RESEARCH PLAN

A. SPECIFIC AIMS

A generation ago, marital change was reaching its stride. Over the last 20 years, some aspects of family life have stabilized (such as the high divorce rate), while others have continued to change (such as the employment of married mothers with young children). Considerable debate centers on whether this flux has influenced the quality of American marriages. The results of the proposed study will inform this debate. **The first aim of the proposed study is to evaluate whether marital quality has remained the same, improved, or declined between 1980 and 2000, and to delineate the factors that account for this change.** Preliminary evidence suggests that marital and family changes have the potential to affect the health and longevity of the middle-aged and elderly--a rapidly growing segment of the U.S. population. However, only a few aspects of marriage and family life have been studied, and the mechanisms at work are not well understood. The results of the proposed study will provide a comprehensive picture of the impact of family and marital history on health. **The second aim is to assess the extent to which family-of-origin characteristics and marital history erode or enhance people's physical health and psychological well-being over the life course, and to specify the mechanisms at work.** Much of our knowledge of the life course comes from longitudinal research. Yet, we know relatively little about how panel attrition affects the veracity of our findings, or how to correct for attrition bias. **The third aim is to understand how differences in people's histories affect whether they leave longitudinal studies, assess the extent to which attrition affects study findings, and develop ways to adjust for attrition bias.** Finally, the proposed investigation builds on a unique research asset. The Marital Instability Over the Life Course Study is one of the longest running national studies of marriage in existence, and the only one with detailed information on marital quality and interaction. By expanding the period of study to 20 years, the addition of a sixth wave of data will significantly increase the value of this public use data set. **Consequently, the fourth aim is to enhance the value of the Marital Instability Over the Life Course Study by collecting additional data.**

To achieve these aims, we propose to build on the Marital Instability Over the Life Course Study, which began in 1980 as a national survey of 2,033 married persons under age 55 (Booth et al., 1991). These individuals were interviewed four additional times between 1983 and 1997. To achieve the first aim (studying changes in marital quality), we will replicate the original 1980 survey in the year 2000; this will require interviewing a new cross-section of 2,000 married persons under the age of 55 in that year. To achieve the second aim (understanding how family and marital history affects health), we will interview the original sample a sixth time. In addition to repeating the core of longitudinal questions, we will add new items dealing with health to the interview schedule. To achieve the third aim (understanding attrition bias in longitudinal research), we will supplement the new cross-section with additional respondents between the ages 38 and 75 who had been married in 1980. Comparing the sixth wave of data with the new cross-section will allow a detailed analysis of attrition bias. Finally, our focus on health (aim 2) is but one of many topics that researchers could investigate with 6-wave panel data. In general, the availability of six waves of data over a 20-year period, combined with a new cross-section, will achieve our fourth aim (to enhance the value and usefulness of our data set for other researchers).

B. BACKGROUND AND SIGNIFICANCE

Theoretical Orientation

The life course perspective is a major theoretical orientation in family studies, and provides an organizing framework for our research. This perspective is concerned not only with changes that occur as people age, but also with the manner in which historical change in the larger society affects the lives of individuals (Bengtson and Allen, 1994). According to Elder (1994), the life course perspective has four central themes.

First, the life course perspective considers families in their historical context. In the proposed study, by comparing a new cross-section of married individuals in the year 2000 with the original 1980 cross-section, we will be able to estimate the effects of large-scale social change on the quality and stability of marriage. Between 1980 and 2000, the proportion of wives and mothers in the paid labor force grew (U.S. Bureau of the Census, 1996), women experienced real increases in earned income (Spain and Bianchi, 1996), the percentage of poor families increased (Zill and Nord, 1994), and attitudes toward divorce became more accepting (Thornton, 1989). Yet, we know surprisingly little about the impact of these changes on the quality and stability of marriage. It is possible, for example, that as the number of dual-earner couples has increased, work-family conflict has raised the overall level of tension in marriage. Another possibility is that the growing social acceptance of divorce has lowered the threshold of marital happiness required for people to think about and initiate steps toward divorce. In our research, we plan to relate the behavior and experiences of married individuals to changes in the larger society during this 20-year period.

Second, the life course perspective focuses attention on the timing and sequencing of events. In relation to the new cross-section, we intend to see how changes in the timing and sequencing of events, such as cohabitation, first birth, and age at marriage between 1980 and 2000, have affected the quality and stability of marriage. Compared with earlier marriage cohorts, recent cohorts are more likely to cohabit prior to marriage, have a child prior to marriage, and marry at older ages. It is not clear, however, how changes in the timing and sequencing of family events, taken together, have affected marriage.

In relation to the longitudinal component of the proposed study, we also plan to examine the timing and sequencing of events, such as divorce. Divorces that occur when individuals are in their 20s, compared with divorces that occur when individuals are in their 40s, may have less effect on the quality of second marriages and on later life health and well-being. People divorcing in their 20s are likely to be dissolving short-term marriages and have good remarriage prospects, whereas people divorcing in their 40s are likely to be dissolving long-term marriages and have poorer remarriage prospects. Moreover, whether the divorce follows the birth of children determines if the second marriage entails a stepfamily relationship-a factor known to affect the quality of family relationships and the stability of remarriages (White and Booth, 1985).

Third, the life course perspective emphasizes the interdependence of lives over time. Although early research tended to emphasize the influence of parents on children, it also is true that children influence parents--an idea we intend to explore in our study. For example, in relation to the new year 2000 cross-section, we intend to see if factors such as increases in premarital fertility and the presence of stepchildren in families are responsible for shifts in marital quality during the last 20 years.

The longitudinal component will allow us to consider whether parents' decisions to divorce have consequences for offspring that persist across the entire life course. We know that

young adult children of divorced parents are more likely to see their own marriages end in divorce, attain lower levels of socioeconomic status, and have poorer psychological well-being (Amato and Booth, 1997). However, it is not clear if the consequences of parental divorce persist into offspring's later years. Our research will examine various dimensions of respondents' health and well-being in the middle and later years in relation to their childhood family structure.

Finally, the life course perspective views individuals as being active rather than passive. Consequently, we do not see peoples' marriages as being shaped in a deterministic fashion by forces beyond their control. Instead, we see large-scale changes (such as shifts in the economy or the law) as contextual variables that create opportunities as well as constraints. Within this context, people make choices about marriage and family life at pivotal points in their lives. Indeed, many of the factors noted above, including those relating to the timing and duration of events (premarital cohabitation, age at marriage) result from the choices people make. Because we have always been guided by this assumption, we include a large number of items in our study that measure people's attitudes, perceptions, preferences, and decisions.

Moreover, although individuals may grow up in troubled families, they often manage to have healthy marriages and satisfying personal lives. In contrast, others growing up in troubled families have a lifetime of unhappy marriages and transitory cohabitation experiences. In the later years, long-term outcomes may be related to whether individuals have made good decisions about forming intimate relationships and have acquired useful relationship skills. The longitudinal component of the proposed study will allow us to explore these ideas.

Aim One: Changes in Marital Quality Between 1980-2000

Following a period of stable divorce rates during the post-World War II period and the 1950s, the divorce rate began to increase during the early 1960s. It doubled during the 1970s, then leveled off during the 1980s at a historically high level. Currently, about one-half of all first marriages are expected to end in divorce (Cherlin, 1992). The increased rate of divorce may reflect the fact that it is easier now than in the past to leave unhappy marriages due to increasingly tolerant community attitudes, the introduction of no-fault divorce, and the growing economic independence of women. Alternatively, it is possible that the increase in divorce reflects a deterioration in the quality of marriage since the early 1960s.

Marital quality may have declined during this historical period for several reasons. First, marital relationships may have been affected by the drop in men's real wages since the early 1970s. This drop was due to declines in manufacturing, mining, and construction industries and corresponding increases in unemployment and underemployment (Hernandez, 1993; Zill and Nord, 1994). Second, dramatic increases in labor force participation among mothers of young children have increased the potential for work-family conflict (U.S. Bureau of the Census, Fig. 21, 1992). The employment of both spouses creates difficulties in managing time and finding suitable child care. Moreover, conflict over the household division of labor is a cause of tension in many marriages (Hochschild, 1989). Third, both women and men--but particularly women-- have become less traditional in their gender role attitudes since the late 1960s (Thornton, 1989); this change has increased the likelihood of disagreements over gender roles within marriage. Fourth, expectations for marriage have risen at the same time that the number of single people in the population has increased (due to later marriage and divorce). Unmet expectations, combined with the availability of alternative partners, may undermine people's commitment to making their current marriages work (Glenn, 1996). Finally, some observers argue that there has been a growth of individualistic values and a decline in support for the norm of life-long marriage in American culture (Bellah, Madsen, Sullivan, Swidler, and Tipton, 1985; Popenoe, 1988). Because divorce is readily available, spouses with an individualistic orientation may invest

relatively little effort in resolving disagreements, thus eroding relationship quality. Each of these factors may have made marriage a more difficult and less secure arrangement than it was several decades ago.

However, other changes since the 1960s, such as increases in education, increases in age at first marriage, and declines in marital fertility (Bumpass, Martin, and Sweet, 1991; U.S. Bureau of the Census, 1992) may have improved marital quality. Indeed, these changes may have offset some of the decline suggested above, or even resulted in a net improvement in the quality of marriage.

How has marital quality changed, overall, during the last few decades? Some limited evidence supports the argument that marital quality has declined. Using merged data from the General Social Survey, Glenn (1991) demonstrated that the percentage of people reporting that their marriages were "very happy" dropped gradually from 1973 to 1988. This is the opposite of what one would expect if the rise in divorce were due only to the more frequent ending of unhappy marriages. If divorce removes poor marriages from the pool of married couples, then remaining marriages should be happier now, on average, than in the past.

Similarly, using data from the Marital Instability Over the Life Course Study, Rogers and Amato (1997) compared data from two groups: the sample of original respondents (interviewed in 1980) and the sample of adult offspring of the original respondents (interviewed in 1992). Two samples were constructed for the analysis: 914 married individuals from the original sample who were between 20 and 35 years of age in 1980 (mean age = 27.2), and 154 married individuals from the offspring sample who were between 20 and 35 years of age in 1992 (mean age = 27.2). These two groups represented distinct marriage cohorts: Those in the older cohort had married between 1969 and 1980, whereas those in the younger cohort had married between 1981 and 1992. The samples were constructed so that none of the individuals in the older cohort were parents of people in the younger cohort. For the older sample, all variables were measured in 1980; for the younger sample, all variables were measured in 1992.

Rogers and Amato (1997) found significant differences between the two marriage cohorts in three of five dimensions of marital quality. The younger cohort, compared with the older cohort, reported lower levels of marital interaction and higher levels of marital conflict and marital problems. (The younger cohort, however, did not report lower levels of marital happiness or greater divorce proneness.) Controlling for age at marriage and education did not change the pattern, suggesting that increases in age at marriage and education did little to offset the cohort difference. Additional analyses were carried out in which explanatory variables were entered into regression models. These analyses indicated that much of the decline in marital quality could be accounted for by increased economic hardship (as reflected in greater use of public assistance), greater work-family conflict (due to a rise in the number of dual-earner couples with preschool- aged children), less traditional attitudes toward gender roles among wives (but not among husbands), and more premarital cohabitation. Overall, these results are consistent with the belief that recent marriage cohorts are experiencing more difficulty than earlier marriage cohorts in adapting to a rapidly changing social climate.

In the proposed study, we will compare marital quality in the 1980 and 2000 cross-sections. Scales are available to measure five dimensions of marital quality: happiness, interaction, problems, disagreements, and divorce proneness. These data will contribute to four separate but related research projects.

Changes in the level of marital quality. The first project will focus on changes in the level of marital quality between 1980 and 2000. We will begin by comparing the mean scores across the two time periods. (For exploratory purposes, we will analyze the data for husbands

and wives separately.) Assuming that differences in marital quality are observed, the next step will be to explain these differences. We will begin by controlling for age, age at marriage, number of children, education, race, and marriage order. It may be that marriages in 1980 and 2000 differ in quality, but only because the two groups are differently constituted. Assuming that differences in marital quality persist, the next step will be to assess the role of several explanatory factors, including economic stress (men's and women's earnings, periods of unemployment, use of public assistance, perceptions of economic hardship), work-family conflict (dual-earner couples with preschool children), husband's and wife's gender role attitudes, the proportion of housework and child care performed by husbands, prior cohabitation, premarital births, and attitudes toward the acceptability of divorce. These variables will be introduced into regression models to determine the extent to which they account for differences in marital quality across the two groups.

Changes in the determinants of marital quality. The second project will focus on changes in the determinants of marital quality between 1980 and 2000. Social change during this time suggests that certain features of marriage may have become more or less important in affecting marital quality. For example, as wives have entered the labor force, many people's views about marriage have become more egalitarian (Thornton, 1989). Many employed wives now expect their husbands to share family work equally--an expectation that many husbands fail to meet. Consequently, the household division of labor has become a salient and contentious issue among many married couples (Hochschild, 1989). These considerations suggest the hypothesis that husbands' share of housework and child care is a better predictor of wives' marital quality in 2000 than in 1980. A second example refers to wives' income. Earlier, wives' income posed a threat to many husbands--especially traditional men who accepted the breadwinner ethic (Blumstein and Schwartz, 1984). More recently, however, as dual-earner families have become normative and as people have come to recognize that two incomes are necessary to raise a family in comfort, it is likely that wives' income has become more highly valued by husbands. Indeed, studies show that women's education, employment, and income increase their chances on the marriage market (Oppenheimer, 1994). Consistent with this reasoning, Greenstein (1990) found that wives' income was negatively associated with divorce, presumably because it eased economic strain. These considerations suggest the hypothesis that wives' income is negatively associated with marital quality in 1980 but positively associated with marital quality in 2000. These and other hypotheses will be tested by including interaction terms in regression models. For example, the first hypothesis described above would involve three variables--decade of survey, husbands' housework, and decade x husbands' housework--to predict dimensions of marital quality.

Changes in the relationship between marital quality and subjective well-being. The third project will focus on changes in the relationship between marital quality and subjective well-being between 1980 and 2000. Some observers have argued that marriage is becoming a weaker institution (Popenoe, 1988), and one less able to meet people's needs for happiness (Glenn, 1996). Consistent with these ideas, Glenn and Weaver (1981) found, using repeated cross-sections from the annual General Social Survey, that the association between marriage and personal happiness is becoming weaker. Similarly, Hochschild (1997) found that as family life has become more hectic and stressful, many people are now viewing the workplace as a refuge from family life. These considerations suggest the hypothesis that marital quality is a poorer predictor of subjective well-being in 2000 than in 1980. Correspondingly, we will be able to test the hypothesis that employment and work satisfaction are better predictors of subjective well-being in 2000 than in 1980. To assess subjective well-being, our survey includes data on life

happiness, psychological distress, and perceived health.

Changes in the association between marital happiness and commitment to marriage. The fourth project will focus on changes in the association between marital happiness and commitment to marriage. During the last several decades, people's expectations for marriage appear to have changed (Amato and Booth, 1997; Glenn, 1996). In the past, marriage offered many benefits to people: a desirable social status, a specialized division of labor between husbands and wives, and a secure environment in which to raise children. Given these benefits, it is likely that many people remained committed to their marriages even if they were unsatisfied with certain aspects of the marital relationship. Their commitment was almost certainly reinforced by the negative views toward divorce held by most people. Today, however, the status of marriage is lower, most spouses share the breadwinner role, and childbearing and child rearing frequently take place outside of marriage. In contrast to earlier eras, many people now marry primarily for personal reasons-- that is, to attain a high level of self-fulfillment and emotional intimacy with their partners. In addition, during the last several decades, attitudes toward divorce have become more liberal (Thornton, 1989). Higher expectations for the marital relationship, combined with wider acceptance of divorce, suggest that the threshold of marital unhappiness at which people begin to think about and initiate steps toward divorce has become lower in recent decades. We will test this notion by examining associations between our marital happiness scale and items dealing with people's divorce-related behavior, including thinking about divorce, talking with one's spouse about divorce, discussing divorce with friends or family, and having a trial separation. Our hypothesis is that a lower level of marital happiness is required to trigger divorce-related behaviors in 2000 than in 1980.

Aim Two: Family-of-Origin, Marital History, and the Health and Well-being of the Middle-Aged and Elderly

The availability of six waves of data makes it possible to answer a large number of questions about marriage and family over the life course. In this proposal, we develop a set of questions dealing with the influence of family and marital history on the health and subjective well-being of the middle-aged and elderly. We focus on these two stages of the life course because almost all of our original respondents (first interviewed in 1980) will have reached age 40 by the year 2000, and our oldest respondents will be 75. We focus on health because concerns about physical well-being become increasingly salient as people age. In addition, the elderly, compared with young adults, are somewhat more likely to experience depression and some other psychological problems. Our data set contains rich information about the quality and stability of people's marriages, as well as their parents' marriages. Consequently, we will use this opportunity to investigate the manner in which characteristics of the family-of-origin and people's marital histories are related to health and well-being in later life.

In relation to the family of origin, parental divorce is associated with lowered offspring longevity by as much as four years (Schwartz et al., 1995; Tucker et al., 1997). There is also evidence suggesting that parental divorce adversely affects offsprings' marital quality and psychological well-being in early adulthood (Amato and Booth, 1991, 1997). Low marital quality among continuously-married parents appears to have similar effects (Amato and Booth, 1991). In relation to one's own marital history, divorce appears to have an adverse effect on men's and women's longevity, even if they remarry (Tucker et al., 1996). This appears to be true with predivorce health status controlled. Some studies suggest that the effects of divorce on depression and anxiety are short-lived (Booth and Amato, 1991). In contrast, other studies suggest that adjustment to divorce occurs primarily among those who remarry or repartner; the psychological consequences of divorce may linger indefinitely among those who remain single

(Johnson and Wu, 1997). Among those who are married, poor marital quality is associated with low subjective well-being (Benin and Nienstedt, 1985; Glenn and Weaver, 1981). And although rarely considered in previous research, a history of vacillating marital happiness also may be problematic. In addition, other life course events, such as premarital childbearing, premarital cohabitation, and age at marriage, may have long-term consequences for people's health and well-being. These considerations suggest that a new analysis of known stress points in people's family and marital histories has the potential to add to our knowledge about physical health and psychological well-being. Previous research, however, has rarely addressed these issues among older populations.

The life-course model guiding our study is shown in Figure 1. The family-of-origin may have a direct long-term effect on health and psychological well-being. In addition, some of the effect may operate through individuals' own marital histories (including the quality and stability of their marriages). For example, parental divorce and remarriage not only increase the chances of divorce among adult offspring (Amato, 1996), but also predict low marital quality (Amato and Booth, 1991, 1997). Another indirect path may operate through income and financial well-being. For example, studies show that parental divorce and stepfamily formation predict lower educational attainment and income in adulthood (Amato and Booth, 1997). Educational attainment and income, in turn, are related to health and mortality (Crimmins et al., 1996; Hayward et al., 1997;) The proximate mechanisms through which family-of-origin history, marital history, and financial well-being are thought to influence health are (a) an orderly life style and (b) "mattering." (We describe these two constructs below.)

Family-of-origin history. As noted earlier, a history of parental divorce increases the risk of a variety of negative outcomes for adult offspring, including poor marital quality, divorce, and psychological problems. A recent analysis indicates that divorces that occur when children are younger (prior to the teen years) have more negative implications for socioeconomic attainment and psychological well-being than those that occur when children are older (Amato and Booth, 1997)--a factor we will take into account in our analysis. In relation to remarriage, children who live in stepfamilies leave home earlier, often for reasons of family conflict (White, 1994). Moreover, they are less likely to attend college, less likely to receive assistance from parents if they do attend college, and more likely to marry early (White, 1994). We assume that living in a stepfamily as a child lowers educational achievement. When early age at marriage is a consequence of living in a stepfamily, we expect it to increase the risk of offspring divorce (Booth and Edwards, 1985). Another relevant family-of-origin characteristic is the quality of the parents' marriage. Conflict between parents, even in marriages that do not end in divorce, appears to lower offsprings' later marital quality (Amato and Booth, 1997). In addition, interparental conflict is related to less community integration and social support among adult offspring (Amato and Booth, 1997), and research indicates that low social support is associated with less cardiovascular, endocrine, and immune system robustness (Uchino et al., 1996).

Marital history. Under the general category of marital history, we include events such as premarital birth and premarital cohabitation. Some research has shown premarital childbearing to lower the stability of subsequent marriages (Teachman, 1983), mostly because of its relation to limited education, early age at marriage, and cohabitation (Bumpass et al., 1991). Premarital cohabitation is negatively related to marital quality and positively related to divorce (Booth and Johnson, 1988). Cohabitors are more likely than noncohabitors to engage in risky or deviant behavior, and hence, may be poor marriage material. Furthermore, cohabitors tend to have a lower commitment to the norm of life-long marriage (Thomson and Colella, 1992). However, there is also evidence that the experience of cohabitation may lower people's commitment to

marriage even more (Axinn and Barber, 1997). We anticipate that premarital childbearing and premarital cohabitation, through affecting the quality and stability of later marriages, have long-term implications for health.

Another relevant factor may be whether the individual marries into a stepfamily. People who marry into a stepfamily are more likely to have weak ties with parents and in-laws, are more willing to leave the marriage, and are more likely to be in age-heterogamous marriages; each of these factors is associated with lower marital quality and a greater likelihood of divorce (Booth and Edwards, 1992). However, the remarriage of a middle-aged or elderly person may have salubrious effects. The first few years of marriage, in particular, are typically characterized by high marital quality, which may convey positive health benefits (VanLanigham et al., 1997).

In general, having children does not improve parents' marital quality. In fact, the relationship between number of children and parents' marital quality is generally negative (Abbott and Brody, 1985); this is partly because children delay the divorce of unhappy couples (White et al., 1986). If there is a divorce, parent-adult child relations are often characterized by estrangement (Booth and Amato, 1994), especially between children and their fathers. Single parenting can be particularly stressful (McLanahan and Sandefur, 1994). Later in life, adult children's instrumental support of parents is strongly related to the quality of parent-child relationships while offspring are still in the home (Whitbeck et al., 1994). Finally, the number of children is related to the amount of support parents provide to children when they are young; in general, the more children, the lower the level of help given (Hogan et al., 1993). Whether parent-child relationships are related to the quality of parents' marriages in later life is not clearly established. However, there is evidence that stressful parent-child relations increase elderly parents' depression, a major indicator of well-being (Pillemer and Suitor, 1991).

Marital quality is integral to health and well-being (Gove et al., 1983; Loomis and Booth, 1995). Marital satisfaction is known to be associated with high morale in later life (Lee, 1978), and older persons who confide in their spouse have higher levels of marital satisfaction and score higher on indicators of emotional well-being (Lee, 1988). The effects of variation in marital quality over time, however, are not well understood. In the Marital Instability Over the Life Course Study, among those who started with high marital quality in 1980, about two-fifths remained high over the next 12 years. In contrast, about one-third reported a substantial decline that persisted over two or more waves. The remaining respondents reported vacillating marital quality. Among those who started with low marital quality in 1980, about one-third increased the quality of their marriage and hung on to the improved ratings through 1992. Another third remained low, and the remaining third vacillated. With the additional data from the next wave, we will be able to fine-tune these patterns of change. We hypothesize that a protracted period of low marital quality will reduce health and well-being, as will vacillating patterns. Whether couples who experience increases in marital quality for an extended period realize health benefits is an open question. Finally, our analysis will be mindful of the possibility of the reverse ordering of these factors--declines in health can erode feelings of mattering and thereby marital quality (Booth and Johnson 1994; Friedman 1991).

Economic well-being. A third set of variables reflect economic well-being. In relation to the family of origin, growing up in a single-parent family or a stepfamily can decrease opportunities for education; a low level of education, in turn, decreases later life income. In relation to one's own marital history, divorce can lower personal income, especially for women (McLanahan and Sandefur, 1994). It is also true, however, that low income is sometimes a cause of divorce (White, 1990), so the relationship between economic well-being and marital history is reciprocal. Low income, even if it is only temporary, interferes with the accumulation of assets,

which may adversely influence economic resources available during the middle and later stages of the life course. Furthermore, research has consistently shown income to be positively related to health (Kessler, 1982) and mortality (Lillard and Waite, 1995).

Proximate mechanisms. Research on the relationship between marital status and health suggests relational qualities as potential mechanisms worth exploring. Married persons enjoy greater physical health and psychological well-being than divorced or single individuals (Joung et al., 1997; Umberson, 1987; Verbrugge, 1979). They are less likely to rate their health as being poor, report fewer chronic and acute conditions, and have fewer days of activity restricted due to health (Anson 1989). Moreover, they are less likely than single people to report depression and symptoms of psychological distress (Gove et al., 1983). What is it about marriage that translates into better health and well-being? We believe that Rosenberg and McCullough's (1981) concept of *mattering* may help to explain the link between marriage and health. Two components of mattering hold the most promise: importance and dependence. Importance is the extent to which individuals believe that their spouse cares about what they want, think, and do. Dependence is the extent to which individuals believe that their spouse is dependent upon them and have a sense of responsibility for their welfare. Rosenberg and McCullough present data showing that mattering is positively related to self-esteem, and negatively related to depression and deviance in adolescents. Ross and Mirowsky (1989) find that adults who believe that their spouse cares for them have lower depression and fewer psychological symptoms--a finding consistent with the concept of mattering. Research showing that psychological well-being enhances physical health is extensive (Aneshensel and Huba, 1983), so we assume that if mattering explains the marriage-mental health link, then it will play a similar role in the marriage-physical health relationship.

A second mechanism suggested by the marital status and health literature is that marriage results in health benefits because spouses provide an *organized lifestyle*. This lifestyle includes getting enough sleep, a balanced diet, and exercise; it also involves fewer behaviors that are detrimental to health, such as drinking, using drugs, driving fast, and failing to wear seat belts (Gove, 1973; Umberson, 1987). Through monitoring one another's behavior, spouses ensure that their partners engage in behaviors that maximize health and minimize risk. Spouses can also give care when individuals are recovering from an illness (Waltz et al., 1988; Waltz, 1986).

Although not included in the model in Figure 1, there is always a possibility that selection may be at work. In particular, some individuals may have personality features that make them incapable of forming sustained intimate relationships. For example, Booth and Edwards (1992) found that remarried individuals have more personality traits that create problems in marriages than do people in first marriages. (These traits include getting angry easily, having feelings that are easily hurt, and being jealous, domineering, or critical.) Furthermore, these personality features are the only qualities found to carry over from one marriage to the next among people who divorce and remarry (Johnson and Booth, in press). McLeod (1995) found that men and women with psychiatric disorders (alcohol or drug dependence and anxiety disorders) were much more likely than those without those ailments to marry individuals who had the same disorder. These marriages are likely to be unstable and unhappy--the type least likely to be characterized by mattering and an orderly lifestyle. One study found that people who marry at a young age (18 and under) are twice as likely as those who marry at an older age to have psychiatric disorders (Forthofer et al., 1996). Early personality problems may be carried forward into adult life through a process of cumulative continuity whereby individuals create environments that reinforce and sustain these characteristics (Caspi et al., 1987). All of these studies suggest the possibility of a selection effect that would predispose people to be part of problematic families and marriages that would affect their later life health

and well-being. The selection mechanism may operate directly or through mattering. In this analysis, we will attempt to account for selection effects by controlling for personality attributes (noted above) that can erode family and marital relations.

Analytic strategies. Our analytic strategy will be to estimate the impact of family-of-origin experiences and work forward in time. We will examine the association between variables such as parental divorce, parental remarriage, and parents' marital quality, and our measures of health and psychological well-being. We will then consider the extent to which these associations are mediated by aspects of marital history, financial well-being, mattering, and an orderly lifestyle. For example, do parental divorces have a direct effect on health in the middle and later years, or is their effect mediated by marital quality and stability in the second generation? When a relationship or a pattern of relationships is observed, we will systematically examine the role of the linking mechanisms described earlier to determine which ones account for the relationship.

Throughout the course of the longitudinal study, we have obtained four measures of physical health and five measures of psychological well-beingwhich will enable us to assess whether health deteriorates faster among those with adverse family and marital backgrounds than those without. However, to fully explore the hypotheses, we will add a number of other health measures to the 6th wave interview. Moreover, information on the respondents' parents' age at death (if deceased) and the respondents' ratings of their parents' health (if living) will allow a rough adjustment for genetic factors that influence the respondents' health. Finally, we estimate that by the year 2000, 110 respondents will have died. This will allow us to examine the effect of family and marital experience on mortality.

There is ample evidence that women suffer economically while men go relatively unscathed following divorce (McLanahan and Booth, 1989). Moreover, while women live longer than men, they report poorer general health, more chronic conditions, and more long-term limitations on their activities due to health reasons; in contrast, men report more injuries (Verbrugge, 1988). In an extensive study of sex differences in depression and other indicators of psychological well-being, Mirowsky and Ross (1995) report that women's higher reports of distress are not due to measurement or other methodological problems, but the fact that women are actually more distressed. Therefore, in the proposed analysis we will continuously check for gender differences in the relationship between marital/family history and health/well-being.

The product of this phase of the proposed research is a delineation of features of the family-of-origin and marital experiences (singly and in concert) that adversely affect physical health and psychological well-being. Our goal is to assemble family life trajectories that are most damaging as well as those that are most beneficial. Furthermore, we will pay special attention to those individuals whose experiences put them at risk but are in good health. As a final step, we will compare the health and well-being of the married persons in the sample with those who are divorced, permanently separated, or widowed--people identified prior research by as least healthy. Our interest is in seeing if the health of married persons with poor family and marital histories reach the levels of these subpopulations.

Aim Three: Sample Attrition and the Integrity of Results in Family Research

Multiple wave panel studies provide a number of advantages for the family researcher studying how marriages change over the life course. These include the ability to follow changes in the same individuals over multiple life transitions and to develop models of patterns of life course changes at the individual level that would not be possible with cross-sectional or two-wave data. The data from such studies also fit well into the recently developed analysis methods such as pooled time-series models, latent growth curve models, and hierarchical linear models

which can provide powerful and valid inferences about the patterns of change.

A major problem with multiple-wave studies that extend over many years is panel attrition. If this attrition is differential relative to important variables in the substantive problems being investigated, then there is a real possibility of biased results. While methodological tools have been developed to assess the degree of attrition bias and correct for it, these tools have been found to have statistical problems when applied to the type of data available in many research applications involving survey data. Because no single tool for assessing attrition bias is free of problems, a strategy that has been proposed is to use a variety of different approaches to evaluate the extent to which the findings are biased by attrition (Stolzenberg and Relles, 1997). A major aim of the proposed research is to apply several approaches to identifying and adjusting for possible biases in the multiple-wave Marital Instability panel study.

The Marital Instability panel study extends over a large portion of the marital life course, is based on a national sample of individuals, and includes detailed information on marital quality and process. For these reasons, it is an important resource for family researchers. It is important, therefore, that the consequences of sample attrition be evaluated as completely as possible. The objective of this research will be to collect additional data and apply a series of techniques to the panel data to evaluate the extent of selection bias from several different perspectives. Making these data and findings available to other family researchers will allow them to more accurately assess the presence, nature, and extent of bias introduced by attrition in this and similar multiple-wave panel studies.

Over the 17 years of the Marital Instability panel study, there has been substantial attrition (see Table 1). By 1997, 53% of the respondents to the first wave completed a 5th wave interview. The table below documents the attrition history across the four follow-up waves. The most common sources of attrition were refusal (22%) and being unable to locate the respondent (17%). The attrition was greatest in the first follow-up interview (around 22%) and has decreased in subsequent waves with a loss of less than 10 % from the previous wave in the 1997 follow-up. Based on our experience with the panel, we estimate that the percent of completed interviews in a 6th wave conducted in 2000 will fall below 50% of the original 1980 panel. The presence of this attrition does not necessarily mean that the findings from the study will be unrepresentative or biased, but it does mean that a careful evaluation of the adequacy of the sample is needed to identify and adjust for differential attrition relative to variables important in the analyses of marital quality and instability over the life course.

Table 1. Sources of Sample Attrition Over 17 Years.

Disposition	1993 Wave		1988 Wave		1992 Wave		1997 Wave		Total in 1997 for 1980 Respondents	
	N	%	N	%	N	%	N	%	N	%
Completed Interview	1,578	78	1,331	84	1,184	88	1,065	90	1,065	52
Partial Interview	15	1	10	1	4	0	17	1	17	1
Refusal	133	6	153	9	111	8	44	4	441	22
Respondent Deceased	13	1	15	1	18	1	26	2	72	4
R could not be located	264	13	50	3	15	1	18	2	347	17
R not found at home after max call backs	22	1	32	2	7	0	9	1	70	3
R too sick to complete interview	1	0	1	0	1	0	8	1	11	1
Other	7	0	1	0	1	0	1	0	10	0
Total	2,033	100	1,593	100	1,341	100	1188	100	2,033	100

It is difficult to evaluate whether the degree of attrition in this panel study is higher or lower than in comparable studies. Since the inception of the panel study, we have used rigorous, state-of-the-art panel tracking methods and survey techniques to maintain the highest quality and most complete sample possible (Booth and Johnson, 1985). While attrition may be slightly lower in some other panel studies, other studies have not involved long periods between waves, used a nationally representative sample of households (obtained from random-digit-dialing techniques), or focused on interviewing the same individual (rather than an informant for the household). Our largest period of attrition--between the first and second waves--largely reflected the problem of locating respondents who refused to provide us with their names or addresses in 1980, making them difficult to track (Booth and Johnson, 1985). Since the 1983 wave, we have been able to locate all but 83 of the respondents. Generally, we believe an analysis of the attrition data demonstrates high compliance, considering the nature of the sample, a national trend towards greater refusals, and the length of the study.

Over the course of the study we have performed a number of analyses to evaluate the differential attrition. Following the collection of each wave of data, we used logistic regression

and probit analyses with attrition as the dependent variable to assess the characteristics of the respondents that may be related to their dropping out of the study. Table 2 of Appendix A shows the percentage distributions of the respondents by 1980 background characteristics for the 1980 and 1997 waves. The distributions are very similar even though certain categories have shown more attrition than others. Table 3 of Appendix A shows the results of logistic regressions predicting non-interview through 1997 with selected demographic and marital quality characteristics. The most consistent predictors of attrition have been background variables such as educational attainment, gender, minority status, renter status, and metropolitan residence, all of which are significantly related to sample attrition. None of the marital quality measures in 1980 were significantly related to attrition over the 17-year period. Not until the 4th wave did we note a tendency for greater attrition since the previous wave among persons with poorer marital quality. These effects were modest in magnitude and were only noted for marital happiness and divorce proneness. This effect may reflect greater attrition rates among individuals who divorced since their last interview, either because they were more difficult to locate or less willing to continue in the study. The extent to which the effect of divorce proneness on attrition between recent adjacent waves has accumulated over several waves to produce a substantial loss of persons with low marital quality or disrupted marriages is not known and cannot be adequately estimated with available data.

We also have done some preliminary analyses to evaluate whether the rate of marital dissolution observed in the panel approximates the rate that would be expected in the general population in the same age groups. Life table analyses of divorce for persons in their first three years of marriage in 1980 found an estimated dissolution rate of around 35% over the period of the study, similar to what might be found in the general population for this marital duration group (Johnson and Booth, in press). Direct comparison with vital statistics data is limited by differences in comparison groups and the fact that in the 1980 sample, persons in the first three years of marriage would have already been selective because of the marriages that terminated before the first three years. A better comparison group is needed to evaluate the bias in the relative dissolution rates in this and other marital duration cohorts found in the panel.

Attrition in panel studies can lead to biased estimates of effects if attrition is related to both the independent and dependent variables (Heckman, 1979). For example, having higher attrition among men than women would not bias the effect estimates in regression models that include gender as a control and test for the presence of interaction effects between gender and the major independent variables of interest. Bias in the effect of gender on marital happiness would arise, for example, if men in unhappy marriages had higher attrition than those in happy marriages and this effect was not found for women. Since some important predictor and outcome measures have been found to be associated with attrition, the possibility of bias in the Marital Instability panel is present. The usual tool to adjust for this bias in regression type models is the Heckman two-step procedure (1979). However, recent work points out the limited utility of this method for adjusting for selection bias (Stolzenberg and Relles, 1997). When sample sizes are relatively small, the selection effect is modest, and the selection variables are highly correlated with (or the same as) the independent variables in the prediction models, the two-step method will more likely produce estimates that increase rather than decrease the overall error in the estimates. Because many of these conditions are present in empirical social survey models (similar to the type of models used with the Marital Instability panel data), Heckman's procedure has not been found to be an adequate tool by itself to deal with attrition bias.

Long-term panels pose additional selection problems that cannot be resolved by techniques such as Heckman's, which compare measured characteristics of respondents in the

first wave who did or did not drop out in subsequent waves. The nature of long-term panel studies increases the odds of selecting for persons who lead geographically stable and maritally stable lives. They are more likely to be living in the same place and the social and psychological context that lead them to agree to participate in an initial wave is likely to be in place at later waves. For example, Johnson, Amoloza, and Booth (1992) found, when controlling for measurement error, high stability over a 12-year period in marital quality. Some of this stability may reflect a bias towards more stable individuals remaining in the sample. It is possible that the relationships among the variables observed may be different than those found in a sample that did not select for more stable individuals. For example, measuring the consequences of divorce on mental health may be biased if the individuals undergoing the most traumatic changes stemming from the divorce were least likely to continue in the study. This effect could not be estimated using differences in measured characteristics of respondents and dropouts, because the critical variables (in this case, the nature of the divorce) are unknown and unmeasured, since the disruption occurred following the last interview with the respondents. Because the variables that may best predict attrition are not measured in earlier waves, selection bias cannot be modeled adequately by the first stage of the Heckman procedure; alternative methods of estimating and adjusting for attrition bias are needed.

We propose to do an extensive analysis of the attrition problem using a multiple method approach. Each approach has its limitations but combined should give a reasonably complete picture of the nature and degree of bias that may be present in the Marital Instability panel. The first set of approaches involves a comparison of the respondents in the 6th wave (to be conducted in 2000) with a new cross-sectional sample of respondents (also interviewed in 2000) selected to represent the same cohort interviewed in the first wave of the panel in 1980. Extensive comparison of these two groups will enable us to evaluate if the approximate half of the original study who are still active in the panel are different from a similar group from the same population. One outcome of this comparison may be a set of case weights that investigators can use in weighted analyses that adjust for attrition effects. Another outcome will be the development of age-specific divorce/dissolution rates and marital survival curves for the panel and cross-sectional respondents making use of hazard (life table) models. These will assess the extent to which the panel may have underestimated the dissolution rate and provide evidence of which groups may be most affected by this bias. The second approach involves use of the analytic tools proposed by Stolzenberg and Relles (1997) to investigate the adequacy of the Heckman technique for adjusting for certain types of attrition bias. This should yield a set of guidelines on the efficacy of the Heckman procedure in adjusting for possible attrition bias in the sample for this study.

The comparison sample. We will compare the 6th wave of the panel with a new sample of respondents who represent the same population as the original panel respondents. This new comparison sample is different from the new cross-sectional sample that will be used to assess changes in marital quality between 1980 and 2000 (the first aim), although it will overlap with it. The comparison sample will be drawn from the population of persons in households with a telephone who were married and living with a spouse in 1980 and were under 55 years of age in 1980. In 2000, these persons will be age 38 through 75, and they may not be currently living with a spouse or the same spouse they had in 1980. We plan to interview approximately 1,500 persons meeting these characteristics. We will compare this sample with the 6th wave panel respondents. The only differences between these two samples should be due to random and non-random sampling error and attrition bias. It is possible that the response rate in the 2000 comparison sample will be different than the response rate we obtained in 1980 because of the

observed decrease in response rates to telephone surveys over the last two decades. We are planning to use monetary incentives to increase the response rate in 2000 (among those who initially decline to be interviewed), but differences in the kinds of persons who choose not to participate may still exist. A comparison of the demographic make-up of the sample with census data will be made to evaluate any such bias due to differential response rates. Assuming the sampling errors are random, any significant differences in characteristics and relationships between the two samples should reflect attrition effects. Overall comparisons of the means and distributions of a number of demographic and social psychological measures will be generated, but the focus will be on comparing some of the findings that relied on later waves of the panel data to examine marital and individual outcomes.

Specific cross-sectional and panel comparisons. The substantive problems we plan to examine will depend on the differences we observe in the means and distributions of the variables, but one likely research problem that would benefit from a comparison of the results in the two samples is the effects of marital dissolution/divorce and remarriage on psychological distress (Booth and Amato, 1991; Johnson and Wu, 1997). Using later waves of the panel data, these studies found that psychological distress decreased with time following a divorce, although this decline occurred primarily among individuals forming new relationships and remarrying. Since divorced persons were only present in later waves (all initial respondents in the panel were married) and the possibility exists that the persons going through the most stressful disruptions may have been disproportionately selected out of the later waves, this would be a critical comparison to evaluate this type of attrition bias. Of course, only those components of the analysis of the panel data that do not involve measures of psychological distress before the disruption occurred could be compared, since that data would not be available in the cross-sectional group. Two other research studies that could be partially replicated with the new cross-section are the effects of retirement on marital quality (Myers and Booth, 1996) and the relationship between perceived health of the respondent and spouse on marital quality (Booth and Johnson, 1994). Both make primary use of later waves of the panel and may be affected by attrition of less stable married persons from the panel.

Comparison of marital disruption rates. Multiple decrement life table methods will be used to develop duration-specific disruption rates from the panel and the cross-sectional comparison group. Since we have information on whether and when disruptions occurred in the panel and will have a marital history on individuals in the cross-sectional comparison, these rates can be computed from both samples. This comparison will provide valuable information on the extent to which the degree of marital disruption may be underestimated in the panel data. If differences are found, then hazard models can be used to evaluate whether the determinants of divorce in both samples are similar or different and identify where the largest differences occur.

Development of case weights to adjust for bias. It is quite common in survey samples for researchers to develop a series of post-stratification case weights to bring a sample back to proportionality relative to population characteristics (Winship and Grabill, 1994). While it is currently possible to do this for some characteristics in the panel by developing weights that are the inverse of the attrition rate of selected background characteristics (e.g., gender, age, race) it is not possible with many of the characteristics that are likely to vary considerably over time and may not be closely related to their level in 1980, such as the various measures of marital quality, social psychological measures such as psychological distress, and measures of household composition, division of household labor, etc. It may be possible, for example, to find higher levels of marital happiness in the panel than in the comparison cross-sectional sample, even though we know from previous analysis that 1980 levels of marital happiness do not predict

attrition. This could occur if panel participants were a more stable group and a long period of stability was associated with increased marital happiness. Developing case weights from comparisons with the new cross-sectional sample would allow us to identify such effects and provide weights to adjust for them. These case weights would correct for bias in measures of central tendency (such as means and percentage distributions), but their value in estimating effects, such as in regression models, depends on whether the weights are related to the independent or dependent variables. Generally, use of weights that are related only to the independent variables are not necessary in regression type models, as the regression coefficients are not biased (Winship and Grabill, 1994). The use of weights will reduce bias when they are related to characteristics typically endogenous in analysis models, such as marital and personal outcome measures and indicators of family and marital processes. Regression type models can use these weights related to the dependent variables to reduce bias, but as in any analysis of weighted data, care must be exercised in using the appropriate statistical procedures to estimate the standard errors (Winship and Grabill, 1994). We plan to do comparisons of weighted and unweighted data for several substantive problems to evaluate the efficacy of these weighting methods. Our initial focus will be on the studies discussed above, involving (a) the effects of divorce and remarriage on mental health, (b) retirement and marital quality, and (c) health and marital quality.

Analysis of the components of the Heckman correction in the Marital Instability panel data. The final strategy for assessing and correcting selection bias is to explore more completely the use of the Heckman correction. This technique typically involves two steps. In the first step a probit analysis is run in which the dependent variable is whether people in the sample responded to a survey item. In the case of correction for panel attrition, it is whether or not the person participated in the panel wave. The independent variable(s) in the probit equation are selected characteristics of all respondents (usually measured in the first wave when all persons responded) that are expected to predict attrition. The results of the probit analysis are used to generate for each person who responded to the panel a probability called the Mills Ratio. The inverse of the Mills Ratio is then included as a predictor in an OLS regression equation estimated for the panel respondents. Stolzenberg and Relles (1997) present an analytic technique to partition the bias due to selection into six components which, when multiplied together, equal the selection bias effect. These components include a measure of the adequacy with which the variables in the selection equation account for selection, the explained variance in the regression model, the relation of the inverse Mills Ratio to the regression dependent variable and independent variables, and estimates of correlations among error terms in both equations. These components provide information about the conditions under which selection bias is likely to result. While the components are designed to apply to a specific regression model with a designated set of selection variables and independent variables in the regression equation, some of the quantities, such as a coefficient from the probit analysis which indicates how well the predictors in the probit model account for selection, can be generalized to a wide variety of regression models. In making use of these analytic techniques, we will evaluate whether Heckman's procedure would be appropriate to adjust for selection bias in this data set and to specify those situations where it is found to be appropriate.

Products of the study. The consequences of panel attrition from long-term panel studies of marriage and family variables are generally unknown. While our previous analyses with limited information and analytic tools suggest that the degree of bias is minimal, the additional studies and data planned here will allow us to assess the bias in a more rigorous manner. Our results will provide comparisons, weights, and guidelines for future researchers making use of

the data to evaluate and adjust for attrition bias. We plan to include this information not only in research papers submitted for publication but also in a set of materials that will be provided with the public domain release of the data. The procedures developed here also can be generalized to other long-term panel studies.

Aim Four: Building a National Family Research Asset

In addition to meeting the three aims noted previously, adding a new cross-section and a 6th wave of data will greatly enhance the scientific value of this public use data set for other researchers. The Marital Instability Over the Life Course Study has many valuable features. Indeed, it is one of the longest-running, longitudinal, national studies of marriage and family life in existence. While some other studies have a longer history (such as the Panel Study of Income Dynamics and the National Longitudinal Survey of Youth), they do not have the same breadth and depth of questions on marriage and family life. Similarly, although the General Social Survey encompasses a wider period of cross-sectional studies, it does not contain the detailed information on marriage and family covered by our study. Furthermore, in 1992 and 1997, we interviewed nearly 700 young adult offspring from these marriages. These data allow us to match the circumstances of parents' lives (as early as 1980) with outcomes for their children in early adulthood. The combination of longitudinal data from two generations creates many possibilities for answering important questions about intergenerational relations and influence.

Funding a 6th wave of data collection, along with a new cross-section, will give the Marital Instability panel substantial new strengths. Specifically, we would have enough data points to (1) separate age, period, and selection effects; (2) better separate long-term trends in marriage from temporary variations; (3) better differentiate linear from nonlinear trends; (4) directly cover a 20-year period of the life course (as much as 75 years when retrospective data is included); (5) study people who move from early adulthood into middle age, as well as study people who move from middle age into the older years; and (6) make better use of powerful analytic procedures that have been developed to study repeated measures, such as pooled time series analysis and latent growth curve analysis.

The Marital Instability panel study also includes a substantial amount of data on employment, income, assets, positive and negative life events, psychological well-being, health, social support, and gender roles. Consequently, researchers can use this data set to answer a variety of questions that do not specifically deal with family. Indeed, researchers in 89 institutions now use our data, which is available from the American Family Data Archive and the University of Michigan ICPSR. What has become a national research asset will become even more valuable with the proposed additional cross-sectional and longitudinal components.

C. PRELIMINARY STUDIES

The proposed study has the advantage of building on a longitudinal study that began in 1980. Extensive efforts were employed to maintain the integrity of the panel. Respondents who had relocated outside the U.S. were called. Respondents who had obtained an unlisted phone were sent a letter requesting continued participation. Reluctant respondents were given the option of completing the interview schedule by mail. Between waves we regularly contacted respondents twice by mail and telephone to avoid losing track of them.The tracking procedures used are reported elsewhere (Booth and Johnson, 1985). Spanish-speaking interviewers were used as needed. In 1997, a special letter was sent to minorities, indicating that their voice is especially important to the study.

The cross-sectional survey data from 1980 and longitudinal data up through 1997 serve

as a basis for carrying out the aims of the proposed study. In fact, there is no other data set upon which we could build in order to meet the demands of the proposed study. The preliminary studies have resulted in a team of researchers with excellent working relationships. The project has led to more than 50 publications (mostly in refereed journals) and a book published by Harvard University Press. The list of publications may be seen in Appendix B. The published studies have contributed much to the development of the proposed projects, and this contribution is reflected in the frequent citation of these studies in the proposal.

D. RESEARCH DESIGN AND METHODS

Data Collection Needs

To achieve the aims of the study we will build on the Marital Instability Over the Life Course Study which began in 1980. We propose to (1) exactly replicate the 1980 national survey of married persons under the age of 55 who have telephones, (2) interview a supplementary random sample of people between the ages of 38 and 75 who were married in 1980, and (3) re-interview persons who were part of a sample of married persons first interviewed in 1980 who were subsequently re-interviewed in 1983, 1988, 1992, and 1997. The replication of the 1980 survey is necessary to assess changes in marital quality that have occurred since 1980. Not only will the new cross-section include the measures of marital quality that may have changed, but also will include a wide range of variables that may explain observed changes.

We plan to interview a total of 2,900 people in the cross-sectional survey. From these, 2,000 will meet the requirements necessary for the replicate sample, 1,500 will fit the definition for inclusion in the comparison sample, and approximately 600 will be included in both groups (the overlap group). We estimated these proportions using the most recent Census age and marital status data, as well as data from the NSFH cross-sectional survey, which has more detail on marital history.

The interview supplement of people under 75 years of age who were married in 1980 is essential to carry out the third aim of the study. The original survey of people under 55 will have aged 20 years by 2000. In order to assess the effect of selection due to attrition we need to interview a sample of people who are under 75 but over the age of 38 (to reflect the current age of people who are representative of those in the original survey) who were married in 1980. The supplementary sample would represent the contemporary marital status of people who were married in 1980 but are no longer married due to divorce, permanent separation, or the death of a spouse. Some of those interviewed for the supplemental sample (those between 38 and 55 who are married) will also serve as respondents in the replication survey. We estimate that 909 additional interviews will be needed for the supplemental sample.

To carry out the second and third aims of the study, the original sample needs to be interviewed for a sixth time. In relation to the second aim, the 6th wave will capture a considerable number of respondents moving into older age categories. Between 1997 and 2000, we estimate that 54 people will shift into the over 40 category, 121 people will shift into the over 60 category, and 85 people will shift into the over 70 category. New questions on health will be added to the sixth interview, as will items needed to measure key explanatory mechanisms. Finally, the 6th wave of data will increase the number of marital changes (such as divorce and remarriage) which have the potential for affecting health. We expect to interview about 952 people in this wave.

Sampling Procedures

The sampling for the 2000 cross-section will replicate as much as possible the sampling

procedures used in the 1980 survey with changes reflecting improvements since 1980 in telephone interviewing technology and sampling methods that should yield a more efficient sample. Both cross-sectional components of the survey will be generated from a single sample of households that will be interviewed with a short screening instrument. The population administered the screener will consist of all persons living in households with a telephone in the continental United States (excluding Alaska and Hawaii–these were excluded in 1980). The screener interview will ascertain whether the person in the household falls into the categories of the characteristics necessary for the two samples. For the cross-sectional replication, the screener will determine if anyone in the household is currently married, living with their spouse, and age 55 or under. If there is more than one person in this category in the household, a random number on the screener will determine which one will be selected to be interviewed. For the comparison sample, the screener will determine if any adults in the household are between the ages of 38 and 75 and were married and living with a spouse in 1980. If more than one person meets these criteria a random number will be used to select one of them.

A random-digit-dialing sampling frame will be used to generate the numbers called. The sample will be purchased from either Survey Sampling, Inc. or Genesys. While we generated our own sample in 1980, purchase of a sample provides a more efficient and accurate sampling frame, given the increased complexity of the phone system with changes in area codes, cellular numbers, etc. Several alternative RDD designs are available to increase the call hit rate, yet insure a representative sample of all households with telephones. We plan to use a design that screens out random numbers selected in 100's blocks that have no listed numbers. (All numbers with the same first 8 digits make up a 100's block.) This procedure increases the percentage of numbers called that are good while only eliminating a very small fraction of potential respondents with telephone numbers recently added to previously unused 100's blocks. To insure that persons in these zero-listing blocks are not completely excluded from the sample, numbers will also be sampled from them but with a much lower sampling fraction (1/10 of the normal fraction). Our experience with this design in a number of surveys conducted by the Bureau of Sociological Research finds that the proportion of the sample that falls in the zero-listing 100's blocks is usually less than 1 percent. Compared with the clustered RDD design used in 1980, the proposed design provides more efficient samples, since any potential clustering effect on standard errors is removed. In addition, the numbers in the sample will be geographically stratified to insure proportional representation in all regions.

The interviews will be conducted by the Bureau of Sociological Research, which has more than 30 years experience in fielding local, statewide, and national interview surveys and has collected the data for the first five waves of the Marital Instability Over the Life Course Study. The telephone interviews are conducted with state-of-the-art computer-assisted telephone interviewing software (CASES). For the new cross-sections, unresolved numbers will be called a minimum of 15 times, and conversion of soft first-time refusals is routinely attempted three or more weeks after the first call. For the panel, continued attempts will be made to contact unresolved numbers until the end of the study period. Many of the interviewers employed by the Bureau have worked on multiple projects over a number of years, and all interviewers go through an extensive training process. Spanish-speaking interviewers are on staff to cover situations in which the selected respondent mainly speaks Spanish, or is most comfortable with a Spanish interview. Other languages also can be accommodated when needed.

The re-interview of the panel respondents will follow a set of procedures we have used in the previous waves. We have maintained a database of panel respondents in which address and telephone number information is recorded and maintained. A number of panel respondents have

graciously informed us on their own of changes in address or telephone number and these have been added to the database. Approximately six months before the re-interview is to begin, we will begin the tracking process. Respondents will be sent a first-class letter with a forwarding address request so the post office will inform us of the address to which the letters may be forwarded. The respondents will be asked to call our toll-free 800 number to let us know of any changes in telephone number or address. Undeliverable letters and forwarding information will be sent through the tracking process, in which a number of procedures will be used to locate the respondents. These procedures have been successful in the past, and since the 1983 wave, we have been able to locate all but 83 of the respondents. (The attrition rate was considerably lower among respondents who gave their names and addresses in any of the previous waves.) About one month before the interviewing will begin, we will send another letter informing respondents that we will be contacting them soon to interview them.

Interview Schedules

The cross-section interview. The interview schedules for the cross-sectional replication sample and supplement sample will be very similar to the 1980 interview schedule. About 10% of the questions will be dropped. We will exclude these questions either because they had little utility in prior analyses, or because they would contribute little to the current aims of the proposed study. The Langner (1962) depression scale was not included until 1983, but we will add it to the year 2000 interview schedule because of its value in understanding change and attrition. A draft of the interview schedule can be found in Appendix C. The format of the interview schedule will be somewhat different because the Bureau of Social Research has since adopted computer-aided interviewing.

The 6th wave interview. The 6th wave interview will include the core questions found in the previous five waves, including items dealing with marriage, family life, employment, income, social support, gender roles, psychological well-being, and health. The measures of health included in prior waves refer to (1) five common diseases (diabetes, arthritis, heart trouble, cancer, high blood pressure), (2) health or physical conditions that restrict everyday activity, (3) a self-rating of health as excellent, good, fair, or poor, and (4) awareness of aging as indicated by recent declines in eyesight, hearing, teeth, energy, hair, skin, and body shape. In relation to psychological well-being, previous waves included a measure of distress symptoms, a self-esteem scale, a single item measure of overall happiness, a life satisfaction scale, and a "life regrets" scale.

The 6th wave interview will strengthen the health measures. First we will add questions dealing with respiratory diseases (chronic bronchitis or emphysema) and a measure of injuries that required a physician's care. In addition, we will add an extensively-used scale of 54 disease symptoms (Wickrama et al., 1997; Wyler et al., 1968;). These symptoms appear to serve as valid indicators of the seriousness of an individual's health from the standpoint of prognosis, duration, threat to life, degree of disability, and degree of discomfort. Information on height and weight will be collected to construct the Quetelet index, which is a measure of obesity. We also will add an item that asks individuals to compare their current health with their health one year ago; this will serve as an indicator of perceived change. Finally, we will include items on parent's health to control for health conditions that respondents might have inherited from their parents.

Few measures are available of the causal mechanisms that are proposed to link marital and family history to health--in particular, having an orderly lifestyle and mattering. Consequently, we will construct an orderly lifestyle scale with items that tap getting enough sleep, eating balanced meals, getting regular exercise, wearing a seat belt, and engaging in fewer risky behaviors, such as drinking, drug use, and smoking. In addition, the scale will assess the

extent to which individuals engage in behaviors such as driving fast, having accidents, and getting into fights outside the household. We also will construct an instrument to measure mattering, which will consist of two components: the extent to which the individual believes (1) her/his spouse cares for and values her/him, and (2) her/his spouse is dependent upon her/him. A preliminary set of items has been developed for each scale. A draft of the items (not yet complete) that will make up these scales appears at the end of the 1997 interview schedule (see Appendix D). The items will be pretested and checked for dimensionality and reliability. The items on mattering will be factor analyzed with the existing marital quality scales to ensure that they are measuring independent constructs.

Plan of Analysis

Aims one, two, and three (as outlined earlier) each subsume several related projects. The complexity of the methods needed to conduct each of these projects precludes describing all of the relevant analyses. Therefore, we present one detailed example of an analysis for each of the three aims.

Changes in marital quality between 1980-2000. This analysis will utilize the 1980 and 2000 cross-sections to focus on *changes in the level of marital quality* between these periods. Five scales of marital quality were included in the 1980 interview schedule: happiness, interaction, disagreements, problems, and divorce proneness. We will administer these scales again in 2000. Confirmatory factor analysis with the 1980 data indicated that the scales reflect two latent variables: positive marital quality (happiness and interaction) and negative marital quality (disagreements, problems, and divorce proneness) (Johnson, White, Edwards, and Booth, 1986). Our first step will be to use structural equation methods to create similar latent variables for the 2000 data. Loadings of each observed indicator (the marital quality scales) on the latent variables will be fixed across the two cross-sections (1980 and 2000) to ensure that the latent variables are measured on the same scale in both groups.

The next step will be to use a multigroup model to see if there are significant differences in latent means across the two periods. Assuming that differences in marital quality means are significant, the next step will be to explain these differences. We will begin by adding age, age at marriage, number of children, education, race, and marriage order to the model as predictors of marital quality. It may be that marriages in 1980 and 2000 differ in quality, but only because the two groups are differently constituted. With these demographic variables in the model, we will see the extent to which differences in latent means are attenuated (or strengthened).

Assuming that significant differences in marital quality persist, the next step will be to assess the role of several explanatory factors, including economic stress (men's and women's earnings, periods of unemployment, use of public assistance, perceptions of economic hardship), work-family conflict among dual-earner couples with preschool children, husband's and wife's gender role attitudes, the proportion of housework and child care performed by husbands, prior cohabitation, premarital births, and attitudes toward the acceptability of divorce. These predictors will be introduced into a series of models (one for each explanatory variable or set of explanatory variables) to determine the extent to which they account for marital quality, not only within each period, but also across the two periods. For example, if the gap in marital quality between 1980 and 2000 decreases when we enter the block of variables measuring economic stress, then this would suggest that changes in economic factors account for some of the change in marital quality. As a final step, we will enter all the explanatory variables into a single model to see if we can account completely for any changes in marital quality between the two periods.

Family and marital history, and the health and well-being of the middle-aged and elderly. To assess the impact of family and marital history on health and well-being, we will

draw on the proposed 6th wave of interviews, as well as the preceding five waves of data. The sixth interview will yield approximately 952 people between the ages of 38 and 75. Of these, 85% will be married, 10% will be divorced or separated, and the remaining 5% will be widowed. We also estimate that 32% will be age 60 or older. There appears to be sufficient variability in people's family and marital history to meet the needs of the proposed investigation. For example, we estimate that 98 of the currently married individuals will have experienced a parental divorce prior to reaching age 19. (Of these, 65 will have mothers who remarried.) Among respondents whose parents remained married, 372 will report some unhappiness in their parents' marriage and 80 will report severe unhappiness. With respect to parent-child relations, 186 will report not being close to their mothers, 259 will report not being close to their fathers, and 97 will report not being close to either parent. Eighty-nine will have had a premarital birth, and 113 will have experienced premarital cohabitation. A number (137) will report marrying before the age of 19. Another substantial portion (161) will report being a stepparent. Over their life times, 218 respondents will report a divorce followed by a second marriage, and 40 will report multiple marital dissolutions and remarriages. There also is sufficient variability in marital quality to conduct the proposed investigation. As indicated in an earlier section, there are large numbers of continuously married individuals who have experienced substantial fluctuations in marital quality during the study.

As example, one analysis uses a measure of the respondents' health as the dependent variable. Independent variables include family-of-origin characteristics (parents' marital quality, divorce, and remarriage), the respondents' current marital quality, and respondents' experiences with divorce, remarriage, and stepfamilies. We will begin by regressing indicators of health on family-of-origin variables (singly and collectively) while controlling for age. The attrition analysis may identify additional variables that would need to be controlled to minimize selection bias. If weights are used to adjust for bias, then robust regression methods in STATA will be substituted for OLS to produce more accurate standard errors. The next step will add premarital and marital history variables (such as the number of marital disruptions, levels, and variability in marital quality across the previous waves) to the equation to see if family-of-origin effects are operating through subsequent marital events and marital quality. We will then check to see if family-of-origin effects are moderated by the respondent's gender or marital duration by including appropriate interaction terms in the model. Finally, we will check for a possible selection effect by including, as a control variable, a scale that taps behaviors that reflect problematic personality traits (such as being in trouble with the law, substance abuse, and violence). These analyses would be repeated for measures of both physical and mental health.

Sample attrition and the integrity of results in family research. The analysis example for this phase of the study focuses on the research procedure to be used to evaluate the effects of sample attrition on findings from the panel sample. In this example, we will focus on the relationship between length of time since a divorce and the degree of psychological distress. This task will be accomplished by comparing the results in the 2000 panel and the cross-sectional comparison sample. The panel and cross-section samples will be pooled together with a binary indicator of sample type (panel=0, cross-section=1). Only people experiencing a marital disruption will be included in the sample. Variables in the model will include the scale of psychological distress, time since disruption in decimal years, whether the person has remarried or cohabited since the disruption, and a set of control variables. We will carry out an OLS regression model with psychological distress as the dependent variable and decimal years since the disruption and type of sample as the primary independent variables. An interaction term between years since disruption and type of sample will be included to evaluate if adjustment to

divorce is similar in both samples. Models with and without remarriage and cohabitation since the divorce will be compared, and interaction effects with the type of sample will be added for these factors as well. These models will allow us to see if patterns of adjustment to marital disruption and the level of psychological distress among persons experiencing a disruption were the same in both samples. For example, if the additive term for sample type is significant and positive, then it would suggest that there is a higher rate of psychological distress in the cross-section sample, which would provide evidence for the selection out of the panel of persons experiencing more difficult divorces. Similarly, if the interaction term involving sample type is significant, then it would suggest that attrition has affected the nature of the relationship between the predictors and divorce adjustment.

Timetable

Year 1. The interview schedules will be further developed and pretested, and the new measures will be analyzed for dimensionality and reliability. The sample of telephone numbers will be drawn, and interviews for the two cross-sectional components and the panel component will commence. It is estimated that two-thirds of the survey work will be completed. *Year 2*. Interviewing will be completed and the data will be transformed into SPSS system files.Variables will be defined, scales constructed, and data checked for errors and cleaned. Data analysis will commence. *Year 3*. Data analysis and report writing will continue.

E. HUMAN SUBJECTS

1. The research outlined in this proposal involves interviews with 952 adults in the United States interviewed by telephone five times previously in connection with this study. In addition, we plan to interview a cross-section of 2000 married individuals under the age of 55 another 909 people between the ages of 38 and 75 who were married in 1980. Respondents in the cross-sectional surveys will be selected through a random digit dialing procedure. If there is more than one eligible individual, another random procedure will be used to select the respondent.

Every effort is made to ensure that women and minorities are included in the survey in proportion to their number in the population. When we started the panel study of married persons under the age of 55 in 1980, 4.8% of the sample consisted of African-Americans which was very close to the proportion they represented in the U.S. population at that time. The proportion of the sample which consisted of other minorities (not including Hispanics) was 1.8% of the sample, a figure also very close to their representation in the population. In the 1996 wave of interviews African-Americans consisted of 2.8% of the sample and other minorities 1.2% of the sample. Further analysis shows that being an African-American male is not a predictor of attrition. Rather it is females who divorce that account for the greatest attrition among African Americans. While the decrease in minorities is of great concern, the loss is not due to a lack of effort on our part to maintain the integrity of the panel. We use state-of-the-art methods at every point in the study to keep attrition at a minimum. Respondents who relocate outside the U.S. are called. Respondents who obtain an unlisted phone number are sent a letter requesting the new number and continued participation in the study. Reluctant respondents are given the option of completing the interview by mail. Between waves we contact respondents twice a year by mail and phone to avoid losing track of them. Spanish-speaking interviewers are used as needed. In 1996 a special letter will be sent to minorities indicating that because they are a minority, their voice is especially important to the study. The letter will emphasize the responsibility they have to remain in the study so that the results accurately reflect their views and circumstances. We treat attrition among minorities very seriously and after each wave of interviews we do extensive

analysis of a wide range of factors that predict attrition and send the results of our analysis to other users of the data set.

The same procedure that were used in obtaining a reproductive cross section in 1980 will again be used in 2000. This would include having African-American interviewer call number with area code that have many minority representation. Other procedures that help to ensure minority representation are described in the sampling procedures section of the proposal.

2. The information will be obtain by telephone interviews that are carried out by staff members of the University of Nebraska Bureau of Sociological Research.

3. Informed consent will be implied if the subject answers the questions after having been informed about the goals and sponsors of the study and reminded of his/her participation in it. Therefore, formal informed consent will not be obtained. Agreeing to be interviewed is assumed to give informed consent. Their action will be recorded by the interviewer at the time of the call. Respondents will be advised that the only possible risk, lack of confidentiality, will be carefully guarded.

4. The chief risk to the respondent would be embarrassment in the situation where his or her responses became publicly known. Great care is taken that no response can be identified with a particular individual.

5. Arrangements to protect the rights of individuals who choose to take part in our study will be extensive and occur at many points throughout the course of the project. Efforts begin with the employment and training of interviewers. Each interviewer is carefully screened and trained before beginning work on the project. Any indication that they might discuss information given to them in confidence with persons other than project staff, or otherwise violate the rights of the respondent, is grounds for dismissal. Considerable training time is devoted to teaching interviewers how to protect the rights of respondents and to impressing them with the importance of confidentiality. Interviewers receive 20 hours of training before beginning the project.

People who are contacted for an interview have an opportunity to decline to participate at any time. Furthermore, no sanctions are attached to refusing to participate. Interviewers are not allowed to use coercion of any type to obtain the respondents cooperation. The respondent is advised that the information is held in strict confidence, is reported only in summary form, and is never attached to his or her name. They are also told that the fact they are a participant in the study is also held in strict confidence.

Following the interview, names and other identifying information are removed from the protocols. Only an identification number serves to link the records with individuals. The list linking numbers with names is kept under lock and key, the only access to which is by the Principal Investigator. The list is seen only by the Principal Investigator and the Bureau secretary who assists in keeping the records.

The history of the Bureau of Sociological Research in protecting the rights of respondents is excellent. They have conducted dozens of studies over the last 30 years and so far as we know, the confidence of the respondent has never once been violated.

Because the quality of marital relations is a sensitive topic, each interviewer will undergo an in-depth interview by the supervisor to determine whether they are capable of maintaining a thoroughly neutral posture with respect to marital relations. Interviews will also be prepared to give the telephone number of a competent referral service should the respondent request information on social services.

6. We are aware that survey research asks much of the people who consent to be interviewed, but offers little in return of direct benefit. Respondents who ask are always given copies of reports generated by the study. Those seeking information on social services will be provided a means whereby they can get in touch with competent help. However, we believe the proposed study will provide more indirect benefits than most. The study deals with a matter of direct concern to the respondent. The study will increase understanding of the sources of change in marriages and the consequences of those changes. The results will be used to alter the character and distribution of human social services of which people with marital difficulties could avail themselves. In this way the respondent and his fellow citizens will benefit from the survey.

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H. CONTRACTUAL ARRANGEMENTS

The University of Nebraska Bureau of Sociological Research is the logical unit to carry out the re-interviews of the panel and the interviews with adult offspring. The Bureau has done the first four waves of data collection and the staff are very familiar with the project. The key staff and many of the interviewers have worked on the project since data were first collected in 1980. The records, procedures, and equipment are in place to do the fifth wave. The letter of agreement from the Bureau Director and institutional representative, along with the budget sheet and lobbying certification, follow.