

2050303

B2

see also
2050301
Focus groups

International
Public Opinion Research
on Emerging Technologies

Canada-U.S. Survey Results

Canadian Biotechnology Secretariat

March 2005

only Download available. (2)

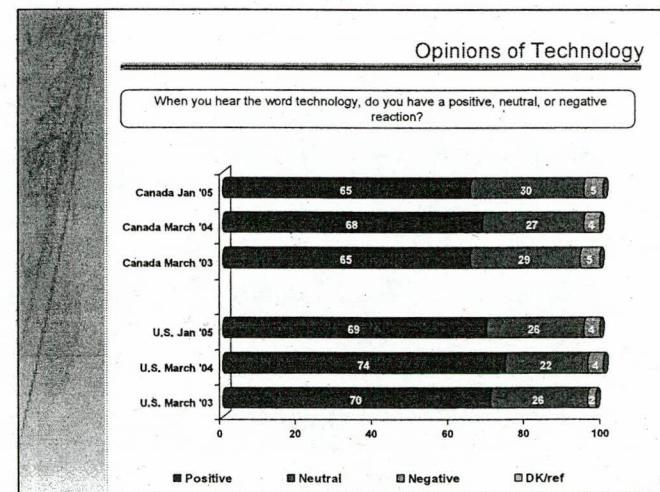
General Attitudes

- Most Canadians and Americans have a very positive orientation toward technology in general
 - Most see it as a positive, virtually none see it as a negative
 - Focus groups reveal that while new technology has downsides and often necessitates change, it has historically proven to provide many benefits to humankind
- Americans tend to be marginally more positively disposed to the idea of "technology" than Canadians are
- General impressions of biotechnology are remarkably consistent in the two countries, with more than 2:1 having a positive view versus a negative view
 - But in both the US and Canada roughly 1 in 6 hold a negative view of biotechnology
- From a demographic perspective, the major differences are very consistent across the two countries
 - Males more favourably oriented, females less so
 - Those who are older, with higher incomes more likely to hold a favourable perspective than those younger, with lower incomes

Methodology

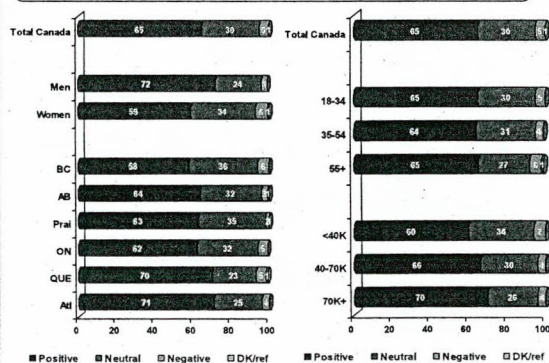
- Survey conducted in January-February, 2005
 - 2000 Cases in Canada, 1200 Cases in the US
 - Margin of error: +/-2.19% in Canada, +/-2.81% in the United States
- Survey part of a larger quantitative and qualitative research program
 - Survey and focus groups in Canada and the United States
 - Focus groups conducted in February-March, 2005
 - 14 Groups (6 cities) in Canada, 6 Groups (3 cities) in the US
- A wide range of subject areas
 - Awareness and familiarity with emerging technologies
 - GM Trees/Genetic Identification and Selection of Trees
 - GM Food
 - Gene Banks
 - Pharmacogenetics
 - Stem Cell research
 - Nanotechnology
 - Public interest and engagement
 - Trust and Credibility

report
see 2050301.



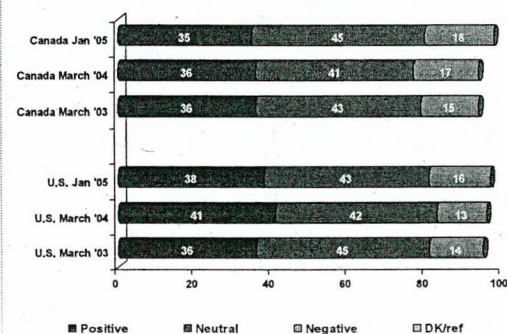
Opinions of Technology: Canada

When you hear the word technology, do you have a positive, neutral, or negative reaction?



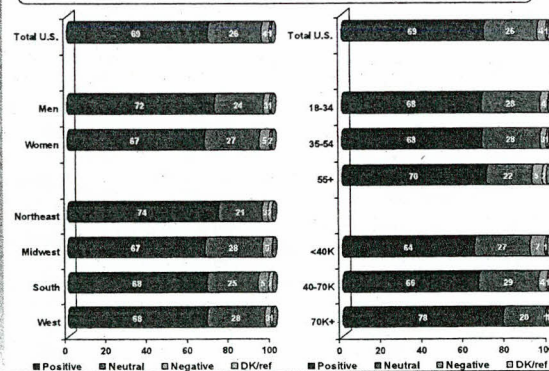
Opinions of Biotechnology

When you hear the word biotechnology, do you have a positive, neutral, or negative reaction?



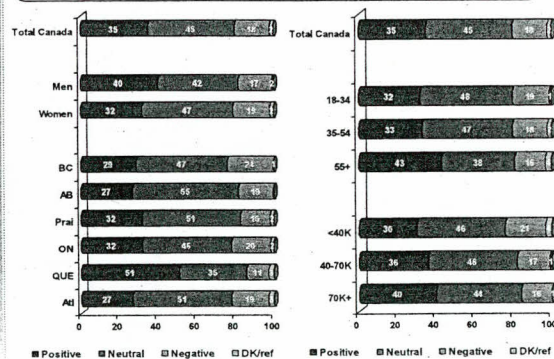
Opinions of Technology: U.S.

When you hear the word technology, do you have a positive, neutral, or negative reaction?



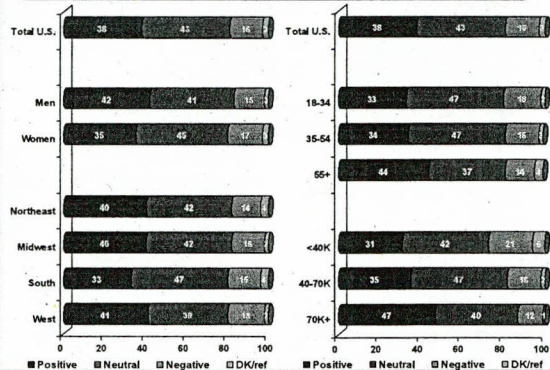
Opinions of Biotechnology: Canada

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Opinions of Biotechnology: U.S.

When you hear the word biotechnology, do you have a positive, neutral, or negative reaction?

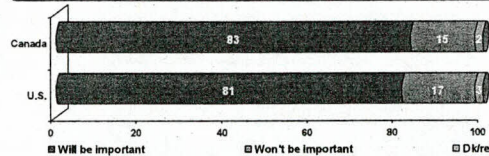


How will new technologies impact our lives?

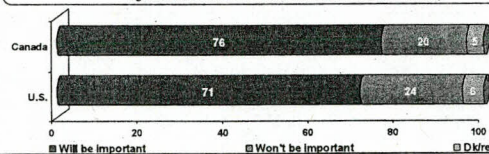
- While new technologies are generally seen as being beneficial to our lives, there are actually some significant differences of opinion about just how beneficial some different technologies will be
 - Those differences are more evident in Canada than the US
- For example, most believe that areas of biotechnology like stem cell research will be very beneficial
 - While other areas like GM food will be much less so, particularly in Canada
 - Focus groups reveal that the Schmeiser case has a profoundly negative impact on attitudes toward GM food, beyond concerns about risk and benefit
- Biotechnology isn't necessarily seen as having a profoundly positive impact as things like hybrid cars, information technology
 - But for the most part, people believe it will have a very important positive influence over our lives in future
- While some segments of the population don't know enough about nanotechnology to offer a view about its potential impact in future:
 - In focus groups many are very vocal about the importance of nanotechnology and the revolutionary nature of this area of technology

Importance of Biotech/Nanotech

Chose: BIOTECHNOLOGY will be one of the most important sources of health treatments and cures in the 21st century OR biotechnology probably won't be a significant source of health treatments in the 21st century

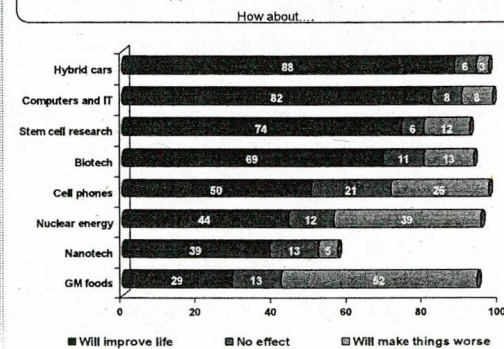


Chose: NANOTECHNOLOGY will be one of the most important sources of health treatments and cures in the 21st century OR nanotechnology probably won't be a significant source of health treatments in the 21st century



Impact of New Technologies: Canada

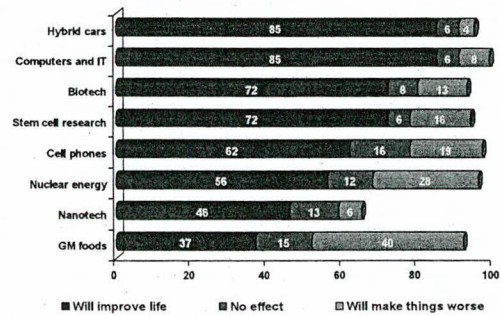
I am going to read you a list of areas in which new technologies are currently developing. For each of these areas, do you think it will improve our way of life in the next twenty years, it will have no effect, or it will make things worse?



Impact of New Technologies: U.S.

I am going to read you a list of areas in which new technologies are currently developing. For each of these areas, do you think it will improve our way of life in the next twenty years, it will have no effect, or it will make things worse?

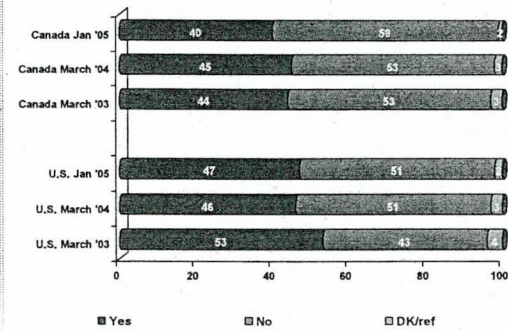
How about...



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Notice Media Coverage of Biotechnology Issues

Over the last three months, have you heard about any stories or issues involving biotechnology?



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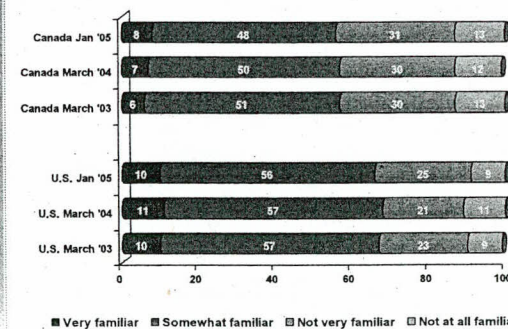
Awareness and Familiarity

- Tracking data reveals that Canadians are less likely to have noticed media coverage of biotechnology this past year compared to previous years
- Reported familiarity with biotechnology has plateaued in both countries
- The data also suggests that few people have taken steps to seek out information, voice their opinions publicly on these new technologies

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Familiarity with Biotechnology

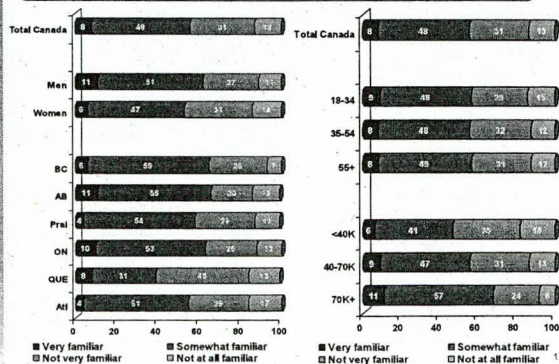
Would you say you are very familiar, somewhat familiar, not very familiar or not at all familiar with biotechnology?



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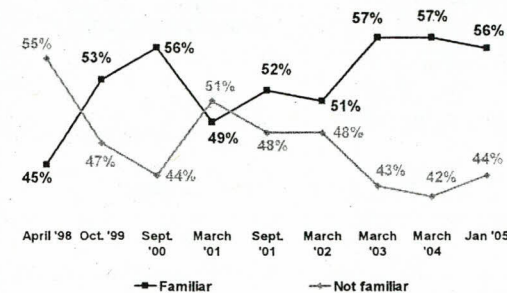
Familiarity with Biotechnology: Canada

Would you say you are very familiar, somewhat familiar, not very familiar or not at all familiar with biotechnology?



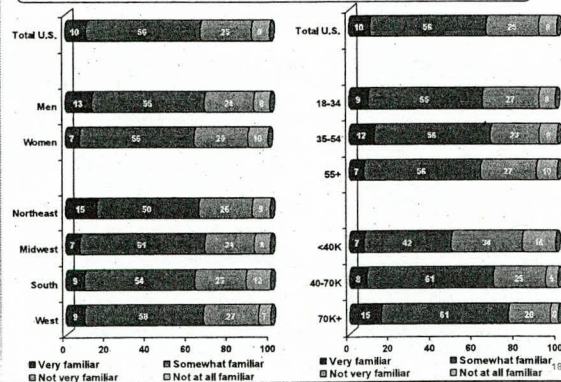
Familiarity: Tracking Canada

Would you say you are very familiar, somewhat familiar, not very familiar or not at all familiar with biotechnology?



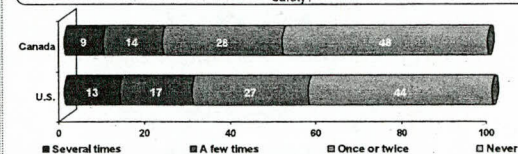
Familiarity with Biotechnology: U.S.

Would you say you are very familiar, somewhat familiar, not very familiar or not at all familiar with biotechnology?

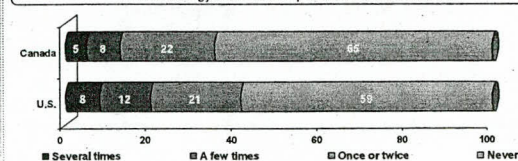


Information Seeking and Opinion Sharing

How often have you actively sought out information about biotechnology research, applications, ethical guidelines, or studies that have been carried out to evaluate safety?



How often have you actively sought out ways to voice your opinions or values about biotechnology research or implications of such research?



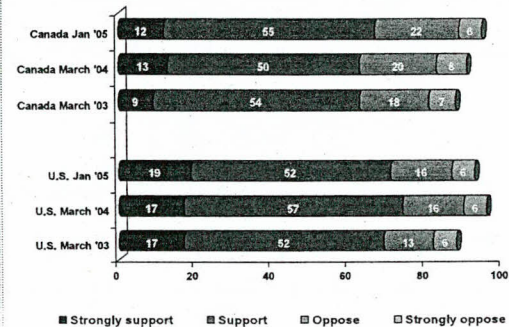
Support for/Opposition to Biotechnology

- While previous waves of research carried out by the Canadian Biotechnology Secretariat have clearly shown that people prefer to assess biotechnology on an application by application basis, the research program has tracked overall directional support for the technology, in order to provide a "big picture" sense of public orientation
- This year's data reveals that support has risen by 4% in Canada, to 67% overall
 - And in the US, support has fallen by 3% to 71%
 - These trends suggest there is growing convergence of opinion in the two countries
- The level of deep opposition (strongly opposed) is the same in the two countries, at 6% overall
 - Generally in public opinion terms when strong opposition reaches 25% or greater, political pressure becomes very strong
- In focus groups, what is often found is that people will begin by talking about the opportunities and benefits of technology, then move to discussion of the concerns they raise, but ultimately return to a point of view that is favourable to most new technologies

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Support for Biotechnology

In general, would you say you strongly support, somewhat support, somewhat oppose or strongly oppose the use of products and processes that involve biotechnology?



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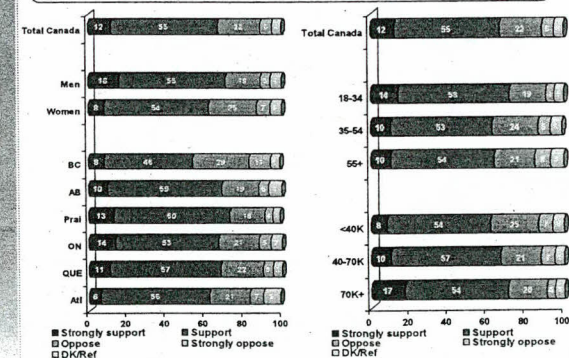
Support for/Opposition to Biotechnology

- The data reveals a substantial gender gap on these issues
 - Females express much higher levels of concern than men, in both Canada and the US
 - The most clearly evident demographic difference in the data
 - Focus groups suggest that perceptions of long term risk, and concerns about moral implications of biotech research are and remain more prevalent among females
 - Even if both genders tend to feel there will be important benefits from the technology
- Also worth noting is the gap between BC and the rest of Canada on these issues – more pronounced than has been in evidence in the past
 - BC attitudes have remained very static over time, whereas in the rest of Canada support has grown slowly but consistently
 - Focus groups reveal that GM food, environmental risks tend to be more prevalent in BC than other areas of the country

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Support for Biotechnology: Canada

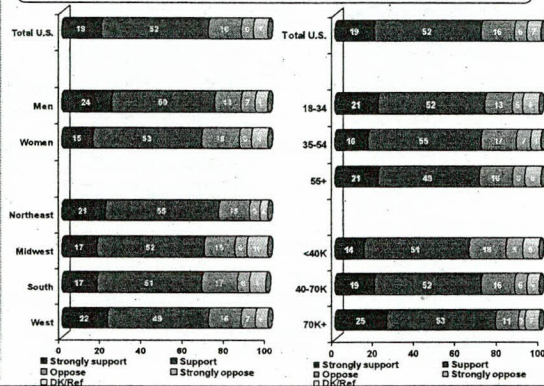
In general, would you say you strongly support, somewhat support, somewhat oppose or strongly oppose the use of products and processes that involve biotechnology?



24

Support for Biotechnology: U.S.

In general, would you say you strongly support, somewhat support, somewhat oppose or strongly oppose the use of products and processes that involve biotechnology?



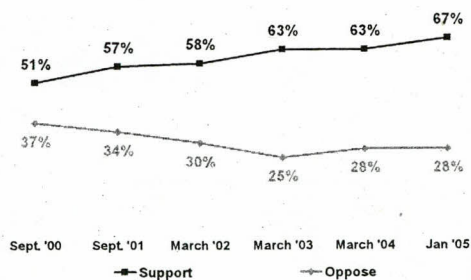
Regulatory Safety and Moral Oversight

- Two areas where Canadians and Americans differ somewhat regard the oversight mechanisms and rules governing these technologies
- In neither country is there a universally held sense that the regulatory and approval process is all that stringent
 - But there is a notable lack of confidence in the stringency of regulatory processes in Canada
 - This gap is also in evidence with regard to ethical oversight
- Focus groups reveal that these gaps in confidence about regulatory and ethical oversight in Canada are undermining support for biotechnology in general
 - Regulatory and ethical systems not necessarily seen to be holding up their end of the government policy "bargain" that is promised with regard to these technologies, "ie. reaping the benefits while managing the risks"

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Support: Tracking Canada

In general, would you say you strongly support, somewhat support, somewhat oppose or strongly oppose the use of products and processes that involve biotechnology?



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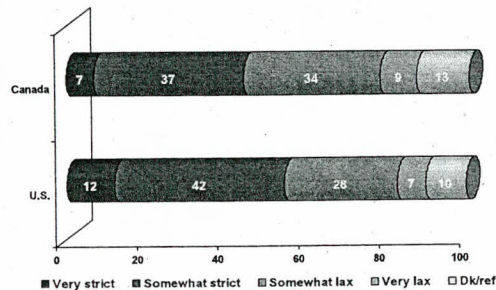
Regulatory Safety and Oversight

- There are several reasons why these views are evident, and growing
 - Concerns that people who work in regulatory systems are able to "keep up" with new technologies
 - Concerns that corporate influence can have undue influence on decisions made by regulatory bodies
 - Concerns that not enough resources are dedicated to this function within government
 - Cases like the pullback of Vioxx and Celebrex, undermining the overall level of confidence in the abilities of regulatory agencies
- All of this makes it more difficult for people to be comfortable with where some of these technologies are heading
 - And causing many people who are broadly supportive of the technology to ask for more controls, more stringent regulations on new innovations
 - Even when many want to go forward, reap the benefits of these technologies

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Safety and Regulations

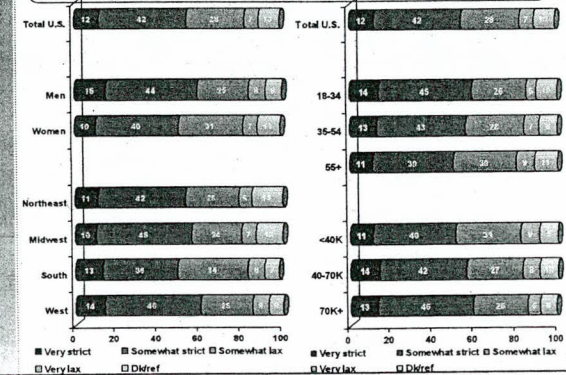
In terms of safety and regulatory approval processes for biotechnology products, do you tend to think that the rules and systems in place here in Canada/the U.S. are very strict, somewhat strict, somewhat lax or very lax?



29

Safety and Regulations: U.S.

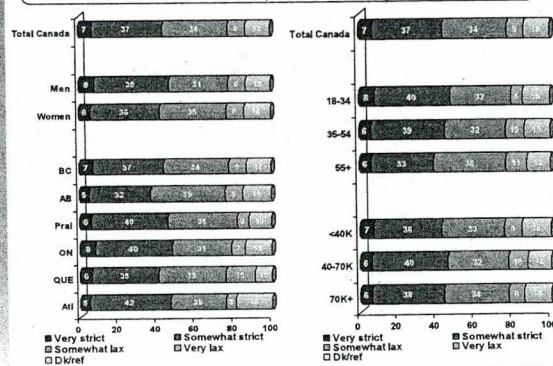
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Safety and Regulations: Canada

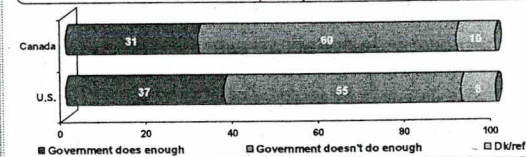
In terms of safety and regulatory approval processes for biotechnology products, do you tend to think that the rules and systems in place here in Canada are very strict, somewhat strict, somewhat lax or very lax?



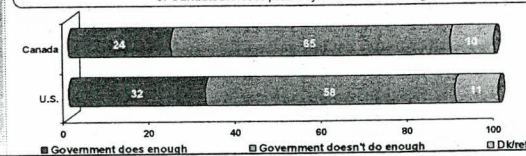
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Government Regulation

Chose: The government of Canada/the U.S. probably does an effective job of studying and monitoring the impact of BIOTECHNOLOGY products OR the government of Canada/the U.S. probably does not do enough.



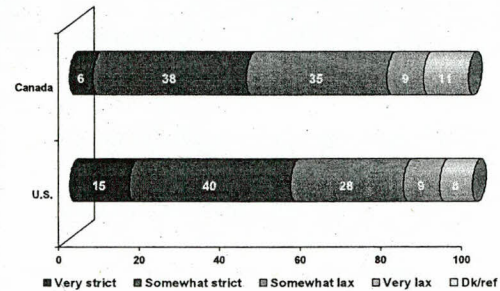
Chose: The government of Canada/the U.S. probably does an effective job of studying and monitoring the impact of NANOTECHNOLOGY products OR the government of Canada/the U.S. probably does not do enough.



32

Moral and Ethical Oversight

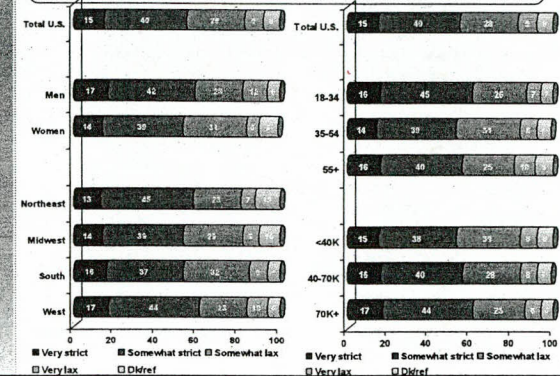
In terms of moral and ethical oversight, do you tend to think that the rules and systems in place here in Canada/the U.S. are very strict, somewhat strict, somewhat lax or very lax?



33

Moral and Ethical Oversight: U.S.

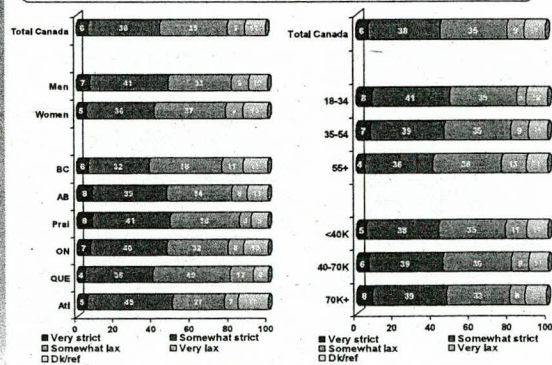
In terms of moral and ethical oversight, do you tend to think that the rules and systems in place here in the U.S. are very strict, somewhat strict, somewhat lax or very lax?



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Moral and Ethical Oversight: Canada

In terms of moral and ethical oversight, do you tend to think that the rules and systems in place here in Canada are very strict, somewhat strict, somewhat lax or very lax?



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Stem Cell Research (1)

- Stem cell research is an area of biotechnology that is very well known among both Canadians and Americans
 - The prominence of the issue in the US election campaign had a profound impact on the level of awareness, consideration of the issue there
 - Focus groups revealed some marked attitudinal differences between Canadians and Americans on these issues
- Both Canadians and Americans see stem cell research as an area that promises significant benefits
 - And relatively few risks
 - 68% say modest or major benefits, 19% say modest or major risks
 - 71% in US say modest or major benefits, 21% say modest or major risks

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Stem Cell Research (2)

- The main set of concerns associated with stem cell research regard moral issues
 - Survey and focus groups reveal that this concern is almost entirely about where stem cells derive from
 - This concern much more profoundly evident in the US, owing to spiritual/religious beliefs – and people entirely willing to express them
 - And among females in general in both countries
 - Taking stem cells from fetuses left over from in vitro fertilization clinics raises moral concerns for many
- Nonetheless, the survey and the groups revealed a high level of overall support for stem cell research, because of the benefits it may yield
 - 81% approval with current or tighter regulations in Canada
 - 73% in the US

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Stem Cell Research (4)

- The Bush decision was met with very different attitudes in the two countries, owing in large part to broader attitudes about the President
 - Americans didn't necessarily all agree with the decision (although some did)
 - But they accepted the principles on which it was based, and his right to make that decision regardless of the implications
 - There was no evidence of a "great divide" on this issue in the US
 - Canadians generally felt that the decision was taken for domestic political purposes, and likely was not grounded in appropriate principles or motivations

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Stem Cell Research (3)

- So when a second scenario of obtaining stem cells was introduced, where deriving stem cells no longer involves destroying an embryo, the level of support rose from already high levels to almost universal support
 - 89% approval with current or tighter regulations in Canada
 - 86% in the US
- The effect was opposite when the idea of creating embryos in a lab to derive stem cells was tested in groups
 - This was seen as more morally problematic as taking them from fertilization clinics
 - Because this approach was believed to show "less respect" for human life
 - In the case of deriving them from fertility clinics, researchers are putting good use to a life that would have been destroyed instead, whereas in this case it would involve creating life for the sole purpose of destroying it

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Conclusion

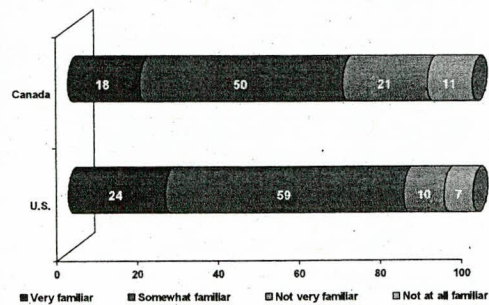
- It is clear that perceptions of morality and risk have different impacts on the ways in which people assess these technologies
 - For most people they are two separate dimensions
- Moral issues act as a gatekeeping mechanism that determines whether someone broadly supports or opposes the development of a technology
 - It works on a different dimension than risk considerations
- Risk issues are the main driver of regulatory stringency
 - So with a particular technology (like new ways of obtaining stem cells) people may move from being opposed to supportive of the technology, but that doesn't have any bearing on whether they support current or more stringent regulations on that technology

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Familiarity with Stem Cell Research

(AFTER EXPLANATION OF STEM CELL RESEARCH)

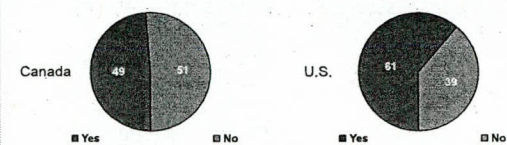
Would you say you are very somewhat, not very or not at all familiar with stem cell research?



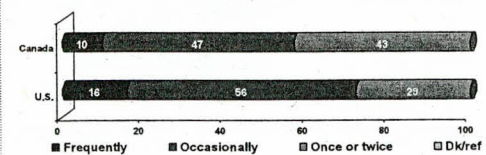
41

Discussed Stem Cell Research?

Before this interview, have you ever discussed stem cell research with anyone?



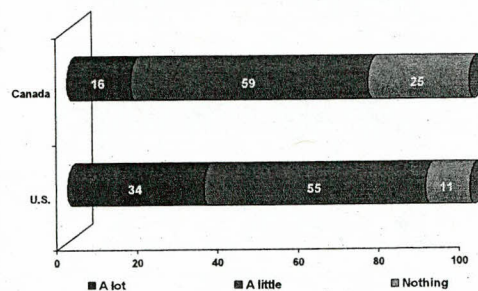
(If yes) Would you say you discussed this issue frequently, occasionally, or once or twice?



43

Familiarity with Stem Cell Research

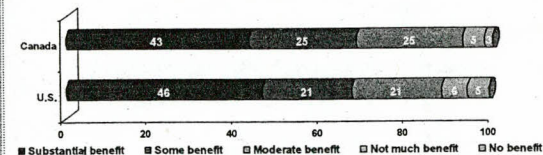
Over the last three months, have you read, seen or heard a lot, a little, or nothing about issues involving stem cell research?



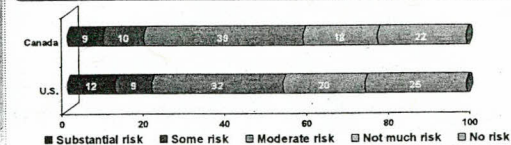
42

Risk and Benefit

I would like to understand the extent to which you think stem cell research might benefit our society. Using a scale of 1-5, where 1 is no benefit and 5 is substantial benefit, how beneficial do you think stem cell research will be to our society?



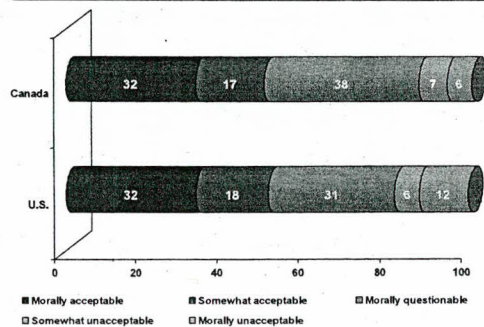
I would like to understand the extent to which you think stem cell research might pose a risk to our society. Using a scale of 1-5, where 1 is no risk and 5 is substantial risk, how much risk does stem cell research pose for our society?



44

Morality of Stem Cell Research

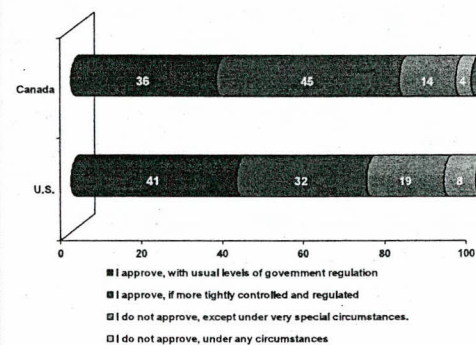
In terms of the moral or ethical aspect of this research, again using the 1-5 scale, where 1 means that stem cell research is morally unacceptable, 5 means it is morally acceptable, and the mid point 3 means it is morally questionable, how do you view this kind of research?



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Approval of Stem Cell Research (1)

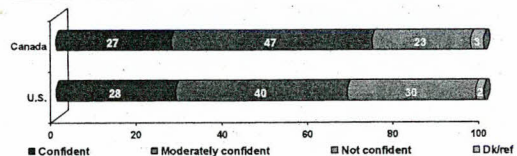
Overall, which of the following best reflects your views about stem cell research?



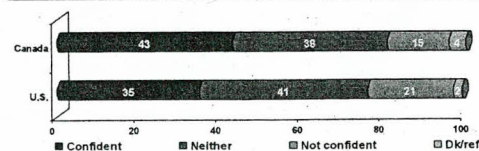
47

Confidence in Regulatory/Science

On a scale of 1-5, where 1 is not at all confident and 5 is extremely confident, where the mid point 3 is moderately confident, how confident would you say you are in the safety and regulatory approval systems governing stem cell research?



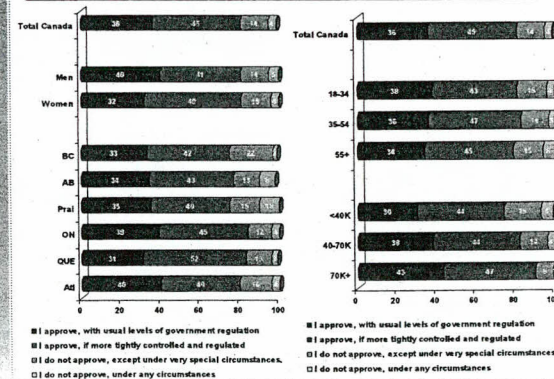
In terms of the scientists who are involved in research of these technologies, on a scale of 1-5, where 1 is not at all confident and 5 is extremely confident, where the mid point 3 is moderately confident, how confident would you say you are that stem cell research is in safe hands?



48

Approval of Stem Cell Research (1): Canada

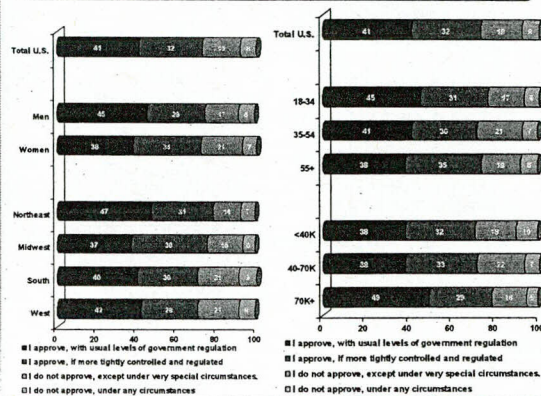
Overall, which of the following best captures your views about stem cell research?



49

Approval of Stem Cell Research (1) : U.S.

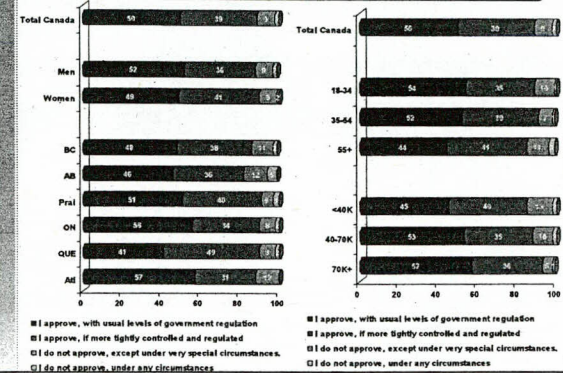
Overall, which of the following best captures your views about stem cell research?



49

Approval of Stem Cell Research (2): Canada

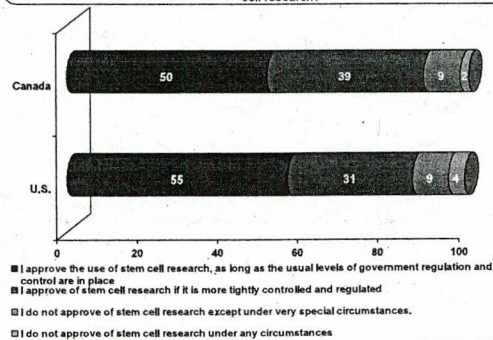
Now I would like to ask you the same question under a different scenario. Suppose scientists were able to get all stem cells they need for research from umbilical cords and no longer had to get them from embryos that were not going to be used in fertility treatments. Which of the following would best capture your view about stem cell research?



51

Approval of Stem Cell Research (2)

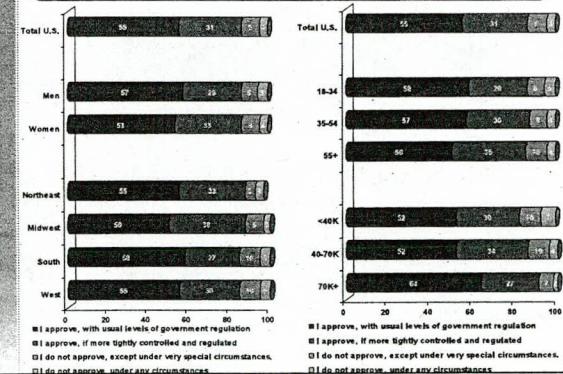
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50

Approval of Stem Cell Research (2): U.S.

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Pharmacogenetics/Personalized Medicine

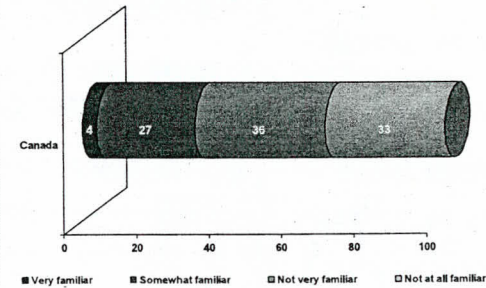
- Familiarity with this topic is very low, not something that many have heard of, or read about
- The benefits generally seen to outweigh risks in this area
- Half (47%) see modest or major benefits
 - 19% see modest or major risks
- Unlike stem cell research, most don't see a significant moral dimension in this area
 - Only one in ten "morally opposed" to this field of inquiry
- In focus groups, discussion reveals that there may be moral issues associated with conducting research involving certain ethnic or other social groups
 - But the main issue raised regards whether certain groups will get more funding than other groups, and therefore get greater access to a technology than others
 - Which is not an issue that is unique to pharmacogenetics, it is an issue that regards virtually all new areas of health research
- As was the case for other emerging technologies, concerns arise with regard to safety/regulatory issues
 - A significant number not confident in regulatory authorities to appropriately test, regulate this area

53

Familiarity with Pharmacogenetics (1)

Personalized medicine, or pharmacogenetics, involves the study of how an individual's genetic makeup affects the body's response to drug treatments. It involves the development of drugs based on an individual's genetic profile. Understanding an individual's genetic makeup is thought by many scientific researchers to be the key to creating more effective, personalized drugs.

Would you say you are very, somewhat, not very or not at all familiar with personalized medicine involving genetics?



55

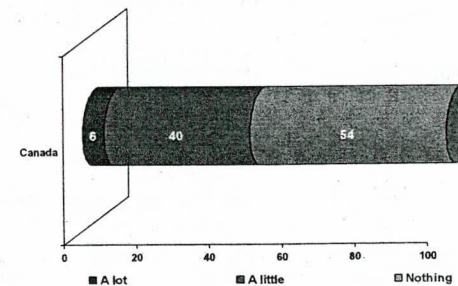
Pharmacogenetics/Personalized Medicine

- Focus groups illuminate:
 - For many, the point of departure is that this area of technological advancement might be a good thing, as it might mean that treatments will become more effective on some groups and new treatments will evolve that can serve the same purpose for others
 - Like everything, they compare it to the situation now, where we have a one size fits all system for drug treatment which often doesn't work for certain groups in society, because of side effects or other concerns
 - Generally this field is looked upon as a subset of the broader issues raised by gene banks and population based genetic research
 - Even the issue of ethnicity not seen as a major moral issue
 - The substance of concern grounded in the idea of anonymity
 - Issues associated with funding for disadvantaged groups are of concern, because some groups that may be stronger at lobbying may end up getting more funds than others who have more pressing needs. However, those concerns apply to all areas of research, not genetic research alone.

54

Familiarity with Pharmacogenetics

Over the last three months, have you read, seen or heard a lot, a little, or nothing about issues involving personalized medicine?

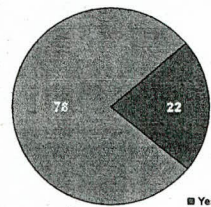


56

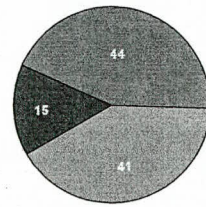
Discussed Personalized Medicine?

Before this interview, have you ever discussed personalized medicine with anyone?

(If yes) Would you say you discussed this issue frequently, occasionally, or once or twice?



■ Yes
■ No

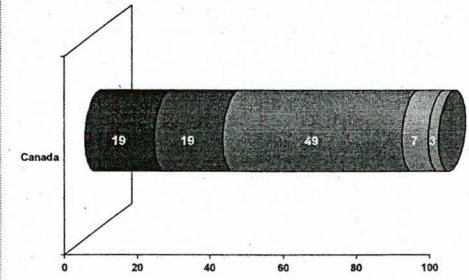


■ Frequently ■ Occasionally ■ Once or Twice

57

Morality of Personalized Medicine

In terms of the moral or ethical aspect of personalized medicine, again using the 1-5 scale, where 1 means that personalized medicine is morally unacceptable, 5 means it is morally acceptable, and the mid point 3 means it is morally questionable, how do you view this kind of research?

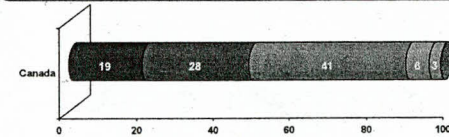


■ Morally unacceptable ■ Somewhat unacceptable ■ Morally questionable
■ Somewhat acceptable ■ Morally acceptable

59

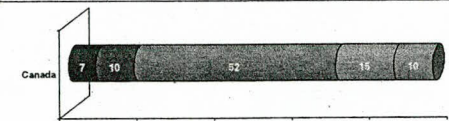
Risk and Benefit

I would like to understand the extent to which you think personalized medicine might benefit our society. Using a scale of 1-5, where 1 is no benefit and 5 is substantial benefit, and the mid-point 3 is moderate benefit, how beneficial do you think personalized medicine will be to our society?



■ Substantial benefit ■ Some benefit ■ Moderate benefit ■ Not much benefit ■ No benefit

I would like to understand the extent to which you think personalized medicine might pose a risk to our society. Using a scale of 1-5, where 1 is no risk and 5 is substantial risk, with the mid point 3 being moderate risk, how much risk does personalized medicine pose for our society?

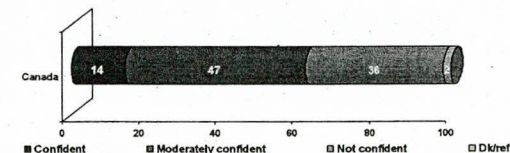


■ Substantial risk ■ Some risk ■ Moderate risk ■ Not much risk ■ No risk

58

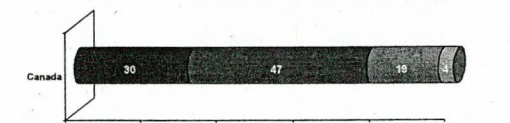
Safety of Pharmacogenetics

On a scale of 1-5, where 1 is not at all confident and 5 is extremely confident, where the mid point 3 is moderately confident, how confident would you say you are in the safety and regulatory approval systems governing pharmacogenetics?



■ Confident ■ Moderately confident ■ Not confident ■ Dk/ref

In terms of the scientists who are involved in research of these technologies, on a scale of 1-5, where 1 is not at all confident and 5 is extremely confident, where the mid point 3 is moderately confident, how confident would you say you are that research into personalized medicine is in safe hands?

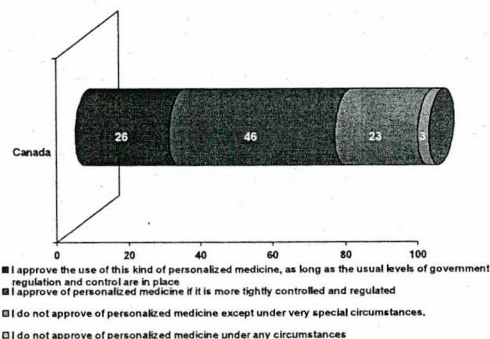


■ Confident ■ Neither ■ Not confident ■ Dk/ref

50

Approval of Personalized Medicine

Overall, which of the following best captures your views about personalized medicine?



61

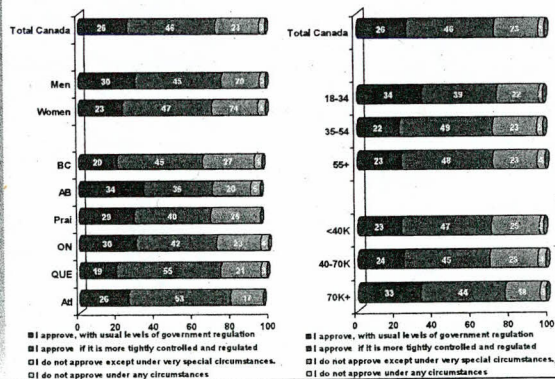
GM Food

- Impressions of GM food are markedly different than for other areas of emerging technology tested in this survey
- Attitudes tend to be more negative, and willingness to explore this area much lower than the others in this research study
- In Canada specifically, there is widespread resistance to GM food, deep resistance in certain pockets of the population
 - Women
 - BC residents
 - Those with lower incomes
- Focus groups illuminate:
 - People generally aren't sure that the benefits of this technology outweigh the risks
 - GM food generally thought to be less healthy, less "natural" than traditional food
 - Environmental risks are seen as being very significant, and there are significant concerns about the ability of regulatory authorities to assess, monitor impacts
 - In Canada the Schmeiser case has had a particularly catalyzing effect on the population, fuelling the impression that GM food is about "big companies" making profits above all else

63

Approval of Personalized Medicine

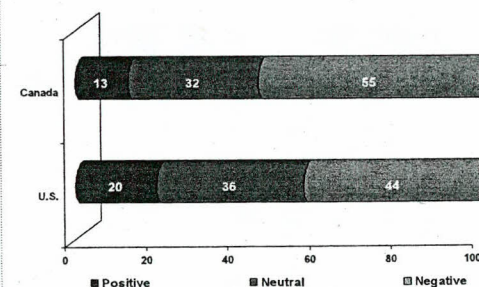
Overall, which of the following best captures your views about personalized medicine?



62

Opinions of GM Foods

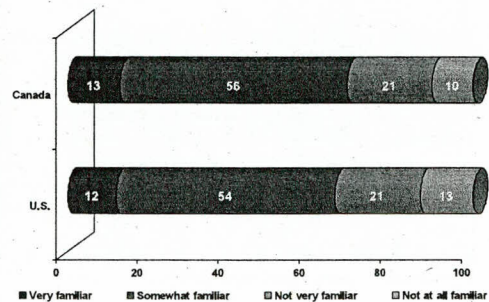
When you hear the phrase "genetically modified food" do you have a positive reaction, neutral reaction, or a negative reaction?



64

Familiarity with GM Food

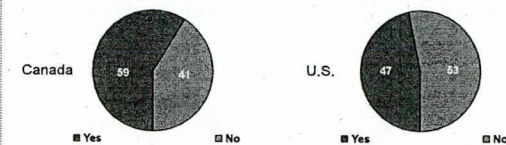
Would you say you are very somewhat, not very or not at all familiar with genetically modified food?



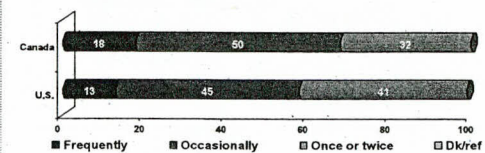
65

Discussed GM Food?

Before this interview, have you ever discussed GM food with anyone?



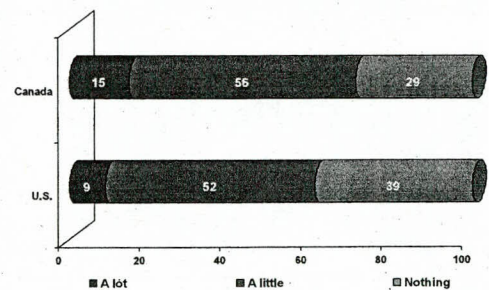
(If yes) Would you say you discussed this issue frequently, occasionally, or once or twice?



67

Familiarity with GM Food

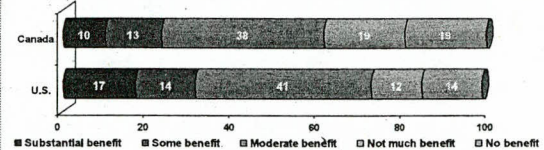
Over the last three months, have you read, seen or heard a lot, a little, or nothing about issues involving genetically modified food?



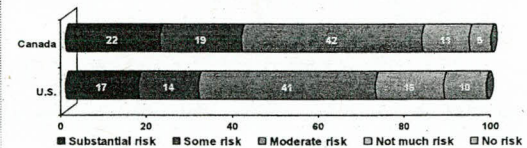
66

Risk and Benefit

I would like to understand the extent to which you think genetically modified food might benefit our society. Using a scale of 1-5, where 1 is no benefit and 5 is substantial benefit, and the mid-point 3 is moderate benefit, how beneficial do you think genetically modified food research will be to our society?



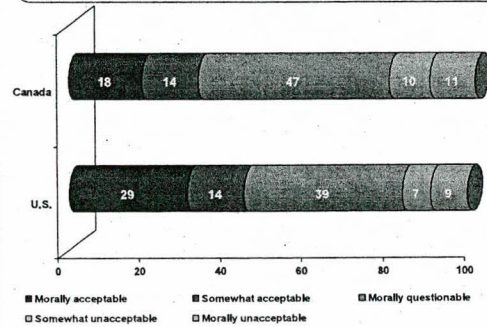
I would like to understand the extent to which you think genetically modified food might pose a risk to our society. Using a scale of 1-5, where 1 is no risk and 5 is substantial risk, with the mid-point 3 being moderate risk, how much risk does genetically modified food pose for our society?



68

Morality of GM Food

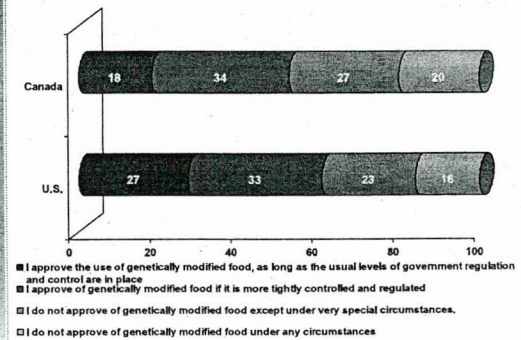
In terms of the moral or ethical aspect of this research, again using the 1-5 scale, where 1 means that genetically modified food research is morally unacceptable and 5 means it is morally acceptable, and the mid point 3 means it is morally questionable, how do you view this kind of research?



69

Approval of GM Food

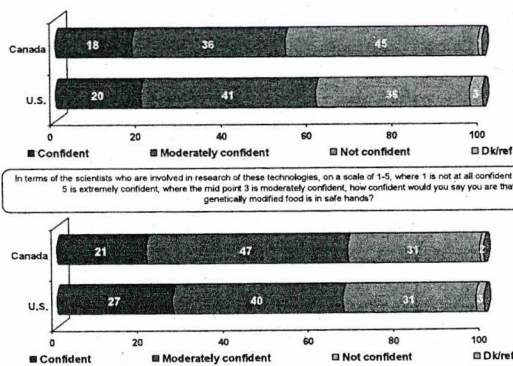
Overall, which of the following best captures your views about GM food?



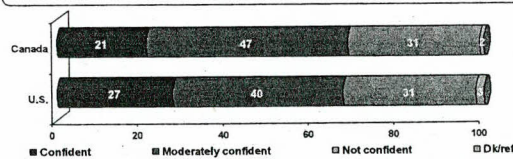
71

Safety of GM Food

On a scale of 1-5, where 1 is not at all confident and 5 is extremely confident, where the mid point 3 is moderately confident, how confident would you say you are in the safety and regulatory approval systems governing genetically modified foods?



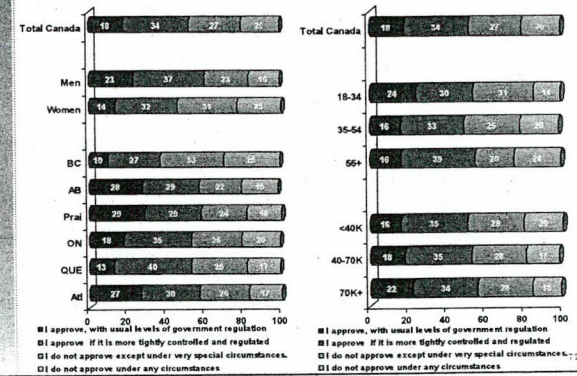
In terms of the scientists who are involved in research of these technologies, on a scale of 1-5, where 1 is not at all confident and 5 is extremely confident, where the mid point 3 is moderately confident, how confident would you say you are that genetically modified food is in safe hands?



70

Approval of GM Food: Canada

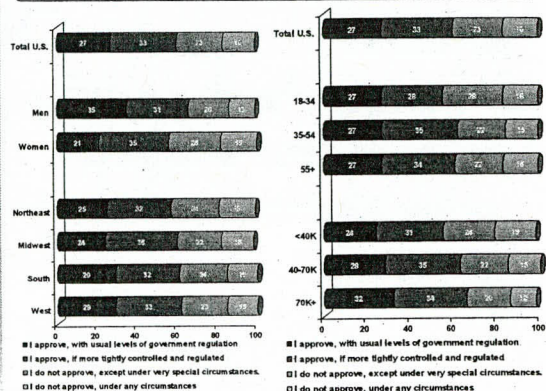
Overall, which of the following best captures your views about GM food?



72

Approval of GM Food: U.S.

Overall, which of the following best captures your views about GM food?



73

GM Trees

- Respondents certainly saw benefits from these technologies, but those benefits primarily accrued to the larger economy rather than themselves
 - And as a result the sense of importance associated with benefits was not as high as found in other areas like stem cell research where people believe they personally might benefit
- On the risk side, the quantitative work didn't reveal that there was a strong sense of risk, but the focus groups did
 - And the main risk people saw regarded the impact on the environment, and on ecosystems
- This was not an area where people expressed strong moral concerns
- Ultimately, a clear majority indicated that pursuing these technologies was an acceptable area of investigation
 - But as is the case in other areas, many wanted tighter regulatory restrictions
 - Focus groups confirmed that the main reason why had to do with concerns about the regulatory system and concerns about long term impacts of these technologies

75

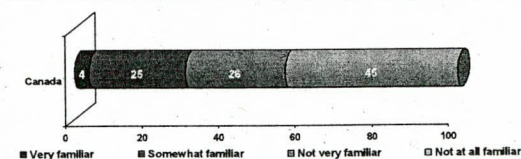
GM Trees

- Canadians and Americans alike are not all that familiar with the topic of GM trees
 - It is not one of the areas of biotechnology that is recognized as health and food applications are
- In this research program, two aspects of biotechnology involving trees were investigated
 - One involving modern biotechnology techniques
 - One involving genetic identification and selection
- The quantitative results tended to indicate that people saw these two areas of research as having only relatively minor differences
 - The focus groups suggested that there were some more substantive differences between the two that affected their relative acceptability

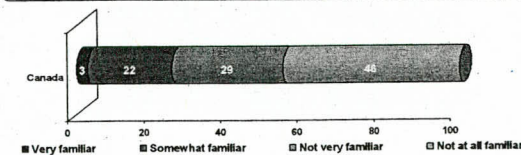
74

Familiarity with GM Trees

Would you say you are very, somewhat, not very or not at all familiar with genetic modification of trees?



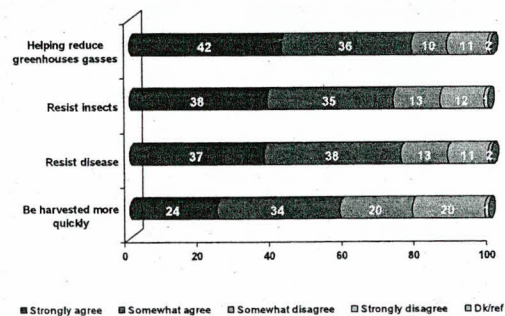
Would you say you are very, somewhat, not very or not at all familiar with genetic identification and reproduction of trees?



76

Approval of Genetic Modification Applications

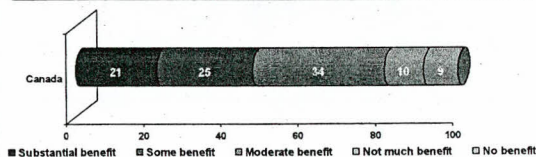
There are numerous ways in which genetic modification of trees with certain traits can be used. Please tell me if you strongly agree, agree, disagree or strongly disagree with the following potential applications of these technologies.



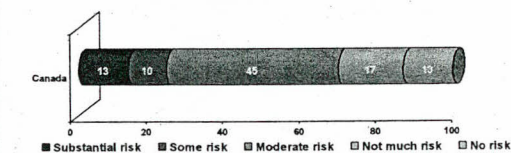
77

Risk and Benefit: GM Trees

I would like to understand the extent to which you think genetic modification of trees might benefit our society. Using a scale of 1-5, where 1 is no benefit and 5 is substantial benefit, and the mid-point 3 is moderate benefit, how beneficial do you think genetically modified trees will be to our society?



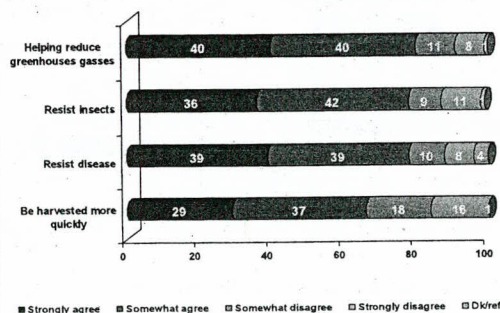
I would like to understand the extent to which you think genetic modification of trees might pose a risk to our society. Using a scale of 1-5, where 1 is no risk and 5 is substantial risk, with the mid-point 3 being moderate risk, how much risk do genetically modified trees pose for our society?



78

Approval of Genetic Identification and Reproduction Applications

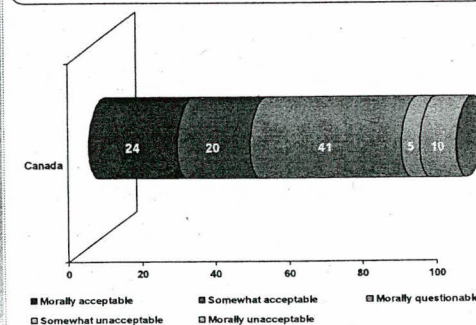
There are numerous ways in which genetic identification and reproduction of trees with certain traits can be used. Please tell me if you strongly agree, agree, disagree or strongly disagree with the following potential applications of these technologies.



78

Morality of Genetic Modification of Trees

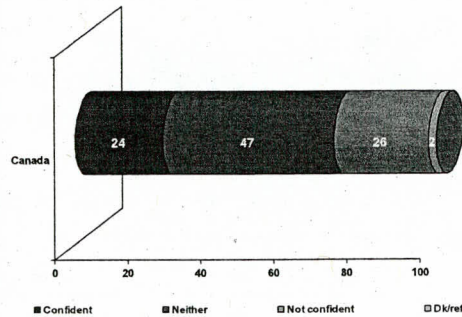
In terms of the moral or ethical aspect of this research, again using the 1-5 scale, where 1 means that genetically modified tree research is morally unacceptable and 5 means it is morally acceptable, and the mid-point 3 means it is morally questionable, how do you view this kind of research?



80

Safety of Genetic Modification of Trees

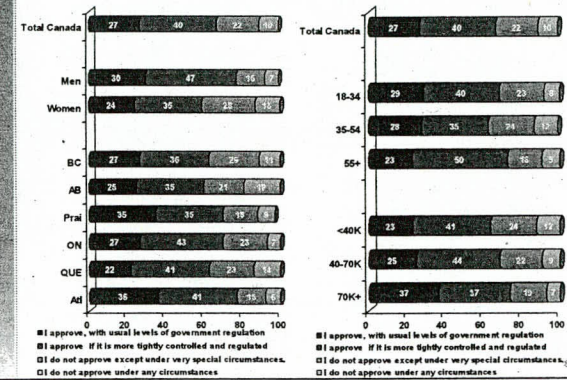
On a scale of 1-5, where 1 is not at all confident and 5 is extremely confident, where the mid point 3 is moderately confident, how confident would you say you are in the safety and regulatory approval systems governing genetically modified trees?



81

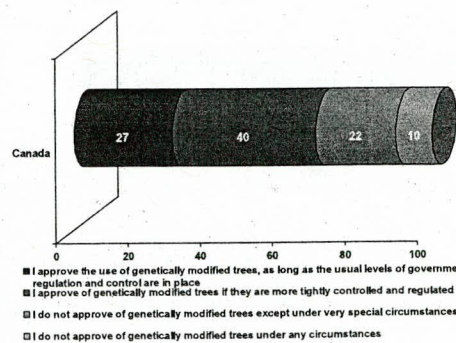
Approval of GM Trees

Overall, which of the following best captures your views about genetic modification of trees?



Approval of GM Trees

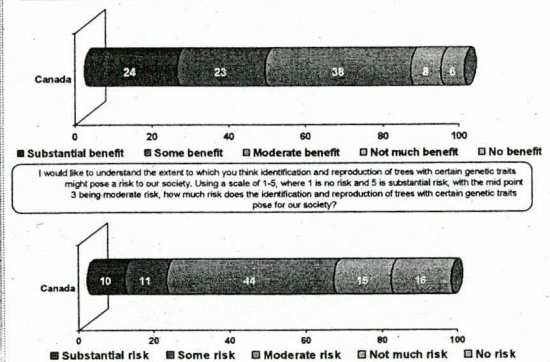
Overall, which of the following best captures your views about genetic modification of trees?



82

Risk and Benefit: Genetic Selection of Trees

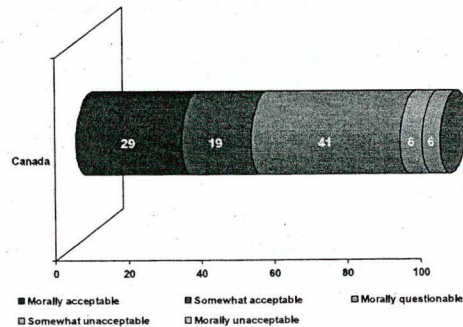
I would like to understand the extent to which you think identification and reproduction of trees with certain genetic traits might benefit our society. Using a scale of 1-5, where 1 is no benefit and 5 is substantial benefit, and the mid-point 3 is moderate benefit, how beneficial do you think genetically modified trees will be to our society?



84

Morality of Genetic Selection of Trees

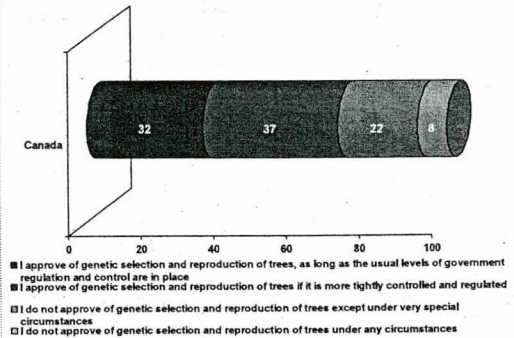
In terms of the moral or ethical aspect of this research, again using the 1-5 scale, where 1 means that research into the identification and reproduction of trees with certain genetic traits is morally unacceptable and 5 means it is morally acceptable, and the mid point 3 means it is morally questionable, how do you view this kind of research?



86

Approval of Genetic Identification of Trees

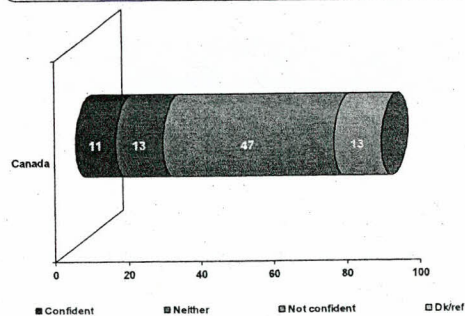
Overall, which of the following best captures your views about the identification and reproduction of trees with certain genetic traits?



87

Safety of Genetic Selection of Trees

On a scale of 1-5, where 1 is not at all confident and 5 is extremely confident, where the mid point 3 is moderately confident, how confident would you say you are in the safety and regulatory approval systems governing research into the identification and reproduction of trees with certain genetic traits?



88

Nanotechnology

- The research program revealed that nanotechnology is really becoming the "next big thing" in terms of emerging technology
 - While still not universally known, recognized, those who know about it express a high level of interest, appeal
 - Involved Canadians/Americans are widely knowledgeable about the technology
- It is seen as having the potential to revolutionize a wide range of areas of our lives
- And the applications that people know about are virtually all seen as providing important and positive benefits to society
 - People see this technology as here now, not science fiction
- While people do harbour some concerns about risks involved, particularly risks to the environment, broadly speaking this area is seen to offer some very substantial benefits to society that outweigh those risks
- Moreover, unlike some aspects of biotechnology, people don't see moral issues as being a significant concern with regard to nanotechnology

89

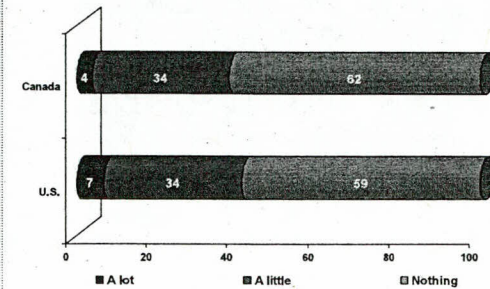
Nanotechnology

- The main area where concerns arise, more so in focus groups than in the survey, regards the regulatory oversight processes and mechanisms that govern nanotechnology
- Most have little to no knowledge about regulatory systems that govern applications of nanotechnology
 - And by and large people overestimate the extent to which these applications are tested, regulated
 - While people express a general sense that such systems are probably not as stringent as they would like them to be, as they begin to discuss the issues and concerns that revolve around this technology, regulatory concerns heighten
- That said, there is a high level of trust assigned to those scientists who are involved in developing these technologies, which does play some role in allaying concern

89

Familiarity with Nanotechnology

Over the last three months, have you read, seen or heard a lot, a little, or nothing about issues involving nanotechnology research?

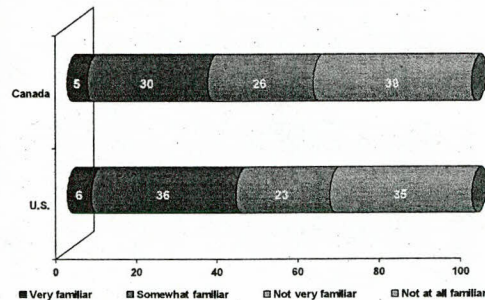


91

Familiarity with Nanotechnology

(AFTER EXPLANATION OF NANOTECHNOLOGY)

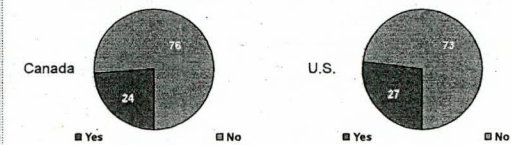
Would you say you are very somewhat, not very or not at all familiar with nanotechnology?



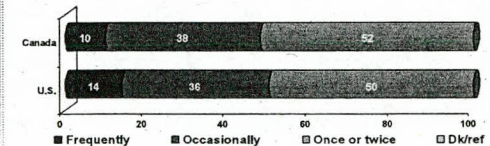
90

Discussed Nanotechnology Research?

Before this interview, have you ever discussed nanotechnology research with anyone?



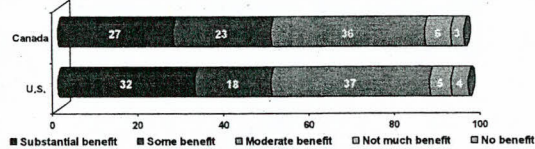
(If yes) Would you say you discussed this issue frequently, occasionally, or once or twice?



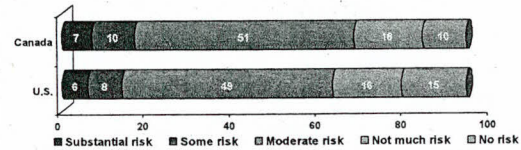
92

Risk and Benefit

I would like to understand the extent to which you think nanotechnology might benefit our society. Using a scale of 1-5, where 1 is no benefit and 5 is substantial benefit, and the mid-point 3 is moderate benefit, how beneficial do you think nanotechnology research will be to our society?



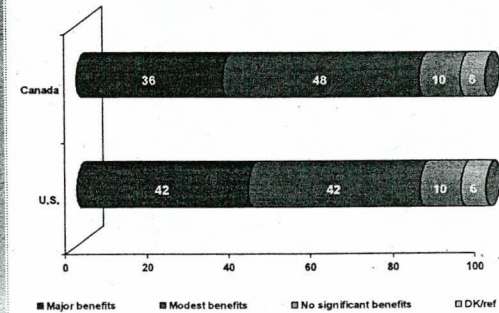
I would like to understand the extent to which you think nanotechnology might pose a risk to our society. Using a scale of 1-5, where 1 is no risk and 5 is substantial risk, with the mid-point 3 being moderate risk, how much risk does nanotechnology pose for our society?



93

Economic Benefits of Nanotechnology

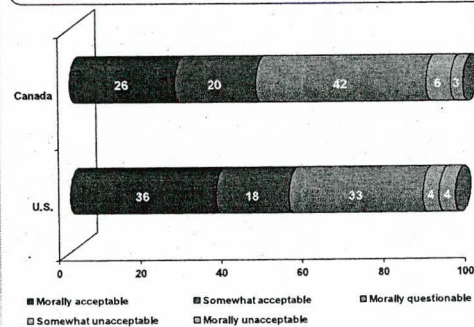
In terms of economic benefits to Canada/the U.S., would you say that nanotechnology will provide major benefits, modest benefits, or no significant benefits?



95

Morality of Nanotechnology

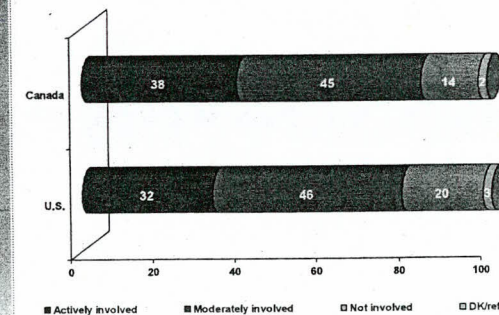
In terms of the moral or ethical aspect of nanotechnology, again using the 1-5 scale, where 1 means that nanotechnology is morally unacceptable and 5 means it is morally acceptable, and the mid-point 3 means it is morally questionable, how do you view this kind of research?



94

Government Involvement in Nanotechnology

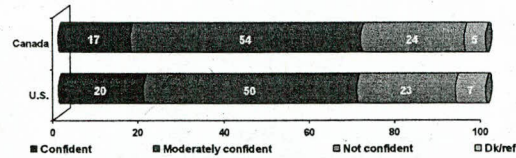
And how involved should the government be in funding nanotechnology research?



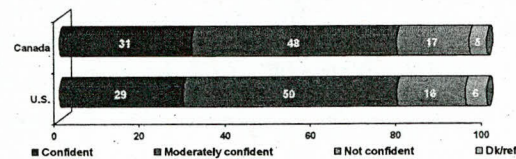
96

Safety of Nanotechnology

On a scale of 1-5, where 1 is not at all confident and 5 is extremely confident, where the mid point 3 is moderately confident, how confident would you say you are in the safety and regulatory approval systems governing nanotechnology?



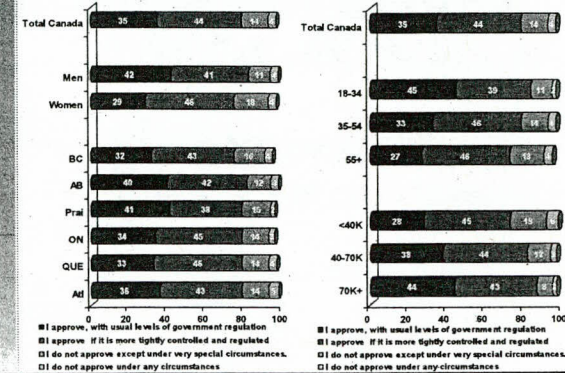
In terms of the scientists who are involved in research of these technologies, on a scale of 1-5, where 1 is not at all confident and 5 is extremely confident, where the mid point 3 is moderately confident, how confident would you say you are that nanotechnology is in safe hands?



97

Approval of Nanotechnology: Canada

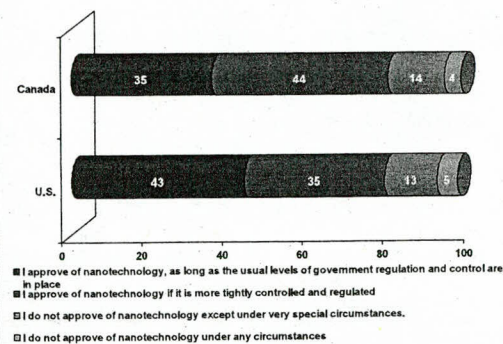
Overall, which of the following best captures your views about nanotechnology?



99

Approval of Nanotechnology

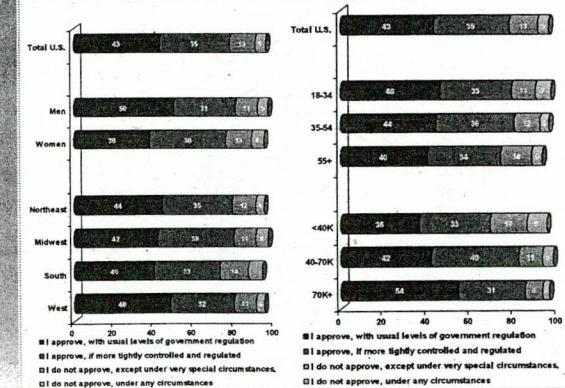
Overall, which of the following best captures your views about nanotechnology?



98

Approval of Nanotechnology: U.S.

Overall, which of the following best captures your views about nanotechnology?



100

Gene Banks/Genetic Research

- Canadians and Americans alike strongly believe that genetic research will play an important role, and a very beneficial role in the future of health research
- Two scenarios involving contribution of individual genetic information to research were tested in the survey, and another two were tested in the focus groups
 - One version involved contributing genetic information only to a genetic research database
 - Another version involved contributing genetic information along with a health history to such a database
 - In groups, a prospective and a retrospective research scenario were tested (a contribution to a general database that would be used for multiple purposes versus one that would be focused on one particular disease)

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Gene Banks/Genetic Research

- Focus groups help to illustrate why those differences were evident in the survey:
 - The main issue regards anonymity
 - Even with assurances about anonymity, people harbour concerns about organizations or institutions, chiefly the insurance industry, gaining access to this information
 - And when a personal health history is connected to genetic information, people feel the risk of anonymity being breached is greater
- With regard to prospective versus retrospective research that was discussed in groups, most people were willing to contribute in both scenarios, but in the retrospective model the willingness was greater
 - Owing to the fact that this research was going to be on a certain specific disease, which gave people greater confidence that the work would serve a purpose they would agree with

103

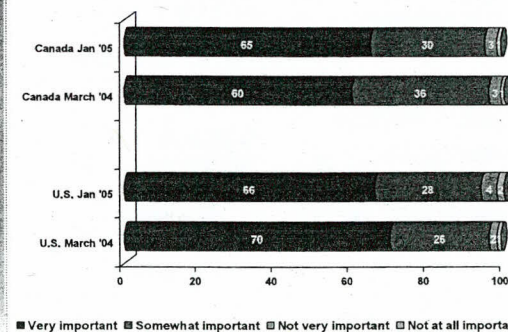
Gene Banks/Genetic Research

- While fairly high numbers of people were somewhat or very likely to contribute their genetic information to research in all the scenarios, there were some significant differences in evidence
 - In the survey, there was greater willingness to contribute genetic information only, without the health history
 - In the focus groups, there was somewhat greater willingness to contribute to retrospective research than prospective research

102

Genetic Information and Health Research

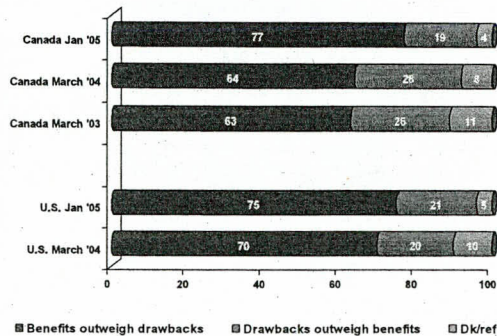
In the future, how important a role do you think genetic information will play in health research in Canada/the U.S.?



104

Benefits Vs. Drawbacks

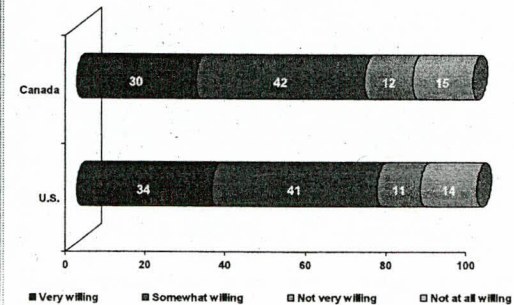
Is it your opinion that the benefits of knowing more about our genetic information outweigh the drawback, or the drawbacks outweigh the benefits?



106

Genetic Testing (2)

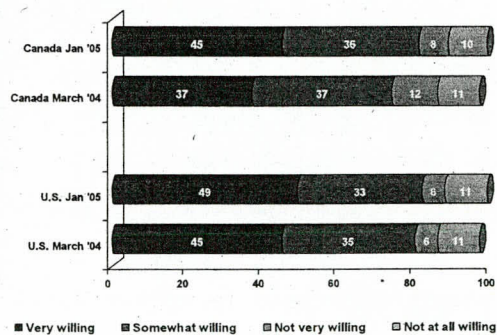
If you were asked to donate a genetic sample and information about your health history to a genebank so that it could be used in health research, would you be very, somewhat, not very or not at all willing to contribute that information, if your identity was made anonymous by stripping it from the database?



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Genetic Testing (1)

If you had a genetic test, would you be very, somewhat, not very or not at all willing to contribute the information to a database that would be used for health research if your identity was stripped from the research database?



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Trust/Social Distance

- One of the most interesting aspects of this research was an investigation of the extent to which people have trust/confidence in different players and institutions that might be involved in research involving emerging technologies
- The research revealed some notable results, some of which were very consistent with past research, and some which were not.
- In terms of sources of information, there was wide variation in the level of trust that people put in different individuals or institutions
 - Some, like scientific journals and the world health organization were assigned a relatively high level of trust
 - Others, like religious leaders, political leaders, and executives of biotechnology companies were assigned a low level of trust
- In focus groups, people indicated that their practice is to source information from range of "credible" sources, and then use that information to form their own opinions
 - With the internet, it is easy to access different points of view
 - And no single group or institution is entirely trusted

109

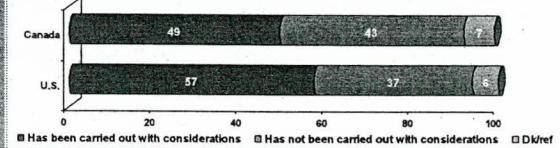
Trust/Social Distance

- One of the most interesting findings in the survey and in the focus groups was that there was generally a greater sense of confidence in the scientists conducting the research than scientists who regulate it
- Focus groups illuminate:
 - The scientists involved in doing the research are generally seen as being the drivers of new ways of helping people, through new treatments and cures
 - Concerns are generally associated with the "Rogue" elements of this community, 5% or fewer who will "push too far"
 - But a high level of respect and admiration and in large part trust in the rest of those doing that work
 - The scientists who regulate seen as being "well-meaning", but not necessarily as capable of ensuring that risks appropriately managed
 - Not as scientifically cutting edge as those developing the products
 - And potentially prone to influence of companies, political leaders

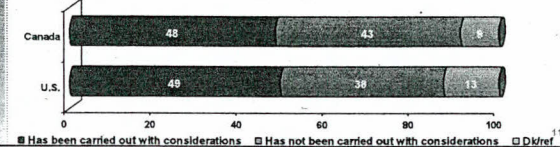
109

Trust/Social Distance

Chose: I believe that BIOTECHNOLOGY research has been carried out in consideration of my interests, values and beliefs, OR I believe that these types of technologies have not been developed in consideration of my interests, values and beliefs



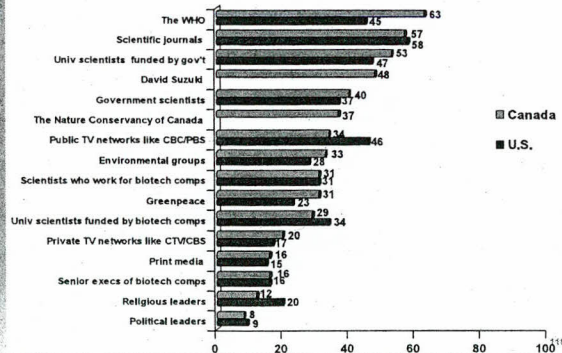
Chose: I believe that NANOTECHNOLOGY research has been carried out in consideration of my interests, values and beliefs, OR I believe that these types of technologies have not been developed in consideration of my interests, values and beliefs



111

Credibility of Sources

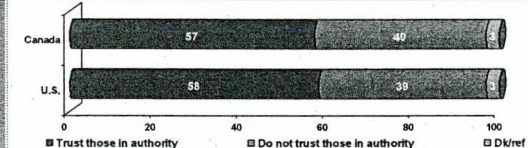
For each of the following, if you were to hear information from them regarding biotechnology, how much would you trust that information to be credible, using a scale of 1-5 where 1 is not at all credible and 5 is extremely credible? How about...? % saying credible (4-5)



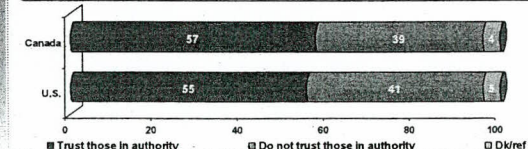
110

Trust in Authorities to Provide Ethics

Chose: I trust that those in authority to ensure that BIOTECHNOLOGY research that takes place in Canada/the U.S. will follow strict ethical guidelines OR I do not trust those in authority to do so



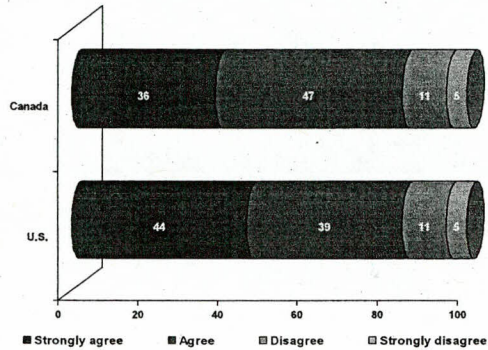
Chose: I trust that those in authority to ensure that NANOTECHNOLOGY research that takes place in Canada/the U.S. will follow strict ethical guidelines OR I do not trust those in authority to do so



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Safety of Biotech: Trust Science?

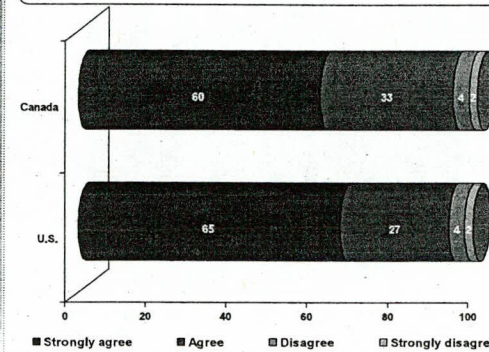
Agree/disagree: If the best available scientific evidence says that a particular use of biotechnology is safe, it should be allowed.



113

Use of Nanotech: People to Decide for Themselves?

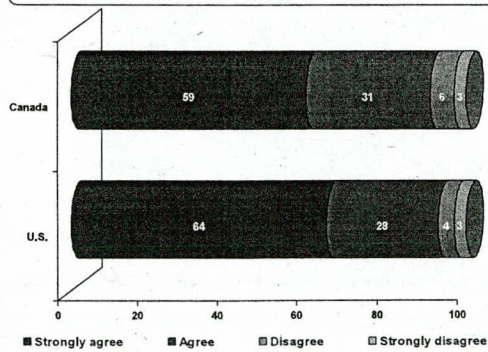
Agree/disagree: Authorities should inform people about nanotechnology and let them decide for themselves whether they want to use products developed using these techniques



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Use of Biotech: People to Decide for Themselves?

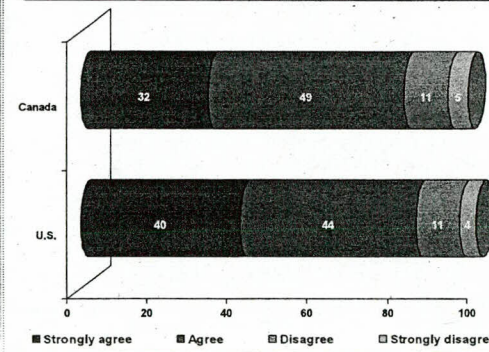
Agree/disagree: Authorities should inform people about biotechnology and let them decide for themselves whether they want to use products developed using these techniques



114

Biotech: Next Frontier?

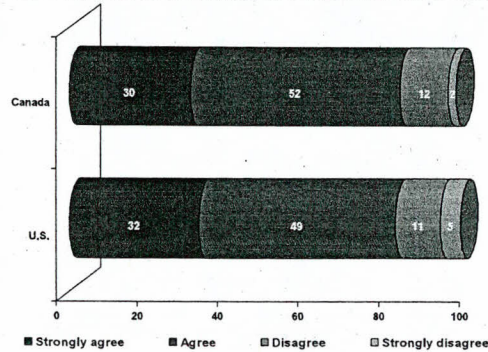
Agree/disagree: Biotechnology research represents the next frontier of human endeavour, a frontier that will lead to significant quality of life benefits for all Canadians/Americans



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Nanotech: Next Frontier?

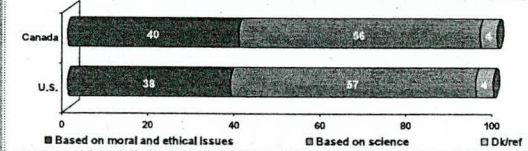
Agree/disagree: Nanotechnology research represents the next frontier of human endeavour, a frontier that will lead to significant quality of life benefits for all Canadians/Americans



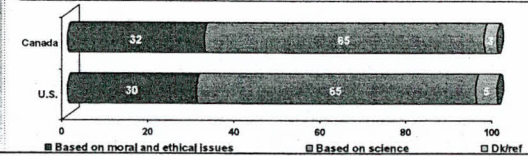
117

Moral and Ethical or Scientific Assessments?

Chose: Decisions about BIOTECHNOLOGY should be based mainly on the moral and ethical issues involved OR decisions about BIOTECHNOLOGY should be based mainly on scientific evidence of risk and benefit



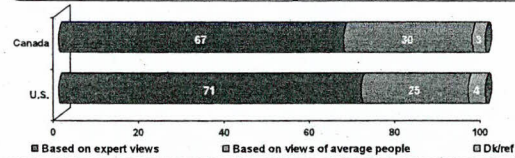
Chose: Decisions about NANOTECHNOLOGY should be based mainly on the moral and ethical issues involved OR decisions about NANOTECHNOLOGY should be based mainly on scientific evidence of risk and benefit



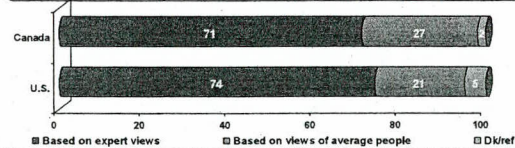
119

Expert Views?

Chose: Decisions about BIOTECHNOLOGY should be based mainly on the views and advice of experts OR decisions about BIOTECHNOLOGY should be based mainly on the views of the average Canadian/American



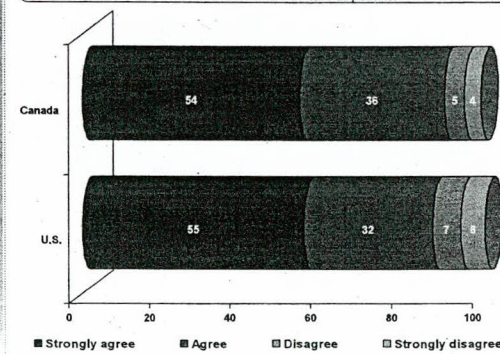
Chose: Decisions about NANOTECHNOLOGY should be based mainly on the views and advice of experts OR decisions about NANOTECHNOLOGY should be based mainly on the views of the average Canadian/American



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Inevitability

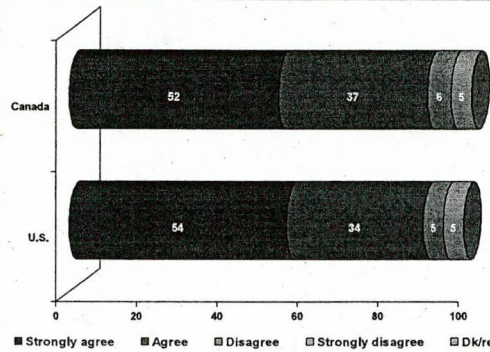
Agree/disagree: Although there may be some unknown risks, technologies like biotechnology are an inevitable part of the future, so all we can do is make sure that its uses are as safe as possible



120

Inevitability

Agree/disagree: Although there may be some unknown risks, technologies like nanotechnology are an inevitable part of the future, so all we can do is make sure that its uses are as safe as possible



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Conclusions

- Most people have a positive orientation toward emerging technologies, as long as the benefits are worth pursuing
 - And the risks can be managed
- That isn't to say that people provide any blanket acceptability about applications
 - GM food is very clearly not seen as being acceptable by many
- But that some of these areas, like stem cell research, pharmacogenetics, nanotechnology all seen as very promising
- Indeed the research indicates that nanotechnology is the area of emerging technology that appears to become the "next big thing"
 - The benefits promised are very appealing
 - People know there are risks, but aren't seen as being significant as in some areas like GM food
 - There are no significant moral issues involved
- There is a clear weakness evident in the regulatory and ethical oversight mechanisms that govern these technologies
 - Particularly in Canada, evident in all of the areas of technology
 - Which leads many to lean toward asking for tighter controls/regulations on the applications as they are being developed

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**#19 – INTERNATIONAL PUBLIC OPINION RESEARCH ON EMERGING
TECHNOLOGIES – CANADA-U.S. SURVEY RESULTS
(2005)**

AVAILABLE DOCUMENTS	
Full report (in Powerpoint)	#19-2005-International POR Emerging Techno Can and US-Powerpoint.pdf

PREPARED FOR / BY	
Prepared for:	
Prepared by (firm):	
Prepared by (authors):	
More information:	

Methodology (quantitative and qualitative)

- Survey in Canada and the U.S.
- Focus groups in Canada and the U.S.

Sample for the survey:

- 2000 cases in Canada; 1200 cases in the U.S.
- margin or error: 2,19% in Canada and 2,81% in the U.S.
- survey conducted in January-February 2005

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Sample for the focus groups:

- 14 groups (in 6 cities) in Canada ; 6 groups (in 3 cities) in the U.S.
- conducted in February-March 2005

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Areas of investigation:

- Awareness and familiarity with emerging technologies
- GM Trees/Genetic Identification and Selection of Trees
- GM Food
- Gene Banks
- Pharmacogenetics
- Stem Cell research
- Nanotechnology
- Public interest and engagement
- Trust and Credibility

MAIN FINDINGS

General attitudes

- Most Canadians and Americans have a very positive orientation toward technology in general
 - Most see it as a positive, virtually none see it as a negative
 - Focus groups reveal that while new technology has downsides and often necessitates change, it has historically proven to provide many benefits to humankind
- Americans tend to be marginally more positively disposed to the idea of “technology” than Canadians are
- General impressions of biotechnology are remarkably consistent in the two countries, with more than 2:1 having a positive view versus a negative view
 - But in both the US and Canada roughly 1 in 6 hold a negative view of biotechnology
- From a demographic perspective, the major differences are very consistent across the two countries
 - Males more favourably oriented, females less so
 - Those who are older, with higher incomes more likely to hold a favourable perspective than those younger, with lower incomes

Conclusions

- It is clear that perceptions of morality and risk have different impacts on the ways in which people assess these technologies
 - For most people they are two separate dimensions
- Moral issues act as a gatekeeping mechanism that determines whether someone broadly supports or opposes the development of a technology
 - It works on a different dimension than risk considerations
- Risk issues are the main driver of regulatory stringency
 - So with a particular technology (like new ways of obtaining stem cells) people may move from being opposed to supportive of the technology, but that doesn't have any bearing on whether they support current or more stringent regulations on that technology
- Most people have a positive orientation toward emerging technologies, as long as the benefits are worth pursuing
 - And the risks can be managed
- That isn't to say that people provide any blanket acceptability about applications
 - GM food is very clearly not seen as being acceptable by many
- But that some of these areas, like stem cell research, pharmacogenetics, nanotechnology all seen as very promising

- Indeed the research indicates that nanotechnology is the area of emerging technology that appears to become the “next big thing”
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