

# THE Generation X Report

A Quarterly Research Report from the Longitudinal Study of American Youth

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## Climate Change: Generation X Attitudes, Interest, and Understanding

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THE CURRENT DEBATE IN THE UNITED STATES AND COUNTRIES THROUGHOUT THE WORLD ON CLIMATE CHANGE IS SYMPTOMATIC OF OUR TIME. The issue of climate change emerged from the concerns of scientists about changes they were observing in our planetary ecosystem. As climate scientists observed the shrinking of the polar ice caps and related systemic changes, they became more concerned and – after several years of study – concluded that the responsibility for these changes rested with the increasing use of fossil fuels worldwide – the burning of coal and oil and the release of resulting gases into the atmosphere. A substantial majority of scientists throughout the world accept this conclusion. A new report from the National Academy of Science in the United States re-emphasized the support of the scientific community for this view (NRC, 2011)

Climate change is unlike almost any other issue that has found its way into the public arena in our history. It did not emerge from the concerns of citizens about a problem immediately influencing their life – a viral epidemic or urban air pollution or unemployment. Individuals experience weather, but the climate issue concerns changes in atmospheric and environmental conditions over hundreds of years. If the concerns of climate scientists are correct, few members of Generation X will live long enough to experience dire consequences from climate change personally. But their children and grandchildren will experience serious consequences. It is an unusual issue in that the current generation of Americans (and citizens of other countries) is being asked to make changes in their energy use and other consumption patterns for the benefit of future generations.

Climate change is a complex issue that requires some understanding of several scientific ideas and depends on some level of understanding of long-term systemic change. Other science-related issues – influenza or cancer, for example – are complex and many Americans of all generations acquire some level of understanding about these issues and depend to some extent on the advice of medical and health professionals. But few Americans know a climate expert – the equivalent of their physician for a medical problem – and must obtain their understanding of the issue from their own educational backgrounds, from the media, and from friends and family who may be knowledgeable or informed about the climate issue. But Generation X is the most scientifically literate and best educated generation in American history and it is important to inquire about how closely the young adults in Generation X are following this issue, what they know about it, and what they think ought to be done about the issue.

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## WHO IS CONCERNED ABOUT CLIMATE CHANGE?

In a series of annual surveys, the Longitudinal Study of American Youth (LSAY) has asked a national sample of Generation X young adults about their awareness and concern about climate change and about how they follow the issue and make sense of the competing arguments. This research report will summarize our findings about these issues.

Immediately after the 2008 presidential election, each LSAY participant was asked about

their level of interest in a set of public policy issues, ranging from foreign policy to local school issues in their community. As a part of this set of questions, LSAY young adults were asked about their level of interest in “issues about climate change” and 28% reported that they were very interested in climate change issues. Fifty-five percent of LSAY participants said that they were moderately interested in climate issues, and 17% said they were not interested in the climate issue. Comparatively, 57% of LSAY young adults were very interested in business and economic issues, 57% in local school issues, and 25% in foreign policy issues. It should not be surprising that young adults are more interested in economic issues and the schools that their children may attend than less immediate issues such as foreign policy or climate change, but it is important to note that nearly three in 10 of these young adults were very interested in the issue in the midst of a presidential campaign that focused more on economic issues than climate or environmental issues.

In the 2009 annual survey, LSAY participants were asked how closely they were following the climate change issue and only four percent claimed to follow the issue “very closely.” An additional 18% indicated that they followed the climate change issue moderately closely (see Table 1). Nearly half of the LSAY young adults reported that they paid little or no attention to this issue.

Two years later, in the 2011 survey, LSAY participants were asked the same questions again and they reported a lower level of interest and attention. In 2011, only two percent of LSAY young adults claimed to follow the climate issue closely and only 14% said that they followed it moderately closely. And slightly more than half of the

respondents indicated that they paid little or no attention to the climate issue. Although these differences are small, they are statistically significant given the number of respondents in the two surveys.

## WHY ARE YOUNG ADULTS RELATIVELY UNINTERESTED IN THE CLIMATE ISSUE?

There is no clear and simple answer to this question. To some extent, public interest in any specific issue is always relative to the other issues competing for attention at the same time. In the months after the attack on the World Trade Center in 2001, many adults turned their attention to terrorism and paid less attention to domestic or environmental issues. The economic crisis triggered by the Great Recession in 2008 caused many adults to focus on economic issues.

Some observers of public attitudes point to issue fatigue, arguing that many adults have a limited attention span for public policy issues and tend to grow tired of the same issues if they persist over a number of years. This argument was made in regard to the public reaction to both the Vietnam War and the Iraq War and it may be applicable to a long-term issue such as climate change. And it is possible that issue fatigue may be especially applicable to complex issues.

It is possible to explore some of these explanations by looking at other sets of questions and responses collected by the LSAY.

**Interest versus concern.** For some issues (taxes or foreign policy, for example), it is best to ask individuals about their level of interest and the LSAY has asked its participants about their interest in numerous issues over the years. For other issues such as climate change or epidemics, it may be more appropriate to ask about individuals’ concern about the issue. The LSAY asked about the level of concern about climate change issues in both the 2009 and 2011 annual surveys. It is useful to compare the results.

**Table 1: Concern and Sense of Understanding of Climate Issues: 2009, 2011.**

		Climate change issue	
		2009	2011
How closely do you follow climate change?	Very closely	4%	2%
	Moderately closely	18	14
	Occasionally	32	33
	Not closely	45	51
Level of concern	High concern (8-10)	23	22
	Moderate concern (5-7)	39	42
	Less concern (0-4)	38	37
Level of Issue Understanding	Well informed (8-10)	16	11
	Moderately informed (5-7)	42	47
	Less well informed (0-4)	42	42
Number of respondents each year		3,074	2,914

Slightly more than 20% of Generation X young adults indicated a high level of concern about climate changes in both 2009 and 2011 (see Table 1). About 40% reported a moderate level of concern and slightly less than 40% expressed lower levels of concern. These results suggest that approximately one in five Generation X young adults are concerned about climate issues and that the level of concern has not increased or decreased significantly over the last few years. This is a slightly different picture than the previous interest questions.

**Understanding and complexity.** A second set of questions asked each young adult in the LSAY to indicate how well informed they feel about the climate issue on a zero-to-10 scale, with zero indicating the lowest level of understanding and 10 representing a feeling of being very well informed. Using this metric, the results indicate that the percentage of young adults who feel well informed about the climate issue declined from 16% in 2009 to 11% in 2011 (see Table 1). This is a statistically significant decline.

We can gain some insight into this process by looking at the responses of LSAY young adults to a series of policy-related attitude and knowledge related questions included in the 2011 annual survey. One question (frequently used in other national surveys) asked participants to agree or disagree with the statement “If the present rate of coal and oil use continues, serious long-term damage will occur.” One in four Generation X young adults strongly agreed with the statement and three percent strongly disagreed with it (see Table 2). Seventy percent of young adults expressed mixed feelings about the statement and 38% indicated that they either had no opinion about the statement or did not understand it well enough to offer an answer. This statement is a core argument in the climate change debate and a majority of Generation X young adults indicated a good deal of uncertainty about it.

Respondents were also asked to indicate their agreement or

**Table 2: The Attitudes of Generation X on Climate Issues, 2011.**

	Disagree			Agree	
	0-1	2-3	4-5-6	7-8	9-10
If the present rate of coal and oil use continues, serious long-term environmental damage will occur.	3%	6%	38%	27%	26%
We are already in the first stages of global warming and climate change	9	8	48	21	14
The primary human activity that causes global warming is the burning of fossil fuels such as coal and oil.	7	8	52	22	11
In the next 20 years, the conversion of green plants into fuels will significantly reduce our dependence on gas and oil.	6	9	56	20	9
There is not enough scientific evidence to support claims that the Earth is getting warmer.	19	15	46	11	9
All tabulations are based on 2,924 responses. * Individuals responding that they were not sure about any statement were assigned a value of 5 and placed in the middle group.					

disagreement with the statement “We are in the first stages of global warming and climate change” using the same zero-to-10 scale. Only 14% of LSAY young adults expressed strong agreement with the statement and nine percent disagreed with the statement strongly (see Table 2). Three of four young adults indicated mixed feelings about the statement and nearly half said that they had no opinion about the statement or that they did not know enough about it to offer an answer.

A third statement – The primary human activity that causes global warming is the burning of fossil fuels such as coal and oil – produced a similar set of responses. Eleven percent of LSAY young adults strongly agreed with the statement and seven percent strongly disagreed. Over 80% of Generation X young adults expressed some degree of ambivalence about the statement and more than half were unable to take a position in regard to the statement.

A fourth statement – There is not enough scientific evidence to support claims that the Earth is getting warmer – was worded in the opposite direction and produced a similar response (see Table 2). Nineteen percent of young adults in the LSAY strongly rejected the statement and nine percent strongly agreed with it. The 72% of respondents in the middle expressed varying degrees of uncertainty about the statement.

These results indicate that the complexity of the arguments about climate change has fostered a good deal of uncertainty among Generation X young adults. In recent years, numerous energy companies have initiated national television advertising campaigns to question the arguments of climate scientists and to suggest that continued and expanded fossil fuel use is necessary to provide jobs and economic growth. Reports from the National Academy of Science and similar scientific institutions have argued that climate change is real and that its long-term consequences are serious. These data indicate that the young adults in Generation X who will have to deal with these issues during the remaining decades of their lives are genuinely conflicted on the issue.

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**The Concept of Six Publics.** A number of social scientists have studied public attitudes toward and understanding of climate attitudes in recent years, and a recent classification of adults into six publics is a helpful tool for thinking about these results. Anthony Leiserowitz (from Yale University) and Ed Maibach and Connie Roser-Renouf (from George Mason University) have used a set of questions to divide American adults into six groups (Leiserowitz, 2005; Leiserowitz, Maibach, & Roser-Renouf, 2009) that they have labeled:

**The Alarmed** (Global warming is very important to them and they are worried about it, feel that they are well-informed about it, and are unlikely to change their minds.)

**The Concerned** (Convinced that global warming is happening, they are less certain than the Alarmed and are moderately well-informed about the issue.)

**The Cautious** (Tend to think that global warming is happening, but are not certain; have thought about the issue some, but not extensively; do not worry about it.)

**The Disengaged** (Are not sure that global warming is happening, have given little thought to it, know little about it, recognize that the consequences are decades away.)

**The Doubtful** (Do not know about global warming; say the issue is not important to them personally and are not worried about it; have little information about the issue).

**The Dismissive** (Are sure that global warming is not happening; say that the issue is not important to them, but they have given some thought to it and know some of the arguments.)

Social scientists refer to the construction of these classifications as typology building and they provide a useful framework for summarizing large numbers of responses to separate questions. Using the same structure as Leiserowitz and Maibach, the responses from the 2011 LSAY survey were used to estimate the proportion of Generation X young adults falling into each of these six categories.

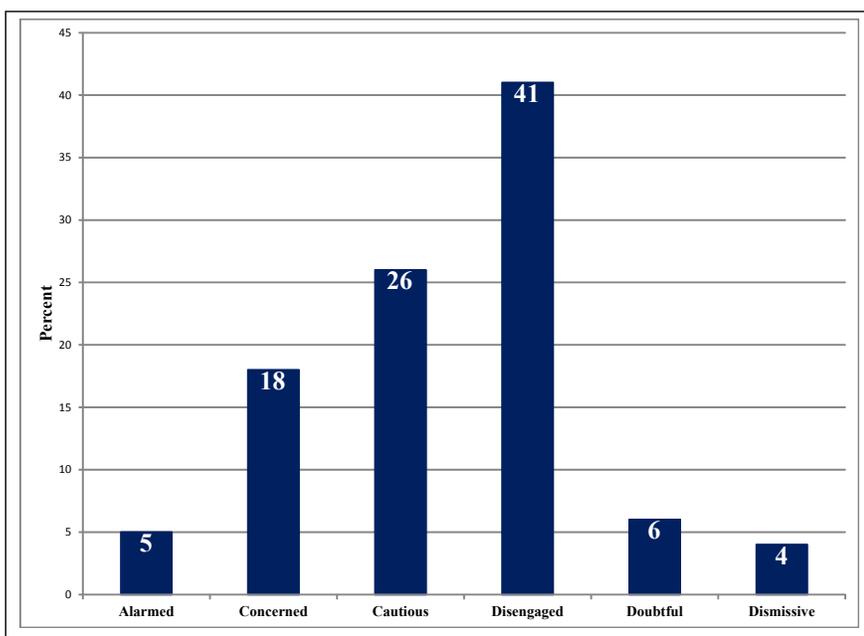
Five percent of LSAY young adults are alarmed about climate change and 18% are concerned (see Figure 1 and Table 3). A quarter of Generation X young adults are cautious about the climate issue and 41% are disengaged. This is consistent with the responses to the individual questions noted above. Six percent of young adults are doubtful about climate change and four percent are dismissive, in the terms used by Leiserowitz and his colleagues.

This is an interesting and unexpected profile. Within Generation X, five percent are alarmed and committed to the climate issue and, with some portion of the 18% who are concerned, provide the leadership on this issue. A smaller group – about 10% who are dismissive or doubtful – reject the seriousness of the climate issue and seek to influence their friends and family as do those who are alarmed and concerned. In between these two poles, two out of three Generation X young adults are disengaged or cautiously on the sideline. Few issues engage a solid majority of adults in our busy and pluralistic society, but the climate issue appears to attract fewer committed activists (on either side) than we would have expected.

### WHO ARE THE ACTIVISTS ON THE CLIMATE ISSUE?

Apart from the numbers of young adults engaged, it is important to understand the factors that make this issue important to some individuals and unimportant to others. The 25-year record of the LSAY provides a wealth of information about the factors that might encourage an individual to become alarmed or concerned about climate change, or to dismiss it. Our previous data explorations provide some useful clues.

First, we would expect that young adults with more formal education may be more engaged with the climate issue. The issue emerged from scientific concerns and its complexity and scope – hundreds of years – may favor individuals who have had more experience thinking about abstract long-term issues and problems. An examination of the distribution of the six climate publics by the level of education completed indicates that better educated young adults tend to be more alarmed and concerned about climate change than other young adults (see Table 3). At the same time, the distribution of the six publics suggests that individuals who are dismissive or doubtful are also well-educated. Young adults with the least formal education were more likely to be disengaged from the climate issue.



**Figure 1: Six Publics for Climate Change, LSAY, 2011.**

**Table 3: Attitude to Climate Change by Major Groups, 2011.**

	Climate Attitude						N*
	Dismissive	Doubtful	Disengaged	Cautious	Concerned	Alarmed	
<b>All LSAY Young Adults</b>	4%	6%	41%	26%	18%	5%	2,924
<b>Education</b>							
Did not complete high school	1	1	60	21	12	5	85
HS diploma or GED	4	5	45	27	17	2	1,248
Associate degree	6	6	41	33	11	3	233
Baccalaureate	5	7	37	24	21	7	835
Masters	4	6	32	26	21	10	376
Doctorate or professional degree	6	7	23	23	23	18	143
<b>Minor children at home</b>							
No minor children at home	4	6	36	28	18	9	792
One or more minor children at home	5	6	42	26	18	4	2,124
<b>Scientific Literacy Score</b>							
0 to 49 (Low)	2	4	56	26	11	1	483
50 to 69	5	5	44	28	16	2	1,003
70 to 89	4	8	34	25	21	8	875
90 to 100 (High)	6	6	15	24	34	15	292
<b>Political partisanship</b>							
Conservative Republican	10	12	42	26	10	0	531
Moderate or Liberal Republican	5	5	44	25	20	1	269
Conservative Nonpartisan	11	11	43	25	10	0	229
Moderate Nonpartisan	2	4	45	28	18	3	695
Liberal Nonpartisan	0	3	32	21	28	16	160
Moderate/Conservative Democrat	1	1	45	27	23	3	406
Liberal Democrat	1	4	24	23	27	21	339
* The number of respondents in each row.							

Second, given the greater anticipated impact of climate change on future generations, we might expect that the parents of minor children would be more concerned about climate change than young adults without minor children. Not so. Generation

X young adults without minor children at home were slightly more alarmed about climate change than were the parents of minor children. The difference is small, but it is in the opposite direction than expected.

Third, over the last 50 years, Americans who have experienced college-level science courses have been more likely to become and remain

scientifically literate (Miller, 1998, 2000, 2010a, 2010b, 2010c). The United States is the only major nation that requires all of its college and university students to complete a year of college-level science courses as a part of a general education requirement and it is reasonable to expect that some of the difference observed in regard to educational attainment reflects this factor. But we can test that idea directly using data from the LSAY.

At several points in the LSAY, participants have been asked to complete science knowledge tests – most recently in the 2008 annual survey. From these responses, we can compute a measure of civic scientific literacy – the kind of science that a citizen needs to make sense of science-based policy issues and disputes. The Index of Civic Scientific Literacy ranges from zero to 100 and an examination of the distribution of the six publics within each level of scientific literacy demonstrates the influence of scientific understanding on making sense of the climate issue (see Table 3). Young adults who scored 90 or above on the Index were significantly more likely to be alarmed or concerned about climate change, although 12% of this group were either dismissive or doubtful. More than half of LSAY participants who scored below 50 were disengaged from the climate issue.

Finally, the United States has an ideologically polarized political system. Over the last 50 years, American political parties have changed from broad regional and occupational groupings

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## HOW DO GENERATION X YOUNG ADULTS KEEP UP WITH THE CLIMATE CHANGE ISSUE?

The inherent complexities and the continuing debate over the seriousness and timing of global warming and climate change point to a problem that Generation X young adults will face throughout their lives. From the preceding discussion of civic scientific literacy, it is clear that young adults who have been fortunate enough to attend college and take some college science courses have an advantage in making sense of emerging scientific issues such as climate change. Although college science courses taken 15 years ago provide an important foundation for making sense of new issues, it is clear that young adults who want to stay abreast of an issue like climate change will need to continue to obtain additional information to update their understanding.

In both the 2009 and 2011 annual surveys, LSAY participants were asked to indicate how often they engaged in various kinds of information acquisition relevant to climate change. Decades of research have shown that adults utilize a variety of sources to become aware of new developments, to merge new information into previous understandings, and to resolve conflicts and misunderstandings related to new information. The results of the 2009 and 2011 LSAY annual surveys confirm this model of adult learning.

LSAY young adults reported an average of 11 climate information acquisition activities per month in both 2009 and 2011 (see Table 4). New information was obtained from a combination of three online and two-and-a-half broadcast media sources each

without a coherent ideology into two parties with clear ideological divisions. The journalistic reference to red states and blue states reflects the reality of a nation that is nearly evenly divided along ideological partisan lines. One of the inevitable results of this process is that issues that might have been decided outside of partisan politics in earlier generations are now a part of an increasingly broad ideological divide. In the last 20 years, as the climate issue has developed and gained visibility in the news media, it has become a part of the partisan divide. The leadership of the Democratic Party has tended to accept the seriousness of climate change and the leadership of the Republican Party has tended to express doubts about the seriousness of the issue or to dismiss it. The data from the LSAY provides an opportunity to examine the partisan basis of the distribution of climate publics in Generation X.

The results show that nearly half of Liberal Democrats are alarmed or concerned about climate change and 26% of Moderate or Conservative Democrats share that sense of alarm and concern (see Table 3). At the other end of the political spectrum, 22% of Conservative Republicans dismiss or doubt the importance of the climate issue. Many Republicans have doubts about the issue or have disengaged from it entirely. There are clearly overlapping levels of concern among partisans of both political parties, but for some individuals, partisan loyalties may be helpful in making sense of an otherwise complicated issue.

**Table 4: Information Acquisition Activities related to Climate Issues: 2009, 2011.**

Information Acquisition Activity		2009		2011	
Talk	Talk to friends or co-workers	1.8	3.6	2.1	4.0
	Talk to other family members	1.7		1.8	
	Attend lecture about ...	0.1		0.1	
Read	Read newspaper/magazine	1.5	1.6	1.5	1.6
	Read book about ...	0.1		0.1	
Broadcast	Watch television show about	1.5	2.7	1.4	2.3
	Listen to radio show about ...	1.2		0.9	
Online	Found info on the Internet	1.7	2.8	1.6	2.9
	Searched Google, Yahoo, ...	0.6		0.7	
	Read blog about ...	0.2		0.3	
	Posted on blog about ...	0.1		0.1	
	Printed/downloaded info	0.2		0.2	
Special	Learned about ... at museum	0.1	0.2	0.2	0.3
	Found info at public library	0.1		0.1	
Total information acquisition activities		10.5		11.1	
Number of respondents each year		3,058		2,913	
Cell entries are the mean number of times each activity occurred in the previous month.					

month along with one or more newspaper or magazine articles. Previous research would suggest that most individuals first hear about new information from a newspaper or magazine article or a television show and that they subsequently obtain additional information from online sources. Often, an individual who has acquired some new information or an expanded understanding of a previous idea will then talk about it to friends, family, and co-workers and use those conversations to test his or her understanding of the new information. The four conversations each month with other adults about climate issues suggests that many individuals feel a need for conversations and discussions with other individuals to sort out the meaning of conflicting arguments on the issue.

These results indicate they Generation X young adults are comfortable using a combination of information sources on a complex issue to update their formal education and prior understandings. The gradual increase in the number of online sources and interpersonal conversations suggests a steady integration of new information technologies into traditional adult learning patterns.

### **CLIMATE CHANGE AS AN ISSUE AND AS A SYMBOL OF THE POLITICS OF THE 21ST CENTURY**

This research report focused on the climate change issue and we found that small segments of Generation X are actively engaged with this issue – more in support of the issue than opposed. But it is clear that climate change is a complex issue and many young adults do not see it as an immediate problem that they need to address. The results suggest that better educated young adults are more likely to recognize the importance of the problem, but that there is a broad awareness of the issue and that many young adults prefer to focus on more immediate issues – jobs and schools for their children – than the needs of the next generation. These results will not give great comfort to either those deeply concerned about climate issues or those who are dismissive of the issue. And these results are not comforting to those of us who worry about the health of American democracy in the 21<sup>st</sup> century.

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In several important ways, the climate change issue is symbolic of the kinds of political issues that will increasingly dominate the national agenda in this century. In previous reports we have looked at attitudes toward and understanding of issues such as influenza and viral epidemics and genetically modified foods. These issues – along with stem cell research, nuclear power, nanotechnology, genetic medicine, and new issues yet to reach the public agenda – will often require some level of scientific or technical understanding. In many cases, they will be long-term and systemic. They will not have short-term solutions and may require citizens to deal with an issue over decades rather than years. These are the kinds of political challenges with which we have had little experience. If our LSAY participants will continue to talk with us through our periodic questionnaires in the years ahead, we may be able to improve our understanding of life in the 21<sup>st</sup> century and of the challenges and achievements of Generation X.

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# A Brief History of the LSAY

Today, the Longitudinal Study of American Youth (LSAY) is the longest and most comprehensive longitudinal study of a national sample of public school students ever conducted in the United States.

To provide a more intensive longitudinal examination of the development of student achievement in middle school and high school (and the relationship of those patterns to career choices), the National Science Foundation (NSF) funded the LSAY in 1986. After a year of pilot testing of instruments, the LSAY began collecting data from a national sample of 7<sup>th</sup> and 10<sup>th</sup> grade students in 50 U.S. public school systems in the fall of 1987. During the next seven years, each of approximately 5,900 students in the two national probability cohort samples were given mathematics and science achievement tests (based on the National Assessment of Educational Progress item pools) each fall and were asked to complete attitudinal and self-report questionnaires each fall and spring.

In addition, one parent of each of the LSAY students was interviewed each spring by telephone, and all of the mathematics and science teachers who served one or more LSAY students were asked to complete a questionnaire for each course, including information about the objectives of the course, the textbook used, and the allocation of time and effort in the course to various kinds of instructional activities. The principal of each of the participating schools was asked to complete a school inventory and questionnaire periodically. The initial period of data collection ended in the spring of 1994 when the 7<sup>th</sup>-grade cohort was one year beyond high school and the 10<sup>th</sup>-grade cohort was four years beyond high school.

With support from the NSF STEP program in 2005, the LSAY was able to locate or account for more than 95% of the original sample of students. Data collection was resumed in 2007 and four additional cycles of data collection have been completed with NSF support.

**The Generation X Report** is based primarily on data from the Longitudinal Study of American Youth (LSAY). The LSAY has been funded by the National Science Foundation (NSF) since 1986 (NSF awards MDR-8550085, REC96-27669, RED-9909569, REC-0337487, DUE-0525357, DUE-0712842, DUE-0856695, DRL-0917535, DUE-1118625, DUE-1118626).

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the NSF.

We acknowledge the continuing cooperation and support of the more than 4,000 LSAY participants who have voluntarily

The LSAY participants in the two cohorts are now 36 and 39 years of age, respectively. Because of its extraordinary longitudinal record of these young adults – who represent the core of Generation X – the LSAY is committed to continuing an annual program of measurement and analysis in future decades.

During the years in which students were enrolled in middle school and high school, data were collected primarily through the use of printed questionnaires and tests administered in school by a local school staff member employed part-time by the LSAY. Teacher questionnaires were printed and collected by a combination of mail and the use of a local in-school coordinator. During the in-school years, one parent of each participating student was interviewed by telephone once each year. Currently, approximately 75% of participating young adults complete an annual questionnaire online and the remaining 25% use a printed questionnaire and a postage-paid return envelope. Current participants are offered a small payment in appreciation for their time and effort.

All of the data collection and data management procedures used by the LSAY are approved by the University of Michigan Institutional Review Board. In earlier years, LSAY data collection procedures were reviewed and approved by the Institutional Review Boards at Michigan State University, Northwestern University, and Northern Illinois University. The data are deposited (in a blinded format to protect the identity of individuals) in the Inter-university Consortium for Political and Social Research (ICPSR) at the University of Michigan and are available for secondary analysis according to ICPSR rules. Over the last two decades, LSAY data have been used in approximately 40 dissertations and more than 200 articles in refereed journals.

**A more comprehensive description of the LSAY is available at [www.lsay.org](http://www.lsay.org).** ◆

completed questionnaires, telephone interviews, and data forms over the last 24 years and thank them for their continuing support. Without their active involvement, the LSAY would not be possible.

We also acknowledge and thank the parents of LSAY students and the teachers, principals, and administrators in public school districts throughout the U.S. who contributed their time and energy to this study.

And, we acknowledge and thank the several hundred staff who have worked on the LSAY over the last two decades to make this study possible.

