetic defects	 Genetic defects Environmental impact
BODY PART CLONING	 Improving health care via: Increased numbers of organs available for transplant Cured diseases and injuries 	 Extending life through: Increased numbers of organs available for transplant Cured diseases and injuries 	• Creating life only to destroy it	 Unethical process of body part cloning Only rich people will have access to cloned body parts Prolonging life through body part cloning
HUMAN CLONING	Cloning children for infertile couples	Genetically engineered people who are impervious to diseases	 Ethics Genetic abnormalities Infertile couples cloning children 	 Evil motives for human cloning Clones treated as second-class citizens Clones will not be the same as originals Human cloning will not be controlled Clones will not have souls Environmental impact "Playing God"

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Table 21: Significant Risk and Benefits in *Globe and Mail* and Focus Groups.

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Differences in the risks and benefits identified in the *Globe and Mail* versus those in the focus groups are best explained by the journalistic principle of objectivity. Objectivity has been defined as reporting existing facts without distortion or bias (Morson, 1992, p. 26). However, Tuchman (1992) argued that it is essentially impossible to report facts without bias. Consequently, he suggests that editors and journalists engage in strategic rituals, which allow them to claim "objectivity." One of these rituals is that journalists often step away from the role of authoritative storyteller and seek expert opinions on both sides of an issue (p. 665). This was the case with cloning. When covering stories about cloning, *Globe and Mail* journalists quoted a variety of experts. Similar to the United Kingdom study (Williams, Kitzinger & Henderson, 2003), the *Globe and Mail* distinguished these experts as proponents and opponents of cloning in an effort to create controversy. Politicians, ethicists, anti-abortion groups, religious leaders and the occasional patient tended to be proponents, while IVF specialists, scientists and doctors shifted between proponent and opponent categories. In favouring these experts, the *Globe and Mail* did not once interview an "Average Joe." As Glasser said:

...[there is] the unfortunate bias of objective reporting—a bias in favor of leaders and officials, the prominent and elite. It is an unfortunate bias because it runs counter to the important democratic assumption that statements made by ordinary citizens are as valuable as statements made by prominent and the elite (1992, p. 180)

In ignoring the average person's opinion, the *Globe and Mail* represented the hopes and concerns of experts that were different from those of the selected public represented in the focus groups. For example, while the *Globe and Mail* interviewed IVF scientists who raised the benefit of cloning children for infertile couples, focus groups explicitly stated they did not share this hope. In favouring expert opinions over those of ordinary citizens, the *Globe and Mail* lost touch of average people's hopes and concerns for cloning. If journalists had included the views of ordinary citizens, as well as official sources, there would have been more similarities between risks and benefits identified in the two domains.

Cloning Risks and Benefits as a New Paradigm

The key cloning risks found in the both the *Globe and Mail* and the focus groups embrace Beck's six criteria for new risks (1992); however, the cloning benefits also seem to meet Beck's six criteria. Beck's first criterion is that new risks must be created by technology, rather than nature (1992, p. 21). This is true of cloning risks and benefits, which are both created by cloning technology.

Next, Beck argues that old risks tend to affect people locally, whereas new risks affect people globally and even future generations (Beck, 1992, p. 2). Both cloning risks and benefits have the potential to be separated by time and space. For example, the human cloning risk of overpopulation could affect future generations. Likewise, the benefits of body part cloning could improve the health of future generations.

Thirdly, Beck said that old risks were perceptible to the senses while new risks escape perception (Beck, 1992, p. 21). This is true for both cloning risks and benefits. The genetic abnormalities associated with cloning are an example of a risk that is often impossible to detect with five senses. Often clones appear to be healthy despite the fact that their internal organs are underdeveloped (Abraham 2001, p. A3). Similarly, the benefits of cloning can also be impossible to detect by the senses. In the future, it is conceivable that a cloned child produced for an infertile couple will appear exactly the same as a child produced through sexual reproduction.

A fourth difference between old and new risks is calculability (Beck, 1992, p.2). It would be impossible to find a mathematical equation to calculate the complexity of the new ethical risks associated with human cloning. There are too many organizations and people involved to ever predict how these agents will interact, what actions they will take, and what the consequences of their actions will be. In the same way, the benefits of cloning can set off a complex chain reaction. For example, using body part cloning to cure a father with cystic fibrosis could have the indirect effect of giving a child his father back. These types of benefits are difficult to scientifically calculate.

Another of Beck's distinctions is that old risks tend to be class-specific, but new risks affect everyone equally (1992, p. 35-46). An extreme example of this would be if human cloning became so commonplace that clones wiped out all humans produced by

sexual reproductions. Similarly, cloning benefits also have the potential to affect everyone equally. In the beginning, it is likely that only wealthy countries will have access to pharmaceuticals produced by cloned animals. However, as the cost of the technology decreases, these pharmaceuticals will slowly become available to third world countries.

Beck's final discrepancy between old and new risks is that old risks are thought of as latent side effects, while new risks take on a central importance (1992, p. 34). In other words, risks, such as those linked to cloning, have the ability to outweigh benefits and take on a central importance. This was true for human cloning when the majority of focus group participants perceived the risks of human cloning to be far greater than benefits; however, the opposite was true for body part cloning. Many focus group participants were willing to support therapeutic cloning because they felt the benefits of increased health outweighed any risks. These findings suggest that benefits are just as likely as risks to take on a role of central importance. It appears that Beck's six criteria for a new model of risk are useful for evaluating not only risks, but also benefits. Cloning technology is creating a new paradigm of risks as well as benefits.

Social Representations of Cloning Risks and Benefits

Having established that cloning risks and benefits are entering a new paradigm, scientific knowledge is no longer adequate to evaluate this new dimension of risks and benefits. Instead, scientific knowledge of risks and benefits must be tempered with public rationality (Beck 1992). In line with Beck's agenda to legitimate public rationality, the theory of social representations allows researchers to tap public understandings of risks and benefits.

Social representations are constructed through two communication processes: objectifying and anchoring. *Anchoring* is the process whereby a group compares an unfamiliar social object against a pre-existing societal category to determine how the object is similar and how it differs (Wagner et al. 1999, p. 97). *Objectifying* is when a group uses techniques such as images and metaphors to help explain a social object

(Moscovici 2001, p. 49). Together anchoring and objectifying help the public transform abstract concepts into tangible social representations.

Anchoring

Both the *Globe and Mail* and focus groups anchored risks and benefits to the category of medical cures. Risks, on the other hand, were anchored to a number of categories. Although there were examples of anchors unique to one domain, both groups anchored the risk of genetic defects in animals to "past animal experiments" as well as their concept of "normal." Both groups also anchored some of the human cloning risks to "evil" and "science fiction/ mad science." This finding, that the *Globe and Mail* and focus groups used science fiction to understand cloning, is consistent with other cloning studies (Wellcome Trust, 1998; Nerlich, Clarke, & Dingwall, 1999).

Further to these individual anchors, there is evidence that the entire group of risks and benefits was also anchored to the category of nature as well as the category of ethics.

Nature Anchor

For all three types of cloning, the Globe and Mail and focus groups anchored abstract hopes and concerns to the tangible category of nature. Both groups perceived a cloning consequence to be a benefit if it "conquered nature" or succeeded where nature failed. In contrast, they saw cloning outcomes as risks if they were unnatural, corrupting nature, or upsetting what most people saw as natural or expected human rights.

The *Globe and Mail* and focus groups presented cloning benefits as though they were overcoming nature's shortcomings such as illness. For example, both groups saw body part cloning as a means to defeat natural diseases such as Alzheimer and Parkinson's. Further to this, the *Globe and Mail* presented the benefit of cloned children for infertile couples as a means of overcoming infertility, a natural limitation of nature. In addition, focus groups talked about their hope that human cloning would be used to genetically engineer people without nature's limitation of genetic defects. One participant said he would like to see cloning result in the "weeding out of genetic defects" (focus group, January 9, 2003). This gardening metaphor compared the removal of weeds, a limitation of nature, to the removal of genetic defects, another limitation of nature. These

were just a few of the many cloning benefits that were seen to overcome nature's limitations.

As for risks, the *Globe and* Mail and focus groups anchored them to nature in three ways: 1) they were identified as "unnatural" 2) they were perceived as meddling with nature 3) they were seen to violate the natural rights that Canadians are typically afforded. An example of an "unnatural" risk was genetic defects in cloned animals. The *Globe and Mail* and focus groups saw abnormalities (such as the large number of attempts needed to produce Dolly or Dolly's premature aging) as unnatural. Another risk perceived as unnatural was the focus groups' concern that the process of body part cloning would involve the removal of organs from cloned humans. One lady said that this process would demote "clones to nothing more than vending machines that spit out packaged organs" (follow-up phone interview, January 28, 2003). This quote clearly showed that participants perceived this process to be artificial or unnatural.

Meddling with nature was the second way risks were anchored to nature. An example of this anchoring was the *Globe and Mail* risk that body part cloning would create life only to destroy it. This risk was objectified by sources, such as the Pope, who said, "Every medical procedure preformed on the human person is subject to limits: not just the limits of what is technically possible, but also limits determined by respect for human nature." The Pope went on to say that body part cloning is an example of a technology that disrespects nature because it creates life to destroy it (Reuters News Agency, 2000, p. A10). The Pope's words suggest that he sees the creation of life for destruction as a risk because it violates nature. Another risk that is perceived as meddling with nature is the human cloning risk of "playing God," which came up in the focus groups. This anchoring was made explicit when one focus group member said, "…it's against God. It's not God's will—they're tampering" (focus group, January 9, 2003).

The final way risks were anchored to nature was that concerns about the rights and status of clones were compared to natural rights that citizens are typically afforded in Canada. This means of anchoring was primarily found in the focus groups. For example, focus groups' concern that only rich people would have access to cloned organs was seen to go against Canadians' universal right to healthcare. Another risk anchored in this way was participants' concern that clones would be treated as second-class citizens. Focus groups felt that treating clones as second class citizens would violate the expected right of equality.

This finding that cloning risks and benefits were anchored to nature is consistent with the Wagner et al. study (2002), which found that all biotechnology risks and benefits are anchored to nature. This anchoring to nature is significant in that it suggests that while society clearly values nature and that which is natural, they are willing to use technology to alter nature if they believe they can improve upon it. Beck (1992) argued, however, that even if a technology improves upon nature, it will still create new and more significant risks. Despite Beck's warning, sources in the *Globe and Mail* as well as focus group participants seemed willing to take this chance in order to eliminate natural risks such as illness.

Ethics Anchor

In addition to risks and benefits anchored to nature, risks and benefits were also anchored to the category of ethics in both the *Globe and Mail* and focus groups. Cloning benefits were anchored to utilitarian ethics, while risks were anchored to deontological ethics. According to John Stuart Mill, utilitarian ethics argues that the end justifies the means. As long as the end product is morally acceptable, it does not matter if unethical behaviour is used in the process (Richard, 1998, p. 57). This utilitarian approach was evident in cloning benefits that focused on desired end products, with less concern for the unethical approaches that might be undertaken to achieve them. For example, the hope was that animal and body part cloning would cure disease, while human cloning would be used to help infertile couples. Curing diseases and helping infertile couples are arguably both laudable goals for cloning.

In comparison, Immanuel Kant's definition of deontological ethics suggests that it is not acceptable to engage in unethical tactics along the way to a goal, even if the end goal is ethical in itself (Richard, 1998, p. 98). This belief was echoed in cloning concerns raised in both the *Globe and Mail* and focus groups. For example, both groups worried that human cloning would produce genetically deformed children along the path to achieving cloned children for infertile couples. In this way, risks questioned the means used to obtain a goal.

This link between cloning and ethics is consistent with the findings of other studies (Einsiedel, 2002; Priest, 2001). The fact that all cloning risks and benefits can be anchored to the category of ethics raises questions about whether risk and benefits associated with other biotech applications can also be anchored to ethics. Priest (2001) argued that ethics was unique to the cloning story because of professional journalistic practices, cultural context and lack of institutional interest. However, it may be that the introduction of ethics into the 1997 cloning story changed the way journalists cover biotech stories; perhaps ethics is now considered an issue in other biotech stories.

Objectifying

Beyond anchoring, objectifying was common as risks and benefits were elucidated. Objectifying techniques identified in the Globe and Mail and focus groups were very similar to those techniques found in other social representation studies (Einsiedel et al., 2002; Wolfgang & Kronberger, 2002). Both groups used images, metaphors, personal stories and humor to explain the risks and benefits for human cloning. This similarity can be explained in terms of the circularity of social representations: the media tend to rely on discourses and images that will find resonance with their audiences and at the same time also provide resources for audiences to build on and add to their stock of representations. Although the Globe and Mail and focus groups used similar objectifying techniques, the Globe and Mail and focus groups also used objectifying techniques unique to their own domains. For instance, the Globe and Mail used statistics to objectify risks and benefits, while focus group participants did not. Again, this difference is a product of the objectivity ideology. In trying to remain objective, journalists are taught to seek out facts to support their argument; however the average person does not have statistics at hand to support their every claim. This is why focus group members used easy-to-recall media references to objectify, while the *Globe* and Mail did not.

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Evaluating Social Representations Theory

The theory of social representations clearly defines anchoring and objectifying to help researchers identify instances where anchoring and objectifying occur; however, it does not explain how these processes occur. For example, while we may know that the public uses anchors to understand abstract ideas, we do not know how the public selects an anchor. Similarly, we do not know how the public constructs a metaphor to objectify a concept. There is also nothing in the theory to explain how individuals negotiate their individual anchors and objectifications in order to arrive at a collective social representation.

In spite of the theory's failure to explain how social representations are created, the theory of social representation does provide insight into the final product of social representations. For example, by examining different means of objectifications, researchers can gather a better understanding of how the public anchors abstract social objects. This anchoring provides researchers with an appreciation for how the public perceives social objects, such as risks and benefits. For example, the *Globe and Mail* and focus groups anchored benefits and risks to the categories of nature and ethics. This indicates that the public's social representations of benefits are that they succeed where nature fails and that they produce a worthy end product. The public's social representations of risks are that they are "unnatural," they tamper with nature, they defy natural human rights, or they use questionable means to achieve an end goal. These representations highlight the public's social values, such as the importance of conquering nature's limitations, preserving nature, and using ethical means to achieve noble goals.

Newspaper Coverage of Risks and Benefits Versus Focus Group Opinions

Overall, the *Globe and Mail* presented a reasonably balanced picture of the risks and benefits associated with both animal and body part cloning. Focus group participants seemed to agree with this balanced media coverage for animal cloning because they too were unable to collectively agree on whether risks or benefits were more significant for animal cloning. They were divided in their positions. As for body part cloning, focus group participants disagreed with the *Globe and Mail's* balanced coverage. The majority of focus group members did not feel that the body part cloning risks were equal to benefits. Both the passion of their arguments and their positions on body part cloning indicated that they had more hopes than concerns for this type of cloning. This difference can be explained by the fact that focus group participants were free to offer their own opinions, while editors and journalists were bound by rituals of objectivity, which encourage them to present both sides of an issue and allow the reader to sort out the truth (Tuchman, 1992).

Despite the *Globe and Mail*'s balanced coverage of animal and body part cloning, the newspaper seemed to abandon the principle of objectivity for their coverage of human cloning. The *Globe and Mail* coverage sided with the majority of focus group participants who fervently felt human cloning was mad science. *Globe and Mail* editors and reporters removed themselves from their objective role of "juxtaposing truth claims, where truth claims are reported as 'fact' regardless of their validity" (Glasser, 1992, 178). They no longer presented facts, but rather evaluated facts. They swayed news coverage of human cloning to ensure that risk claims were more prominent than benefit claims. In doing so, they legitimized risk claims of mainstream experts and discredited benefit claims of maverick IVF scientists.

The question is: why did *Globe and Mail* editors and journalists feel compelled to ignore the rituals of objectivity in their coverage of human cloning, but not in their coverage of animal and body part cloning? One reason might be that news values such as "controversy" and "human interest" clouded their objectivity. In addition to rituals of objectivity, editors and journalists are also taught that controversy and human interest sell newspapers (Tuchman, 1972). They may have decided against presenting both sides of the human cloning story, in order to create more controversial and interesting coverage.

Another reason for the anti-cloning coverage might be that editors and journalists felt the consequences of cloning a full human were more serious than those associated with cloning a human embryo. In this way, they believed that human cloning was too important to simply provide readers with competing claims and trust them to sort out the truth. Some would argue that these reporters were right—after all should maverick opinions be afforded the same amount of press coverage as mainstream scientists? Would it not be more objective to report maverick opinions to the degree in which they represent public opinion? The problem is that sometimes maverick opinions turn out to be correct. For example, when AIDS was first discovered, medical explanations of the disease were considered maverick, yet today the scientific community embraces medical explanations of AIDS (Priest, 2001, p.101). In light of the fact that less popular viewpoints can be accurate, newspapers have a professional responsibility to present a balanced report. In the case of human cloning, readers should have been given balanced coverage of risks and benefits. This would have allowed readers to reach their own conclusions about human cloning and if the focus groups were any indication, their conclusion would have been anti-human cloning.

Normalization

The newspaper coverage of cloning risks and benefits as well as focus group opinions on cloning suggest that human cloning is becoming normalized. It appears to be moving "from rejection to neutrality, and even to approval," just as Bioethicist Somerville predicted in 1998 (p. A19).

The 1997 announcement that scientists cloned Dolly brought visions of scientific progress and nightmares of human cloning together at once. In one breath, headlines proclaimed the benefits of animal cloning along with the risk that cloning technology might be used to produce humans: "Adult mammal cloned successfully: Research breakthrough involving female sheep may mean that humans can be duplicated as well" (Kolata, 1997, p. A1). Headlines raising fear about human cloning continued, until 2001 when *Globe and Mail* coverage shifted to distinguish between two types of human cloning: therapeutic and reproductive.

Therapeutic cloning is what this thesis has consistently referred to as body part cloning, cloning a human embryo for the purpose of extracting stem cell which can then grow into tissue and organs (Trounson, 2002). Conversely, reproductive cloning is what this thesis has called human cloning, cloning to create a living child (Green, 2002). Both

involve cloning humans, but therapeutic cloning involves producing only a human embryo, whereas reproductive cloning involves producing an entire human being.

Following the *Globe and Mail's* 2001 distinction between the two types of cloning, the *Globe and Mail* coverage immediately took a neutral stance on cloning a human embryo for therapeutic purposes but continued its negative coverage for reproductive cloning. Similarly, focus group participants also distinguished between these two types of human cloning. Most were willing to support body part cloning, but not the cloning of complete human beings.

The move from rejecting all forms of human cloning, to accepting body part cloning, to eventually accepting the cloning of entire human beings may be a slippery slope. The *Globe and mail* coverage and focus groups have already moved from fearing and rejecting all types of human cloning, to taking a fairly neutral or accepting stance on body part cloning. It is, therefore, only a matter of time before both begin to accept the cloning of entire human beings. This trend of acceptance occurred with other controversial technologies such as birth control pills, in vitro fertilization and freezing of human embryos. The acceptance of human cloning, however, will be a very slow process that only takes shape when the risks of the technology diminish.

Limitations of Study and Future Research

A researcher cannot answer every imaginable question around a certain topic. Rather, a good researcher must limit the scope of the research question to ensure that an answer is attainable. Narrowing of a research question however, inevitably limits the study. These limitations are best thought of as areas for future research.

The first challenge of this study was the use of terms "hopes" and "concerns" in the focus groups. As indicated in *chapter three*, these terms were chosen because the researcher believed focus group participants would see the terms as broader than "benefits" and "risks." However, these terms presented a couple of difficulties. The first was that by structuring the focus groups around hopes and concern, focus group participants felt they had to spend equal time on each area. For example, when discussing hopes for body part cloning, participants felt obligated to discuss hopes even though many participants indicated they had none. As a result, participants would often rephrase their concerns as hopes. For example, "concern that human cloning would be done" became "hope that human cloning would *not* be done." A second problem with the terms "hopes" and "concerns" was that they made it difficult to compare media representations that were coded using the terms "benefits" and "risks." While it is unlikely that using the terms "benefits" and "risks" consistently across the content analysis and focus groups would have produced significantly different findings, future research is needed to determine this absolutely.

Beyond the challenges of "hopes" and "concerns," this study was not entirely successful at exploring how information might affect opinions. After completing the focus groups, the researcher provided participants with information packages and followed up two weeks later to see if and how the information impacted their opinions. Unfortunately, without an incentive, few participants chose to read the information packages. This made it difficult to determine the impact of information. A future study should be re-designed to offer an incentive for reading the information package. This would allow researchers to study the impact of information on public opinion.

This thesis looked solely at cloning risks and benefits. In doing so, it provided a detailed overview of social representations of cloning risks and benefits, but it did not provide any information on the risks and benefits of other biotechnology applications. Comparing the findings of this thesis against the more broad Wagner et al. (2002) study suggests that the social representations of cloning risks and benefits may be very similar to other biotech applications. A future study is needed to confirm this presupposition.

Another limitation was that this study was designed only to explore collective representations. A future study is needed to examine both individual representations as well as social representations. This would provide insight into how people negotiate their individual representations to arrive at collective social representations.

Finally, cloning technology is still in the early stages. It is still unknown whether therapeutic and human cloning is even possible, let alone safe. This makes it difficult to assume that social representations will remain consistent. In the future a study similar to this thesis should be implemented to determine if and how people's attitudes towards the risks and benefits of cloning have evolved.

Final Thoughts

Regardless of the differences between the *Globe and Mail* and focus groups, both domains revealed social representations, or public understandings, of cloning risks and benefits. The *Globe and Mail* looked at representations of official sources and journalists, while the focus groups gathered social representations of the lay public. Together, these two domains offer insight into how the larger public perceives cloning risks and benefits. These perceptions need to be taken into account during policy decisions.

In Canada, the government is currently on its third attempt to pass a law against body part or human cloning; however, it is unlikely that Bill C-13, the Assisted Human Reproduction Act, will be passed before a new election is called. This means that this thesis still has an important role to play in influencing cloning legislation.

This thesis' finding, that the majority of focus group participants were in favour of body part cloning, has already been used in an attempt to persuade the Canadian government to amend Bill C-13 in favour of therapeutic cloning (Caufield et al., 2003). However, there is more to this thesis than a simplistic look at the focus groups' favourable positions on body part cloning.

The media and focus group representations highlight important social values, such as utilitarian and deontological ethics. These values indicate that the public would ideally like to see cloning produce desirable end products while adhering to ethical processes along the way. This suggests that although the public is willing to support body part cloning, they would be happier to find an alternative technology that not only produces the desirable end product of organs, but also avoids unethical processes such as creating life only to destroy it. According to a recent publication in the *New England journal of Medicine*, adult stem cells may be this alternative technology (Korbling & Estrov, 2003).

Adult stem cells are taken from adult tissue such as a lung. Traditionally, scientists thought that adult stem cells could only differentiate into the tissue from which

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they came. For example, bone marrow cells could only become bone marrow cells; heart cells could only become heart cells. This disadvantage caused scientists to concentrate their efforts on body part cloning to collect embryonic stem cells which grow into variety of tissues and organs.

However, a recent article in the *New England Journal of Medicine* has challenged traditional scientific thought to suggest that adult stem cells can differentiate beyond their own tissue boundaries (Korbling & Estrov, 2003). If this is true, adult stem cells may be a more ethical approach to generating different types of organs because unlike body part cloning it does not involve the destruction of human life. It would provide the public with an alternative to body part cloning that embraces both utilitarian and deontological ethics. Ultimately, the public would probably be willing to support Bill C-13 which bans therapeutic cloning, if new funding was being allocated to scientists working on adult stem cells.

This is just one way social representations can play a role in public policy surrounding new technologies. Decision makers need to consider the opinions of business people, scientists, religious leaders, and ethicists, as well as the general public if effective public policy is to be achieved.

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Appendix A – Focus Group Participants' Biographies

Thursday January 9, 2003

Male, age 35 This participant is married with a 13 year-old daughter. He makes his living as an insulator.

Male, age 26 He is single and works as a carpenter.

Male, age 66 This participant is currently retired. He used to work as a marketing analyst for a natural gas firm. He is divorced with five adult children.

Female, age 39 This participant is single. She has her post-secondary diploma and works as a library technician in charge of audiovisual materials.

Male, age 29 He is single and works as a siding subcontractor.

Male, age 34 This man is happily married. He has his BA and currently works in corporate communications.

Female, age 40 She runs a housecleaning company.

Monday January 13, 2003

Male, age 45

This participant has a B.Sc. in chemistry and a B.Sc. in computer science. He currently works as a computer consultant.

Female, age 42 This woman is married with three children ages 12, 20 and 21. She has a college diploma in rehabilitation and currently works as a rehabilitation practitioner.

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Female, age 47 No information is available.

Male, age 25 He makes his living as a construction framer.

Female, age 57

This participant is married with two grown children. She is currently a finance manager at a post-secondary institution.

Female, age 70 No information is available.

Female, age 47 This participant has a degree in psychology. She works as a caseworker and is married with two children ages 12 and 13.

Female, age 46

This participant has a degree in language and literature. She previously taught English in China, but today she raising her two children full time.

Female, age 42 All that is known is that she has a PhD.

Female, age 32

This woman has an undergrad degree. Today, she works full-time as a stay-at-home mom. She has two boys, ages seven and three.

Male, age 42 He makes his living as a truck driver.

Female, age 57

This participant is divorce with two adult children. She has her B.Sc. and works as a technician in charge of drilling samples.

Tuesday January 14, 2003

Male, age 47 This participant works as a secretary. He is married with a 14-year-old daughter.

Female, age 56 This woman has her PhD in art history and works as a museum director. She is also a single mother raising two children ages 16 and 20.

Female, age 42

This participant has an MA in health administration. She is the director of a science program. She is also married with one child and three stepchildren.

Female, age 45

This participant has her education degree. She teaches grade five elementary. Outside school, she and her husband are raising three teenage children.

Male, age 38

This man has his BA. He currently works as an environmental specialist. He is also married with two children ages seven and five.

Female, age 78

This participant used to work as a teacher's aid at a nursery school as well as a high school. Today she is a retired widow with four adult children.

Female, age 78

Before retiring, this woman had a diverse career as a farm worker, nanny, and drugstore employee. She is now widowed with one adult son.

Male, age 73

This man has a degree in commerce and worked as a real estate executive before he retired. He is married with four grown children.

Male, age 66

This participant works in sales for a moving company. He and his second wife share four children from their two marriages.

Male, age 51

This participant used to be a foreman for the City of Calgary, until a disability prevented him from working. He now has more time to spend with his wife, five children and nine grandkids.

Appendix B – Focus Group Recruitment Guide

Introduction

Hello. May I speak with Mr./Ms. ______. My name is {*interviewer*} and I am calling from Praxis, a social science research firm. We are calling randomly selected households on behalf of work being done under the direction of Dr. Edna Einsiedel, Faculty of Communication and Culture, at the University of Calgary. We are trying to find participants for an important study related to genomic research. I assure you there are no sales or promotions involved of any kind.

May I have about two minutes of your time to explain the study and what we are hoping to achieve?

If no – Sorry to have troubled you. Thank you for your time. Have a nice day.

If yes – Continue with the following script.

The University of Calgary is leading a study dealing with genomic research. While you may or may not be familiar with the term genomic, you may have heard about some of the predicted benefits of genomic research. Things like new drug therapies, improved diagnostics, personalized medicines, healthier more nutritious foods, more bountiful crop yields, and a cleaner environment are just some of the predicted benefits of genomic research. There are also a number of societal concerns and unanswered questions, both ethical and scientific. We feel that the general public can play an important role in helping us understand the perspectives of those who are not directly involved in the research, but are affected in their daily lives by the products of this research.

The University of Calgary research team would like to assemble a group of people from the general public who have no involvement in genomic research to discuss some of these issues. We are seeking 8 to 10 people to meet with us from 7:00 to 9:00pm on {date} at {location}. Each participant will receive \$50.00 to help offset the cost of travel, parking and so on.

The meeting will be a very informal. We will not ask any personal questions and to show that this is a legitimate research study, each participant will receive a written invitation from the University of Calgary.

Would you be interested in taking part in this group discussion?

If No – Sorry to have troubled you. Thank you for your time. Have a nice day. If yes – Continue with the following question.

I need to ask you a question about your interest in genomic research - Do you have a professional or financial interest in genomic research?

If yes – Sorry to have troubled you. Your background may bias the results of our general public group.

If no – Thank you, you are eligible to attend the focus group.

The discussion group will be held from 7:00 to 9:00pm on {date} at {location}. As I mentioned, no personal information will be asked of participants and there is no fund raising, promotions or sales associated with the session. The University of Calgary research team is simply looking for your opinions about how the general public feels about genomic research. All the information collected will be kept strictly confidential and in no way will any information be released about individual participants.

Can I include you in this session?

If no – Thank you for your time. Have a nice day.

If yes – Thank you very much. We will be sending you some additional information about the group discussion. We will also call you a few days prior to the group to confirm your attendance.

Can I confirm your name and have your mailing address to send out your package?

Name: Address: Postal Code:

Thank you once again for agreeing to be part of this important study. If you have any questions about the discussion group, or if you would like additional information, please contact Dr. Edna Einsiedel (ph: 220-3924) or Grace Reid (ph: 521-0221) with the Faculty of Communication and Culture at the University of Calgary.

Appendix C – Invitation to Participate in Focus Group

{University of Calgary letterhead}

January 3, 2003

{participant's name} {participant's address}

Dear {participant's name}:

Thank you for agreeing to be part of the focus group discussion on genomic research. The focus group will be held on {day}, {date} at 7:00pm. We will be meeting at {location}. The session will last one and a half to two hours. A map is enclosed providing directions to the location.

In the focus group, we will be exploring topics related to genomic research. There are many predicted benefits of genomic research as well as a number of societal concerns and unanswered questions, both ethical and scientific. Genomic research affects everyone, and we feel that the general public can play an important role in helping us understand the perspectives of those who are not directly involved in the research, but are affected in their daily lives by the products of this research.

People were randomly selected for the group you will be attending and all participants have no particular background in this topic. The questions will be very general and will result in a group discussion that everyone can take part in, regardless of their background.

I want to assure you that the discussion will not deal with any personal matters pertaining to you or the other participants. Your views and those of the group participants will be regarded with strict confidentially. You may be familiar with focus groups that are held in rooms with one-way mirrors where unidentified observers can oversee the proceedings. We will not be using this type of facility. Rather, we will gather in a meeting place in your area. The setting will be very informal. Each participant will receive \$50.00 to help offset the cost of travel, parking and so on.

Please review the attached consent form. If you wish to participate in the study, you must sign this form. Please bring your signed consent form with you to the focus group.

Thank you once again for agreeing to be part of this important study. If you have any questions about the focus group, or if you would like additional information, please do not hesitate to contact me at 220-3924. If for some reason you will not be able to attend the focus group, please contact Jennifer Hewson at 249-8822.

Sincerely,

{scanned signature}

Edna Einsiedel, PhD Communication Studies Program Faculty of Communication and Culture University of Calgary

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Appendix D – Focus Group Consent Form

{University of Calgary letterhead}

INFORMED CONSENT FORM

Please read all sections of this form carefully. To participate in the focus group you will need to sign this form and bring it with you to the focus group.

Informed Consent

This project is called the Publics and Genomics. I understand that this form is part of the Publics and Genomics research study. This study is being carried out by researchers from University of Calgary working in collaboration with GELS components of Genome Prairie.

What does informed consent mean?

Informed consent means that you understand the basic idea of what the research is about and what your participation will involve. Your consent means that you agree to participate in the study at your own free will.

What is the Publics and Genomics study about?

A number of focus groups will be held with the general public to explore topics related to genomic research. There are many predicted benefits of genomic research as well as a number of societal concerns and unanswered questions, both ethical and scientific. This phase of the study will provide the research team with the identification and awareness of the issues, potential benefits and concerns about genomic research that exist within the general public.

Why is my participation important?

The research team is seeking a diversity of opinions, even if you have no knowledge about genomics. Genomic research affects everyone and will become more prevalent in the future. One area that has been generally overlooked in policy development is the perspective of the general public. Our ultimate goal for this project is to find ways in which researchers and policy makers can effectively gather inputs from all citizens.

What will happen in the focus group?

The focus group is a meeting of 8 to 10 people such as yourself. The meeting will be informal. The group will discuss a number of topics and the group's responses will be recorded. Information about individuals will not be collected. There are no tests or trick questions. We are seeking your opinion and as such there are no right or wrong responses. The focus group will last one and a half to two hours. You will receive \$50.00 cash for your participation.

Who will get to see the information and what will they get to see?

Once the focus groups are completed, the researchers will analyze the information. Only the research team will ever see the raw data. None of the comments, suggestions or opinions you provide will ever be linked back to you personally. The comments and views of the groups will be provided to the researchers at the group level, meaning they will have a list of all of the points raised, but no one's name is attached to these points.

Who can I contact for more information?

The Project contacts are:

Dr. Edna Einsiedel Principle Investigator GELS/Genome Prairie University of Calgary Tel: 220-3924

Or

Grace Reid Research Assistant GELS/Genome Prairie University of Calgary Tel: 521-0221

Please feel free to contact either of the above if you desire any additional information about your participation in the project.

If you have any questions or issues concerning this project that are not related to the specifics of the research, you may also contact the Research Services Office at 220-3782 and ask for Mrs. Patricia Evans.

I understand that my participation in this focus group discussion is voluntary and any information I provide will be kept strictly confidential. That means my name will not be associated in any way with the results of this research.

By signing below, I agree to participate in the focus group discussion.

Signature of participant

Date

Appendix E – Initial Moderator's Guide

<u>1. Arrival</u>

- Greet and register all participants as they enter
- Collect consent forms

2. Introductions

- Good evening and welcome.
- Thank you for attending the focus group discussion tonight.
- My name is Jennifer Hewson and I will be moderating the session this evening.
- Assisting me is Grace Reid who is a graduate student at the University of Calgary. She will be the note taker.

<u>3. Overview of the Project</u>

- This project is called Publics and Genomics and it is under the direction of Dr. Edna Einsiedel with the Faculty of Communication and Culture at the University of Calgary.
- This research project is sponsored by the Genome Prairie Genomics, ethical, environmental, legal and society research project.
- At the end of the session we will provide you with an information package and Dr. Einsiedel's business card that includes her name and contact information, should you wish to contact her with questions about the project.

4. About tonight's session

- As we indicated on the telephone and in the letter you received, our discussion tonight will explore topics related to genomic research.
- Since there are a number of topics and we only have two hours, we will focus our discussion on one type of genomic research cloning.
- We will explore your understanding of this topic as well as your hopes and concerns about cloning.

5. How the results will be used

• The transcripts will be described and analyzed according to themes that emerge from the discussion.

- Through this focus group study, we hope to expand our understanding of Canadian citizens' perceptions of new genomic technologies.
- This information will be useful in expanding our understanding of why certain technologies are more or less likely to receive support from the general public.

6. Participants and participation

- Participants were randomly selected to include a cross-section of Canadian society, balancing participation by such criteria as sex, age, occupation and education.
- Your participation is voluntary and you are free to leave the discussion at any point, should you wish to do so.
- We are interested in hearing from each of you I will be going around the room asking each of you to comment if you are talking a lot, I may ask you to give others a chance to speak.
- We have name cards to help me remember names and also to help you feel free to follow up on something that was said to have a conversation with one another you do not always have to respond to me.
- We are looking for a diversity of opinions there is no right or wrong answer, we are not trying to achieve consensus or resolve issues.
- You will each have different views about this topic so let's be respectful of one another.

7. Confidentiality

- The focus group discussion will be audio-taped so that we don't miss any of the comments you raise. No names or personal information will be included in the transcripts and the tapes will be destroyed after transcription.
- The results of this discussion will be summarized for the group as a whole; we will not be identifying specific individuals with specific comments.
- While we cannot guarantee confidentiality completely, given the nature of focus groups, we assure you that we will do our utmost to secure and maintain this confidentiality.
- As participants in this focus group, we ask that everyone respect the privacy of others in the group.
- •

8. Miscellaneous information

- This discussion will take about two hours.
- Help yourself to refreshments.
- The washrooms are located...
- On completing the session, you will receive \$50 in appreciation of your participation along with an information package and an invitation to participate in a follow-up telephone interview.

9. Opening Question: Ice breaker

• Before we begin, let's find out a little bit about each other by going around the room- please say your first name and what you would normally be doing on a {day of week} night from 7:00 - 9:00pm.

10. Introductory Question: Awareness of Cloning

- I want to begin with an open discussion about cloning.
- What are the main areas of cloning that you are aware of/may have heard of?
- Take a few minutes to write down your ideas and then we will go around the room and have you identify one area from your list. We will continue going around the room until the items on your lists are identified.
- •
- NOTE to Moderator
- Listen for the following areas: infertile couples, zenotransplant, to replace loved ones
- that have died, for breeding livestock, for the production of drugs.
- Probe for examples of cloning for the purposes of infertile couples, zenotransplant, to replace loved ones that have dies, for breeding agriculture, for the production of drugs.

<u>11. Key Question: Sources of information</u>

- What do you think are the primary sources of information?
- Where did/do you obtain your knowledge/information about cloning?
- •
- NOTE to Moderator
- probe for detailed sources (e.g., particular TV show, newspaper, magazine, radio program etc.)

12. Key Question: Main issues re: cloning

- We have spent some time exploring the areas of cloning research and the sources of your information.
- Let's now turn to a discussion of your hopes and worries about cloning.
- What are your hopes and worries related to cloning research?
- Take a few minutes to write down your thoughts and then we'll go around the room and have each of you identify the first item on your list. We will continue going around the room until all of your ideas have been expressed.

NOTE to Moderator

- Listens for funding, research, privacy & confidentiality, health, environment, MORAL and legal rights etc.
- If necessary, introduce examples from previous discussion to cover the different areas of cloning.
- The focus is on having people express what they <u>hope for and are worried about</u>. If they start stating positions on issues, ask for the hopes and worries that they think should help decide the issues. Example participant says "I don't think we should do research on stem cells from fetuses!"—moderator says "What concerns do you have that would be solved by a prohibition on stem cell research?"
<u>13. Review of the Focus Group</u>

- The purpose of this discussion has centred around your hopes, expectations, concerns and the social issues related to cloning.
- You have identified the following societal benefits, concerns and issues pertaining to cloning research (moderator summarizes these).
- Thinking back over the discussion we have had, are there any expectations or concerns that you have about cloning research that we have not covered?

14. Wrap Up

- Thank you all for participating in this discussion.
- We have prepared an information package on cloning for those of you who are interested in learning more about the issue.
- We'd also like to invite you to participate in a follow-up 10 minute phone interview in two to three weeks. This will be an opportunity for you to discuss your thoughts about today's focus group.
- If you are interested in participating in the follow-up interview, please come to the front and we will provide you with a consent form to sign in order to participate in this follow-up interview. This is to confirm that we have your consent to interview you in two to three weeks.
- As we mentioned earlier, each participant receives \$50 to help offset some of the costs associated with your attendance tonight.

As you leave, you will be also asked to sign that you have received the \$50. This is simply a record that everyone has received the payment. Thank you again and have a safe trip home.

Appendix F – Telephone Interview Consent Form

Research Project Title: Publics and Genomics

Funded by: Genome Canada (with funding from the government of Canada, with matching funds from Alberta Innovation and Science)

Investigator: Dr. Edna F. Einsiedel Co-Investigator: Grace T. Reid (MA student)

This consent form, a copy of which has been given to you, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

The purpose of this research is to follow-up your recent participation in a focus group on cloning. You are among several participants who have been selected to be further interviewed via telephone on the topic of cloning. This interview will take place approximately two to three weeks after the your focus group took place. It will take approximately 15 minutes and will be tape-recorded with your permission. During this interview we will as you a few questions regarding your views and opinions about cloning.

We would like to be able to identify our interviewees in our reports. Should you prefer otherwise, we can maintain confidentiality by not identifying you by name in connection with specific comments or observations within the report or publication. We would, however, like to list all our participants at the end of our report.

Data (interview transcripts, audiotapes) will be stored in a locked file and will be shredded or disposed of after six years. On request, we can provide you with copies of our reports or publications. Expected completion date of this project is December, 2003.

Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at anytime. You're continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

If you have further questions concerning matters related to this research, please contact:

Dr. Edna Einsiedel (ph: 403-220-3924) or Grace Reid (ph: 403-521-0221)

If you have any questions or issues concerning this project that are not related to the specifics of the research, you may also contact the Research Services Office at 403-220-3782 and ask for Mrs. Patricia Evans.

Your name:	
Consent for interview:	
Your signature:	
Date:	
Investigator's signature:	
Date:	
Witness' signature:	
Date:	
Consent for taping:	
Your signature:	
Date:	

A copy of this consent form has been given to you to keep for your records.

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Appendix G - Reading Package Letter

{University of Calgary letterhead}

January 3, 2003

Dear Focus Group Participant:

Thank you for being part of the focus group discussion on cloning. We have put together the following information package on cloning in case you are interested in learning more about cloning. This package is by no mean exhaustive, we have simply selected resources that you might find both informative and interesting.

Please find enclosed the following:

- 1. A Cloning FAQ.
- 2. A Timeline of Cloning Events.
- 3. A diagram explaining nuclear transfer cloning.
- 4. Some current newspaper/journal articles on cloning.
- "The case for cloning." *Time*, February 9, 1998
- "Second batch of knock-out pig clones" New Scientist Online News, January 3, 2002
- "ROM Scientists move toward resurrecting Auk: Determining genetic code"- National Post, March 7, 2002 A5
- "CC, the first cloned house pet, ushers in a fuzzy new world" Calgary Herald, March 9, 2002 0S04
- "Cloned cows produce human antibodies" New Scientist Online News, August 11, 2002
- "Cult set to produce first clone of human" -Globe and Mail, December 27, 2002 A1
- "The dark side of cloning"- Calgary Herald, December 28, 2002 A8
- "Hoax suspicions grow as DNA test dropped" Calgary Herald, January 7, 2003 A3
- 5. Cloning cartoons.
- 6. A list of useful websites which will provide additional, more extensive cloning information.

Thank you once again for agreeing to be part of this important study. If you have any questions about the focus group, or if you would like additional information, please do not hesitate to contact me at 220-3924.

Sincerely,

{scanned signature}

Edna Einsiedel, PhD Communication Studies Program Faculty of Communication and Culture University of Calgary

Appendix H – Complete List of "Animal Cloning" Benefit and Risk Themes Found in the *Globe and Mail*

Benefits

- 1. Pet cloning
- 2. Cloning endangered/ extinct animals
- 3. Advances in animal husbandry
- 4. Advances in scientific/ medical knowledge
- 5. Animal cloning techniques may lead to genetically engineered animals
- 6. Financial
- 7. Health products such as pharmaceuticals
- 8. Xenotransplants
- 9. Animal cloning puts scientist closer to achieving human cloning for purposes of immortality
- 10. Animal cloning provides the entertainment industry with comedy material and movie ideas

Risks

- 1. Financial
- 2. Genetic abnormalities
- 3. Clone not the same as the original
- 4. Animal cloning may lead to human cloning
- 5. Cost
- 6. Ethical issues
- 7. Environmental impact
- 8. Animal hybrids
- 9. Eating cloned animals
- 10. Clone will take over life of original
- 11. Rejection of organs if cloning leads to xenotransplantion
- 12. Swine disease, being passed from pigs to humans, if cloning leads to xenotransplantion

* Please note benefits and risks are in no particular order.

Appendix I – Complete List of "Body Part Cloning" Benefit and Risk Themes Found in the *Globe and Mail*

Benefits

- 1. Improving health through:
 - Increased organs available for transplant
 - Cured diseases

Risks

- 1. Public outrage
- 2. Long time before society sees the benefits of body part cloning
- 3. Difficult to gain access to human embryo cells
- 4. Consent
- 5. Genetic abnormalities
- 6. Legislation moving too slow
- 7. Creating life only to destroy it
- 8. Body part cloning will lead to human cloning
- 9. Body part cloning will get out of control

* Please note benefits and risks are in no particular order.

Appendix J – Complete List of "Human Cloning" Benefit and Risk Themes Found in the *Globe and Mail*

Benefits

- 1. Cloning children for infertile couples
- 2. Cloning dead loved ones
- 3. Genetic engineering
- 4. May be less genetic abnormalities in human clones than in animal clones
- 5. Cloning aborted fetus years later
- 6. Immortality
- 7. Cloning dream date
- 8. Scientific freedom
- 9. Cloning human who needs a matching bone marrow to live

Risks

- 1. Cloning for narcissistic reasons
- 2. Genetic abnormalities
- 3. Loss of genetic diversity
- 4. Ethics
- 5. Infertile couples cloning children
- 6. Human cloning may cause backlash against therapeutic cloning
- 7. Cost
- 8. Human cloning may get out of control
- 9. Clones have to share identity with originals.
- 10. Environmental impact
- 11. Loss of respect for human life
- 12. Cloning designer people
- 13. Lack of regulation

* Please note benefits and risks are in no particular order.

Appendix K – Complete List of Themes for Focus Group Members' Hopes and Concerns about Animal Cloning

Hopes

- Cloning endangered/ extinct animals
- Animal cloning will expand scientific/medial knowledge
- Animal cloning will be regulated
- Animals will be cloned to feed people in third world countries
- Cloning technology will be perfected on animals before it is used on humans
- Advances in animal husbandry
- Animals will be cloned for food without growth hormones
- Pigs will be cloned so that their organs can be used for human transplants (xenotransplants)
- Pets will be cloned and the proceeds from pet cloning will help fund more important research
- Animal cloning will take place in public rather than private institutions

Concerns

- Environmental impact
- Cost
- "Playing God"
- Regulating animal cloning will force animal cloning underground
- Scientists cloning animals for no other purpose than to stroke their egos
- Genetic defects
- Animals cloned for food
- Animal rights
- Clones won't be the same as originals
- Ethical issues
- Pet cloning
- Lack of information

* Please note hopes and concerns are in no particular order.

Appendix L – Complete List of Themes for Focus Group Members' Hopes and Concerns about Body Part Cloning

Hopes

- Extension of life through:
- Cloning organs for transplant
- Curing diseases and injuries
- Stem cells for body part cloning will be taken from sources other than embryos
- Body part cloning will be regulated
- Public will be kept informed about the progress of body part cloning

Concerns

- Ethics of prolonging life
- Process of body part cloning
- Creating life only to destroy it
- Without regulation body parts will be cloned and sold without consent
- People will take body part cloning too far and over refine their body
- Only rich people will have access to cloned parts
- People will lose their identity if they have too many cloned body parts
- Organ cloning will take priority over more important research

* Please note hopes and concerns are in no particular order.

Appendix M – Complete List of Themes for Focus Group Members' Hopes and Concerns about Human Cloning

Hopes

- If human cloning must be done, it will lead to scientific advances
- Cloning will result in genetically engineered people who can't get diseases
- · Human cloning will be regulated
- Incentives for human cloning will be removed
- Scientists will try downloading memories into clones
- If human cloning is going to happen, it will be done out in the open.
- Human cloning won't happen
- Religion will play a role in the debate on human cloning
- Cloning technology will be perfected on animals before it is used to clone humans

Concerns

- Clones won't be the same as the originals
- Evil Motives for human cloning
- Human cloning won't be regulated
- Rights of clones
- "Playing God"
- Clones without souls
- Human cloning will decrease the value of life
- Cloning will upset family structures
- Only the rich will have access human cloning
- Some cultures will not allow human cloning
- Environmental impact
- Gentic abnoramlitties
- Lack of information available
- Human cloning will be used to create a utopian society
- Non-specific ethical issues
- Acceptance of human cloning by religious groups
- Human cloning will take precidence over more important sceintific research.
- Society is not be ready for human cloning
- Human cloning is inevitable
- Religion will interfere with decision to clone humans
- Philosophical repercussions

* Please note hopes and concerns are in no particular order.