

## A. Specific Aims

We propose a collaborative, multidisciplinary program of projects on aging and the life course that will both exploit and add to core resources of the Wisconsin Longitudinal Study (WLS). We are more than 50 investigators and research colleagues at the University of Wisconsin and across the nation. We want to exploit the unique scientific value of the WLS, along with other relevant and comparable sources of data on population aging, to pursue a broad agenda of research on social and economic factors in health and aging. This proposal consists of 3 Cores: Administration (A); Data Dissemination: Documentation, Outreach, and Security (B); and Complementary Data Collection and Management (C), which will serve an initial set of eight research projects (see Specific Aim 5). These activities will complement the 5th major round of WLS data collection, 45 years after the 1957 high school graduation of the original 10,317 participants.

We represent diverse scientific fields – sociology, demography, epidemiology, economics, social and cognitive psychology, industrial engineering, neuroscience, social work, psychiatry, nursing, and medicine. Our long-term plan – of which this program of projects is only one component – spans many modes of data collection: telephone and mail surveys, brain imaging, personal interview, bio-indicators, content analysis of interviews, and linked records for individuals, organizations, and small areas. Likewise, our analytic work will reflect, intermingle, and, we hope, integrate the many theories, models, and methods of our home disciplines.

We intend and expect that our analysis of the new waves of WLS data, along with the rich data presently available from the WLS, will resolve old questions and open new areas of interdisciplinary inquiry about health, aging, and the life course. Regardless of our individual and collective plans, all WLS data will be released to the research community, either directly or through a secure data enclave, to the maximum extent consistent with high standards of protection for the privacy and confidentiality of research participants, as soon as they have been collected, cleaned, and documented. To these ends, we have requested that the National Institute of Aging (NIA) establish a Data Monitoring Board to oversee the conduct of the WLS.

The Specific Aims of the WLS program of projects are as follows:

1. To recruit, encourage, and support a cadre of researchers (and researchers-in-training) at the UW-

Madison and elsewhere who will fully exploit the unique resources of the Wisconsin Longitudinal Study for studies of aging and health in the life course (See Core A).

2. To supplement existing survey and biomedical data in the WLS with scientifically valuable linked data from individual administrative records, organizational records, small area data files, and pilot biomedical measurements (See Core C).
3. To disseminate well-designed and documented data products of the WLS by all available means, including web-based access to public data and indirect analysis of sensitive data through the secure data enclave of the Center for Demography of Health and Aging (See Core B).
4. To sponsor and organize local and extramural seminars and workshops to promote use of WLS data and report research in progress and to organize a small project competition and workshops to encourage innovative uses (and new users) of WLS data (See Core B).
5. To provide common resources and a venue for productive scientific interaction within and among an initial set of eight major analytic research projects that will use data from the WLS:
  - a. Social and Behavioral Contexts of the Aging Mind
  - b. End-of-Life Planning and Well-Being in Late Life
  - c. Nonnormative Parenting Impacts in Midlife and Old Age
  - d. Access to Care and Health Outcomes in the Near Elderly
  - e. Family Relations, Labor Supply, and Health in Later Life
  - f. Work, Health, and Well-Being
  - g. Education in Careers, Health, and Retirement
  - h. The Emotional Brain across the Life Course
6. To develop additional research activities and data resources using the Wisconsin Longitudinal Study.

## B. Background and Significance

Some research agendas focus on a central idea or hypothesis. Ours focuses on a set of processes – the cumulation of experiences and outcomes across the life course during the last half of the 20th century and the beginning of the 21st century. It addresses a broad array of questions through a set of interrelated research projects that will exploit shared data about the life course of a large sample of ordinary Americans. The defining features of the enterprise are the facts that we have already observed this cohort for almost half a century and that we can invest

in additional observations – social, economic, behavioral, and biomedical – for decades to come.

How will the large cohorts now reaching midlife pass through the remaining decades of their lives? Which women and men will be “healthy, wealthy, and wise,” and which will be less fortunate in their later years? What affects access to and use of medical care among the near-elderly? How does the quality of life among the elderly depend on conditions and experiences in childhood, youth, and midlife? How do the effects of social origins and academic success play out in later life? What are the cumulative effects of job characteristics and working conditions? What vocational or social activities lead to better cognitive and psychological functioning among the aging? How do life trajectories affect brain structure and activation? When and how do the near elderly begin to prepare for their own deaths? How – and for how long – are the lives of parents disrupted by the disability or death of their own children? How do family structure and history affect the transition to retirement? These are exemplars of the questions we propose to address in this program of projects.

In several major reports, expert panels of the National Research Council (NRC) have offered new, but convergent recommendations for future research on health and aging (National Research Council 1997; 2000a; 2000b; 2000c; 2000d; 2001a; 2001b). These reports emphasize the importance of (1) social context for behavior; (2) interdisciplinary approaches to scientific and policy issues; (3) developmental or life-course perspectives; (4) recognition of multiple levels of influence; (5) identification of mechanisms or pathways to health and illness; (6) development and use of new methodologies; and (7) development of new institutional and training infrastructure to support the new research agenda (Berkman 2001). These admirable goals require continued development of major, public longitudinal data resources on population health and aging. We believe that a broad, interdisciplinary program of research built around continuing, intensive observation of participants in the WLS will contribute to each of these salutary goals.

### ***B.1. A Description of the WLS***

The WLS began with a 1/3 random sample (N = 10,317) of women and men who graduated from Wisconsin high schools in 1957.<sup>1</sup> The original purpose of the study

was to assess the demand for higher education in Wisconsin. Figure 1 provides a succinct overview of sources of survey data and types of administrative record data available or proposed for the WLS.<sup>2</sup>

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### **Figure 1. Survey and Administrative Record Data in the Wisconsin Longitudinal Study**

#### Sources of Survey Data:

- 1957 Senior Survey of Graduates
- 1964 Postcard Survey of Parents
- 1975 Telephone Survey of Graduates
- 1977 Telephone Survey of Siblings
- 1992 Telephone/Mail Survey of Graduates
- 1994 Telephone/Mail Survey of Siblings
- *Proposed:* 2002-03 Telephone/Mail Surveys of Graduates, Siblings, Spouses, and Widows

#### Complementary Public or Administrative Record Data:

- Henmon-Nelson Mental Ability (9<sup>th</sup> and 11<sup>th</sup> grades)
- Rank in High School Class
- Parents' Adjusted Gross Income, 1957-60
- Male Graduate's earnings, 1957-71
- College Characteristics
- Employer Characteristics, 1975
- National Death Index-Plus
- See Core C for proposed supplementary data

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The next two waves of survey data were collected from the graduates or their parents in 1964 and 1975. Those data provide a full record of social background, high school curriculum, youthful aspirations and social influences, schooling, military service, family formation, labor market experiences, and social participation. Early survey data were supplemented by earnings of parents from state tax records, mental ability test scores and rank in high school class, and characteristics of high schools and colleges, employers, industries, and communities of residence. Recently, we added state archival data on high school district resources from 1954 to 1957 (Olson and Ackerman 2000a; 2000b). WLS records for graduates are also linked to those of three best same-sex high school friends; about half the graduates have a named peer in the

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<sup>1</sup> The WLS cohort thus includes Milwaukee's “Class of '57,” made famous by the TV comedy, *Happy Days*. In 2002, Richie, Potsie, and Ralph would be 63 years old.

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<sup>2</sup> Appendix A of Core B provides a description of WLS data and survey instruments through 1992-94.

sample. Data on the occupational careers of male graduates are supplemented by Social Security earnings histories from 1957 to 1971, and we are currently seeking permission from the Social Security Administration to obtain full earnings histories for both male and female graduates and siblings.

In 1975, we obtained a roster of living siblings and chose a focal sibling at random for each graduate (except we included all twins). We located adolescent cognitive ability test scores for 6619 of the focal siblings of graduates (75%). In 1977 we obtained parallel interview data for a highly stratified sample of 2100 of these randomly selected siblings.

In 1992-94, we conducted four major surveys with NIA support (AG-9775): telephone and mail surveys of WLS graduates and nearly identical telephone and mail surveys of an expanded random sample of focal siblings. We updated measurements of marital status, child-rearing, education, labor force participation, jobs and occupations, social participation, and future aspirations and plans among graduates and siblings. We expanded the content of earlier follow-ups to include psychological well-being, mental and physical health, wealth, household economic transfers, and social comparison and exchange relationships with parents, siblings, and children.

In 1975, our concepts and measures resembled those of the Current Population Survey (CPS) and the 1973 Occupational Changes in a Generation Survey (OCG). In 1992, we balanced continuity with comparability to other well-designed surveys, e.g., Health and Retirement Survey (HRS), National Survey of Families and Households (NSFH), NIH surveys of work and psychological functioning, and the NORC General Social Survey (GSS). We also coordinated our design with members of the MacArthur Foundation Research Network on Successful Midlife Development, with the Whitehall II study (Marmot et al. 1991), and with Wadsworth's (1991) longitudinal cohort study of births in Great Britain in 1946.

In 1992, the 1-hour telephone interview covered life history data, family rosters, and job histories, which have many skips or branches. For example, our job history protocol covers 94% of jobs held since 1975 that lasted 6 months or longer. Because we anticipated lower response rates in the mail survey, the telephone survey collected selected items from key inventories of personality (The Big Five, John 1990; 1991), health (depression and alcohol use), and well-being (Ryff 1989; Ryff and Keyes 1995), of which there are more detailed measures in the mail instrument. The mail instrument also adds measures of

well-being, social contact, exchanges, and health, including an extensive account of menopausal experience. The sibling mail survey was modified to obtain additional measures of physical health and health-related behaviors, richer accounts of menopausal experiences, and more information about relationships between the focal sibling and other family members—including indicators of childhood abuse.

Recently, we matched WLS graduates and siblings to the National Death Index-Plus (NDI-Plus)—using SSNs, names, and birthdates as identifiers—in order to obtain cause(s) of death and confirm date and place of death. We are currently doing the same for parents of the graduates and siblings, and we plan to add searches for their deceased children.<sup>3</sup>

The WLS sample design has become increasingly complex over time, but a fair summary is that, in 1992, we completed telephone interviews with 8493 WLS graduates out of 9741 survivors, and we interviewed 4804 siblings out of 6260.<sup>4</sup> (The flow chart in Appendix A of Core B summarizes sample design and attrition.)

We have elsewhere proposed new surveys of WLS participants to be carried out in 2002-03. As in the 1992-94 round of the WLS, we will first carry out telephone surveys of the WLS graduates and our sample of their brothers and sisters. As in the past, we plan to contact all surviving members of the samples, whether or not they participated in the last round of the survey. These will be followed by mail-out, mail-back surveys, which will be longer than in 1992-94 – as many as 48 pages. The telephone interview schedules will build in supplementary sections for (a) graduates or siblings who have been widowed and (b) who have had a physically or mentally disabled child or have experienced the death of a child. We will obtain permission from WLS participants to tape-record randomly selected telephone interviews in anticipation of an R01 to support subsequent behavior coding of respondent cognition and interaction with

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<sup>3</sup> We estimate that about 500 fathers and 2000 mothers of graduates or siblings will still be alive in 2002. More than 800 children of graduates or siblings had died by 1992-94 (See project 3, “Non-normative Parenting Impacts in Midlife and Old Age.”)

<sup>4</sup> An additional randomly selected 20% of the siblings who had not been interviewed in 1977 were not interviewed by telephone because we ran out of money; 55% of these siblings responded to a modified mail survey.

interviewers.<sup>5</sup> Because of our interest in joint survivorship and (eventual) widowhood, we will carry out shorter (30 minute) interviews with the spouses of graduates and siblings, which will focus mainly on health and family relations, and with approximately 900 widows or widowers of graduates and siblings. Relevant details about the content of the 2002-03 surveys and other new data collection are provided in Core C and in the 8 research proposals.<sup>6</sup>

**B.2. Is the WLS Worth the Investment?**

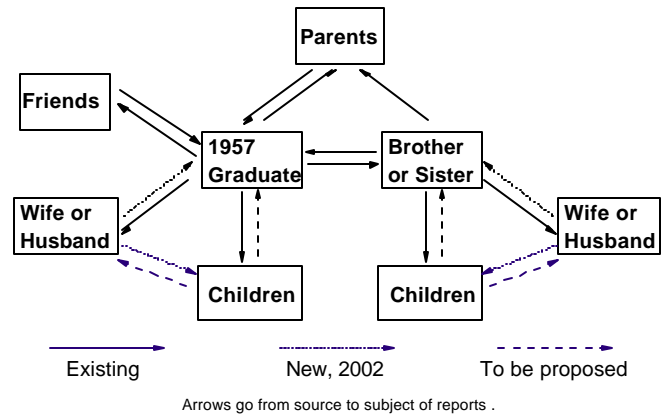
The strengths of the WLS as a resource for studies of midlife and aging lie in its *longitudinal scope*, its exceptional *sample retention*, the *content and quality* of survey and administrative data, and its *relational design*: It has followed a large and diverse sample from high school graduation to the cusp of retirement, and it has followed a number of social and economic relationships between the graduates and their significant others.<sup>7</sup>

We are not alone in believing that the WLS is a uniquely valuable resource for studies of aging in America. For example, *New Horizons* extols the value of the classic British birth cohort surveys but then adds that, “In the United States, the Wisconsin Longitudinal Study ... is the closest to the British birth cohorts in richness of psychosocial information, but goes well beyond the British studies with its in-depth assessments of educational attainment and occupational experience as well as accompanying data from siblings, spouses, and parents” (National Research Council 2001b:105).

While the WLS data center on the 1957 graduates, we now find it useful to think of them as focal points in sets of relationships with aging parents, spouses, adult children, and siblings, as shown in Figure 2, as well as relationships with the localities and social institutions through which they have passed—high schools, colleges, and employers. WLS files include full survey and administrative data records for graduates, linked with those of friends and siblings. Parents were the initial post-high school informants about graduates, but a great deal of our information about parents has come from administrative records or from graduates and siblings. Data have not previously been obtained from spouses or children—except sometimes to help locate sample members—but we have proposed to interview spouses (and widows) in this wave of the study, and we hope to add children soon thereafter.

The parallel data for siblings are a special strength of

**Figure 2. Relational Links in the Wisconsin Longitudinal Study**



the WLS. Siblings provide unique data—self-reporting variables that cannot be obtained from proxies, cross-validating information about graduates and their families, and complementary accounts of inter-household (and intergenerational) exchanges. Analytically, the sibling data permit construction of multi-level models of family and individual effects on life course outcomes (Hauser and Sewell 1986; Hauser, Sheridan, and Warren 1999).

Among Americans aged 60 to 64 in March 2000, 66.7% are non-Hispanic white women and men who completed at least 12 years of schooling (U.S. Bureau of the Census 2000: Table 1a) and thus resemble the WLS cohort. The WLS is unusually valuable in its representation of women as well as men. Also, because the WLS is the first of the large, longitudinal studies of American adolescents, it provides the first large-scale opportunity to study the life course from late adolescence through the mid-60s in the context of a full record of ability, aspiration,

<sup>5</sup> Short segments of all interviews will be recorded for accurate coding of cognition items.

<sup>6</sup> Also, see Section D, below.

<sup>7</sup> A comprehensive review of the WLS, “As We Age: The Wisconsin Longitudinal Study, 1957-2001,” appears as Appendix B6 of Core B.

and achievement.<sup>8</sup> The WLS graduates and their siblings have lived through major social changes: rising affluence, suburban growth, the decline of old ethnic cleavages, the cold war, and changing gender roles. Moreover, the WLS cohort, born mainly in 1939, precedes by a few years the baby boom generation that has taxed social institutions and resources at each stage of life, and thus the study can provide early indications of trends and problems that will become important as the larger group passes through its early 60s. The WLS overlaps the youngest cohorts that entered HRS in 1992, and this has provided opportunities to check the scope of our findings. Unlike the WLS, HRS is nationally representative, but it does not cover the lives of respondents from adolescence to old age.

The WLS data also have obvious limitations. Some strata of American society are not represented. Everyone in the graduate sample completed high school. Sewell and Hauser (1975) estimated that about 75% of Wisconsin youth graduated from high schools in the late 1950s; about 7% of siblings in the WLS did not graduate.<sup>9</sup> There are only a handful of African American, Hispanic, or Asian persons in the WLS. Given the minuscule share of minorities in Wisconsin when the WLS began, there is no way to remedy this omission. About 19% of the WLS sample is of farm origin; this is consistent with national estimates for cohorts of the late 1930s. In 1964, 1975, and 1992, 70% of the sample lived in Wisconsin, but 30% lived elsewhere in the U.S. or abroad. Fifty-seven percent of WLS graduates resided in Wisconsin at every contact. WLS graduates are homogeneous in age, but the ages of selected siblings vary widely, mainly 10 years older to 10 years younger than the graduates.

We think that the WLS data are a scientific resource of inestimable value. In their evaluation of the WLS for studies of status attainment, Jencks, Crouse, and Mueser (1983:4) wrote: "If the determinants of status attainment really vary appreciably from state to state, we should not be pooling data from different states into national samples.

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<sup>8</sup> There have, of course, been exceptionally important and influential longer-term studies of the life-course in the U.S. These reflect careful and insightful work, but they are based on small, local, or highly selected samples (Oden 1968; Elder 1974; Clausen 1993).

<sup>9</sup> Even so, because of its high response rates, we think that the WLS may be less positively selected than many other large epidemiological studies of aging populations, in which higher status and high-performing elders are more likely to respond.

If the processes do not vary appreciably, we can learn as much from Wisconsin as from the whole country." We think this applies also to studies of health and aging, and we note, also, that many other key data resources in health and aging are based on local or non-representative samples, e.g., the recent nun studies, the nurse study, and the Framingham studies.

### ***B.3. The WLS as a National Resource***

In a recent symposium at the National Academy of Sciences, Hauser (2001) outlined several potential strengths of longitudinal population surveys: (1) Giving us "the big picture," global descriptions of variations in the life course in populations; (2) Making it possible to model dynamic processes over long periods of time; (3) Providing data across time about role-relationships, e.g., parent-child, sister-brother, wife-husband; (4) Providing data at multiple levels of analysis, e.g., the biological, neurological, psychological, and social, as well as at varying levels of aggregation; (5) Providing representative data about rare as well as common events and processes; (6) Facilitating serendipitous findings; and, taken together with other studies, (7) Permitting piecemeal construction of synthetic models of life-course processes.

We think that the WLS will make contributions in each of these ways, but the strengths and limitations of the WLS should be considered in the context of other major studies of aging. We have assembled a tabular comparison among several major studies. We compare five major studies:<sup>10</sup>

1. Wisconsin Longitudinal Study (WLS)
2. Health and Retirement Survey (HRS)
3. National Survey of Families and Households (NSFH)
4. Americans' Changing Lives (ACL)
5. Midlife in the United States (MIDUS)

The last of these is not (yet) a longitudinal study, but a second wave has been proposed.

In our judgment, each of the five focal studies has made important contributions to our knowledge of midlife development, health, and aging, and each is likely to make important contributions in the future. Moreover, we believe that partial overlaps in content among multiple surveys are valuable features of the nation's repertoire of longitudinal studies (Hauser 2001). Thus, we would not propose that

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<sup>10</sup> For the rationale for our choice of studies, and detailed comparisons among their design and content, see "Surveys of the Life Course and Aging: Some Comparisons," Appendix B4 of Core B.

the WLS is a substitute for any of these other data resources.

The other four studies differ from the WLS in similar ways: All attempt to cover the entire U.S. population; all are presently of relatively short duration and, except HRS, they cover adults of all ages. Only NSFH provides rich (retrospective) data on early life circumstances, but it lacks the psychological measures in the WLS. Beyond these features, each study is unique in content and design, reflecting the interests of its leaders and research community.

To summarize, the WLS has unique and valuable features. No other study combines its historical location, length of coverage, breadth of content, sample size, sample retention, and coverage of siblings (Jencks et al. 1979; Center for Human Resource Research 1992). The graduates are similar in education and race-ethnicity to about 2/3 of their birth cohort nationwide. Measurements are of high and often of known quality. The WLS has fared well in comparisons of findings with those from national studies of comparable populations (Jencks, Crouse, and Mueser 1983; Sewell and Hauser 1975; Corcoran, Gordon, Laren, and Solon 1992). HRS, NSFH, PSID, ACL, and MIDUS were not designed to obtain comparable long-term or public-record data on social and psychological background—nor do they have comparable occupational histories or job characteristics. Other major longitudinal studies—the national studies of youth and of high school graduates that began in adolescence—cover much more recent cohorts, and several of them are inactive. We think that the WLS is worth the investment that we propose to make, as it provides a unique and important resource for continuing analyses of aging and the life course in America.

### **C. Preliminary Studies/Progress Report**

In the past three and a half years, with NIA support (AG-9775), the WLS has focused on three interrelated activities, leading up to this and other related proposals. (1) *Research Activities*: Continue studies of the antecedents and patterns of life trajectories in socioeconomic attainment, family circumstances, and health from adolescence to midlife; (2) *User Contact and Support Activities*: Maintain, enhance, document, and disseminate the WLS as a public data resource; (3) *Planning Activities*: Anticipate and design a new follow-up of the WLS samples. In the following sections, we describe our progress in meeting these objectives.

#### **C.1.a. Research Activities**

Since mid-1997, the WLS has yielded 37 articles or

chapters in books, 7 completed dissertations (and 2 more in progress), 3 Master's theses, and more than two dozen presentations and/or manuscripts in progress. Of the published works, about half are by the PI (Hauser) or his advisees, and the remainder have been prepared by other scholars associated with the project. The dispersion of authorship represents both the efforts of project staff to encourage public use of WLS data and the products of the Life Histories and Health in Midlife Study (LHHMS, PI, Carol Ryff), which carried out intensive interviews and collected bio-indicators from a highly selected subsample of WLS graduates.<sup>11</sup>

Beginning in the 1960s, analyses of WLS data focused on college entrance and the early career (Sewell 1971; Sewell and Hauser 1975; Sewell and Hauser 1980; Sewell and Hauser 1992). Since the early 1990s, the WLS has focused on later stages of the life course, and its content has encompassed a wider range of familial, socioeconomic, psychological, and health outcomes (Hauser et al. 1992). However, the project will continue to build on key findings from the early life course.

In the first two decades of the project, we developed a widely known and tested theory of the social psychological processes in late adolescence that give direction to the socioeconomic life course (Sewell 1971; Sewell, Hauser, and Wolf 1980; Hauser, Tsai, and Sewell 1983). These ideas have provided a flexible framework for our ongoing investigations of a broader range of outcomes. Briefly, our initial theory was that social background and mental ability, along with school performance during adolescence, are reflected in social support for achievement among significant others, e.g., parents, teachers, and peers. These social influences affected levels of educational and occupational aspiration, which strongly affect post-high school education and labor market success.

The WLS data and research based on them are well-known. As of June 2001, there had been more than 1600 citations in the Social Science Citation Index to just eight key project publications.<sup>12</sup> WLS data had also been used,

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<sup>11</sup> The WLS project has yielded since its inception 4 research monographs, 32 doctoral dissertations, 19 masters theses, more than 160 research articles or chapters in books – and more than two dozen works in progress. For a comprehensive review and bibliography of the WLS, see Appendix B4 of Core B.

<sup>12</sup> These are Sewell and Shah (1967), Sewell, Haller, and Portes (1969), Sewell, Haller, and Ohlendorf (1970),

even before the 1992-94 round of data collection in studies of geographic constraints on college access; recruitment into teaching, nursing, and other occupations; choice of marital partner; differential family formation and fertility; gender differences in market participation and success; religious and ethnic differences in achievement processes; birth order effects on ability and achievement; effects of high schools and colleges on aspirations and achievements; and inter-firm and inter-industry differences in compensation.

In recent years, the key questions have been whether or not we have been correct about the significance of adolescent experiences throughout the adult life course, whether (and how) their effects may fade with the passage of decades (Warren and Hauser 1997; Hauser et al. 1999; Hauser, Warren, Huang, and Carter 2000), and what range of outcomes are affected by these processes (Hauser and Sweeney 1997; Miech and Hauser 2001). The short answer is that, for the most part, social and psychological characteristics of childhood and adolescence affect adult outcomes primarily through educational attainment. But there are also fascinating exceptions to this generalization. For example, cognitive ability has small, but statistically significant, long-term effects on occupational success and the timing of menopause, and occupational aspirations have a persistent effect on occupational standing.

Recent publications from the WLS include studies of schooling in full sibships (Kuo and Hauser 1996; Kuo and Hauser 1997; Hauser and Kuo 1998); sibling resemblance in socioeconomic achievement (Hauser et al. 1999; Hauser et al. 2000; Warren, Hauser, and Sheridan 2001); measuring occupational status and social class in studies of health (Hauser and Warren 1997; Warren, Sheridan, and Hauser 1998; Miech and Hauser 2001; Warren and Kuo 2000); long-term effects of childhood poverty and three-generation mobility (Warren and Hauser 1997; Hauser and Sweeney 1997); new mathematical models of labor market choice (Logan 1996a; Logan 1996c; Logan 1996b; Logan 1998); life course profiles and mental health (Singer, Ryff, Carr, and Magee 1998); life pathways to physiological risk (Singer and Ryff 1999); socioeconomic status, gender, and health at midlife (Marks and Shinberg 1997; Marks and Shinberg 1998; Shinberg 2001); entry of women into male-dominated occupations (Sheridan 1997); the effects of

family role changes on midlife career changes (Carr and Sheridan 2001); long-term effects of cognitive ability (Hauser and Sweeney 1997; Hauser et al. 1999; Hauser et al. 2000; Shinberg 1998; Warren 1998; Hauser 1998; Olson and Ackerman 2000b); timing and differentials in menopause and hormone therapy (Shinberg 1998); effects of social mobility on psychological well-being (Carr 1997); effects of child-disability on the life-course of parents (Seltzer, Greenberg, Floyd, Pettee, and Hong 2001); and sibling resemblance in depression (MacLean and Hauser 2000; MacLean and Hauser 2001).

### ***C.1.b. Supplementary Data Collection***

In addition to analytic work, we have augmented the WLS data in several significant ways. We have already mentioned the NDI-Plus matches to multiple cause(s) of death and the match of high schools to archival resource data in the state archives. We have also added new measures of cognitive ability in adolescence, obtaining freshman year scores for most of the graduates and increasing the coverage of siblings. We completely updated the coding of some 60,000 occupation-industry entries from the 1992-94 surveys to the 1990 Census classification system. Finally, we have abstracted and recorded all marginal comments from 1992-94 mail questionnaires.

### ***C.2. User Contact and Support Activities***

WLS data are secure, well-maintained, and available to external users to the maximum possible extent. Our past accomplishments and future plans are described in Core B. We note that current public data (in their 4<sup>th</sup> edition since 1994), extensive documentation (bibliography, codebooks, flowcharts, and other memoranda), and extraction tools are available on the web at <http://dpls.dacc.wisc.edu/WLS/wlsarch.htm>. We have recorded at least 290 different users, with e-mail addresses from all over the world, who have downloaded WLS data since 1995. Archival WLS data are at the Interuniversity Consortium for Political and Social Research.

### ***C.3. Planning Activities***

In 1999, we joined investigators from MIDUS (Midlife in the U.S.) to explore possibilities for joint data collection and analysis in that project and the WLS. Both projects were very large, and the most promising designs for the immediate future were somewhat different. Thus, while there is overlap (including 3 PIs) between the two projects, we currently pursue independent, but complementary, lines of proposal development.

Early in 2000, after identifying researchers or research

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Sewell and Hauser (1972; 1975), Sewell, Hauser, and Wolf (1980), Hauser, Tsai, and Sewell (1983), and Hauser and Sewell (1986).

groups with potential interest in the WLS, Robert and Taissa Hauser met personally with them as individuals or in small groups. We invited participants to prepare a brief prospectus that described their potential scientific interests in the WLS and the resources, including new data, needed to pursue them. These led to a plan for a series of small and large proposals to develop and exploit the WLS over the next five to ten years. We convened a dozen research workshops during the winter and spring of 2001. The investigators listed on this proposal, along with our collaborators and consultants, have developed, shared, criticized, and rewritten multiple sets of specific aims and full proposal drafts.<sup>13</sup>

This proposal is to support the second major component of our research agenda—a plan to analyze, supplement, and disseminate repeated measures and new baseline data from WLS graduates, siblings, spouses, and widows. In the paragraphs below, we describe the overall plan and provide selected details.

*Our long-term plan has four major phases, of which this proposal is the second. **Phase 1: Surveys of graduates, siblings, spouses, and widows:***<sup>14</sup> In this, as in previous waves, we propose to interview all surviving graduates or siblings, plus spouses and widows of graduates and siblings. These surveys will provide new data to support research proposed in the eight projects in this package, along with other research for which proposals are in progress.<sup>15</sup>

**Phase 2 (this proposal):** This program of projects includes three Core support proposals and eight analytic

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<sup>13</sup> *Investigators* are core WLS staff and faculty at the UW-Madison and elsewhere who will play lead roles in the analytic proposals to be submitted independently or as components of a forthcoming program of projects. *Collaborators* are other UW faculty who are serving as advisors on this proposal; several of these plan later proposals. *Consultants* are not at the UW; some consultants may later join the project as investigators either through the P01 mechanism or independently.

<sup>14</sup> This phase of research has been proposed in the competing renewal of The Wisconsin Longitudinal Study (AG-9775).

<sup>15</sup> Many survey items will repeat questions from the 1992-94 WLS surveys, as presented in Appendix A of Core B. However, we also plan to include a great deal of new material, which appears in questionnaires appended to individual research proposals.

proposals and will augment WLS data through administrative record-matches, medical examinations, and neurophysiological measurement.<sup>16</sup>

*Core A: Administration.*

Core A of the Wisconsin Longitudinal Study (WLS) will be responsible for leadership, coordination, and oversight of research activities, grant management, and support services for all components of the WLS research program: three cores, eight analytic research projects, and survey activities proposed independently in connection with the WLS R01 (AG-9775). The Principal Investigator (R.M. Hauser) will convene an internal Steering Committee, consisting of PIs or delegates from each core and research component of the WLS program.<sup>17</sup> While the PI is administratively and scientifically responsible for the program, the Steering Committee will meet regularly and advise the PI informally as necessary. Lead scientific and professional staff will be responsible for planning and coordination of all project activities, quality control of research activities, supervision of administrative functions, protection of human subjects, liaison with grant agencies, consultants, data suppliers (survey centers, data archives, administrative agencies, and private vendors), local technical support units, and officials of the UW Madison and other participating institutions. Administrative functions are described in Core C.

*Core B: Data Dissemination: Documentation, outreach, and security.*

Core (B) of the WLS will be responsible for creating, documenting, disseminating, and maintaining the security and confidentiality of WLS data. Non-identifiable WLS data have been in the public domain since 1983. We have a firm commitment to placing data in the public domain as soon as they have been cleaned and documented. No project participants will claim any proprietary rights in the data. Plans for data creation, documentation, dissemination, and security will be developed with advice from the WLS Steering Committee (see Core A) and in consultation with the Data Monitoring Board. (See Core B for details.)

*Core C: Complementary and pilot data collection and*

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<sup>16</sup> Neurophysiological measurements will be carried out by Richard Davidson, “The Emotional Brain across the Life Course.”

<sup>17</sup> In connection with the competing renewal of the WLS R01 (AG-9775), we have also requested that NIA appoint an external Data Monitoring Board to oversee the conduct of the WLS.

*management.*

Much of the WLS data required for the WLS program of projects is already in hand or will be collected in proposed telephone and mail surveys. Other data collection activities will be essential for research projects in the program or related projects that will be proposed independently. These will expand the range of research that investigators may undertake using the WLS and related data resources. We think it sensible to centralize these activities in a single project core in order to share staff and other resources, coordinate sampling designs across complementary activities, and assure quality data matching, management, and documentation. All supplementary data will be equally available to WLS projects and to public data users, either directly or through our secure data enclave. There will be 11 distinct data-collection activities: (1) matching WLS records for graduates and siblings born in Wisconsin to official birth records; (2) linking records of WLS graduates, siblings, and parents to additional years (post-1998) of the National Death Index (NDI-Plus); (3) collecting bio-medical data and bio-markers from subsamples of graduates and siblings; (4) linking WLS records to the Wisconsin state tumor registry; (5) conducting a survey of Wisconsin health insurance plans; (6) linking respondent locations to local health resources using the Area Resource File and Interstudy data; (7) linking older sibling's records to Medicare enrollment and claim data; (8) collecting and linking data on elementary schools attended by the graduates (from Wisconsin state historical archives); (9) linking WLS records to Wisconsin Worker's Compensation records; (10) linking WLS records to SSA earnings and disability benefit records; (11) completing the geocoding of addresses of WLS participants throughout the course of the study and linking them to local area data.

*Affiliated Research Projects:*

Eight research projects will complement one another and use core resources to create and manage data, and to provide a venue for scholarly communication. Each project has a distinct analytic agenda, but there are also large and intriguing areas of overlap in uses of core data, theoretical ideas, and methodological opportunities and problems. Indeed, all eight projects share the common task of identifying the ways in which early life circumstances – social contexts and individual characteristics – continue (or fail) to affect the life course.

1. Social and Behavioral Contexts of the Aging Mind - PI: Robert M. Hauser (with Jeremy Freese, Deborah Carr, Dean Dennis Krahn, Mary L. Carnes, Kristen Lawton Barry, Fred Blow, Brian Goodman)

2. End-of-Life Planning and Well-Being in Late Life - PI: Deborah Carr (with Karin Kirchhoff, Karen Holden, Howard Erlanger, Mark Suchman)
3. Nonnormative Parenting Impacts in Midlife and Old Age - PI: Marsha Seltzer (with Jan Greenberg, Frank Floyd)
4. Access to Care and Health Outcomes in the Near Elderly - PI: Maureen Smith (with John Mullahy, Roberta Riportella-Muller, Stephanie Robert, Mary L. Carnes, Karen Holden, Robert M. Hauser, Richard Campbell)
5. Family Relations, Labor Supply, and Health in Later Life - PI: James Raymo (with Carolyn Liebler, Gary Sandefur, John Karl Scholz, Kara Levine, Megan Sweeney)
6. Work, Health, and Well-Being - PI: John Robert Warren (with Pascale Carayon, Marla C. Haims, Peter Hoonakker)
7. Education in Careers, Health, and Retirement - PI: Robert M. Hauser (with Craig Olson, Charles N. Halaby)
8. The Emotional Brain across the Life Course - PI: Richard Davidson

**Phase 3:**

*Personal, household interviews* with a large and highly stratified subset of graduates and focal siblings. The personal interviews will cover sensitive material that cannot be ascertained by telephone, e.g., measurements of sexual behavior and attitudes, biological data, and more intensive assessments of cognitive and physical functioning. We believe that it is essential to renew our contact with graduates and siblings before attempting new and more invasive modes of data collection. After the 2002-03 surveys, our plan is to interview both members of each of approximately 1500 sibling pairs, chosen to maximize completeness of the existing data, i.e., participation in all previous waves. We will supplement these cases with a highly stratified set of other sibling pairs and of graduates who were only children.

**Phase 4:** *Other research proposals* to be submitted either independently or as later additions to this program of projects. Some of these are

1. Doing Well by Doing Good: Volunteer Work and Health–Jane Piliavin
2. Cognition and Interaction in Interviews of Older Adults–Nora Cate Schaeffer, Douglas W. Maynard, and Jennifer L. Dykema
3. Sexual Behaviors and Relationships of Older Adults–John DeLamater and Janet Hyde

4. The Relationship Between Physical Attractiveness, Human Capital Investment, Socioeconomic Attainment, and Spousal Quality Over the Life Course–Nora Cate Schaeffer, Sheri Meland, Aimee Dechter, and Megan Sweeney
5. Affect in the Life-Course–Daniel Kahneman and Norbert Schwarz
6. Gender, Care-work, and Income: Outcomes of Family Attitudes and Work Experiences–Myra Marx Ferree
7. Childhood Abuse and Adult Outcomes–Mary L. Carnes, Daphne Kuo, and Kristen W. Springer
8. The Long-Term Impact of Early Family Environment and Personal Characteristics on Obesity and Smoking–Daphne Kuo
9. Early Parental Loss, Risk Taking and Health–Karen Swallen
10. Dimensions of Health and Mortality Differentials: Survival Models Using Sibling and Spouse Data–Alberto Palloni, Aimee Dechter, and Daphne Kuo (Consultants: Elizabeth Arias, Dennis Fryback, John Mullahy, Diane Shinberg)
11. Civic Engagement over the Life Course–Cheryl Bowdre

We believe that the components of this proposal for the WLS can stand on their own, but we also think that they are a promising beginning for a broad and cumulative program of interdisciplinary research on aging and the life course that will make major scientific contributions across a span of decades to come.

**e. Human subjects -**

1) Description of subject population: The subjects are:

- a) a random sample of female and male Wisconsin high school graduates in the class of 1957;
- b) a random sample of sisters and brothers of the subjects in sample (a);
- c) spouses or widows of the subjects in samples (a) and (b).

N = maximum of 26,277 (This includes all of the original members of the graduate sample (N=10,317) or their widows; the selected siblings who responded to the 1977 and/or 1994 surveys (N=5,812) or their widows; and spouses of living graduates and siblings (N=10,148.)

Ages ~ 40-90 (graduates, siblings, and spouses)

Health status = mentally and physically healthy enough to participate in a one-hour telephone interview and a self-administered mail questionnaire.

2) We currently have data on individually identifiable human subjects (samples a and b, above) which were obtained in 1957, 1964, 1975, 1977, 1992, and 1994. These data were obtained through self-administered questionnaires, telephone surveys, state tax records, Wisconsin State Testing Service, high school records, and the National Death Index. Sources of new research material will be obtained from or about these sample members: a) via 1-hour telephone interviews; b) 48-page mailed questionnaires; and c) supplementary public records (see proposal text, especially Core C).

3) All subjects have been preselected because they were either in the 1/3 random sample of Wisconsin high school graduates of the class of 1957, or they are related to one of these graduates (selected sibling, widow, or spouse). Consent procedures and forms: Subjects receive a letter explaining purposes of the study and seeking their cooperation. Oral permission will be obtained by interviewers in the course of data collection. This is consistent with previous approvals from the IRB of the University of Wisconsin-Madison. Signed informed consent will be obtained as appropriate for additional administrative record data matches, e.g., Social Security earnings or disability records (see proposal text, especially Core C).

4) Potential risks: The only immediate or long term risk to subjects that we can conceive is the possible, but highly improbable, release of project data, gathered in confidence, to unauthorized persons or agencies. We always have and will continue to follow procedures that make this a highly unlikely possibility--even though we are not aware of any specific or likely harm that could be suffered by any subject on the release of any information we have in our files. We will file for a Certificate of Confidentiality from the Department of Health and Human Services in order to provide legal protection from external demands to disclose identifiable data.

5) Procedures for protecting against risks to confidentiality: Because of the longitudinal nature of the project, it is necessary to maintain files containing identifying information of each subject. We recognize a special obligation to protect the privacy of these records. They are maintained in the project office and are accessible to project staff only for use in the room under the surveillance of a project supervisor. Identifying information is removed from all magnetic tapes used in computer analysis.

6) Reasonability of risks in relation to anticipated benefits: There is little or no risk of harm to subjects but there are potentially great social gains from knowledge of factors

affecting behavior, health, and psychological functioning in the post-childrearing, pre-

retirement age span.

**e.1. Gender and Minority Inclusion**

**Table 1. Gender and Minority Inclusion**

NOTE: This table includes all of the original members of the graduate sample (N=10,317), and the selected siblings who responded to the 1977 and/or 1994 surveys (N=5,812), and their living spouses (N=10,148).

<b>Grads &amp; sibs</b>	American Indian or Alaskan Native	Asian or Pacific Islander	Black, not of Hispanic Origin	Hispanic	White, not of Hispanic Origin	Other or Unknown	Total
Female	17	1	20	7	8,254	-	8,299
Male	12	2	12	11	7,793	-	7,830
<b>Total</b>	29	3	32	18	16,047	-	16,129
<b>Spouses</b>							
Wives	8	1	8	7	4,903	-	4,926
Husb	11	1	13	4	5,193	-	5,222
<b>Total</b>	18	2	20	11	10,096	-	10,148
<b>Full-sample</b>							
Female	25	2	28	14	13,157	-	13,225
Male	23	3	25	15	12,986	-	13,052
<b>TOTAL</b>	47	5	52	29	26,143	-	26,277

Among Americans aged 60 to 64 in March 2000, 66.7% are non-Hispanic white women and men who completed at least 12 years of schooling (U.S. Bureau of the Census 2000: Table 1a) and thus resemble the WLS cohort. The WLS is unusually valuable in its representation of women as well as men. The WLS cohort, mainly born in 1939, precedes by about a decade the bulk of the baby boom generation that continues to tax social institutions and resources at each stage of life. For this reason, the study can provide early indications of trends and problems that will become important as the larger group passes through its sixties. In addition, the WLS is the first of the large, longitudinal studies of American adolescents, and it thus provides the first large-scale opportunity to study the life course from late adolescence through the mid-60s in the context of a full record of ability, aspiration, and

achievement.<sup>18</sup> The WLS overlaps the youngest cohorts that entered the HRS, and this provides opportunities to check the scope of our findings (and those of the HRS). Unlike the WLS, the HRS is nationally representative, but it does not cover the lives of respondents from adolescence forward to midlife.

The WLS data also have obvious limitations. Some strata of American society are not represented. Everyone in the primary sample graduated from high school. (Sewell and Hauser 1975:207-15) estimated

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<sup>18</sup> There have, of course, been important and influential longer-term studies of the life-course in the U.S. These reflect careful and insightful work, but they are based on small, local, or highly selected samples (Holahan and Sears 1995; Elder 1974; Clausen 1993).

that about 75% of Wisconsin youth graduated from high schools in the late 1950s; about 7% of siblings in the WLS did not graduate. There are only a handful of African American, Hispanic, or Asian persons in the WLS. Given the minuscule share of minorities in Wisconsin when the WLS began, there is no way to remedy this omission. About 19% of the WLS sample is of farm origin; this is consistent with national estimates in cohorts of the late 1930s. In 1964, in 1975, and again in 1992, 70% of the sample lived in Wisconsin, but 30% lived elsewhere in the U.S. or abroad. Fifty-seven percent of the graduates have always lived in Wisconsin, and 17% have lived outside Wisconsin at every contact since 1957. The WLS graduates are homogeneous in age, but their siblings are not, and their ages cover a broad range, mainly within 8 to 10 years of the age of graduates.

In summary, the WLS samples consist of women (5323) and men (4994) who graduated from Wisconsin high schools in 1957 and a random sample of approximately 5800 of their sisters and brothers. Because of differences in longevity and willingness to respond, there are yet more women than men currently active in the study. While there are no restrictions on the ethnic compositions of the samples, because of the population composition and schooling outcomes in Wisconsin in the late 1950s, the sample contains a very small share of racial or ethnic minorities, and there is now no way in which this problem in sample coverage can be corrected.

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#### **f. Vertebrate Animals DOES NOT APPLY**

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**h. Consortium/Contractual Arrangements DOES NOT APPLY**

**i. Consultants DOES NOT APPLY**