Outwitting Divorce: How Intelligence Can Keep Couples Together

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INTRODUCTION

Divorce has become a staple of American family life. Current estimates are that after 15 years, 43 percent of first marriages will dissolve, and at least half of all first marriages will eventually end in divorce (e.g., Bramlett & Mosher, 2002; Cherlin, 1992). Divorce is shown to have negative consequences for both the spouses involved and their children (c.f. Amato, 2000). Because of the high prevalence and the negative consequences of divorce, it is not surprising that numerous studies are devoted to understanding the factors that predict divorce.

The dominant perspective in studies predicting divorce has been the selection perspective (Masheter, 1998). These studies argue that characteristics that individuals have prior to their marriage can impact their chance of divorce. Sociodemographic characteristics such as the race and ethnicity of the individual, age at marriage, family income, unemployment status, religious affiliation, religious importance, and parental divorce have all been found to affect the probability of divorce (Bramlett & Mosher, 2002). Cohabitation prior to marriage has also been linked to divorce and it is increasingly argued that this is due to selection rather the cohabitation experience (Vetter, 2002).

While these are all important personal characteristics, it is somewhat surprising that previous studies have basically ignored the role that intelligence plays in predicting the probability of divorce. While some evidence surmounts that intelligence may be inversely related to divorce (Hernstein & Murray, 1994), the underlying mechanisms that guide this possible relationship are yet to be explored. It seems quite likely that independent of its impact through education and income, intelligence may lower the probability of divorce. For example, one aspect of intelligence is problem-solving ability and more intelligent people may be better at solving the problems in their marriage and avoiding divorce than less intelligent people.

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In this paper, we address the gap in the literature regarding intelligence as a predictor of divorce. We develop a theoretical framework that hypothesizes why intelligence may be related to divorce and then examine several mechanisms that may explain the relationship between intelligence and divorce. To test our hypotheses, we use data from the Intergenerational Panel Study of Mothers and Children, a 31-year, 7-wave panel study of 670 individuals from birth to young adulthood.

THEORY AND HYPOTHESES

In the classic works on intelligence Benet and Simon (1916) define the central aspect of intelligence as "judgment, otherwise called good sense, practical sense, initiative, the faculty of adapting one's self to circumstances." In summarizing Benet's approach to intelligence, Sternberg (1991) notes that "intelligent thought comprises three distinct elements: direction, adaptation, and criticism." Each of these aspects has obvious applicability to successful spousal role performance. For example "(d)irection consists in knowing what has to be done and how it is to be accomplished." (Sternberg, 1991:184). Having direction can increase marital stability through the development of couple goals such as maintaining a workable family budget or setting limits on a pre-school child's behavior. "Adaptation refers to one's selection and monitoring of one's strategy during the course of task performance" (p. 184). In marital processes such as sharing the household chores, more intelligent people should be better at choosing good strategies, recognizing when their strategy isn't working and making adjustments. "Criticism is the ability to critique one's thoughts and actions" (p. 184). More intelligent people are able to critique their own spousal role performance, which should make them more flexible and responsive spouses than those who cannot see their own limitations.

This study uses a subset of the widely used Wechsler intelligence test, which will be discussed further in the methodology section. However, it is important to note that Wechsler designed his test sharing many of Benet's assumptions regarding the definition of intelligence. Whereas Benet's tests were designed to measure children's intelligence, Wechsler's test was designed to measure adult intelligence (Mackintosh, 1998). Turning our attention now to how intelligence can impact divorce, there are at least three ways of conceptualizing the process: spurious, structural and direct.

Spuriousness Hypothesis. The first way of conceptualizing the relationship between intelligence and divorce is that the relationship may be spurious. In other words, the true relationship between intelligence and divorce (if one exists) might be attributable to factors that precede the observed relationship. Thus, the spuriousness hypothesis draws heavily on parental background factors that may influence both intelligence and divorce. For example, parental income and education are both found to be positively related to their children's intelligence (e.g., Cohen, Belmont, Dryfoos, Stein, & Zayac, 1980; McDermont, 1995; Smith, Brooks-Gunn, & Klebanov, 1997). Higher levels of parental education (e.g., Amato & Rogers, 1997; Bumpas, Martin, & Sweet, 1991) lower a child's risk of divorce while coming from an impoverished family can increase the risk (Wolfinger, 2000). Thus, the relationship between intelligence and divorce may be a spurious one.

Spuriousness may also be implicated through the intergenerational transmission of divorce. Children of divorce are known to have a higher chance of divorce after they marry (e.g., Amato & DeBoer, 2001; Bramlett & Mosher, 2002). Experiencing a parental divorce greatly enhances children's susceptibility to marital disruption (e.g., Amato & Rogers, 1997; Keith & Finley, 1988; Kulka & Weingarten, 1979; Mueller & Pope, 1977; Greenberg & Nay,

1982), especially if the parental divorce occurs in early childhood (e.g., Bumpass, Martin, & Sweet, 1991; McLanahan & Bumpass, 1988). Parental divorce has also been shown to have negative consequences on children's development, including their academic ability (McLanahan & Sandefur, 1994). Thus, the relationship between intelligence and divorce may be spurious if parental divorce is related to both.

Structural Hypothesis. Higher intelligence may lead individuals to have experiences or characteristics that lower their risk of divorce. In other words, having higher intelligence may be associated with roles, statuses, and attributes that are negatively associated with divorce. These roles, statuses, and attributes may in turn act as intervening mechanisms of the effect of intelligence on divorce. We call this the structural hypothesis.

For example, previous research shows that an individual's intelligence is highly predictive of his/her socioeconomic status. Sewell, Hauser, and Wolfe (1980) found that adolescents' measured intelligence—along with their family's socioeconomic status and other factors—is strongly related to their educational attainment, and this holds true for both men and women. In turn, educational attainment (and intelligence) is known to predict subsequent occupational attainment and income levels (e.g., Featherman, 1980). Moreover, each of these factors (i.e., educational/occupational attainment and family income) is shown to reduce the risk of divorce (e.g., Bramlett & Mosher, 2002; Wolfinger, 1999).

Educational and occupational attainment may reduce the risk of divorce for several reasons. One explanation is that college degrees, prestigious jobs, and high incomes or salaries are valuable resources that make their possessor appear more attractive (or valuable) to others. In terms of social exchange theory, married individuals who've obtained these various forms of human capital would be less likely to divorce because their spouses have a vested interest in

securing and maintaining the relationship. This capital attainment may serve as a benefit or

attraction of the marriage because it produces a higher standard of living for both spouses. If one

invokes the "comparison level for alternatives" (see Thibaut & Kelley, 1986) and compares their

marital relationship to that of others, the family with the higher socioeconomic status may appear

more attractive to the contemplative spouse. Thus, higher educational and occupational

attainment may serve as barriers to marital dissolution (see Levinger, 1976).

Another reason why income and education may reduce the risk of divorce is that persons

with more material (i.e., financial) resources than average will have easier access to other

resources that could prevent a marriage from dissolving in a troublesome time (i.e., marital

counseling). Kirby & Davis (1972) shows that families with higher income and education were

more likely to participate in marital counseling than people with less income. Those with greater

financial resources, especially those who own their homes, may also find divorce more an

unattractive option for marital problems because of the loss involved when property is divided

(e.g., Booth, White, Johnson, & Edwards, 1987; South & Lloyd, 1995).

Closely related to educational and occupational attainment is the individual's full-time

work status. If it can be assumed that full-time work status leads to financial stability, which is

shown to reduce one's likelihood of divorce, then we might also assume that working full-time is

associated with a decline in the likelihood of divorce. However, this assumption may be wrong.

There are good theoretical reasons to expect that the effect of full-time employment on divorce

vary by sex. For men, employment often adds to the stability of a marriage because employment

is compatible with the male provider role (Becker, 1981). The husband's income is often a

stabilizing factor in a marriage (e.g., Cutright, 1971; Becker et al., 1977; South & Lloyd, 1995).

For women, on the other hand, employment has been shown to be a potential risk factor for

divorce (South, 2001) especially when the wife's income exceeds that of her husband's (e.g., Ross & Sawhill, 1976; Cherlin, 1976). The wife's income may not be a destabilizing factor; it may simply allow women who are unhappily married to leave the relationship (e.g., Sayer & Bianchi, 2000; Schoen, Astone, Rothert, Standish, & Kim, 2002). Thus, intelligence may operate differently for males than for females through the intervening mechanism of employment and income on the divorce rate.

Another possible mechanism through which intelligence may operate to impact the divorce rate could be childbearing during the marital relationship. The presence of children in a marriage is commonly shown to reduce the couple's likelihood of divorcing (e.g., Waite, Haggestrom, & Kanouse, 1985; White & Booth, 1985). In contrast, studies show a similar effect by using an alternative approach, namely, by demonstrating that childlessness increases the likelihood of divorce (e.g., Wineberg, 1988). According to Becker, Landes, & Michael (1977), having children in marriage is a type of marriage-specific capital that reduces the probability of divorce. Therefore, it is possible that intelligence impacts divorce indirectly through the number of children that a couple has.

Direct Hypothesis. In contrast to the structural hypothesis, the direct hypothesis proposes that people with higher intelligence have unique cognitive and interpersonal skills that decrease their risk of divorce. For example, people with higher intelligence may be more thorough, thoughtful, and circumspect about important life behaviors such as marriage. They may be more likely to delay marriage until they are ready. Clausen (1991) argues that adolescents high in "planful competence" make realistic choices in various aspects of life, including choices related to education, occupation, and marriage. Planful competence incorporates self-confidence, dependability, and intellectual investment. Intellectual investment,

which is of most interest to the current study, is related to both intellectual ability and the ability to effectively use one's intelligence. Rational decision-making will likely lead to greater satisfaction and stability throughout the life course and will make these competent individuals appear as desirable mates (Clausen, 1991). Moreover, "those who make well-thought-out choices early on will tend to show greater stability in their relationships...They should be less likely to divorce…and their networks of significant others should have greater continuity and persistence" (Clausen, 1991:811-12).

Another mechanism may be the concept of emotional intelligence (e.g., Mayer and Slavony, 1993; Goldman, 1995). Although a controversial concept, emotional intelligence "is a type of social intelligence that involves the ability to monitor one's own and others' emotions, to discriminate among them, and to use the information to guide one's thinking and action" (Mayer & Slavony, 1993). For example, people with high emotional intelligence can more readily interpret other's facial expressions and nonverbal behavior that those with a lower emotional intelligence. It is unclear if the concepts of general intelligence overlap with emotional intelligence, but some research indicates that it may (Ford & Tisak, 1983). Thus, higher intelligence may be a weak proxy for emotional intelligence, which in turn would be related to better relationship skills within a marriage and lower rates of divorce.

In sum, there are three different hypotheses that may explain the relationship between intelligence and divorce. Following directly from these hypotheses, our analysis has two aims. The first aim is to test if there is a relationship between intelligence and the rate of divorce. The second aim is to describe either the mechanisms that explain this relationship or the factors that explain the potential spuriousness of the relationship. The three hypotheses, however, are not necessarily exclusive. For example, it is possible that while some effect of intelligence on

divorce may be endogenous to parental background, remaining effect could be either direct or explained by structural factors.

Research on Intelligence and Divorce. Very little has been published on the effect of intelligence on divorce. Further, the two publications that have examined the relationship have not attempted to test alternative explanations of the relationship. In their controversial book, *The Bell Curve,* Herrnstein and Murray (1994) examined the relationship between intelligence measured in adolescence and probability of getting divorced within the first five years of marriage using the National Longitudinal Survey of Labor Market Experience of Youth (NLSY). They found that the top 40 percent in intelligence were significantly less likely than the bottom 60 percent in intelligence to become divorced within the first five years of marriage. These effects remained controlling for parental SES, age at first marriage, and parental divorce status. In a longitudinal study using two Dutch cohorts, Dronkers (2002) found that the effect of intelligence on divorce is cohort specific. For those born in 1958 (making them about the age of the respondents in the NLSY) more intelligent people were less likely to get divorced, whereas for those born in 1940, more intelligent people were more likely to get divorced. They attribute the contradictory findings to the changes in divorce laws, which made it easier for the younger cohort to obtain divorces. Neither of these studies gives an in-depth understanding of why intelligence might affect divorce. By testing alternative theories we hope to provide some understanding of the relationship.

Other Determinants of Divorce

Before any of the direct, indirect (i.e., structural), or spurious mechanisms can be determined as hypothesized, it is important to control for other extraneous factors that are known to relate to divorce (and which may be related to intelligence). These factors include remarriages

and stepchildren, premarital cohabitation, age at marriage, and religion and religiosity. Although these predictors of divorce are not central to the hypotheses, they can nonetheless alter the relationship between intelligence and divorce and must therefore be taken into consideration.

Remarriages and Stepchildren. Individuals who enter a marriage and are previously divorced tend to have a higher rate of divorce the second time around. In 1995 the rate of divorce for second marriages was 20 percent higher than for first marriages by the third year of marriage, and 15 percent higher than first by the tenth year (Bramlett & Mosher, 2002). This finding may be attributable to the "types of people" who enter into a second marriage; in other words, the characteristics of an individual that caused the first marriage to break up may carry over into the second marriage to cause the divorce (see Martin, Bumpass, & Teachman, 1986). Another reason that second marriages may be more likely to end in divorce is because they often involve stepchildren, which Becker et al. (1977) refer to as a negative form of capital in remarriages. However, White (1985) finds that only double remarriages with stepchildren (i.e., where both spouses were previously married and had children) have substantially higher divorce rates than single remarriages or first-time marriages for both spouses (with or without children). Bramlett and Mosher (2002) find that remarriages involving two more children at the time of remarriage have higher divorce rates than those involving one child.

Premarital Cohabitation. In past, cohabitation prior to marriage was found to increase the probability of divorce (e.g., Axinn & Thornton, 1992; Booth & Johnson, 1988; Bennett, Blanc, & Bloom, 1988; White, 1987; Teachman & Polonko, 1990). The cause of this relationship has received much debate but several interrelated themes emerge from the literature: those who cohabit are nontraditional, they hold the institution of marriage in low regard, and they are more likely to hold to pro-divorce attitudes than non-cohabiters (e.g., White, 1990;

Bennet, Blank, & Bloom, 1988; Booth & Johnson, 1988; Teachman & Polonko, 1990). More recent findings suggest that there is little or no difference in divorce rates between those who cohabit before marriage and those who enter into a traditional marriage (Amato & Rodgers, 1997). For remarriage, Bramlett and Mosher (2002) find that cohabitation prior to remarriages is a protective factor, leading to lower divorce rates for cohabitors than non-cohabitors.

Age at marriage. Early age at marriage is consistently shown to increase one's likelihood of divorce (e.g., Amato & Rogers, 1997; Booth & Edwards, 1985; South & Spitze, 1986; Balakrishnan, Rao, Lapierre-Adamcyk, & Krotki, 1987; Thornton & Rodgers, 1987; Martin & Bumpass, 1989; Bumpass, Martin, & Sweet, 1991; Bramlett & Mocher, 2002). In the first five years of matrimony, age at marriage is the most important determinant of divorce (Martin & Bumpass, 1989). In fact, younger couples are likely to divorce at a higher rate than older couples in that they have more opportunities to remarry once in the singles market (Amato, 1996). On the other hand, Booth & Edwards (1985) argue that people who marry earlier limit their time to find an appropriate partner and are less likely to be established than those who delay marriage until they secure economic resources.

Religion and Religiosity. Marital stability is also affected by religion and religiosity. In general, Catholics are found to have lower divorce rates than other religious denominations (e.g., Levinger, 1965; Wolfinger, 1999; Teachman, 2002) and like-faith marriages are less likely to dissolve than interfaith marriages (Levinger, 1965). Religiosity, as measured by church attendance, also reduces an individual's proneness to divorce (e.g., Booth, Johnson, Branaman, & Sica, 1995; Thomas & Cornwall, 1990; Amato & Rogers, 1997).

METHODS

Data

The data source for this study is Intergenerational Study of Parents and Children (ISPC), which is a 7-wave panel study that used a probability sample of first-, second-, or fourth-born white mothers from the Detroit metropolitan area whose children were born in 1961. The first interviews with mothers began in 1962, which were followed by re-interviews in 1963, 1966, 1977, 1980, 1985, and 1993. Eighty-seven percent of mothers interviewed in 1962 completed interviews in 1980; seventy-nine percent completed the final interview in 1993.

Because the study is limited to white families from a single metropolitan region in the United State, its generalizability to other populations may be in question. From the standpoint of study design, however, this localized sample may be of benefit. The measurement of intelligence is a highly controversial topic (e.g., Eysenek, 1998; Mackintosh, 1998; Gardner, 2003) and arguments suggest that measurement is biased by racial and ethnic background (e.g., Taylor, 2002; Gopaul-McNicol & Armous-Thomas, 2002). A sample that is a single racial group eliminates this heterogeneity in the measurement of intelligence across different groups. Furthermore, there may also be large variation in schooling systems and curriculums across geographic regions. Limiting the sample to a single large metropolitan area allows some of this regional variability to be reduced, while at the same time providing enough variability on important factors such as parental educational and economic backgrounds.

The children from the 1961-birth cohort were interviewed in 1980, 1985, and 1993. In addition, 906 of these children completed full Life History Calendars covering the period from July 1976 to December 1993. The calendars contained the adult children's marital and familial histories, school attendance and labor force participation, and living arrangements. These events

were measured to the nearest month. The rate of re-interview of children from 1980 to 1993 was extremely high, nearly 97 percent of the original sample over the three interviews.

The sample consists of 670 respondents who married for the first time during the course of the study as recorded in the Life History Calendars.   From this sample, 23 respondents were dropped from the analysis because they married and experienced a divorce prior to the 1980 interview. Since many of the independent variables were taken from this 1980 interview, deleting these cases from the dataset maintains proper causal ordering in modeling the relationship between intelligence and divorce. Although removing cases always reduces the sample's representativeness and introduces the possibility of bias, the deletion of these individuals did not substantially affect the overall findings. To check for potential bias, we ran the results twice: once with all 670 respondents and again with the smaller sample of 647 respondents. The results for the two sets of analysis were basically the same[1]. Thus, the more theoretically sound choice of deleting the 23 left-censored cases was employed.

Because the dependent outcome is the transition from marriage to divorce, there may be right-censored cases among individuals who have not divorced. Event history analysis is appropriate for modeling these transitions. Discrete-time methods are used to estimate the monthly hazard of divorce. Although Cox proportional hazard models could have been used and would have yielded similar findings, we choose discrete-time methods because the models easily incorporate time-varying covariates and can be estimated with logistic regression (Allison, 1995). Because the dates of marriage, divorce, and time-varying characteristics (e.g., schooling, childbearing) are measured to the nearest month, the person-month is the unit of exposure to risk.

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[1] Two points should be noted. The analysis of the full sample (n = 670) actually demonstrated a stronger effect of intelligence on the divorce rate than the effect demonstrated in Tables 2 and 3 in the Results section, which represent the smaller sample (n = 647). Thus, are reduction of the sample actually had the effect of making our estimates more conservative. Also of note, the coefficient for age at first marriage is also stronger in the larger sample. This is reasonable since we excluded those individuals who married and divorced prior to the age of 18.

Measures

The transition from the married to divorce state is the dependent outcome. As in standard practice in discrete-time models, for each month the respondent stayed married he/she was assigned a value of 0 on the divorce indicator. On the other hand, if the respondent experienced a divorce, he/she was assigned a value of 1 for the indicator variable and no longer contributed person months of risk. Individuals become at risk for divorce once they marry, which could happen anytime between the 1980 interview (age 18) and the 1993 interview (age 31).

There are three categories of independent variables. The first category is the main independent variable of interest: intelligence. The second category of variables corresponds to the structural and spuriousness hypotheses (for the direct hypothesis, which proposes a direct effect of intelligence on divorce, we do not present any intervening variables). The last group of independent variables is control variables. These controls are included because they are known to affect the risk of divorce and may also be related to intelligence.

Intelligence. This study operationalizes intelligence by using the Similarities subtest from the verbal component of the Wechsler Adult Intelligence Scale (WAIS), which is the most widely used individual intelligence test today (Mackintosh, 1998). The Verbal tests measure the individuals' "learned or absorbed knowledge," or the "knowledge relating to competent functioning in the world" (Belsky, 1990:120). According to Robinson (1991), the Similarities subtest is the best marker for "crystallized intelligence," or what is commonly referred to as "acquired knowledge." Belsky (1990) defines crystallized intelligence as "the extent to which a person has absorbed the content of culture" (p. 125). The Similarities subset has also been used in other data collection, including the Wisconsin Longitudinal Study (WLS, 1957-1977).

Although this subset is only one aspect of intelligence, it is correlated with general intelligence and cognitive ability (Wechsler, 1955).

The Similarities subtest asks respondents in what ways two things are alike (e.g., a hammer and a screwdriver or avarice and gluttony). The test consists of 13-items and was administered in the 1980 child interview. A respondent could receive a maximum of 2 points for each item. For example, the first item asked: "In what way are an orange and banana alike?" If respondents answered this question in a simplistic form (e.g., "tastes good".) they received 0 points. If his/her answer was descriptive (e.g., "have peels), they were awarded 1 point. On the other hand, if respondents provided the appropriate answer (i.e., "fruits"), they were awarded the full 2 points. The scores for these 13 items were averaged, and this score was standardized to have a mean of 100 and standard deviation of 15.

Spuriousness Hypothesis variables. Variables related to spuriousness include several parental background measures: parental divorce, income, and education. Parental divorce is measured with a dichotomous variable that is coded 1 if the parents divorced by the time the respondent was 18, and 0 otherwise. Parental income is the parent's household income at the time of the 1980 survey, when the respondents were 18 years old. Parental education was the average of the years of schooling completed by the mother and father at the time of the 1962 interview. A different specification, in which mother's and father's education were coded as separate variables, gave similar results, and thus we present the combined measure.

Structural Hypothesis variables. Variables related to the structural hypothesis include the respondent's income, education, employment and childbearing. These variables are included in the models because they are potential intervening mechanisms of the effect of intelligence on divorce. Although occupational attainment is also of interest, this variable is not sufficiently

measured by the ISPC study. However, measures of income, educational attainment, and full-time employment status serve as good indicators of socioeconomic status and allow us to test for intervening mechanisms in the relationship between intelligence and divorce.

Income. Income was measured at two points in time, 1980 and 1985. For person months of risk from 1980 up to 1985, the 1980 income measure is used. For person months of risk after 1985, the 1985 income measure is used. Yearly income was measured with a series of 16 discrete categories: 0-$599, $600-$1199, $1200-$2399, etc. The highest category was $30,000 a year or more. Although these categories may appear low, it must be remembered that respondents' income was measured at ages 18 and 23. These are times in the life course when income is not likely to be high. Furthermore, the distribution of the income measure did not show excessive heaping on the highest income category.

Education. In the analyses, there are two measures of education. The first is a time-varying measure of educational attainment, which is the number of years of schooling accumulated. The second measure is a time-varying measure of enrollment which is coded 1 if the respondent was enrolled in school that month, and 0 otherwise. Both measures are lagged by one month. It is important to separate schooling attainment from enrollment because the two can potentially have distinct effects. Previous research suggests that combining school and spouse roles may be difficult (Thornton, Axinn, & Teachman, 1995), which could lead to relationship strains and divorce. Attainment represents human capital accumulation, while enrollment may represent the potential for role conflicts between the roles of student and spouse.

Employment. The respondent's monthly employment status was obtained from the Life History Calendars. The time-varying measure of employment is coded 1 if the respondent worked 30 or more hours per week, and 0 otherwise. This measure is lagged by one month.

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Because we expect differing effects of employment, we interact the employment measure with the respondent's gender.

Childbearing. Childbearing within the marital relationship was also obtained from the Life History Calendars. A time-varying measure for childbearing was created. This variable starts at 0 and increments by 1 for every child the respondent has. This time-varying variable was lagged by one month.

Control variables. These variables are included because they are basic controls or known risk factors for divorce. They include gender, age at marriage, religion and religiosity, and female labor force participation. Gender is coded 1 if the respondent was female, and 0 otherwise. Age at marriage is self-explanatory. To measure religious affiliation, we use dummy variables to indicate if the respondent was Catholic, Protestant, or some other religion. Catholic served as the reference group. To measure religiosity, the survey asked, "How often do you usually attend religious services—would you say several times a week, once a week, a few times a month, once a month, or less than once a month?" This variable was coded from 1 to 6, where 1 represented no religious attendance and 6 represented attendance several times a week. The respondent's cohabitation history was measured with a question that asked the respondent if he or she cohabited with his or her spouse before marriage. The measure is coded 1 for respondents who cohabited, and 0 for respondents who did not.

Lastly, we include variables to parameterize the duration of the hazard. Unlike a Cox proportional hazard model, the functional form of the hazard cannot remain unspecified in a discrete-time hazard model (Allison, 1995). The duration of the hazard is specified as a quadratic form, which allows the risk of divorce to increase and then decrease over time in an

upside-down "U" shape. This quadratic shape has been found to describe many family patterns such as the rates of marriage and divorce (e.g., Yamaguchi, 1993; Hill, 1997).

Analytic Strategy

The analytic strategy is to first examine the simple relationship between intelligence and the rate of divorce. Once this relationship is tested, the second step is to add the controls and the substantive variables related to the hypotheses. If the effect of intelligence decreases when parental background measures are added, this would suggest the spuriousness hypothesis. If the effect of intelligence is diminished by adding factors such as employment, income, schooling, and childbearing, then the structural hypothesis would be implicated. A remaining effect of intelligence once all variables are added may indicate a direct effect of intelligence on the divorce rate.

RESULTS

Before presenting the results of the event history analysis, the means, standard deviations, and sample size (n) pertaining to each variable used in the analysis is presented in Table 1. As previously mentioned, intelligence is standardized to have a mean of 100 and a standard deviation of 15. Slightly more than half of the sample is female (53 percent) and the average age at first marriage is 24. Also worth noting is that nearly 43 percent of respondent's cohabited prior to marriage. This might reveal that cohabitation was becoming a standard precursor to marriage in the Detroit-metropolitan area for this cohort born in 1962.

(Table 1)

With regard to the parental influence variables, the average education of both parents was 12.220 years. In other words, on average, the respondent's parents were high school educated. In 1980, these children's family income was $34,250 on average. Only 4 percent of parents had divorced by the time respondents turned 18. The incidence of parental divorce may seem low, but the 1962 sample was of mothers who had just given birth to a first, second, or fourth child. Thus these marriages are likely to have been more stable than all marriages as a whole.

Concerning the hypothesized structural variables, 6.5 percent of respondent's were full-time students in the month prior to experiencing a divorce or censoring. The average years of education accumulated were 13.232, indicating that on average, respondents had some college education. The average respondent's annual income, which was measured on a 16-point scale, was 5.417. This value translates to somewhere between $3,600 and $4,799 per year. Although these values appear low, one must remembers that income was measured when the respondents were 18 and 23. Thus, their income potential had not yet reached its maximum. About 81

percent of the sample worked 30 or more hours in a week. Finally, 8.5 percent of respondents had a child or children in marriage.

(Table 2)

Table 2 presents the results of the spuriousness hypothesis tests. The results are presented as odds ratios, which are the exponentiated logistic regression coefficients. An odds ratio greater than 1 is a positive effect that accelerates the dissolution of marriage. An odds ratio less than 1 is a negative effect that delays marital dissolution. An odds ratio equal to 1 represents no effect on the rate of divorce. Although discrete-time methods estimate the effects of predictors on the odds of divorce, out of convenience we interpret these effects as influencing the rate of divorce. When the number of person-periods is large and the number of events is relatively small, odds approximate the rates, and the two are virtually the same (Allison, 1995).

Model 1 examines the zero-order relationship between intelligence and divorce along with the duration variables (time and time squared). Model 1 shows a significant effect of intelligence on divorce: a one-unit increase in intelligence results in a 1.5 percent reduction in an individual's rate of divorce (1.00 - .985 =.015). One will recall that intelligence is measured on a standardized scale with a mean of 100 and a standard deviation of 15. Thus, compared to an individual with average intelligence (100), and individual with an intelligence one standard deviation above the mean (115) has a predicted rate of divorce that is 20 percent lower $(.985^{115}/.985^{100} = .80; 1-.80 = .20)$. In addition, both the linear and quadratic functions of time are significant in this equation. The divorce rate for this model increases in the first 6 years and 5 months of marriage, after which time the hazard of divorce declines.[2]

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[2] This information is derived from the formula to find the maximum value of x, which is as follows: $b_1 / -2b_2$, where b_1 is the linear coefficient and b_2 is the quadratic coefficient.

Model 2 adds a set of control variables to the original model. These variables included the respondent's gender, religious affiliation—Protestant or Other religion (Catholics are the reference group), religiosity (i.e., church attendance), cohabitation status, and age at first marriage. The second model also controls for characteristics of the respondents' spouses that are likely to affect divorce: their marital history (if the spouses had been married before) and whether or not they brought stepchildren to the current marriage. Note that all respondents themselves were in their first marriages.

The addition of these controls over Model 1 had minimal effect on the coefficient for intelligence, changing the odds-ratio from .985 to .987. This represents only a slight attenuation of the effect towards 1.00. The only control variable to demonstrate a significant effect on the divorce rate was religiosity at the age of 18. A one-unit increase in the religiosity scale decreases the rate of divorce by 23.2 percent, controlling for other factors as mentioned above.

Models 3 through 5 add three separate variables to test for the possibility of spuriousness, each of which is related to parental background factors. First, we added the average education of both parents in Model 3 to the model with the intelligence and duration variables and all controls. The coefficient for parental education on the divorce rate is negative but small and insignificant. Moreover, it does not alter the relationship between intelligence and divorce. Similarly in Model 4, where parent's income is added, there is no significant impact on either the divorce rate or the relationship between intelligence and divorce. In Model 5, the effect of parental divorce is tested and reveals no impact on the divorce rate.

The final model related to the Spuriousness Hypothesis Test (Model 6) added all three parental influence factors simultaneously. While the coefficients are altered slightly for these three factors (e.g., the coefficient for parent's education changes from .988 in Model 3 to 1.025

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in Model 6), there is no appreciable change in the effect of intelligence on the rate of divorce. The relationship between intelligence and divorce remains virtually unchanged from the Model 2, which included only intelligence and controls. Since the addition of these three parental background variables does not significantly or substantively affect the focal relationship between intelligence and divorce, there is little support for spuriousness hypothesis as an explanation between the relationship between intelligence and divorce.

(Table 3)

Table 3 presents the results of the Structural Hypothesis test, which examines the experiences, statuses, and attributes people with higher intelligence may be exposed to across the life course. In the Structural Hypothesis models, we retain all variables from the Spuriousness Hypothesis and treat them as controls in Table 3.

The first variable used to test this hypothesis is the respondent's full-time school enrollment status (Model 7). This time-varying measure indicated if the respondent was enrolled full-time in school in the previous month. Model 7 does not show a relationship between school enrollment status and divorce, and subsequently the effect of the intelligence coefficient is unchanged. Model 8 tests the effects of respondent's educational attainment. Educational attainment does not show a significant relationship with the rate of divorce, and the effect of intelligence on divorce is also little changed.

Model 9 examines the effect of income on the rate of divorce. Like individuals with higher education, individuals with higher income may be seen are more valuable as spouses, thus lowering their risk of separation. In addition, higher income may enhance the ability to afford resources that can prevent divorce (i.e., counseling). As hypothesized, respondent's income has

a negative effect on divorce.[3] The effect of intelligence, however, remains virtually unchanged,

suggesting that income is not an intervening mechanism of the effect of intelligence on divorce.

Model 10 presents the effect of employment on the rate of divorce. This model adds a

measure for the respondent's full-time work status (working 30 or more hours per week) and an

interaction term between gender and full-time work status. In line with previous research on

female labor force participation and divorce, women who work 30 or more hours per week have

the highest rate of divorce: compared to men who do not work, these women have a 85 percent

higher rate of divorce (.561 * .969 * 3.410 = 1.854).   The group with the lowest divorce rate is

women who do not work: their rate of divorce is 44 percent lower than that of men who do not

work (1.000 - .561 = .439). Thus work raises the rate of divorce for women: women who work

have a rate of divorce 1.854/.561 = 3.305 times that of women who do not work. For men,

however, work decreases the rate of divorce. Compared to men who do not work, men who

work divorce at a rate that is 3.1 percent less (1.00 - .969). Note that although this difference for

men is not likely significant, it is the significant difference in the effects of employment for

women that is driving the significance of the interaction. Despite the significant interaction in

the effects of full-time employment on divorce, employment experiences did not mediate the

effects of intelligence on divorce: the coefficient for intelligence remains largely unchanged.

Model 11 examines the effects of having children on divorce. For each child born during

the marital relationship, the hazard of divorce is decreased by 45.5 percent. Although this

variable adds a large amount of explanatory power in the dependent outcome of divorce, it does

not substantially alter the relationship between intelligence and divorce. Similar to the previous

two models, each point in intelligence reduces the rate of divorce by about 1.4 percent.

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[3] In a model not shown, an interaction between income and gender was tested. In contrast to literature indicating
that women's income may increase the odds of divorce (e.g. Sayer and Bianchi, 2000), for our sample, no significant
difference was found between the effect of income on divorce by gender.

The final model (Model 12) adds all variables used to test for intervening mechanisms. Collectively, these variables slightly reduce the strength of the intelligence and divorce relationship, changing the odds ratio from .986 in the model with no structural variables added (Model 6 in Table 2) to .989 in the current model. Informally comparing the reduction in the effect from 1.4% (Model 6) to 1.1% (Model 12), the decrease in the size of this effect is about 21 percent (1.1/1.4=.786; 1-.786=.214). Thus, there is only limited support for the structural hypothesis, and the relationship between intelligence and divorce remains statistically significant. Although the coefficients for some predictors change in Model 12, the direction of effects is largely similar to previous models.

In sum, no predictors from the Spuriousness or Structural hypotheses substantially diminished the effects of the relationship between intelligence and the divorce. Although the effect of intelligence on divorce in the final model may appear small—1.1 percent decrease in the rate for every 1-point increase in intelligence—it must be remembered that these effects are multiplicative. If we compare the predicted rates of divorce for an individual whose intelligence is one standard deviation below the mean to an individual whose intelligence is one standard deviation above the mean, the former individual has a rate of divorce that is 40 percent higher ($.989^{85}/.989^{115}=1.396$) controlling for all other variables in the analysis. Thus, there remain in the model substantial effects of intelligence that are not explained by either spurious or intervening factors.

DISCUSSION

Summary of Findings

This study set out to determine the nature of the relationship between intelligence and divorce. Three hypotheses were proposed to test for the effect of intelligence on the rate of divorce: (1) the Spuriousness Hypothesis Test (i.e., common cause); (2) the Structural Hypothesis Test (i.e., intervening mechanisms); and (3) the Direct Hypothesis Test (i.e., direct causal relationship).

The Spuriousness Hypothesis Test predicted that the relationship between intelligence and divorce was a false one, caused by some third variable(s) that influenced both variables. Adding three separate parental influence factors to our model tested this hypothesis: parent's education, parent's income, and parental divorce. None of these variables demonstrated an appreciably effect on the focal relationship, nor did they add explanatory power to the model. Thus, there is little support for the spuriousness hypothesis.

The Structural Hypothesis Test predicted that the relationship between intelligence and divorce was fully explainable by other factors that were more proximal to the dependent outcome. To operationalize this hypothesis, we separately and collectively tested the effects of the respondents' school enrollment, educational attainment, income, employment, and marital behavior on the divorce rate. Individually, each of these factors had little impact on the focal relationship. The respondent's educational attainment showed the most overlap with intelligence in predicting divorce rates, but this overlap did not statistical alter the relationship between intelligence and divorce. The combination of all these factors in our final model did however demonstrate a more appreciable impact on understanding our pattern of results. The odds ratio for intelligence dropped from a 1.3 percent reduction in the divorce rate in Model 6—the model

with no structural variables included—to a 1.1 percent reduction in Model 12, when all structural factors were added. Still, this relationship remained statistically significant according to standard levels ($\alpha \leq .05$), which suggests limited but not full support for the Structural Hypothesis. Thus, the results may be consistent with a direct effect of intelligence on divorce.

A word of caution is advised. We cannot conclude with certainty that a direct effect exists between intelligence and divorce since there are other possible explanations yet to be tested, which could change our interpretation of the data. Our findings are also limited by the sample used and the measures chosen or available. Different results could be found for other racial and ethnic groups (recall that are sample is all white) in other regions of the United States. Future replications of this study with other datasets—especially those which measure both the husbands' and wife's intelligence—would certainly increase confidence in our findings.

Although our measure of intelligence was based solely on the respondent, studies have shown that couples are likely to be similar in intelligence (Lewak, Wakefield, & Briggs 1985). In Lewak et al.'s study, they found that similarity in intelligence was not related to increased marital satisfaction. If both our results and Lewak's are reliable, this means that increased intelligence leads to less divorce but not better marriages. Thus, the increased problem-solving skills may keep crises in marriages from reaching the point of divorce, but they don't make marriages idyllic. Is there a gain from this reduced risk of divorce? Research suggests that divorce is harmful for children, with both short-term and long-term consequences (e.g., Amato and Booth, 1977; Cherlin, Chase-Lansdale, & McRae, 1998). Thus, if more intelligent couples can keep a less-than-perfect marriage together, it may not lead to high levels of marital satisfaction, but it may lead to better outcomes for their children.

Explaining the Intelligence-Divorce Relationship

Although it is difficult to determine what aspects of an individual's intelligence affect his/her probability of marital dissolution, there are several insights that lead us to postulate a few explanations. As discussed earlier, cognitive ability comprises the three distinct elements of direction, adaptation, and criticism. Persons who have direction are capable of identifying goals within a marital relationship and have the knowledge and patience to work with their spouse to achieve these goals. Couples that work together in unison are more likely than their counterparts with separate agendas to achieve marital happiness and success, thus reducing the likelihood that they will eventually divorce. Direction is thus a key component of any good relationship.

Adaptation refers to the spouse's ability to adapt to different situations. This reflects the individual's willingness to compromise with their spouse in times of need and adjustment. For instance, while many of the children from the present study's cohort (born in 1962) grew up in a household where the father participated in the workforce and the mother tended the home, there has arguably been a cultural shift in the past 40 years towards the contemporary trend of gender egalitarianism and equality in the household division of labor. Indeed, many of the respondents from the IPST study may be caught somewhere between this cultural change in their attitudes and behaviors, possessing some characteristics of the "traditional" nuclear family and of the "contemporary" family where equality of the sexes is stressed.

It may be argued that intelligent persons will be able to adapt to their changing environment and apply the new standards to their own relationship. In the long run, this will make an intelligent person more compatible with his/her spouse and more respectful of his/her spouse's needs. Husbands with high adaptation skills will not expect their wives to perform all the housework, which can cause undue stress in a relationship, and wives who can adapt to

different situations will be comfortable with working full time and perhaps earning more than their husbands.

Also related to a cognitive ability is the ability to critique one's own thoughts and actions. Individuals who can constructively criticize themselves can evaluate their role as a spouse and make adjustment's where needed. This may be done either introspectively, by thoughtfully responding to external situations, or explicitly through interactions with one's spouse. The individual's verbal ability will thus enhance effective communication patterns with his/her spouse and provide them with the ability to work out their differences. It should also be noted that ideation and verbal ability constitute aspects of "crystallized intelligence," which are indicative of an individual's problem solving skills.

The individual's ability to criticize his/or actions is also related to decisions the individual makes prior to entering marriage. Individual's who are critical of their own actions are less likely to be impulsive and "jump" into a marriage with the wrong person for the wrong reasons. They will more likely choose mates with whom they are compatible so as to ensure a long and healthy relationship. During the marriage, these individuals will also be more hesitant in getting a divorce when problems arise. They will instead look for ways to resolve their marital problems and keep their family intact.

In conclusion, there are a number ways to explain how intelligence can influence the rate at which individuals divorce—none of which will explain this phenomenon completely. The aim of this study was to provide clear empirical evidence that a relationship between intelligence and divorce does in fact exist, and to explain this connection using strong theoretical arguments. The authors hope that the nature of this relationship will continue to be explored with a diversity of perspectives across numerous social science disciplines.

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Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	N
Intelligence	100.000	15.000	638
Spuriousness Measures			
Parent's Education (1962)	12.220	1.831	647
Parent's Income (1980)	34,249.59	18,458.89	606
Parental Divorce (Yes=1)	.042	.200	647
Structural Measures			
R in School (Yes=1)	.065	.247	647
R's Educational attainment (years)	13.232	1.912	646
R's Income (1-16 scale)	5.417	4.007	641
Worked 30+ hours per week (Yes=1)	.807	.395	647
Children	.085	.370	647
Controls			
Gender (Female=1)	.530	.499	647
Religion			
Protestant	.347	.476	643
Other	.103	.304	643
Catholic (reference group)	.551	.498	643
Religiosity	3.337	1.511	644
2nd Marriage (Yes=1)	.131	.338	639
Stepchildren (Yes=1)	.095	.294	639
Cohabitation (Yes=1)	.427	.495	647
Age at Marriage	24.361	3.234	647

Table 2: Spuriousness Hypothesis Test

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intelligence	.985**	.987*	.987*	.987*	.986*	.987*
	[-2.915]	[-2.514]	[-2.448]	[-2.367]	[-2.544]	[-2.424]
Parents' Education			.988			1.025
			[-.215]			[.418]
Parents' Income				1.000		1.000
				[.491]		[.749]
Parental Divorce					.715	.653
					[-.790]	[-.980]
Gender (Female=1)		1.299	1.305	1.281	1.315	1.291
		[1.483]	[1.498]	[1.361]	[1.547]	[1.396]
Protestant ‡		1.024	1.024	1.003	1.018	.994
		[.128]	[.127]	[.014]	[.097]	[-.033]
Other Religion ‡		.992	1.006	.917	.977	.881
		[-.026]	[0.020]	[-.289]	[-.084]	[-.413]
Religiosity		.768***	.771***	.760***	.767***	.756***
		[-3.955]	[-3.831]	[-3.922]	[-3.982]	[-3.944]
2nd Marriage		1.366	1.362	1.511	1.425	1.605
		[.941]	[.931]	[1.263]	[1.049]	[1.420]
Stepchildren		.570	.569	.497	.548	.472†
		[-1.411]	[-1.417]	[-1.726]	[-1.487]	[-1.824]
Cohabitation		1.165	1.165	1.189	1.175	1.204
		[.824]	[.824]	[.900]	[.868]	[.965]
Age at Marriage		.965	.967	.966	.963	.961
		[-.942]	[-.881]	[-.895]	[-.986]	[-1.003]
Time	1.035***	1.035***	1.035***	1.035***	1.035***	1.035***
	[3.768]	[3.696]	[3.698]	[3.648]	[3.695]	[3.642]
Time-Squared	1.000**	1.000**	1.000**	1.000**	1.000**	1.000**
	[-3.123]	[-3.141]	[-3.144]	[-3.173]	[-3.137]	[-3.160]

Notes: Coefficients represent odds-ratios. Numbers in brackets represent t-values.
†p=.10; *p<.05; **p<.01; ***p<.001; two-tailed tests
‡ Catholic is reference group

Table 3: Structural Hypothesis Test

Variable	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Intelligence	.987*	.988*	.986*	.986*	.986*	.989*
	[-2.423]	[-2.176]	[-2.490]	[-2.500]	[-2.488]	[-1.992]
R in School	.995					1.425
	[-.010]					[.664]
R's Educational Attainment		.963				.881*
		[-.649]				[-2.192]
R's Income			.944*			.910***
			[-2.481]			[-3.908]
Worked 30+ hours per week				.969		1.041
				[-.060]		[.073]
Gender*Worked 30+ hours per week				3.410*		3.184†
				[2.044]		[1.900]
Children					.545***	.571***
					[-5.282]	[-4.813]
Parents' Education	1.025	1.032	1.021	1.010	.989	.988
	[.418]	[.527]	[.350]	[.171]	[-.196]	[-.188]
Parents' Income	1.000	1.000	1.000	1.000	1.000	1.000
	[.749]	[.686]	[.603]	[.710]	[.719]	[.133]
Parental Divorce	.653	.665	.692	.696	.569	.788
	[-.978]	[-.936]	[-.845]	[-.839]	[-1.280]	[-.543]
Gender (Female=1)	1.291	1.321	1.077	.561	1.223	.472
	[1.395]	[1.494]	[.380]	[-1.019]	[1.085]	[-1.304]
Protestant ‡	.994	.998	.990	.944	.946	.900
	[-.033]	[-.010]	[-.051]	[-.301]	[-.291]	[-.544]
Other Religion ‡	.881	.898	.897	.814	.835	.860
	[-.413]	[-.349]	[-.354]	[-.667]	[-.583]	[-.485]
Religiosity	.756***	.762***	.770***	.760***	.752***	.789**
	[-3.942]	[-3.775]	[-3.721]	[-3.854]	[-3.902]	[-3.227]
2nd Marriage	1.605	1.610	1.548	1.834†	1.712†	1.888*
	[1.420]	[1.427]	[1.320]	[1.832]	[1.652]	[2.021]
Stepchildren	.472†	.461†	.479†	.417*	.501†	.389*
	[-.824]	[-1.872]	[-1.803]	[-2.100]	[-1.689]	[-2.300]
Cohabitation	1.204	1.189	1.186	1.179	1.285	1.180
	[.965]	[.896]	[.885]	[.858]	[1.296]	[.851]
Age at Marriage	.961	.969	.938	.957	.946	.925†
	[-1.003]	[-.739]	[-1.534]	[-1.084]	[-1.366]	[-1.751]
Time	1.035***	1.036***	1.037***	1.039***	1.046***	1.051***
	[3.639]	[3.648]	[3.769]	[3.970]	[4.665]	[5.149]
Time-Squared	1.000**	1.000**	1.000**	1.000***	1.000***	1.000***
	[-3.159]	[-3.156]	[-3.220]	[-3.395]	[-3.354]	[-3.729]

Notes: Coefficients represent odds-ratios. Numbers in brackets represent t-values.
†p=.10; *p<.05; **p<.01; ***p<.001; two-tailed tests
‡ Catholic is reference group