

Aliens, Technology and Freedom: Science Fiction Consumption and Socio-Ethical Attitudes

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Abstract

As we enter the 21st century, we do well to consider the values implicit in science fiction, the principal arena of future speculation in popular culture. This study explored whether consumption of science fiction (SF) is correlated with distinctive socio-ethical views. SF tends to advocate the extension of value and rights to all forms of intelligence, regardless of physical form; enthusiasm for technology; and social and economic libertarianism. This suggests that consumers with these socio-ethical views would be attracted to the SF genre, and that amount of SF consumption would be correlated with adoption of these views.

Groups of respondents involved in medical ethical and environmental issues were surveyed in 1992 (N=278). SF consumption was found, at first-order correlation and controlling for covariates, to be associated with: greater support for extending rights to animal and machine intelligence; greater enthusiasm for technology, and rejection of limits to human endeavors; and greater social libertarianism. SF consumption was not associated with specific views on the cognitively and physically disabled; support for abortion rights; or economic libertarianism.

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Introduction

Contemporary bioethics and environmental ethics are often faced with questions of the value of different kinds of life. These movements argue for greater or lesser value for animals, fetuses, the disabled, the comatose and the cognitively impaired. Opponents of abortion, euthanasia, capital punishment and animal experimentation have all argued that these interventions transgress cognitive barriers, leading down slippery slopes to lessen respect for life in other spheres (Kass, 1973; Devall and Sessions, 1980, 1984; Singer, 1983; Bernardin, 1983; Tobias, 1984; Cleghorn, 1986; Thomasma, 1990; Wagstaff, 1991).

Defenders of these practices, on the other hand, have argued that clear ethical distinctions can be made between animals and humans, fetuses and children, or murderers and citizens. Debate often turns on whether these different kinds of life have the qualities necessary to endow them with value, a "right to life," or citizenship (Bok, 1974; Brody, 1984; Davis, 1986;).

This study seeks to explore if consumption of science fiction is correlated with distinct medical and environmental ethical attitudes towards these anomalous categories of life. Science fiction is one of the few places in popular culture where extreme examples of anomalous life are often considered. In science fiction one finds a great variety of life forms in conflict, communication, and side-by-side in harmonious community. Since the 1960s the latter, pro-alien perspective has become more common in science fiction literature and film. As opposed to the older perspective which saw all forms of non-human life as potential threats, this pro-alien perspective has suggested that new boundaries of community can be established on the grounds of respect for intelligent life in any form. If this is the emergent ethos of science fiction, it would have an elective affinity for specific medical and environmental ethics views which preference cognition over human form as the basis for valuing life.

The study also makes two additional hypotheses about the relationship of the cultural ethos of science fiction to medical and environmental ethics. The first is that science fiction has a generally positive orientation toward technology and human intervention in the "natural order." This "pro-technology" or "anti-Luddite" orientation would create an elective affinity among science fiction consumers for specific views towards medicine and nature.

Secondly, much science fiction has a distinct libertarian orientation, both socially and economically. Again, it is posited that science fiction consumers would have an

elective affinity for libertarian political views, shaping their responses to specific medical and environmental ethics issues.

Hypotheses

A. Extending value and rights to cognition over human form

Faith in the universality of reason, and hence in the fundamental similarity of all intelligent beings, is strongly evident in many accounts of physically exotic aliens... (Stableford, 1993: 18)

Science fiction has treated the biological and cognitive Other with both horror and respect. From Mary Shelley's *Frankenstein* and Wells' (1896) *The Island of Dr. Moreau*, to the thousands of science fiction novels and films about evil brains-in-tanks, mutants, giant insects and aliens, the modern imagination is clearly disturbed by minds and bodies that don't come in an idealized human form.

Yet science fiction since the Sixties has also striven to "humanize" the Other and establish expanded boundaries of civil community (Stableford, 1993). For instance, while the *Planet of the Apes* series projects a future in which humans have been subjugated by simians, it clearly also opposes the human ownership and enslavement of simians by humans, equating it with the enslavement of Africans. Philip K. Dick's (1966) classic *Do Androids Dream of Electric Sheep?*, made into the hit 1980s movie *Blade Runner*, similarly portrays enslaved genetically-engineered humans as dangerous to humanity, but also deserving of citizenship and rights. While *Terminator* portrays self-aware machines as humanity's enemy, *Terminator 2* humanizes the cyborg as humanity's ally. *Alien Nation*, a 1988 movie and subsequent TV series, depicts humanoid aliens joining the melting pot of Los Angeles as just another minority group.

Undoubtedly the most influential science fiction product has been the Star Trek series and its sequelae, and here again alternative forms of life are both threat and ally. The mission of the star ship Enterprise is to discover new forms of life, in particular intelligent life. The forms discovered are not always friendly, but when they are friendly they are clearly welcome in the galactic civilization as equal citizens.

Views of machine-based intelligence in science fiction again show a gradual shift from horror to acceptance. Dangerous automata began to appear in fiction in the early 1800s, and the term "robot," from the Czech for worker, was coined in a 1922 play, and dangerous robots and computers have been a staple of science fiction since the '50s, when the first warehouse-sized calculators pointed to the possibility of a cybernetic future. Usually cybernetic minds were depicted dominating and enslaving humanity, intentionally or accidentally. The confrontation of Hal and the astronauts in Clarke's *2001* continued this tradition.

In the 1950's, however, writers such as Lester Del Rey and Clifford Simak began to depict machine intelligences in sympathetic ways, exploring their possible candidacy for citizenship. But the full implications of cybernetic minds only began to be depicted in the 1960s, as radical science fiction writers extrapolated the human rights struggles of the period into future machine intelligence. Robert Heinlein's (1966) *The Moon is a Harsh Mistress* makes an artificial intelligence an ally in an anarchist revolt. Isaac Asimov's (1968) "Segregationist," equates the effort to deny machine intelligence citizenship with Jim Crow. *Star Trek: The Next Generation*, has also frequently dealt with the rights of machine-based life. In one episode Data successfully defends his claim to "human rights," before a military tribunal. In other episodes, the ship's computer system develops dangerous self-aware personalities, which are nonetheless treated with great respect.

While the science fiction world is clearly populated by visions of the need to defend human boundaries against non-humans, the dominant tendency has been to extend value and citizenship to intelligent non-humans. While science fiction has rarely dealt with abortion and brain-death formally, the logical corollary of extending citizenship to intelligent non-humans is that ethical boundaries should be contingent upon cognition and personhood, and not on human form. This leads to the following hypotheses:

- H1. Science fiction consumption will be correlated with support for abortion rights
- H2. Science fiction consumption will be correlated with greater support for value of physically disabled humans over the value of cognitively disabled humans
- H3. Science fiction consumption will be correlated with greater support for animal rights, and for the rights of higher animals over lower animals
- H4. Science fiction consumption will be correlated with support for the rights of machine intelligence

B. Pro-technology

Like the Romantics before them, genre SF writers have generally been on the side of Faust, convinced that the quest for knowledge was a sacred one, no matter how fondly a jealous God might prefer blind faith. (Stableford and Nichols, 1993: 1203)

Science fiction is usually described as having two broad genres: "hard SF," focused on space travel and few technologies, and "soft SF" focused on future and alternative societies (Slusser and Rabkin, 1986; Bainbridge, 1986). The hard SF genre is broadly technophilic, portraying technology as the answer to any problems that technology might create. The soft SF genre has often offered anti-technological themes, from horrific visions of technology run amuck to pastoralist utopian visions (Yannarella, 1985). Yet in "pastoral writings within genre SF...the joy and triumph of technological rediscovery and redevelopment provide a frequent theme" (Stableford and Nichols, 1993: 1203).

The broad ethos of science fiction has been to embrace technological possibility and reject sacred limits to human intervention in nature. This suggests several hypotheses:

5. Science fiction consumption will be correlated with opposition to bans on technology, genetic engineering and other medical technologies
6. Science fiction consumption will be correlated with use of, and enjoyment of, computers
7. Science fiction consumption will be correlated with rejection of the idea of sacred limits to human endeavor

C. More socially and economically libertarian

As with the Other and with technology, so also has science fiction expressed a gamut of political views from Left to Right to non-political. But the dominant political mood of American science fiction since the 70s has been libertarian of one strain or another. The libertarian mood of science fiction can probably be traced back to the dystopian authoritarian fiction that emerged in response to fascism and communism, such as Huxley (1932) and Orwell (1948), which displaced the earlier statist utopian visions of Bellamy (1888) and Wells (1905). Today, most social speculation in science fiction portrays heroic individualists rebelling against planning and authority. Today's few utopian visions, from both the left and the right, are of libertarian societies (Ross, 1991).

The most prominent right-wing libertarian of the golden age of science fiction is Robert Heinlein, whose many popular novels expressed an explicit social and economic libertarianism, and occasionally a revolutionary anarchism (Heinlein, 1965; Franklin, 1980). In recent years the stalwarts of the right-wing anarchist canon has been L. Neil Smith and Jerry Pournelle. Even the cyberpunk sub-genre, while far less explicit in its politics, often portrays radical individual struggle against the corporations that have displaced nation-states.

On the Left, Ursula K. Le Guin's (1974) *Dispossessed* and Marge Piercy's *Woman on the Edge of Time* (1976) are examples of popular libertarian utopias. More recently Iain Banks' (1987, 1989) Culture series has also portrayed an attractive socialist libertarian society.

Someplace between Left and Right, the Star Trek' series advocates a militant version of liberal society for humans, and liberal tolerance of other species. Respect for the Prime Directive's libertarian principle of non-intervention is carried to the extreme of allowing species to be destroyed by exploding suns, or enslaved by their neighbors. The most vilified foe of the Next Generation series was the collectivist species, the Borg, whose infection with individualism recalled the jeremiads of Ayn Rand. Although a military order, the Starfleet permits a high degree of personal and cultural liberty.

The principal difference between the libertarianism of the Left and the Right has been its focus; while the Left has focused on social and cultural freedom, and assigns the distribution of goods to cooperative administration, the Right has focused on the freedom of the market and individual, while often idealizing patriarchy, heterosexuality and other conservative social values. This study will consequently examine the correlation of science fiction consumption on these two forms of libertarianism, social and economic, separately.

8. Science fiction consumption will be correlated with support for social libertarianism
9. Science fiction consumption will be correlated with support for economic libertarianism

The Sample

The survey sample was selected from national mailing lists of activists and organizations involved in environmentalism and medical ethics. Medical ethicists and environmentalists were chosen as samples because they were presumed to have the most coherent and internally consistent positions on bioethics, at least within their domains. Most people are not very ideological or systematic in their opinions, and their responses to surveys are very sensitive to context and nuance (Converse, 1964; LeBlanc and Merrin, 1977; Conover and Feldman, 1981). Two things predict ideological consistency: higher education and life experiences that have crystallized the issues for the respondent (Krosnick, 1988; Zaller, 1990). People are more consistent about things that they have been thinking about. From higher education and life experience, medical ethicists and environmentalists should have more consistent ideological positions on these issues than the general public.

The survey was mailed out in September 1992 and all surveys were received back by December 1992. The response rate was 56% from the sample of environmentally-related individuals (133 of 238) and 71% from the medical ethics-related individuals (145 of 239).

The environmentalist sample included directors and staff at organizations working for conservation, animal rights, alternative energy, organic farming, population control, vegetarianism, local toxics issues, and a variety of social justice issues, as well as a number of ecologist academics and organizers of local Green party chapters.

The sample of medical ethics-related individuals was composed of about half Ph.D.s in philosophy and related social science and humanities, two dozen students with interests in medical ethics issues, as well as about 20 physicians, ten directors or staff at health policy organizations, a handful of priests and nuns, and several nurses and lawyers. The occupations of the medical ethics-related sample included ethics consultants at hospitals, the directors of academic programs in philosophy, medical ethics or policy, and the staff of lobbies for AIDS funding, national health insurance, drug legalization, senior concerns, alternative medicine, and for and against abortion.

There were no significant difference between the sample groups in education or age: the mean member in both groups was college-educated and 42 years old. But the environmentally-related sample was 50% male, while the medical ethics-related sample was 65% male.

Survey Instrument

The survey instrument was constructed with sets of questions designed to tap traditional political, environmental and medical ethical attitudes. The instrument also included sets of wild card questions aimed at revealing underlying attitude constructs for post-facto scale construction.

Science Fiction Consumption Science fiction consumption was measured by two questions:

Do you ever read novels or watch films based on science fiction themes?

- Never or rarely
- Sometimes
- Often

Do you watch the television show Star Trek: The Next Generation?

- Yes
- No

The two science fiction consumption questions correlated highly ($r = .60$, $\text{sig} < .001$), and were summed into a four-point scale of SF consumption (None, Low, Moderate, High).

Four kinds of life were chosen to measure the respondents' boundaries of the "right to life": disabled newborns, disabled elderly, animals and fetuses.

Mentally and Physically Disabled Newborns Support for euthanasia of disabled newborns was measured by the following series of questions :

Do you believe that parents, consulting with their pediatrician, should be permitted to discontinue medical treatments that may preserve the life of a week-old newborn, if:

- the newborn has a normal brain, but has severe physical deformities that will cause death within several months • Yes • No

- the newborn has a normal brain, but has severe physical deformities that will cause death within several years • Yes • No

- the newborn has a normal brain, but has severe physical deformities that will cause death within twenty years • Yes • No

- the newborn has a normal brain, and will live a normal life span, but has severe and disabling disfigurement of the face, arms and legs • Yes • No

- the newborn has an able brain and body, but has a condition that will cause constant pain for the rest of his or her life • Yes • No

- the newborn has an able body, but has such severe brain damage that s/he will only learn a few words and simple tasks, such as how to feed themselves • Yes • No

- the newborn has an able body, but has such severe brain damage that s/he will never learn any tasks or how to communicate • Yes • No
- the newborn has an able body, but has such severe brain damage that s/he will never wake up, and will always require a feeding tube • Yes • No

Mentally and Physically Disabled Elderly Support for euthanasia of disabled elderly was measured by:

A 70 year-old person, who has not previously expressed an opinion towards whether s/he would want to be kept alive, has fallen into a coma. Should the person's relatives be permitted, in consultation with a doctor, to discontinue medical treatments that may preserve the person's life, if:

- the person may awake from the coma, but has a terminal illness that will cause death within several months • Yes • No
- the person may awake from the coma, but will be paralyzed below the neck for the rest of his or her life • Yes • No
- the person may awake from the coma, but have severe and disabling disfigurement of the face, arms and legs • Yes • No
- the person may awake from the coma, but will be in constant pain for the rest of his or her life • Yes • No
- the person may awake from the coma, but will have such severe brain damage that they will only re-learn a few words and simple tasks, such as how to use a spoon • Yes • No
- the person may open their eyes and move, but have such severe brain damage that they will never re-learn any tasks or how to communicate • Yes • No
- the person will not awake from the coma, and will always require a feeding tube • Yes • No

Both euthanasia question sets were designed to measure reactions to different degrees of cognitive and physical disability. The cognitive disabilities range from severe impairment to permanent coma, reflecting debates about the varying definitions of brain death and personhood (Gervais, 1986). The physical disabilities range from pain, paralysis and disfigurement to terminal illness, reflecting debates about the importance of quality of life.

The two parallel sets of euthanasia questions sets broke down into four principal components: attitudes towards withdrawing treatment from (a) cognitively disabled infants, (b) cognitively disabled elders, (c) physically disabled infants, and (d) physically disabled elders (alphas = .67, .73, .69, and .75 respectively). These sets were merged into four separate scales. The dependent variable was created by subtracting the scores on the two cognitive disabilities scales from the values on the two physical disability scales. This fifth scale, "Cognitive Preference," is intended to measure the degree to which the

respondent preferences the cognitively able, but physically disabled, over the cognitively disabled.

Use of Animals in Medical Experiments Support for animal rights was measured by asking:

Medical researchers often use animals in painful and fatal medical experiments. Please consider the following list of animals and consider whether you believe researchers should be allowed to use this kind of animal in painful and fatal experiments that have a clear benefit to human beings (not cosmetics research, for instance), do not contribute to the extinction of the species, and for which no other animal can be used?

- fish • Yes • No • rats • Yes • No • birds • Yes • No
- cats • Yes • No • chimpanzees • Yes • No • dolphins • Yes • No
- wolves • Yes • No • dogs • Yes • No • bears? • Yes • No

Respondents were also asked to rate their support or opposition to the animal rights movement and vegetarianism, and these two items were strongly intercorrelated with the animal experimentation questions ($\alpha = .85$). Consequently support for these two movements were summed with the number of animals the respondents were willing to protect from experimentation into an animal rights support measure.

Fetal Life Attitudes towards the value of fetal life was measured by a set of questions on support for abortion. These questions were designed to focus on the changing status of the fetus across the three trimesters, a distinction established in the *Roe v. Wade* decision and defended by many ethicists (Bok, 1974; Brody, 1974), rather than focusing on the mother's reasons for the abortion as many surveys have done:

Do you believe that women with unplanned pregnancies should be permitted to have abortions if they want them:

- during the first three months of pregnancy • Yes • No
- during the second three months of pregnancy • Yes • No
- during the last three months of pregnancy • Yes • No

In addition, the respondents were asked whether they supported fetal tissue transplantation, and to rate their support or opposition to the "abortion rights movement" and the "pro-life/anti-abortion movement." As expected, the questions about tolerance for abortion in the different trimesters were intercorrelated with the questions about support

for the abortion rights and anti-abortion movements ($\alpha=.69$), and these were merged into a scale.

Machine Intelligence Attitudes toward machine intelligence were tested by the question:

Do you agree that: • “A computer that thinks like a human being, and is not a threat to humans, should be granted human rights” • Strongly Agree • Agree • Disagree • Strongly Disagree

Technology and Human Interventionism Factor analysis also discovered a strong relationship ($\alpha = .60$) between the three technology-related questions:

Do you agree that: • “Humans should not ‘play God’ through genetic engineering”
• “Humans should stop interfering in Earth's natural processes”
• “Some technologies should be banned”

These were summed into a measure dubbed “pro-technology,” which is also closely related to whether the respondent believes there are limits to human endeavor which must not be transgressed.

Attitudes towards technology were also tapped by two additional measures related to computers. Respondents were asked:

How do you feel about computers?

• Like computers • Indifferent to computers • Dislike computers

How often do you use a computer?

• Never or frequently • A few times a week • A few times a week • Daily

These two questions were correlated ($r = .48$, $\text{sig} < .001$) and summed into a “pro-computers” measure.

Social and Economic Libertarianism Factor analysis also revealed two underlying scales political attitude scales: social libertarianism and economic libertarianism. The component questions that were summed to construct the two variables are shown below in Table 1.

Table 1: Social and Economic Libertarianism Scales

Social Libertarianism Scale	Economic Libertarianism Scale
<ul style="list-style-type: none"> • lack of Christian religiosity • support for drug legalization • support for homosexuals' use of reproductive technologies <p style="text-align: right;">alpha = .63</p>	<ul style="list-style-type: none"> • opposition to the trade union movement • opposition to national health insurance • disagreement that "the rich are getting richer and the poor poorer" • disagreement that "the wealthy control America" <p style="text-align: right;">alpha = .78</p>

Analysis

The SF consumption measure produces four groups who vary in their demographics, as shown below in Table 2:

Table 2: Demographics of the SF Consumer Groups

SF Consumer Group	N	Percent from Environ. Sample	Percent Male	Mean Age
None	85	35%	49%	47
Low	82	41%	55%	44
Moderate	49	24%	61%	41
High	61	25%	70%	37
<i>ANOVA</i>	---	not sig.	not sig.	sig. < .0001

SF consumers are more likely to be male, and from the medical, rather than environmental, sample, though neither of these trends are significant. The SF consumers are, however, significantly younger.

At the level of first order correlations, shown below in Table 3, only some of the hypotheses are confirmed. SF consumption is not correlated with "Cognitive Preference," the variable measuring the degree of preference given to the physically disabled over the mentally disabled, nor with any of the four subsets of euthanasia questions that comprise this variable. SF consumers are also not more likely to support for abortion rights or be economically libertarian.

But there is strong support for the other hypotheses. SF consumption is correlated strongly with willingness to accord rights to machine intelligence and to animals. SF consumption is also correlated with the use and enjoyment of computers, and with the rejection of limits on humanity's technological innovation. SF consumers are also more socially liberal.

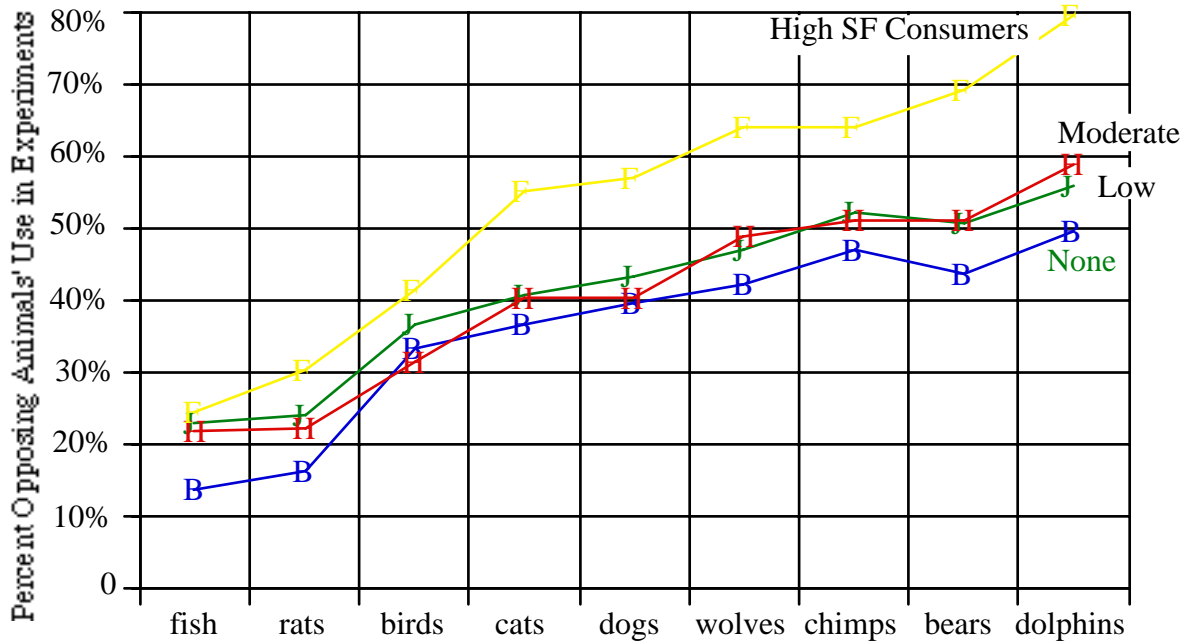
Table 3: Correlation Matrix of Attitude Scales

	SF Consumption	Cognitive Preference	Pro-Animal Rights	Pro-Abortion Rights	Pro-Machine Intelligence	Pro-Technology	Pro-Computers	Social Libertarianism	Economic Libertarianism
SF Consumption		-.06	.14*	.04	.41**	.26**	.20**	.18**	.08
Cognitive Preference	-.06		.14*	-.00	-.05	-.10	.03	.08	-.00
Pro-Animal Rights	.14*	.14*		-.04	-.04	-.47***	-.09	.14*	-.26**
Pro-Abortion Rights	.04	-.00	-.04		.04	.11	.00	.58***	-.29**
Support for Machine Intelligence	.41**	-.05	-.04	.04		.30**	.10	.28**	.16*
Pro-Technology	.26**	-.10	-.47***	.11	.30**		.19**	.15*	.25**
Pro-Computers	.20**	.03	-.09	.00	.10	.19**		.00	.11
Social Libertarianism	.18**	.08	.14*	.58***	.28**	.15*	.00		-.30**
Economic Libertarianism	.08	-.00	-.26**	-.29**	.16*	.25**	.11	-.30**	

* p <.05 **p<.01 ***p<.001 Pair-wise Ns vary between 248 and 270.

While the hypothesis that SF consumption would be correlated with cognitive preference is not confirmed for the euthanasia-related questions, there is strong support for the hypothesis in the pattern of the animal experimentation responses. As shown below in Figure 1, the High consumers of SF have a steeper slope in their attribution of rights to animals across the spectrum of sentience from fish to dolphins.

Figure 1: Science Fiction Consumption and Animal Rights



Since the SF consumers have distinct demographic characteristics there is the possibility that these are the underlying reason for their distinctive attitudes. There is also the possibility that one or a combination of the attitudes measured here may explain the values of the SF consumers better than their SF consumption. In other words, SF consumers may be no more supportive of abortion than other social liberals.

In order to test these alternative explanations for the correlation SF consumption with attitudes regression models were tested with the attitude scales as the dependent variables, and age, gender, sample group, and likely attitude scales included as independent variables along with SF consumption. The best fit ordinary least squares regression models are shown below in Table 4, with the standardized Betas in parentheses.

Table 4: Best-Fit Regression Models on the Attitude Scales

	Cognitive Preference	Pro-Animal Rights	Pro-Abortion Rights	Pro-Machine Intelligence	Pro-Technology	Pro-Computers	Social Libertarianism	Economic Libertarianism
N	245	235	219	238	251	251	240	236
R ²	.02	.31	.37	.32	.22	.14	.13	.14
	Environ. Sample (.15*)	Pro-Technol. (-.51***)	Social Libertar. (.55***)	SF Cons. (.30***)	Environ. Sample (-.29***)	Age (-.33***)	Economic Libertar. (-.32***)	Social Libertar. (-.33***)

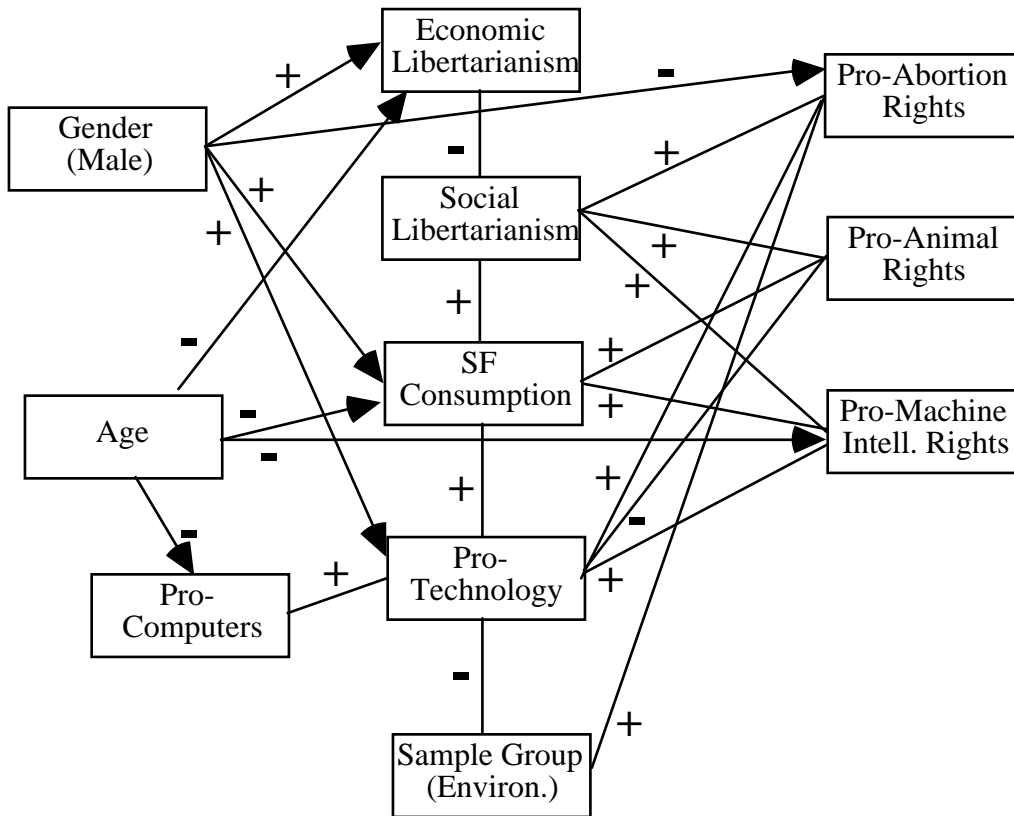
	SF Cons. (.25***)	Environ. Sample (.14*)	Pro- Technol. (.22***)	Male (.23***)	Pro- Technol. (.19***)	SF Cons. (.20***)	Male (.19**)
	Social Libertar. (.15**)	Male (-.14*)	Social Libertar. (.18*)	SF Cons. (.19***)			Age (-.14*)
		Pro- Technol. (.12*)	Age (-.18*)				

* p <.05 **p<.01 ***p<.001

Most of the first order correlations of SF consumption and attitudes are sustained in these regression models. Controlling for their demographics and related attitudes, SF consumers are still more supportive of extending rights to animals and machine intelligences; more likely to reject limits to human technological endeavors; and more socially libertarian. Controlling for age and technological orientation, however, SF consumers are not more likely to use and enjoy using computers.

The resulting model is shown in Figure 2 below. Causation is only imputed for age and gender since membership in the sample groups, SF consumption, and many of the attitudes are probably mutually causative.

Figure 2: A Model of SF Consumption and Attitudes



Discussion and Conclusions

Cognitive Preference As hypothesized, at least for these samples, SF consumption is correlated with consistent attitudes towards the extension of value and rights to animal and machine intelligence. On the other hand, SF consumption was not associated with distinctive attitudes towards fetal life, or the protection of cognitively or physically disabled newborns or elders.

Another way of casting this finding is that SF consumers were more likely to extend value and rights to cognitively worthy Others, than to withdraw value and rights from cognitively unworthy human beings. Given the frequent overlap of futurism and eugenics before the Second World War, this is an optimistic finding.

Technology Also as hypothesized, SF consumers were distinctly more enthusiastic about human technology, and dismissive of limits to human endeavors. Although SF consumers are also more likely to use and enjoy using computers, this is SF consumers are also younger, and younger people are more likely to use and enjoy computers.

Libertarianism Again as hypothesized, SF consumers were more socially libertarian, although they were not more economically libertarian.

Caveats The principal caveat of this study is that the survey respondents are a very unusual set of Americans. The sub-genres of SF consumed by these respondents may differ in important ways from the genres consumed by a more representative sample of SF consumers. Also the effects of SF consumption on respondents actively engaged in the medical ethics and environmental communities may be quite different from the effects on the general population.

Conclusions With these reservations in mind, this study nonetheless suggests that SF speculations about humanity's future reflects distinct values for the kind of humanity we should become.

It is a humanity which rejects taboos on technology and "boldly goes where no one has gone before." While many SF themes are critical of future trends, and the effects of technology, the SF dominant values are those of Faust and not those of Ned Ludd.

It is also a humanity which extends respect to the Other, regardless of its form, and yet does not denigrate cognitively-impaired humans. And it is a humanity with expanded personal liberty, and yet not necessarily more economically unequal and Hobbesian. In this respect SF culture reflects and extolls the values of liberal democracy, expanding the circle of citizenship and defending civil freedom.

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