WHAT DO WE KNOW ABOUT ADOLESCENT HEALTH?

Findings From The National Longitudinal Study of Adolescent Health

A Congressional Breakfast Seminar

July 17, 1998

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Transcript of Proceedings

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WHAT DO WE KNOW ABOUT ADOLESCENT HEALTH?

Findings From The National Longitudinal Study of Adolescent Health

A CONGRESSIONAL BREAKFAST SEMINAR

Adolescents are generally health people concerned with achieving popularity, autonomy from adults, success in school or sports, satisfying relationships, and confidence in themselves. Threats to their health stem primarily from their behavior. The National Longitudinal Study of Adolescent Health (Add Health) focuses on forces that influence that behavior: families, friendships, romantic relationships, peer groups, schools, neighborhoods, and communities. Four social scientists who designed, implemented, and are now analyzing the data from this study will speak at this session about the impact of these social forces on adolescent behaviors.

DATE: Friday, July 17, 1998
TIME: 8:30 a.m. to 10:30 a.m.
PLACE: Room B338, Rayburn House Office Building

SPEAKERS

J. Richard Udry, Principal Investigator, University of North Carolina, Chapel Hill

Peter Bearman, Columbia University

Kathleen Mullan Harris, University of North Carolina, Chapel Hill

James Jaccard, University at Albany, State University of New York

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Executive Summary

Adolescent Health

July 17, 1998

COSSA’s 1998 congressional breakfast seminar series came to an end on July 17th with nearly 80 people gathered to hear four social scientists discuss findings and results from the National Longitudinal Study of Adolescent Health (Add Health). Among the audience members were Representatives Ben Gilman (R-NY) and David Price (D-NC). The seminar speakers included Peter Bearman, Professor of Sociology at Columbia University; Kathleen Mullan Harris, Professor and Associate Chair of the Sociology Department at the University of North Carolina, Chapel Hill; James Jaccard, Professor of Psychology at the University at Albany, State University of New York; and J. Richard Udry, Kenan Professor of Sociology at the University of North Carolina, Chapel Hill.

After a brief welcome by COSSA Executive Director Howard Silver, Udry, the study’s principal investigator, discussed some background of the study and described the research design. Udry noted that the Add Health study was mandated to the National Institutes of Health’s (NIH) National Institute on Child Health and Human Development (NICHD) by Congress in the NIH Revitalization Act of 1993. Add Health, according to Udry, is a study of a nationally representative sample of adolescents from grades 7 through 12 in the United States, designed to “explain the causes of adolescent health and health behavior.” He further noted that Add Health covers “all the main health conditions and health behaviors of current concern,” including: depression, eating disorders, violent behavior, and drug, tobacco, and alcohol use. Udry explained, though, that much of the research effort is focused on risk behaviors, because “the main determinant of poor health among adolescents is their behaviors.”

Udry proceeded to discuss the study’s research design. He noted that the Add Health survey has been conducted in three phases. The first phase included selecting a random sample of 80 high schools throughout the study, from which 90,000 students from grades 7 through 12 were given in-school questionnaires to provide information about themselves and their “friendship networks and to measure a variety of health conditions.” In addition, Udry noted that roughly 140 school administrators were given questionnaires. During the second phase, researchers conducted in-home interviews with approximately 16,000 students and their parents. Finally, the researchers repeated the in-home interviews a year after the first in-home interview. He noted that from the in-school interviews, researchers “built a large number of special samples,” including samples of blacks, Puerto Ricans, Chinese, and Cuban adolescents.

James Jaccard followed Udry and focused his discussion on unintended teen pregnancy, which he said has “tremendous social, emotional, and economic costs.” Jaccard noted that for the last ten years he has been developing family-based approaches that promote communications between parents and their children to address the problem of unintended teen pregnancies. He mentioned several advantages to the family-based approach, saying that “messages given to adolescents can be done in the context of the moral values and the moral codes of the family’s values.” Also, unlike school-based programs, parents can tailor their communications to the maturity level of their children.

Jaccard said that even if parents cannot provide technical information to their children, they can serve as a motivational force for their children. In fact, he said that the notion that parents have little, if any, impact on the actions of their teenage children is wrong. Add Health data show that parents do indeed have an effect on their children’s behaviors, he said.

Despite Add Health evidence that parents “do make a difference,” Jaccard said that “all is not rosy.” The Add Health data, for example, show a “tendency for parents to underestimate the sexual activity of their children.” Thus, Jaccard noted that “we need to strengthen communications between
parents and adolescents.” He said that “we need to develop ways of teaching parents how to effectively communicate with their children on these [sexual] matters.” And, “we need to understand better why parents do not always talk to their kids.”

Peter Bearman focused his discussion on two projects that he has been working on: 1) school attachment (how kids feel about their school on multiple dimensions); and 2) the structure of sexual networks among adolescents. Bearman first discussed school attachment. He noted at the outset that school attachment “is important for school success.” The Add Health data that he has analyzed shows that “as racial heterogeneity increases, school attachment decreases.” He cautioned, though, that his research results should not be interpreted as an argument for racially segregated schools. He said that schools can take steps to increase school attachment, such as “integration of extracurricular activities to organize social relations of black and white students.”

Bearman next discussed the research he has conducted on adolescent sexual networks. One analysis centered on “Jefferson High School,” an all white, rural school of 850 students. Using extensive interview data, Bearman constructed a complete structure of all romantic and sexual relations at the high school. He found that 531 of the 850 students “are in some form of relationship with another student in the school.” He added that “236 students are tied together in a long string by sexual or romantic relationships.” Bearman noted that the structure of the relationship of the students at Jefferson High School is “really designed for extremely efficient and extremely widespread transmission of sexually transmitted diseases.” The structure, however, according to Bearman, is very fragile — use of contraceptives or abstinence by just a few students can “break apart” the whole structure. He cautioned that the sexual network study was based on only one school. Thus, Bearman noted that it was “hard to know how generalizable it is.” He said, however, that “if it is generalizable, we’ll have radical implications for how we think about intervention.”

Kathleen Mullan Harris was the seminar’s last speaker. Like Bearman, she focused her discussion on two projects. The first project she discussed examined the impact of “family structure and father involvement on risk behavior among adolescents.” The study, Harris noted, examined the patterns of involvement of resident biological fathers and non-resident biological fathers in 20,745 families. The study considered adolescent risk behavior with respect to several different types of family structures, including: two biological parents, biological mother/step-father, biological father/step-mother, two step-parents, single mom, single dad, and other.

The Add Health data, according to Harris, indicate a general pattern that “adolescents in two biological parent families are least likely to engage in risk behavior, while adolescents in single father families are most likely.” This pattern is particularly noticeable, according to Harris, with two specific risk behaviors: adolescents having sex, and adolescents using 3 or more substances (cigarettes, alcohol, marijuana, chewing tobacco, and hard drugs). She noted that high father involvement can protect youth from engaging in risk behavior. This is true, Harris said, for both resident and non-resident fathers’ involvement, even though the effects “are not as strong” for non-resident, highly involved fathers.

Harris proceeded to discuss a study she is conducting that examines the health status and risk behaviors of adolescents in immigrant families. The Add Health data, according to Harris, indicate that “the longer the time spent in the U.S. and the younger the age that immigrant children arrive in the U.S. the greater the number of health problems they experience.” She said that this is also true for risk behaviors (sexual behavior, juvenile delinquency, violent behavior, substance abuse). In addition, the longer the time spent in the U.S., the “greater the socialization in American schools and neighborhoods, the greater the likelihood that immigrant children will engage in risk behavior.”
Good morning everybody. I am Howard Silver, Executive Director of the Consortium of Social Science Associations (COSSA). COSSA is an advocacy organization for the social and behavioral sciences, supported by more than one hundred professional associations, scientific societies, universities and research institutes. Through a generous grant by the Ford Foundation, today’s seminar is part of an ongoing effort to bring the findings of social science research to the attention of policy makers.

Before introducing the speakers I would like to thank several people who helped put this event together. Congressman Steve Horn was very gracious in getting us the room. One of the speakers, Richard Udry, the general behind the study you are about to hear described, helped to organize this session. Christine Bachrach, Demographic and Behavioral Science Sciences Bureau Chief at the National Institute of Child Health and Human Development (NICHD), was also quite helpful. I would also like to thank the COSSA staff, Karen Carrion, David Hess and Angela Sharpe. Their hard work, dedication and their willingness to carry chairs at 8:30 in the morning are greatly appreciated.

Let me also thank former Congresswoman Patricia Schroeder. In 1993, after enormous controversy following the cancellation by the Bush administration of the American Teen Survey, which many of us in this room helped to get funded, Ms. Schroeder figured out that if you add the word “health” to the title of a study people would think that it was worthwhile. Thus, the Adolescent Health Survey was approved by Congress and the Clinton administration. What you will hear today are the results of that work. Most importantly, though, I want to thank you for your interest in this important topic and for coming out this morning.

I will introduce the speakers briefly in order of their appearance. Dick Udry is the Kenan Professor of Maternal and Child Health and Kenan Professor of Sociology at the University of North Carolina, Chapel Hill (UNC). He has conducted research on adolescents for most of his career, currently under a Merit Award from the NICHD. He is a recent past-president of the Population Association of America, and a Fellow of the American Academy of Arts and Sciences. Dick will give us an overview of the study, the methodology, and what it took to carry out this massive undertaking.

Next we will hear from Jim Jaccard, Professor of Psychology at the University at Albany, State University of New York. He is also the director of the Center for Applied Psychological Research. He has published six books, including Parent-Teenager Communication: Toward the Prevention of Unintended Pregnancies. Jim will talk this morning on parental influences on adolescent sex and pregnancy. Peter Bearman is about to become Professor of Sociology at Columbia University, where he recently moved after spending 12 years in the sociology department at the University of North Carolina, Chapel Hill. His current research focuses on the structure of social networks, virginity pledges and the transition to first intercourse, school attachment, determinants of adolescent suicides, and the effects of schools on adolescent health. Since we only gave him fifteen minutes this morning he is going to focus on two of these, the structure of sexual networks and school attachment. Finally, Kathleen Mullan Harris is the Associate Chair of the Sociology Department at the University of North Carolina, Chapel Hill. Her research interests include the family, poverty, and social policy. Her recent book on the welfare experiences of adolescent mothers, Teen Mothers and the Revolving Welfare Door, received the Otis Dudley Duncan Book Award from the American Sociological Association. Kathy will talk about father involvement and children of immigrant families. Without further ado let me turn the program over to Dick Udry.
I am going to tell you about the National Longitudinal Study of Adolescent Health called Add Health. Add Health is a study of a nationally representative sample of adolescents in grades 7 through 12 in the United States. It is designed to help explain the causes of adolescent health and health behavior, with special emphasis on the effects of the multiple contexts of adolescent life. Add Health was mandated to the National Institute of Child Health and Human Development (NICHD) by action of the U.S. Congress (1993), and is funded by NICHD and 18 other federal agencies as a program project. We have a nationwide group of adolescent health researchers as co-investigators. An important feature of this project is that the data from the study are now available for public use.

I want to describe first the research design of Add Health. Add Health was designed to help understand how the social context of adolescents’ lives influence their health and health behavior. If you want to understand the social context of adolescent life, you have to have social context built into your study. Your study has to include their parents, their schools, their friends, their neighbors, and their romantic partners. You can’t just pluck a random sample of adolescents who don’t know one another.

Add Health provides coverage of all the main health conditions and health behaviors of current concern. Figure 1 (page 6) reports the aspects of health that we cover. Because the main determinants of poor health among adolescents are the result of their behaviors, in contrast to the determinants of health status among other age groups, Add Health focuses much of its efforts on risk behaviors. These range from not wearing helmets while riding bicycles to engaging in unprotected sex. When we say that we focus on the effect of context, we cover the following contexts in the study: community, neighborhood, school, peer group, family, friends, and romantic partners. Unlike many other “contextual” studies in which measures of context are derived from respondents’ self-report, Add Health collects data from individuals who make up the relevant context of an adolescent’s life. Thus contextual data about family are derived by interviews with parents and siblings, data on schools are derived from interviews with all the other students and school administrators, and data on partnerships and friendships are derived from partners and friends.

From a scientific perspective, Add Health is unusual in the degree to which the major theoretical issues of the study are articulated in the features of the research design. Here are some of the ways we think about adolescents and how environment relates to their health: similar adolescents from similar families who live in different kinds of environments (different schools, different neighborhoods) end up with different health; adolescents who live in similar environments (similar schools, similar neighborhoods) but who engage in different risk behaviors end up with different health; adolescents from similar families, similar schools, and similar neighborhoods have individual strengths, personalities, and abilities, and end up with different health. Some kids will be healthy whatever kind of terrible environment they have. Some other kids require carefully nurturing environments to thrive.

Because adolescents, like all humans, not only are affected by the contexts in which they are embedded but also select and shape the environments they are exposed to, Add Health has a longitudinal design. Figure 2 (page 7) provides an image of our sampling design. Our primary sampling frame is a list of all the high schools in the United States. From this frame we selected a stratified sample of 80 high schools, with probability proportional to size. For each high school we selected one of its feeder schools with probability proportional to its student contribution to the high school. We then gave a self-
administered op-scan questionnaire simultaneously to everyone who attended each school on a particular day of administration. In most schools, more than 90 percent of all students enrolled participated in the in-school phase of the survey. Some schools, however, did not let us do a school administration. We have administered more than 90,000 in-school questionnaires.

The purposes of the in-school questionnaire were (1) to measure school context, (2) to obtain friendship networks, (3) to measure a variety of health conditions, and (4) to obtain data to select special samples of individuals in rare but theoretically crucial categories. No sensitive questions were asked in the in-school interview. A school administrator also completed a half-hour self-administered questionnaire on characteristics of the school.

We also obtained a roster of students enrolled in each school. From these rosters, we selected a random sample of 16,000 for a one and one-half hour in-home interview. Approximately 200 students were selected from each school pair as part of the core in-home sample, irrespective of size. This creates a self-weighting sample. Whether or not the student was included in the school administration does not affect inclusion in the main home sample. A parent of each respondent received a half-hour interview; more than 85 percent of the parents participated in the survey. The adolescent in-home interview was laptop computer administered. Half of the interview was conducted by the interviewer and half was self-administered on the laptop, with an earphone audio component. All sensitive data were collected using the audio-computer assisted, self-interview technology, thereby reducing potential sources of interviewer effects on crucial risk-behavior data. In two large schools and 12 small schools we attempted to interview all students on the roster. This allowed us to get a complete view of the effects of friend pairs on health and health behaviors.

From the in-school questionnaires, we selected the following special samples: high-education blacks (one parent has a college degree), N = 1500; Puerto Ricans, N = 500; Cubans, N = 500; Chinese, N = 400; and physically disabled (limb disabilities), N = 500. In most cases the sample exhausts those available in the school administration.

We also selected a genetic sample using the in-school questionnaire information. In most categories the sample exhausts the cases available in the school administration. The categories of pairs of adolescents in the genetic sample are as follows: identical twins, fraternal twins, full-sibling pairs, half-sibling pairs, and unrelated pairs in the same household. This sample design yields the full range of genetic relationships within households, from complete similarity (identical twins) to no shared genes (unrelated adolescents).

The genetic sample can be used for many different types of analysis. For the social scientist uninterested in genetic aspects, the sample can be used for analysis that distinguishes variance due to shared parental environment from environmental variance from other sources. It is especially useful for identifying "family effects" as usually defined by social scientists, but it can also provide a measure of family effects purged of genetic variance.

The first wave of in-home interviews was completed in 1995. In 1996, those originally in grades 7-11 were followed up with a second interview. Over 88 percent of those interviewed in Wave I completed Wave II interviews. This enabled us to follow changes in behavior over the year. Figure 3 (page 8) lists the five questionnaires used in the study and the approximate number of completes for each questionnaire.
Additionally, we can now examine how design features map onto the measurement of contextual effects. Figure 4 (page 9) gives the sources of data used for each level of contact in the design.

We have 80 communities. For each community, one of our investigators prepared a list of attributes of communities from public data. Neighborhoods were specified for each in-home respondent, and neighborhood attributes were assembled from public data. School attributes can be aggregated from in-school questionnaires, administrator questionnaires, and in-home questionnaires. Family characteristics are obtained from parental and sibling questionnaires. The highly clustered sample design creates the possibility of estimating these contextual effects. This direct estimation of context from others’ partners are embedded in long chains of prior relationships characterized by unprotected sex. Driving drunk is always risky, but more so if all of one’s peers do so too. Taking drugs may be attractive only if the high-status adolescents within one’s peer group are drug users. Analysis of these kinds of direct risks, missed in self-report data, is possible with the Add Health clustered sampling design.

Most surveys pluck individuals one at a time out of their communities for interviews. Add Health has a unique design that allows us to put together real groups of people who know one another. We can identify groups of friends within a school. We can put together groups of parents who know one another, and whose children are friends with one another. We have several children who live in each neighborhood in the study. We can identify romantic pairs and match their questionnaires. We know who loves whom.

Confidentiality

Add Health sets a new standard in the protection of confidentiality. This is most important because of the highly contextualized research design. The design makes it possible to match questionnaires where needed and, at the same time, makes it impossible for anyone — even us — to match any respondent’s identity with a questionnaire response. The main feature that makes this possible is a third-party contract with a security manager.

Because of the problems of deducible disclosure involved in providing contextual data, access to various types of data has different restrictions. But for the basic data sets, off-the-shelf unrestricted data sets have been prepared. Our object is to make as much data as possible available with the minimum restrictions necessary to control deducible disclosure of identities.

All the parts of the in-home questionnaire that collected information on sensitive behavior were contained in the self-administered section of the laptop questionnaire, so that the respondent was entering responses directly into the computer. The advantage of this procedure is that neither the interviewer nor others in the room heard any questions asked or heard any responses.

Contextual Factors in Adolescent Behavior

Contextual analysis (Figure 4, page 9) embodies the fundamental sociological principle that attributes of the collectiveness in which people live shape their individual behavior. Beginning more than a decade ago, researchers began using multilevel models to examine contextual factors affecting adolescent sexual behavior. Most of these models rely on the effects on respondent behavior of attributes of populations living in the country or census tract of the respondent’s residence. Often these models first use tract data (e.g., percentage of women divorced) to account for an individual’s mediating factors (such as
permissive sexual attitudes), which then can account for the variance in individual behavior. Such analysis is necessarily restricted to the data available for counties and census tracts in existing census or administrative data. Add Health has census block group data for each individual. Some respondents’ locations and addresses could not be matched with block groups by available computerized program services. For these the interviewers used Global Position System hand-held devices to ascertain the longitude and latitude of households with precision. These data were then matched with census data to the lowest level of aggregate released by the U.S. Census Bureau.

Add Health uses a school-based sampling frame. Thus, many aggregate characteristics of the school (based on the in-school questionnaire) can be used as contextual data. In addition, aggregate attributes on sensitive characteristics (such as proportion using illegal drugs) can be prepared, because most schools had 100 or more respondents for the in-home questionnaire. Sensitive attributes of the mothers can be used as aggregate characteristics in contextual models, because most respondents’ mothers also completed an in-home questionnaire. For example, schools’ levels of the restrictiveness of parental control can be estimated and used as a contextual variable to explain the behavior of students at the school.

I have with me three of my closest collaborators on the Add Health project. Each of them will be sharing with you some of their findings from the project that we think have both scientific interest and important policy implications.
<table>
<thead>
<tr>
<th>Dental Health</th>
<th>Infectious Diseases</th>
<th>Chronic Health Problems</th>
<th>Safe Vehicle Use</th>
<th>Sleep Problems</th>
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<td>Viral and Bacterial Health</td>
<td>Obesity</td>
<td>Disabilities</td>
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<td>Weapon Use</td>
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<td>Health Insurance Coverage</td>
<td>Exercise Use</td>
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<tr>
<td>International Injury</td>
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<td>Depression</td>
<td>Eating Disorders</td>
<td>Diet and Nutrition</td>
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**Figure 1. Add Health Coverage**
Figure 2. Sampling Structure for Add Health
Figure 3. Adhd Health Questionnaires

- Parental Questionnaire--Wave I
- In-Home Adolescent Questionnaire--Wave II
- In-Home Adolescent Questionnaire--Wave I
- School Administrator Questionnaire
- School Administrator Questionnaire

N ~ 1,800
N ~ 1,400
N ~ 200
N ~ 140
N ~ 90

Figure 4. Sources of Contextual Data

- Peer Relationship: Friendship nominations and matches
- Families: Questionnaire responses of parents and siblings
- Communities: Census data, other published sources
- Neighborhoods: Census data
- Questionnaire data
- School: School Administrator Questionnaire, aggregated
As is well known, unintended pregnancy is a serious social problem among adolescents. Unintended pregnancies have significant social, emotional, and economic costs that have been amply documented in the scientific and public policy literatures. Social analysts and policy makers have developed numerous approaches to reducing unintended pregnancy in adolescents. Two of the most prominent approaches are that of sex education programs in schools and the use of clinic outreach programs that provide contraceptive services to adolescents.

Over the past ten years I have been developing another approach that relies on a different context, namely the family. Specifically, I have been developing approaches that attempt to reach adolescents through their parents. My strategy is to educate parents about ways of communicating with their adolescents about sex and birth control. By increasing communication between parents and adolescents about these important topics, and by providing parents with the skills and information they will need for effective communication, my hope is that the occurrence of unintended pregnancies can be decreased.

There are many advantages to such a family based approach. First, the messages and information that are provided to adolescents are done in the context of the moral codes and values of the family unit. Controversies surrounding the morality of presenting different forms of information to children is rendered moot because the family decides what information to present. Second, it is possible for parents to tailor the communications to the unique maturity levels and needs of their child. Developmental psychologists recognize that children differ in their maturity levels not only in terms of their physical development but also in terms of their social development, emotional development, moral development, and cognitive development. A given adolescent may be quite mature in one of these domains yet immature in another. A distinct advantage of a parent based strategy is that parents can be sensitive to the child’s level of maturity in each of these different domains and tailor the kinds of communications provided to the child in a way that will be most effective. By extension, parents can also tailor their messages and communications depending on the day to day context of the adolescent. If a child is having a bad or stressful day, then the parent does not have to talk about sensitive topics on that particular day. In contrast, group structured programs, such as sex education classes in school, do not permit such flexibility and generally gear the level of presentation based on chronological norms of what the “typical” child is like in a given grade. Family based approaches typically offer greater opportunity for the individuation of the presentation of information that takes into account the adolescent’s unique family context, maturity level, and their day to day circumstances.

A distinct advantage of a parent based strategy is that parents can be sensitive to the child’s level of maturity in each of these different domains and tailor the kinds of communications provided to the child in a way that will be most effective.
There are, however, objections to the use of parent based approaches for reducing undesirable sexual activity on the part of adolescents. One objection is that parent based approaches will not work for dysfunctional families. I agree. However, as we all know, adolescent pregnancy is not restricted to dysfunctional families. Indeed, unintended pregnancies are widespread in family units that most of us would consider "normal," in a broad sense of the term. A second objection is that parents lack the necessary technical information about sex and birth control to be effective communicators. Parents simply do not have the technical knowledge to convey what adolescents need to know about sex and birth control. My past research has shown that many parents do indeed lack technical knowledge about aspects of reproduction and birth control. However, this objection seriously underestimates the role of parents.

The role of the parent goes far beyond the mere delivery of technical information about reproduction and birth control. Parents are a source of motivation for their children. They are the basis for many of the beliefs that children form about the advantages and disadvantages of engaging in unprotected sex and avoiding an unintended pregnancy. Parents play a very important role in shaping the motivations of their children. In addition, parents can be educated themselves about the technical aspects of reproduction and birth control so that they can become more effective communicators. In some respects, doing so is desirable because we are not only increasing the knowledge levels of our adolescents, but we are also increasing the knowledge levels of their parents. A final objection is one that is commonly heard in lay audiences, namely that adolescents pay little attention to their parents. According to this perspective, a parent based approach cannot be effective because adolescents are peer oriented rather than parent oriented. This view has been challenged by an increasingly large body of research in the developmental sciences and it is commonly recognized among experts in the field that the impact of parents has been dramatically underestimated. This is also a message that is emerging from the Add Health data and my own analyses of it.

Let me underscore this point by highlighting a few of the results from Add Health. One of the variables that I have examined in this and my past research is adolescents' perceptions of the extent to which their mothers disapprove of them engaging in sexual intercourse at this time in their life. Most people believe that all parents are uniformly opposed to their young children engaging in sex. This, however, is not the case. Some parents are very strongly opposed to this, but others are not so strongly opposed. Some even feel that under the right circumstances, such as a steady boyfriend who is "special," sexual intercourse would be acceptable. In short, there is actually a range of attitudes expressed by parents. If you ask adolescents to characterize the degree of disapproval on the part of their mothers, in Add Health about 55 percent of the unmarried adolescents think that their mothers strongly disapprove of them engaging in sex; about 25 percent of the adolescents think that their mothers either slightly disapprove or moderately disapprove of them engaging in sex; and about 15 percent of the adolescents think that their mothers do not care one way or the other, that they are indifferent about it. This perceived disapproval is related to sexual activity and unintended pregnancies in the adolescents. For example, in one analysis I did, I focused on seventh and eighth graders, that is twelve and thirteen year olds. I compared those who
thought that their mothers strongly disapproved of them engaging in sex at this time in their lives with those who perceived weaker attitudes and determined the percentage of each group that engaged in sexual intercourse over the ensuing next twelve months. Sixteen percent of the seventh and eighth graders who saw their mother as being strongly disapproving of them engaging in sex did so over the next 12 months. By contrast, for those seventh and eighth graders who saw their parents as being indifferent, about 51 percent engaged in sex over the ensuing year. For the seventh and eighth graders who saw their parents as strongly disapproving of them engaging in sex, one percent got pregnant over the next 12 months. For those seventh and eighth graders who saw their parents as being indifferent, eight percent of them got pregnant.

I have observed similar trends with respect to the overall quality of the relationship between parents and adolescents: the higher the quality of the relationship between the parent and the adolescent, the less likely it is that the adolescent will engage in sex in the ensuing twelve months and the less likely he or she is to experience an unintended pregnancy.

As critical scientists, whenever we observe associations such as the above, we immediately think of alternative explanations for the result. Maybe the association between parental disapproval and engaging in sex does not reflect a causal relationship, but rather it reflects a spurious one. For example, as adolescents get older there is a tendency for parents to become more approving of them engaging in sex. As adolescents get older they are also more likely to engage in sex for reasons that have nothing to do with their parents. Perhaps the association is due to the common influence of age on both variables. To address this, I examined the relations when age was held constant (i.e., when all adolescents included in the analysis were of the same age). If age is the source of the association, then the association should vanish when age is held constant. The association did not vanish when I controlled for age.

As another example, the association between relationship satisfaction and sexual activity may not occur because the quality of the relationship between parent and teen influences the sexual activity of the adolescent, but rather just the reverse. When a child engages in sex, the parent may find out that this has occurred and confront his or her daughter accordingly. This results in fighting and a subsequent deterioration of the relationship. One way to test this possibility is to focus the analysis only on children whose parents are certain their children have not engaged in sexual intercourse. It can not be for these parents that the quality of the relationship deteriorated after learning that their child engaged in sex because they do not think their child has done so. When I analyzed the association between relationship satisfaction and later sexual activity only for such mothers, the association between the variables persisted. This is consistent with the idea that it is relationship satisfaction that influences an adolescent’s propensity for sexual activity, rather than vice versa.

There are about seven or eight alternative explanations of this nature that I have carefully considered in the context of the Add Health data and in each case, the message that parents make a difference comes through clearly. Coupled with previous research in this domain, I believe the evidence is mounting that parental orientations towards the sexual activity of their children do indeed make a difference.

**Coupled with previous research in this domain, I believe the evidence is mounting that parental orientations towards the sexual activity of their children do indeed make a difference.**
While the above is heartening, the picture is not an entirely rosy one. There is also evidence in Add Health and other research that I have conducted that communication between parents and their children is suboptimal. There seems to be considerable miscommunication. For example, in the Add Health data, we see a tendency for parents to underestimate sexual activity on the part of their children. At the time of the first interview, approximately 38 percent of the adolescents reported that they had engaged in sexual intercourse. When we asked the parents if they thought their child had engaged in sexual intercourse, about 21 percent of the parents said they thought so. Parents are underestimating the sexual activity of their children. We have identified correlates of tendencies for parents to underestimate the sexual activity of the children and have observed some interesting results. For example, we have found that parents who are strongly opposed to their child engaging in sex are more likely to underestimate the sexual activity of their children. Similarly, we have found that parents who have a high quality relationship with their children are more likely to underestimate sexual activity on the part of their son or daughter, perhaps because they think that a child who is so “good” would not engage in such behavior.

In my prior examples, I stated that adolescents’ perceptions of their mother’s orientations towards them engaging in sex influence their behavior. The keyword in this phrase is the adolescent perception of the parent’s attitude. It turns out that there is only a moderate correlation between the adolescents’ perceptions of their parents’ attitudes and the actual attitudes that the parents espouse. The correlation is about 0.25, which is surprisingly weak. We have also identified factors that are associated with the tendency for an adolescent to underestimate the degree of opposition of their mothers. For example, we have found that males are more likely to underestimate the orientation of their mothers than females. We have found that older adolescents are more likely to underestimate the degree of parental opposition than younger adolescents.

These findings are important because we have also found that what predicts behavior best is not so much the attitude that the parent has but rather the adolescent’s perception of that attitude. Both variables are relevant depending on the outcome variable being examined, but it is the adolescent perceptions that are the strongest and most consistent predictors of future adolescent behavior. As a psychologist, this is not surprising to me because it is how people construe the world that often dictates how they act toward the world. The above results underscore the importance of strengthening communication between parents and adolescents in this important domain.

... what predicts behavior best is not so much the attitude that the parent has but rather the adolescent’s perception of that attitude.

I would like to conclude with some final points to consider. First, it is my belief that parents can make a difference in our battle against unintended pregnancy and the spread of sexually transmitted diseases in adolescents. Add Health is helping us to understand the ways that parents do make a difference. It is helping us identify what family based variables are most important to focus on in the context of intervention efforts aimed to educate parents and to make parents more effective communicators with their children.

Second, I believe that family based outreach programs are a very important and underutilized tool and that we need to exploit such approaches more fully. Such outreach programs can be developed and implemented in conjunction with schools, community organizations, churches, and clinics. There are serious challenges as we approach such policies. Parental messages do not always get through to their
children. We must develop ways of teaching parents how to effectively communicate with their children on these matters. We have an avalanche of social science research and highly sophisticated social scientists advising schools how to devise their curricula to make more effective sex education programs. It only makes sense that parents should be able to tap into such expertise and bodies of knowledge to help schools design their “family curriculum.” We need to put more efforts and resources into such parent outreach programs.

Third, we need to understand better why parents do not always talk about these important issues with their children. Indeed, we need a better understanding of the entire communication process. My own research has focused on understanding five core dimensions of communication. One such dimension is the timing of communication or when it is that we decide to say what we are going to say. At what age should we be talking with our children about sex and birth control and just when should we say it? Another important dimension is the frequency of communication or how often we communicate. Many parents believe that you have one big talk with your child about sex and your job is done. But adolescence lasts a long time and if you think that a single message is going to persist with its effect for a period of 10 years, you are in for a rude awakening. The frequency of communications is a very important construct that must be carefully considered in the communication context. Yet another important dimension is the content of the communication, that is what we actually say to our children. There is surprisingly little research on this area to help us identify the content of messages that work best with different adolescents. A fourth facet of communication that is important is the style of communication, that is how we say what we say. Finally, there is the communication context or the setting in which our communications occur. These five dimensions — the timing, frequency, content, style, and context of communications — are central to effective communication and the development of programs that encourage such communication between parents and adolescents. The Add Health database is providing insights on each and thus represents an extremely important database for social scientists.
It had a lot of difficulty thinking about what I wanted to talk about today. Of course I think all of my work is fascinating, which made the choice even more difficult. I cannot resist the opportunity to say a couple of things about the work I have decided not to talk about in more detail, because I think that Add Health contributes some interesting information about them. One of my current projects involves assessing the effectiveness of virginity pledges for delaying first intercourse — there is a significant, independent effect. Another project I am working on with Carol Ford, an M.D. at the University of North Carolina, Chapel Hill focuses on the determinants of foregone care, that is why adolescents who think that they are sick and who are objectively sick, think they should go to a doctor but don’t go. The simple statement is that adolescents who forego care do so because they have insufficient insurance. Finally, I have been working on the determinants of adolescent suicidality. In this work we identify some very interesting and, I think, significant gender differences that point to the really special role that social relations play for girls in organizing their suicidal ideation but not for boys. These are the projects that I rejected for one reason or another, in part because of the difficulty of thinking about how to present them visually.

I have decided to talk about two other projects. The first focuses on school attachment, or how adolescents feel about their school on multiple dimensions: whether they feel school is a home for them; whether they feel part of the school community; whether they fell close to teachers and adolescents; whether they feel like school is a place that they want to be. We call this basic set of feelings “attachment.” Other researchers would think of it as an important element of what we know of as school climate. School climate, or school attachment, is an important predictor of academic achievement and future expectations. If we want adolescents to do well in school and orient themselves toward school, it is important that they feel good about their school.

The second project that I plan to talk about focuses on the structure of sexual networks among adolescents. I selected this work to show both how much we can possibly know about sexual network structures and the implications of these structures for STD and HIV transmission dynamics, and at the same time, how little we do know. The results that I briefly present today point to a new picture of the potential pathways through which disease could flow. I have a very fundamental reason for showing the second set of findings: to encourage continued support for research projects like Add Health that make these kinds of data available. There is a lot of work that needs to be done.

The bottom line on school attachment is that it is important for academic success. It varies considerably by school. Schools can do things to enhance attachment and the things that they can do are simple. They tend to operate at the level of adolescent friendship groups. Schools can work if they can figure out strategies to restructure friendship groups within schools. The bottom line on the structure of sexual networks amongst adolescents is that the observed structure that we find in Add Health is different than we expected. It seems to be designed for widespread disease transmission, but it is extremely fragile,
and effective interventions could make a stunning impact on subsequent STD diffusion. So those are the two conclusions that I am going to reach today.

School Attachment

First, let me turn to school attachment. James Moody, a Ph.D. candidate in Sociology at UNC, is the co-author of this work. We have 148 schools and they are distributed across a number of categories, public and private, religious and secular. We have magnet schools, vocational, and general schools. The schools provide a representative sample of secondary schools in America. They are located in 80 communities which are also representative of U.S. communities. Many are rural and suburban and, of course, our sample contains many inner-city schools. In this component of the study, adolescents reported on their friendships, clubs, school activities, interests, and aspirations.

One of the things I am going to focus on today is the effect of racial heterogeneity on school attachment. A couple of weeks ago my 16-year old son read that Carlos Castenada died, and this precipitated his reading some of his books. I don’t know if any of you read Carlos Castenada, but if you have, you might recall that when Don Juan (Castenada’s advisor) sees people, he sees arrows of light emanating from their bodies. When some people sees schools they see building and classrooms. When I look at the world I see circles and lines, so naturally I represent schools as social structures in which circles (persons) are connected by lines (relations, like friendships or romantic partners), thereby describing the social networks in which students are embedded.

Figure 1 (page 19) is a sociogram of a school district in one of the 80 Add Health communities. It is a rural district; for this reason we called it “Countryside School District.” Add Health interviewed all of the students in two schools in this district, covering grades 7-12. Like many school systems, adolescents in grades 7-9 attend middle school, while adolescents in grades 10-12 attend high school.

Figure 1 reports the friendships of all the students in this rural school system of roughly 1200 students. Circles are students, and the lines connecting them are friendship nominations from one student to another. Each student is represented by a circle. Students that are close to one another with respect to the pattern of their friendship choices appear close to one another in the sociogram. In fact, while there are 1200 students in this school, there are fewer distinct circles, for many students share the same friends (they belong to densely interacting cliques) and therefore appear in Figure 1 on top of one another. The two clusters on the top are a population of white adolescents on the left, and black adolescents on the right in the junior high, grades seven, eight, and nine. The two clusters on the bottom are a population of white students on the left, and black adolescents and mixed-race adolescents on the right. Visible therefore is a separation between the junior high and senior high in terms of organization of friendships. There is also an apparent railroad track that runs through both schools and this railroad track separates black adolescents from white adolescents. This is not an atypical observation in American high schools. Subsequently, where there is a lot of racial integration, we find a tremendous amount of friendship segregation. This has implications for school attachment.

Subsequently, where there is a lot of racial integration, we find a tremendous amount of friendship segregation. This has implications for school attachment.
School social structures do not have to take this shape, as you can see if you turn to the next figure. Figure 2 (page 20) is a sociogram for a school of eight hundred adolescents. In contrast to "Countryside," this school is racially homogeneous (all white). What I think you can see is that the social structure of that school is a single cluster. All of the adolescents are densely interrelated in one large cluster. There are eight adolescents in this school who have no friends whatsoever. These adolescents are at great risk for negative health outcomes, as isolation is one of the main predictors of poor mental and physical health. When I look at schools one of the things I'm interested in, and I think one of the things that schools and principals ought to be interested in, is what's happening at the level of friendship organization in the school. The relevant question is: are adolescent friendships structured in a way that make adolescents feel better about the school that they attend?

Figure 3 (page 21), labeled racial heterogeneity and friendship structure, is rather complicated. Here we shift focus from individual schools and look instead at the relationship between two variables across all of the schools in our sample.

Figure 3 shows that as the racial heterogeneity of the school increases, that is as it moves from zero to one, friendship segregation by race increases significantly. On the right-hand axis is the extent of friendship segregation greater than you would expect by chance. The point of this graph is to show that in contrast to what many sociologists think, which is that if you put people together who are of different races and different ethnicities they would come to associate with each and develop greater tolerance, the relationship is actually the opposite, at least in most schools. So, in most schools, the greater the racial heterogeneity of the school, the greater the on-the-ground friendship segregation of the school.

Recall that I started off focusing on school attachment. Figure 4 (page 22) looks at one of the critical school level characteristics of student attachment: racial heterogeneity. Figure 4 shows that the relationship is complex. Here we operationalize racial heterogeneity as percent black, but the results are robust across many specifications of heterogeneity. What you can see is that in schools that are all white or all black, adolescents feel closer to school. The lowest level of school attachment is in racially heterogeneous schools.

This might lead people to the policy implication that we should advocate racially segregated schools. That is not the necessary conclusion that one has to draw. The thing that we have to look at is what organizes racial segregation in schools that leads to these different effects. What I can't visually show because it is in the form of multi-level analysis, is that the principal dimension that organizes the effectiveness of schools with respect to how they manage the heterogeneity and its effects on attachment is how well they are capable of breaking down the race segregation among friendship groups.

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\[ \text{the principal dimension that organizes the effectiveness of schools with respect to how they manage the heterogeneity and its effects on attachment is how well they are capable of breaking down the race segregation among friendship groups.} \]
I am going to skip over the gender findings that are reported. Basically, I can say a couple of words about the effect of gender on school attachment, which is that there is a very simple thing that makes girls feel attached to their school — the proportion of females in the student body. Whereas girls’ attachment is almost always lower than boys’, in schools in which 54% or more of the students are female, female attachment levels become comparable to males’. It is not necessary to figure out how to have more girls. Just as with race, simple strategies for increasing the density of female-female friendships within schools (creating female classes, encouraging female participation in extra-curricular activities, etc) have significant effects on the structure of friendship choices. In schools where girls associate with other girls, their female attachment to school is higher than in schools where girls associate disproportionately with boys.

The Structure of Adolescent Sexual Networks

Let me shift focus and talk about the structure of sexual networks. When people think about disease diffusion, what they really have in mind is a series of images that report the structure of sexual contacts that would allow an infection to pass from one individual to another. Particularly, we have three models in our mind, or rather, STD and HIV modelers have three images of social structure in their mind, which are reported in Figure A (page 24) as Figures 1,2, and 3.

The first model is what is known as the Core Infection Model. The idea is that some population of persons (the core) with multiple sex partners pass infection back and forth to each other and create pools of disease. Subsequently, disease spreads out to the periphery. So, you can represent this image as a densely interrelated core of individuals who are sparsely tied to people on the outside. The second model is what I call a Switching Station Model. It is an image appropriate for the heterosexual transmission of HIV in third world countries, for example, Thailand, where the principal transmitters of disease do not have sexual relations with one another. For instance, if you thought about the principal transmission group as long distance truck drivers, they don’t have sex with each other, but they have sex with prostitutes and then spouses back at home. So, a switching station model is the inverse of the core infection model, in which key actors are not tied to each other but are tied to the outside. Finally, in our own imagery we often think about the STD and HIV transmission dynamic as driven by the importance of a few people who we think of as bridgers, or persons who connect otherwise disjoint populations. The third model represents a structure that would look like that. When you have a population of persons, (Group A) perhaps engaged in low-risk behavior and a population of persons (Group B) engaged in high-risk behavior, we can imagine some set of persons who bridge these populations. These are the typical images that we have.

One of the things that we were able to do in Add Health is interview all of the adolescents in a number of communities, fourteen communities in all. One of the things that we asked these adolescents was to nominate their romantic and sexual partners by unique identification number. This gave us the capacity to look at the actual structure of sexual and romantic relationships among interacting adolescents. What is reported here as Figure B (page 25), the sexual and romantic relations of Jefferson High, is the complete component structure of all romantic and sexual relationships among adolescents attending a single rural high school.

It is the same high school I showed earlier, an all white school in the middle of the country with about 830 students. These are not all sexual relationships. Some are romantic relationships, that is they involve kissing, hugging, holding hands, and so on. Nonetheless, this is a structure of potential disease
FIGURE 1

Points Colored by Race

The Social Structure of "Countryside" School District
Friendship Relations in "Jefferson High"
Based on regressions controlling for school type, teaching, size and region.
The Effect of School Size and Percent Black on Closeness to School.
diffusion. What this graph shows is all of the sets of individuals that are involved in any kind of romantic or sexual relationship.

We have 63 couples who have no other partners down in the right hand corner. Those individuals are not at STD risk. By the way, in the school 531 of the 800 adolescents are in some form of romantic or sexual relationship with another student in the school. We have a number of different structures in which some students have two male partners or two female partners and so on.

In the top left corner is one of the most interesting things we have discovered so far in Add Health, a complete component of 286 adolescents all tied together in a long string by sexual or romantic relationships. It is this structure that really varies and is of great interest to STD modelers because it is so strikingly different from what we have expected. From a structural point of view, this is what is known as a spanning tree, but you can think of its as a telephone line system. It simply has a major trunk running down it and then all sorts of lines going off to all of the houses that are connected to it. This kind of spanning tree is designed for extremely efficient transmission of STDs. But the other thing that is striking about it is how fragile it is, because unlike the core or inverse core models, one can just remove a single line and the whole component could just break apart. A structure simultaneously so efficient and so fragile is of great interest from a policy perspective.

What we tried to do in our work is figure out what generates these kinds of structures. If we understand what generates them we could have expectations for them in the future. Figure C (page 26) reports from simulation using the same structural growth that generated the component that we have observed empirically, a whole set of other kinds of sexual networks that we expect to see in the future. All of them share the same characteristics: fragility and efficiency.

Let me summarize what I think are the lessons from these two pieces of work. First, social context makes a really important difference for the lives of adolescents. If we want to make effective interventions into their lives then we need to operate at the level of social context. I think this is especially true for schools.

With respect to the sexual network structure that I have observed, these data come from a limited population of one school. It is hard to know right now how generalizable it is. If it is generalizable, it will have radical implications for how we think about intervention, but without further research like Add Health it would be difficult to see into the future. Thank you.
Figure 1. Core Injection Model

People: Dark circles indicate initial infected person.

The core injection models of the structure of sexual and romantic contact. Circles represent people and lines represent relationships between people.

Figure 2: Switching Station Model

Here, we observe a reverse core. Infected individuals transmit disease to multiple partners on the periphery.

Figure 3: Linked Disease Populations Model

Here, we observe two groups at different STD risk, one of more people bridge these two groups.

Appropriate for heterosexual transmission of HIV in high-world countries, for example.

Passing infection between one set of individuals to another.

Figure A:
FIGURE C

Largest Components for 4 Randomly Generated Networks:
Degree, Isolated Dyad and Cycle Constraint.
I will talk about two studies that I’ve conducted in Add Health that are relevant to families and social policies. The first examines the impact of family structure and father involvement on risk behavior among adolescents. While Jim Jaccard focuses on mothers, I am particularly interested in the extent to which fathers influence their children’s behaviors and healthy development. Because of the special genetic samples, Add Health contains an over-sample of a diverse set of family structures, including various forms of blended and step-families that are typically too few in most data sets to study in detail. Also, in the in-home interview adolescents are asked about their relationships with both their resident fathers and their non-resident biological fathers. So, this research examines patterns of fathering and father involvement by resident fathers and non-resident fathers, according to the particular family structure in which adolescents live.

Father Involvement

I am conducting this research with two of my students from the University of North Carolina, Chapel Hill. Table 1 (page 30) shows the distribution of family structures that we observed in Add Health in 1995. More than half of adolescents live with both biological parents.

We have three types of step-families. When I refer to a parent as a “step” I am just using the term in a general way. Step-parents can include foster parents, adoptive parents or the mother/father’s partner who lives in the home. Essentially a step-parent is a non-biological parent. You can see the breakdown. The first type of step-family contains a biological mother and step-father, which is the most common form of step-family. We also have enough cases to study adolescents who live with a biological father and step-mother. Finally, we have two step-parent families — these primarily contain adoptive parents and foster parents.

About one-fifth of adolescents live with a single mother. A small proportion live with a single father. This small proportion numbers over 600 adolescents in our study. The “other” category includes adolescents who do not live with a parent, but who live with grandparents, aunts, uncles, other relatives, other adults, or in a group home.

Table 2 (page 31) shows the relationship between family structure and some selected risk behaviors. These outcomes indicate whether the adolescent ever engaged in the behavior just for simplicity of presentation. Here I chose some examples of risk behavior measured in Add Health. Reading down the column on the left, the measures include ever had sex, different use of substances, delinquent behavior, running away from home, and some violent behaviors. There are really too many numbers to digest and I am not going to go through this — I present it for your perusal later. Adolescents in biological dad/step-mom step-families display a greater likelihood of ever having had sexual intercourse, as do adolescents in single mother families, with the highest likelihood among adolescents who live with only their father.

I’ve shaded two rows of risk behaviors that I’ll use to illustrate the effects of family structure and father involvement in the next set of graphs: ever had sex and the use of three or more substances which include the use of cigarettes, alcohol, marijuana, chewing tobacco, and hard drugs.
If you turn to first set of figures, Figure 1 and Figure 2 (page 32), you can see these same relationships from the table between family structure and ever had sex in the top panel, and the use of three or more substances — which I refer to as substance use — in the bottom panel. Consistent with most of the research on family structure effects, adolescents who live with their two biological parents are less likely to be sexually active. Adolescents in biological dad/step-mom step-families display a greater likelihood of ever having had sexual intercourse, as do adolescents in single mother families, with the highest likelihood among adolescents who live with only their father. You see the same relationship for substance use in the bottom panel. The likelihood of using substances is especially high for adolescents in step-families with a biological father and for adolescents living with a single father.

Now, I ask whether father involvement can protect youths from engaging in these risk behaviors, especially youth who are more at risk to engaging in these behaviors living in the step and blended families and with single fathers.

To examine the impact of father involvement on youth behavior, we identified fathers who are highly involved with their children on the dimensions of communication, shared activities, and affective relations with their youth. These dimensions tap both the quantity and the quality of father involvement. We can measure these dimensions for both resident fathers and non-resident biological fathers. We classified fathers as highly involved if the adolescent engaged in multiple shared activities with the father, such as playing a sport, attending a sporting event, attending a religious event, going to movie or play, or shopping; and adolescents if they also reported a very close bond with the father and talked with the father about several different topics in the last month. On average, about 40% of the fathers are highly involved according to this measure.

Figures 3 and 4 (page 33) show the effects of resident father involvement on risk behavior. These effects are adjusted for differences in adolescent’s age, race, gender and other individual characteristics. Here we show resident biological fathers in two parent families and in the biological dad/step-mom family and step-fathers and single fathers. The two bars in each family structure show differences in the percent of adolescents who have ever had sex in the top panel, by the level of father involvement (The light gray bars are adolescents with low father involvement, dark gray bars are adolescents with high father involvement). You can see the results are dramatically consistent. Figure 3 shows that when fathers are highly involved, youth are less likely to ever have had sex. This is consistent across family structures and outcomes. You see the same results for substance use in Figure 4. Father involvement in step and single dad families never brings down the risk behavior to the level of highly involved biological fathers in two parent families, but it does lower risk behavior below the average level for all adolescents in two biological parent families.

Finally, in Figures 5 and 6 (page 34), you can see that the effects are not as strong but high
father involvement by non-resident biological fathers also reduces risk behavior among youths. When a non-resident biological father is highly involved in his children’s lives by talking to them frequently on many different topics, by doing things with them, and by fostering a close relationship, youth are less likely to ever have sex and to use three or more substances. This result holds whether adolescents live in a step-family or with a single mother.

To conclude on this study, the effects of father involvement are consistent and pervasive across family structures and multiple indicators of risk behavior. The effects of high involvement are important to both resident and non-resident fathers and can protect youth from engaging in risk behavior.

**Immigrant Families**

Now, let me turn to a second study on which I want to report. This research has to do with the health status and risk behavior of adolescents in immigrant families. This study will appear later this year as a chapter of the National Academy of Sciences’ volume *Children of Immigrants: Health, Adjustment and Public Assistance*, edited by Don Hernandez. Add Health is a valuable source of data for the study of immigrant children and families — a group of considerable concern given the higher rates of poverty among immigrants, the increasing fiscal pressure and policy initiatives to restrict health services and government benefits to immigrants, and the ongoing debate over the process of adaptation and assimilation into U.S. society and culture. Because of Add Health’s large sample size, there are sufficient numbers of certain ethnic groups that occur naturally in the population, such as adolescents from Mexico and the Philippines. Because of the special samples of adolescents from Puerto Rico, Cuba, and China, we have sufficient numbers to study these ethnic groups.

Of interest is the extent to which immigrant youth assimilate into mainstream youth culture by adopting the health norms and behaviors of adolescents in native-born families. We examined the assimilation process by contrasting immigrant youth or foreign born youth to foreign born parents, typically referred to as first generation immigrants; U.S. born youth to foreign born parents are the second generation; and native born youth to native born parents as the three-plus generation.

Examining outcomes across immigrant generations describes immigrant assimilation as an inter-generational process. The classical theory of assimilation argues that the first generation of immigrants, those not born in the U.S., are rarely expected to achieve socio-economic parity with the native population. But the second generation, U.S.-born children of immigrant parents, are socialized in American schools and neighborhoods, they receive a mainstream education and they obtain the skills that are needed to participate in the American occupational structure. The third generation of children, native born children with native born parents but possibly immigrant grandparents, is thought to differ little from the fourth or higher generation because any ethnic influence of grandparents is thought to be relatively minor in a home in which parents do not speak a foreign language and were educated and socialized in American schools. This “straight line” model of immigrant adaptation, or what is called “Americanization,” describes assimilation across immigrant generations.

You can use the same approach to a intra-generational perspective or process of assimilation. Here we focus just on foreign born youth, those in the first generation, and observe outcomes by the length of time they have been in the U.S. The classical theory would argue that the longer the length of residence
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<th>Family Structure of Adolescents, 1995</th>
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Percent Engaging in Health Risk Behavior by Family Structure

Table 2
FIGURE 1

Ever Had Sex by Family Structure

Family Structure

FIGURE 2

Substance Use by Family Structure

Family Structure
FIGURE 3

Effects of Father Involvement on Ever Had Sex

FIGURE 4

Effects of Father Involvement on Substance Use
in the United States, the greater the assimilation into U.S. society and the narrowing of differentials with the native born population.

Results from Add Health on the health status and health risk behavior of immigrant children show very strong evidence of these types of assimilation — although the results may be quite different than what you’re expecting. Figures 7 and 8 (page 37) show the perspective of intra-generational assimilation. Figure 7 shows an index of health and learning problems. This index contains measures on five outcomes: poor general health, missing school for health or emotional problems, learning difficulties, obesity and asthma. The higher the index the more health and learning problems. This index is shown by the length of time in the U.S. for foreign born youth. As you can see in Figure 7 the longer the time spent in the U.S., or the younger the age that immigrant children arrive in the U.S., the greater the number of health problems. Figure 8 shows a risk behavior index, indicating the number of risk behaviors in which youths engage. The index includes sexual behavior, delinquency, violent behavior, and substance use. Again, the higher the index, the greater the involvement in risk behavior. The results show that the longer the time spent in the U.S., the greater the socialization in American schools and neighborhoods, the greater the likelihood that immigrant children will engage in risk behavior.

Next we turn to findings on inter-generational assimilation, which is shown on Figure 9 (page 38). Here I compare similar outcomes across immigrant generations. The first generation are foreign born youths, the second generation are the children of immigrants, and the third-plus generation are U.S. born youth to U.S. born parents or children in native born families. I compare across generation within ethnic background, because different generations of immigrants come from many different countries and regions, and these differences in ethnic background could influence differences in health outcomes. In Figure 9 I only show the risk behavior index by immigrant generation and ethnic background. Again, you see a remarkably consistent and linear pattern of increasing risk behavior with greater assimilation into U.S. society across immigrant generations for nearly all ethnic groups. First generation youth are less likely than second generation youth to engage in risk behavior; and second generation youth are less likely than youth in native born families to engage in risk behavior.

I just want to make one final point on these results. There is a revisionist theory to the classical model of assimilation that is referred to as “segmented assimilation.” This perspective argues that immigrants may experience different adaptation processes according to the social and economic context or the “segment” of the U.S. population into which they assimilate. As a result, greater exposure to American culture may be associated with mixed prospects. For instance, the classical hypothesis would argue that adolescents who arrived in the U.S. at a younger age and who have spent more time in the U.S. will assimilate into society more rapidly than immigrant adolescents who arrived more recently. If however, the greater exposure to American society has primarily been in an inner city environment where many new immigrants settle, where the social environment and economic opportunities have been declining, then immigrant children with longer U.S. residence may not be doing better than recent arrivals.
My conclusions then, are that immigrant youth are protected from the higher levels of health and learning problems and risk behavior in mainstream youth society.

America, Puerto Rico, and the Philippines, with the very last bar on the graph which represents non-Hispanic white three-plus generation youth. Risk behavior of second generation youth from these countries is greater than risk behavior of the mainstream youth culture of non-Hispanic whites in the native population. Second generation youth are behaving more like their respective ethnic group in the native population because that is the segment of the population to which they are assimilating.

My conclusions then, are that immigrant youth are protected from the higher levels of health and learning problems and risk behavior in mainstream youth society. Research is under way to discover what the mechanisms of protection are. The one thing that we know and that my research shows is that the greater the assimilation into U.S. youth culture, children in immigrant families increasingly adopt the health norms and behaviors of the native youth population, especially within their own ethnic groups, by experiencing more health problems and engaging in riskier behavior.

Figure 9 shows evidence of segmented assimilation in the sense that the risk behavior of the second generation is approaching the risk behavior of youths in native born families of its respective ethnic minority in the U.S. rather than approaching the mainstream, non-Hispanic white youth. You can see this on this graph, by comparing the bars for the second generation, which is the white bar, for Mexico, Central South
The Health Status and Risk Behavior of Foreign-born Youth by Time in the U.S.

FIGURE 7
Health and Learning Problems Index

FIGURE 8
Risk Behavior Index
Ethnic Group and Immigrant Status

Health Risk Behavior Index by

Mean Index

Nativé-born with native-born parents
Nativé-born with foreign-born parents
Foreign-born with foreign-born parents
SILVER: We have digested a lot in the last hour and fifteen minutes. I hope this has stimulated some thoughts, questions, and comments.

Bert Rito - Department of Health and Human Services: Does the Add Health survey incorporate questions about sexual orientation?

UDRY: We didn’t ask the question on sexual orientation, but we did ask things like: Have you ever had a romantic attraction to a male? Have you ever had a romantic attraction to a female? Both male and female students got those questions. Preliminary analysis has already been done. The results to those questions individually and combination have produced a lot of surprising findings, which I’m not going to review for you today. The second thing is that when we asked the adolescents to describe their relationships we didn’t tell them what sex. So, while we got about 20,000 romantic relationships and other sexual relationships described by our adolescents, we got about 200 of each sex who reported same sex relationships. Those haven’t been analyzed in any detail. Again, we didn’t ask people whether they preferred males or whether they preferred females. We do, however, know a lot about their same sex interests and behaviors.

Barbara Gault - Institute for Women’s Policy Research: I was interested in hearing a little bit more about the gender differences in suicidal ideation and whether there is a difference in incidents or a difference in causal factors that leads to ideation among boys and girls?

BEARMAN: There is a big difference in incidents. Girls are more likely to have suicidal ideation and there is a fundamental difference in causal mechanisms. For boys, the traditional mechanisms of alcohol abuse, difficulty with others, and depression play a big role. For girls, the principal determinant is the structure of social relationships in which they are embedded in with other friends. Girls who are isolated from the peer environment are two times more likely to report suicidal ideation than girls with in-school friendships. Likewise, for girls who are in social relationship that are dissonant, that is in which they like somebody, the somebody they like likes X but they don’t like X, what we call a structure of imbalance. Girls who find themselves in these kinds of conflictual and dissonant relations are also two times more likely to have suicidal ideation. So, the relational structure for girls is really important, whereas it is not for boys. In terms of attempts, the relational structure effects disappear for both. So what is important is the warning sign that isolation has for girls.

Nancy Nickell - Washington Fax: I’m wondering if any of you found some gender pressure on the part of parents afraid for girls to go to college, afraid for them to move out, wanting to keep them close to home, afraid they might adopt a different religious view and wouldn’t be around to provide the elder care for the parents? I’ve heard that this occurs in the Spanish community, I know it occurs in the Appalachian community.

UDRY: I’m getting a lot of head shaking from my colleagues. I think those are issues that can be explored and they haven’t been. Maybe your raising the question will stimulate somebody to take on that exploration.
Lorien Abrams - National Institute on Child Health and Human Development: You suggest that schools can restructure social networks. I'm wondering if you could explain a little bit about what you have in mind. How school administrators can know what the social networks are like and whether you think that changing social networks might affect school attachment?

BEARMAN: I hope I didn't suggest that school principals can change sexual networks or restructure disease diffusion. They can structure the school environment so that barriers between cross-race friendships are eliminated. Principally what we find is that in racially heterogeneous schools that work for both black adolescents and white adolescents, that is, where both populations feel that they are a part of the school, the thing missing in that school is deep ability tracking. The thing present in these kinds of schools are structures of extracurricular activities that facilitate racial integration. Schools can really make simple changes to the timing of extra-curricular sequences and ordering of possibilities of these kinds of focal points for adolescents and start to undermine the race segregation that appears otherwise in their friendship patterns. So, the point might be there are schools that work and this is the characteristic they have.

Lorien Abrams - If you know what the structure of a sexual network looks like then how does that help you design an intervention?

BEARMAN: If you have an image of the fundamental diffusion dynamic that is associated with the core group of individuals, then you can design policy to influence the core. So, you focus on people who apparently have characteristics that would fit them into the core. If you imagine that the structure of STD transmission is driven by bridgers then you design and implement policy to shape people who otherwise link disjoint populations. I think the evidence that we have is that these kinds of spanning tree structures are very diffuse, so that the effective intervention might well be diffused across all adolescents. It can be relatively subtle because very subtle shifts in contraceptive use and very subtle shifts in partnership acquisition can really break apart these large components that are most threatening for disease diffusion. That's about as far as I can go.

Angela Huebner - Virginia Polytechnic Institute and State University: You talked about school social climate as predicted by heterogeneity. How were you measuring friendship patterns?

BEARMAN: We have 90,000 adolescents that we interviewed. We asked the interviewees to nominate their five best male and five best female friends. This gave rise to about 600,000 friendship nominations in the schools. It's those non-tangible nominations that we look at to try to assess what the structure of friendship is in the school. You are right that these kinds of friendship relations are different than the relationships that are obtained by joint participation in activities. But where do you find schools where the focal organization of adolescent life leads to a disjoint group. In fact, it is replicated in the friendship structure. So, there is no wonderful matching, but there's a correspondence between these networks.

Shepherd Smith - Institute for Human Development: A couple of questions. Dr. Jaccard, does family structure, in respect to communication, play a role in what's being heard? Dr. Bearman, one thing that struck me in the Journal of the American Medical Association article was the statistic on pledges of virginity, which you avoided talking about. Can you just say a little bit about why it had such a high protected value for kids?
JACCCARD: With respect to family structure effects, I have not yet conducted extensive analysis to compare family structures on communications patterns in the context of the Add Health data. This is a variable that I have held constant in my analyses, but I have not pursued any in-depth analysis of the implications of the different family structures. I do think that’s something very important and something that should be looked at, but I can’t report anything at this time.

BEARMAN: We have about 16 percent of our adolescents who have taken a public pledge to remain virgins. So, it would be about 2.5 million adolescents extrapolated out to the population. It has a really exciting effect. For example, a pledge who has a romantic relationship is less likely to transition to first sex than a non-pledger with no relationship. So, there is a big effect. The question is why is there a big effect? The effect is an interesting one and is conditioned by the social climate in which pledgers find themselves. So, in schools where there are other pledgers for every percent pledger there’s about a one percent decline of transition to first intercourse, up to schools that cross a threshold somewhere between 28 - 40 percent pledgers. At that point the pledge effect disappears. This sort of thing is common in social science research. We know that Catholic non-working women have lower divorce rates. If we recommended that everybody who didn’t want to get divorced become Catholic and stopped working, I don’t know if their divorce rates wouldn’t become lower. The pledge effect disappears at a certain point, either because the heterogeneity of pledgers creates a reversal or, probably most likely, because pledging is constitutive of identity. If individuals are in a context where everyone pledges, that is, where pledging is normative, pledging no longer is constitutive of identity, and the effect on you as an individual disappears.

Nora Gordon - Council of Economic Advisers - I was wondering what kind of data you’ve collected about delinquency or any involvement of the juvenile justice system?

HARRIS: I will talk about the delinquency measures and defer the second question to Dick Udry. We have a delinquency index that we constructed from several different questions that asked whether in the last twelve months or how often in the last twelve months did the adolescent — shoplift something for more than fifty dollars or something less than $50; break or enter into a building; damage property; run away from home, and sell drugs. These behaviors we consider to be more serious acts of delinquency. We also measured what we call “light” or “minor” delinquency. These behaviors include being rowdy in public, lying to your parents (we actually had that in our delinquency index but then we took it out because we could not imagine an adolescent who had not lied to their parents) and painting graffiti. Those are the delinquent behaviors that we measured in Add Health. We also have questions about violent behavior, which I referred to in my talk. These range from carrying a weapon to school, using a weapon in a fight, and threatening somebody with a weapon. We ask about different types of weapons — guns or other weapons. Then the obvious violent behaviors of shooting somebody, stabbing somebody, and “jumping” somebody are also measured. We also have questions as to whether or not the adolescent is the perpetrator or the victim of these types of violent behaviors.

UDRY: I have an answer to the arrest question. That is “yes” we do have data on arrests. But, I don’t know what they show and no one has looked at them yet. So, there again is an opportunity waiting to be explored.

Michele Ver Ploeg - Committee on National Statistics, National Research Council: Can you talk about the longitudinal importance of the survey a little?
UDRY: This study has three waves of data. It has the in-school questionnaire. Then about a year later it had the first in-home questionnaire. Then about a year later it had a second in-home questionnaire for a substantial proportion of those who were in the first study. We didn't follow-up the seniors in the second wave, except that we did follow-up the seniors who were in the genetic paired sample. Sibling pairs are in both sets of the study. That gives us a chance to look at the very high proportion of the kids that participate in our study at three different points. The more different points we accumulate, the more interesting patterns of development we can observe in the adolescents. We can see risk patterns go away, we see risk patterns appear. We look forward to adding to this dataset in the future in such a way that we can see what kind of adults these kids turn out to be.

Pamela Smith - Congressional Research Service: The first of the charts on the immigrant study, does this index compare these kids with average American, non-immigrant youths? This index that goes up to one, if they don't reach one does that say anything about whether they are more or less healthy?

HARRIS: Yes, the next figure gives that comparison.

Smith: I take it that's the European third generation bar.

HARRIS: Right.

Smith: What you see in the shaded bar becomes the whole rest of the population?

HARRIS: Your question asks how do immigrant youth compare with mainstream youth — or what you are calling typical American youth? If you turn to the last graph of my handout, the very last bar on the right represents the third-plus generation of European and Canadian background — this probably comes closest to “typical American youth” — these are non-Hispanic white youth in native-born families. This last graph only shows the risk behavior index, but we get the same basic pattern for the health problems index. If you compare all of the bars that represent first generation youth (across all ethnic groups) you can see that first generation youth — all ethnic groups — engage in less risk behavior than the “typical American youth” shown in the last bar. By the second generation, some ethnic groups are still less likely to engage in risk behavior than the “typical American youth” (for example, Chinese, Other Asian, and Cuban youth); while for other ethnic groups, second generation youth have surpassed non-Hispanic white youth in native-born families, what we are calling “typical American youth.” For example the bar for second generation Mexican, Central-South American, Puerto Rican, and Filipino youth is higher than the bar for typical American youth, indicating greater involvement in risk behavior among these immigrant groups than the mainstream American youth group. The main point, however, is that first generation youth are less involved in risk behavior than majority American-born youth.

Catherine Chilman - National Council on Family Relations: You must have taken account of level of parental education and socio-economic status since other studies shows the tremendous effects of those variables on child development outcomes. For instance, the higher level of risk behavior the kids from one parent families could be confounded by economic status. I want to know if you took account of variables like that?

HARRIS: Yes, the figures that you see in my handout are adjusted for those factors, because they are very important — socio-economic status and education of the parent. Once we control for the differences in
socio-economic status between immigrant youth and native born youth, we still find the differences you see. In fact, the effects of immigrant status become stronger because immigrant children live in very poor families and in poor neighborhoods, so that operates to disadvantage their health. That is what is so astonishing about these findings, that there is something protective about being an immigrant that operates over and above the tremendous obstacles that they face, in terms of the neighborhood’s economic disadvantage in which they live. I should say that the effects of father involvement are there — even after adjusting for these other factors — but they are not as large as the effects of socio-economic status and family structure.

Ann Maney - National Institute on Mental Health: I’m wondering if apart from your suicidal measure were you able to measure anxiety, depression, and substance use?

UDRY: We have a lot of different measures of anxiety and depression. We have several kinds of measures of substance use and they are under extensive analysis right now.

Gerald Sroufe - American Educational Research Association: What is the status of this study? Is it over? Where is it all going? Is it continuing? The question to Professor Harris is that I find the analysis of family structure unsatisfying, not the data but the interpretation of it. We all know different family structures and we’ve seen some that succeed and some that don’t. Your data opens the door to some new and important questions and I’m wondering if you have some plans for exploring the relationship of these single father families, for example, because 50% of those families appear to be working? Do you have plans to explore that?

HARRIS: Yes. I think that’s a very good point. What is so exciting about this study is the opportunity to better understand what is going on in families of different forms. The first research that I’ve done is a broad brush of family structure. I was very excited about the prospects of studying the more than 600 kids that live in single father families in Add Health because our knowledge is very limited about such families. We have information on how single father parents monitor their children, and what their relationships are like. The plans are there for more in-depth research. I’ve begun with an overview of all family forms, and will proceed to study specific family forms and their functioning and family processes next. I should note, however, that one reason that we see these high levels of risk behavior in single father families is probably related to the history of how kids end up in a single father family. There is probably a high degree of instability in the living arrangements of adolescents who live with a single father that is correlated with involvement in risk behavior. One of the things that we will study is the history of living arrangements, where they were, in what family form and what happened with that family before they ended up with a single father.

UDRY: Now I’d like to answer the question of what is next? What goes on from here? Are we going to stop working on this after we get through with this presentation? We expect to be working on Add Health for a long time. First thing, we have an enormous amount of work to do on the data that we have in our hands. Second, we have a enormous amount of work to do to get this data into other peoples’ hands and get them doing analyses. Third, we have submitted a grant application to NICHD to continue Add Health for five more years. That application has been favorably reviewed by a scientific review and is going to be taken to NICHD Council in September. We have high hopes for reinterviewing these then-adults in 2000, at which time they would age be 18-25. What difference did adolescence make? What difference did it make in terms of what kind of adults they have become? So, stick around.

SILVER: With that good news and high hopes let me thank the speakers and thank the audience for a very interesting morning. The speakers will be here for a short time if you have individual questions and want to talk to them. Thank you all for coming.
WHAT DO WE KNOW ABOUT ADOLESCENT HEALTH?
FINDINGS FROM THE NATIONAL LONGITUDINAL STUDY OF
adolescent Health

A Congressional Breakfast Seminar
Friday, July 17, 1998
8:30 a.m. to 10:30 a.m.
Room B338, Rayburn House Office Building

PETER BEARMAN is Professor of Sociology at Columbia University, where he recently moved after spending 12 years in the Sociology Department at the University of North Carolina, Chapel Hill (UNC). He is the co-designer of the National Longitudinal Study of Adolescent Health. His areas of interest are social and sexual networks. His current research focuses on the structure of social networks, virginity pledges, and the transition to first intercourse, school attachment, determinants of adolescent suicides, and the effects of schools on adolescent health. He earned his Ph.D. from Harvard University.

KATHLEEN MULLAN HARRIS is the Associate Chair of the Sociology Department at the University of North Carolina at Chapel Hill. She is also a Faculty Fellow at the Carolina Population Center. Harris is co-principal investigator for the National Longitudinal Study of Adolescent Health in which she is studying the health status and health behavior of children in immigrant families and the role of social context, family process, and parental involvement on adolescent risk behavior. Her research interests are in the areas of family, poverty, and social policy. Her recent book on the welfare experiences of adolescent mothers, Teen Mothers and the Revolving Welfare Door, received the Otis Duncan Book Award from the American Sociological Association. She earned her Ph.D. from the University of Pennsylvania.

JAMES JACCARD is Professor of Psychology at the University at Albany, State University of New York. He is also the Director of the Center for Applied Psychological Research. His research has focused on family based approaches for preventing adolescent problem behaviors. He has published six books, including Parent-Teenager Communication: Towards the Prevention of Unintended Pregnancies, and over 100 articles in scientific journals on the topics of research methodology, attitude theory, decision making, and parent-adolescent communication. He is currently conducting fieldwork evaluating the effectiveness of parent outreach programs for reducing alcohol impaired driving and for reducing unintended pregnancy. He earned his Ph.D. from the University of Illinois at Urbana.

J. RICHARD UDRY is Kenan Professor of Maternal and Child Health and Kenan Professor of Sociology at the University of North Carolina, Chapel Hill. He is the principal investigator of the National Longitudinal Study of Adolescent Health. He served for many years as the director of the Carolina Population Center at UNC. He has been doing research on adolescents for the past two decades, currently under a Merit Award from the National Institute of Child Health and Human Development. He is a recent past-president of the Population Association of America, and a Fellow of the American Academy of Arts and Sciences. He earned his Ph.D. from the University of Southern California.
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The National Longitudinal Study of
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http://www.cpc.unc.edu/addhealth

Seminar speakers (l to r): James Jaccard, Peter Bearman,
Kathleen Mullan Harris, J. Richard Udry
What Do We Know About Adolescent Health?
Findings from the National Longitudinal Study of Adolescent Health

Attendance

Honorable Ben Gilman (R-NY)
Honorable David Price (D-NC)

Lorien Abrams
Sharon Adams-Taylor
Virginia Anthony
Joy Austin-Lane
Christine Bachrach
Peter Bearman
Gem Benoza
Bill Bukoski
Sarah Bolt
Joshua Boxer
Arnold Bruce
Jennifer Burgess
Aggie Byers
Jennifer Callahan
Karen Carrion
Lynn Cates
Tracy Chamblin
Sonia Chessen
Catherine Chilman
Mark Coggeshall
Paulette Como
Edith Cooper
Kristin Cormier
Mary Crosby
Cynthia Diehm
Lisa Esquivel
Jeff Evans
Jonathan Fishburn
George Gaines
Thesia Garner
Barbara Gault
Catherine Gaze
Nora Gordon
Katherine Halpin
Mark Harkins
Kathleen Mullan Harris
Stephen Hendry
David Hess
Angela Huebner
Kindra Ingram
James Jaccard
Brittany Kneebone
Sarah Knox
Elisa Koff

National Institute on Child Health & Human Development
American Association of School Administrators
American Academy of Child & Adolescent Psychiatry
Congressional Research Service
National Institute Child Health & Human Development
Columbia University
Hamilton Fish National Institute on School & Community Violence
National Institute on Drug Abuse
National Institutes of Health
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U.S. Department of the Army
Office of Representative Steve Largent (R-OK)
Consortium of Social Science Associations
Office of Senator Jim Jeffords (R-VT)
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U.S. Department of Health & Human Services
National Council on Family Relations

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Congressional Research Service
National League of Cities
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Jim Lemon
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Office of Representative Sheila Jackson-Lee (D-TX)
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National Institute on Child Health and Human Development
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