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Factors Predictive of Midlife Occupational Attainment and Psychological Functioning in Adults With Mild Intellectual Deficits

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Abstract

The life course of individuals with mild intellectual deficits and the factors that account for heterogeneity in their midlife outcomes were examined. Past research has shown that such individuals are at risk for poor occupational attainment in adulthood and more compromised psychological functioning, including increased depression. Although predictors varied for men and women, in general greater midlife occupational attainment was predicted by continuation of education beyond high school, having role models for achievement, and social participation earlier in adulthood. Midlife psychological functioning was predicted by having role models of achievement, having discussed plans for the future with parents and teachers, and achievement of aspirations set in high school. Implications for contemporary models of transition planning are discussed.

Having mild deficits in general intellectual functioning is a risk factor for limitations in achievement and social functioning throughout the life course (Dragow, 2002; Gottfredson, 2004; Kuncel, Hezlett, & Ones, 2004). Performing below average on intelligence tests in high school predicts fewer years of postsecondary educational attainment and more limited employment opportunities in adulthood (Hauser, 2002; Neisser et al., 1996). In national data, only 35% of adults with borderline IQs or mild mental retardation were employed as compared to 81% of the general population (Fujiura, 2003). In addition, individuals with mild intellectual deficits are at greater risk of poor psychological functioning than those with higher IQs; for example, women with mild intellectual deficits have been shown to have clinical depression at a rate of 3 to 5.5 times the rate in women with average intellectual functioning (Maughan, Collishaw, & Pickles, 1999; Tymchuk, 1994).

These patterns were largely confirmed in a previous study of individuals with mild intellectual deficits conducted by Seltzer and colleagues (Seltzer et al., 2005), in which the authors

examined life course outcomes for a subgroup of participants in the Wisconsin Longitudinal Study–WLS (Hauser & Sewell, 1985; Hauser, Sheridan, & Warren, 1998). The WLS has followed a random sample of young adults who graduated from high school in 1957 to examine outcomes in midlife. Intelligence tests administered during the junior year in high school made it possible to identify individuals with mild intellectual deficits, operationalized as people who had IQs of 85 or below. Using a case-control design that compared siblings with and without mild intellectual deficits, Seltzer et al. found that, in midlife, the individuals with mild intellectual deficits had less prestigious occupations and poorer psychological functioning than did their siblings with higher IQs. Thus, even after potential effects of family background were controlled, having mild intellectual deficits, on average, was associated with poorer life outcomes.

Masked by this mean-level deficit in life outcomes is the fact that there is great heterogeneity in the long-term success of individuals with mild intellectual deficits, with some achieving success across multiple life domains while others struggle to adapt and maintain mental health. However, little is known about the factors that promote successful versus unsuccessful outcomes for this group. One key to optimizing life outcomes for individuals with mild intellectual deficits is to identify the early experiences and educational and social resources that can enhance later success. Thus, in the present study we extend Seltzer et al.'s (2005) prior between-group analyses by focusing on the heterogeneity within the group of individuals with mild intellectual deficits, again using participants from the WLS. Because the WLS includes variables measured in late adolescence and early adulthood, we were able to examine earlier predictors of midlife occupational achievement and psychological functioning. The specific dependent variables for this investigation were selected based on prior investigations by our research group showing that these were areas of particular vulnerability for individuals with low IQ relative to their higher IQ siblings (Seltzer et al., 2005).

Although *midlife* has been defined variously in past research (Ryff & Seltzer, 1996), it is generally conceptualized as the period of life between age 40 and 55, after young adulthood has ended and before the early years of old age. We focused on adjustment in midlife because it is the stage of life when occupational accomplishments and psychological functioning should be evident.

Theories of the life course (Ryff, 1989) and ecological systems theory (Bronfenbrenner, 1992) focus attention on the combination of personal characteristics and social contexts that influence adult achievement and psychological functioning in midlife. Findings from research on normative samples generally support these theoretical formulations. For example, studies of the effects of socioeconomic status (SES) have shown that early life experiences and educational attainment cumulatively contribute to physical and mental health in midlife (Marmot & Fuhrer, 2004). Other studies of the normative life course have shown that fulfillment of aspirations expressed early in adulthood are predictive of mental health in midlife (Carr, 1997) and have confirmed the cumulative importance of social relationships and religiosity in shaping midlife physical and mental health profiles (Ryff, Singer, & Palmersheim, 2004).

In addition to the normative literature on adjustment and attainment over the life course, two important longitudinal studies of individuals with mild intellectual deficits further contributed to the conceptualization of the current study. In one study, by Vaillant and Davis (2000), 73 boys with a mean IQ of 80 from an urban environment were followed from age 14 to 65. In another longitudinal study, Werner (1996) followed a group of high-risk children on the Island of Kauai from birth into adulthood, some of whom developed learning disorders, mental health problems, and antisocial behavior. The findings from these two studies, together with theory and research predicting life course outcomes from normative samples (e.g., Carr, 1997; Caspi,

Wright, Moffitt, & Silva, 1998; Dubow, Huesmann, Boxer, Pulkkinen, & Kokko, 2006; Marmot & Fuhrer, 2004; Ryff et al., 2004), led to the conceptualization used in the present paper.

The Vaillant and Davis (2000) study highlighted the importance of early social functioning for later adult outcomes. Better outcomes at age 65, as defined by occupational success and psychosocial functioning, were predicted by higher levels of social skills and social involvement in adolescence. Presumably, social skills and sociability contribute to effective work relationships that enhance occupational success and may also help to build social supports and community ties that protect individuals from depression and enhance psychological well-being. Social engagement and enjoyment of social relationships have similarly been found in many other studies of normative populations to be predictive of adult productivity and well-being (Argyle & Lu, 1990; Pulkkinen, Ohanen, & Tolvanen, 1999; Shiner, Masten, & Roberts, 2003; Werner & Smith, 2001). In the current study, we examined whether earlier social engagement is predictive of midlife outcomes. We measured social engagement by assessing participants' involvement in a wide variety of social organizations as well as in religious activities, which has been shown to provide a primary source of social contact for many individuals and to have important positive effects on well-being (Bonner et al., 2003; McFadden, 1995).

In Werner's (1996) Island of Kauai study, a different set of predictors of successful life course outcomes was emphasized, namely, encouragement of achievement by parents and other adults. Among other predictors, individuals with successful life outcomes had parents with caregiving styles that enhanced self-esteem, and they had access to supportive adults who fostered trust and acted as gatekeepers for the future (Werner, 1996). Similarly, in normative samples, encouragement by parents and teachers for postsecondary education has been shown to have powerful life course consequences. Sewell and Shah (1968), in an early publication based on the WLS, found that encouragement by parents was a stronger predictor of a child's plans for college than SES or intelligence, particularly for women. Other investigators concur that there are far-reaching consequences of parental encouragement of education for children's adult success (Dillman, 1989; Wang & Wildman, 1995). Similarly, encouragement by teachers has been shown to predict better academic performance (Tuckman & Sexton, 1991). This literature has involved either general samples or college students, and, thus, it is not known whether encouragement has similar effects for adolescents with mild intellectual deficits. Because encouragement has direct implications for intervention, in this investigation we examined its role as a predictor of midlife success.

In addition to encouragement by parents and teachers, research suggests that midlife success might also be influenced by the role models that parents set for children during their formative years. In a recent longitudinal study, Dubow et al. (2006) followed two groups of individuals in the United States and Finland from middle-childhood (age 8) to middle-adulthood (age 40). Findings revealed that after childhood personal and cognitive-academic variables were controlled, occupational status of parents had positive long-term effects on adult occupational achievement, suggesting that children emulated their parents' occupational success. Similarly, another study indicated that adolescents are more likely to achieve greater career maturity when they can identify a career role model in their lives (Flouri & Buchanan, 2002). The effects of role models have not been examined with respect to individuals with mild intellectual deficits, but we include it in the present analysis because we hypothesized that it would help account for the level of occupational attainment in this population. We predicted that role models and encouragement also would be predictive of midlife psychological functioning. Individuals with mild intellectual deficits may be more vulnerable to feelings of inadequacy and self-doubt in anticipating adulthood than are their peers with higher intellectual functioning and, therefore, having positive role models and receiving encouragement during the transition from school to

work may bolster a young adult's self-esteem, with potential positive influences on psychological functioning.

Research on the general population has also indicated that intellectual ability (Tomlinson-Keasey & Little, 1990) and more years of education (Caspi et al., 1998; Kokko, Pulkkinen, & Puustinen, 2000; Sanford et al., 1994; Weisner, Vondracek, Capaldi, & Porfeli, 2003) predict successful life course outcomes. Although the present sample had a restricted range in these factors, we nevertheless expected similar effects of intellectual ability and postsecondary education on midlife achievement and psychological functioning even within the subgroup of individuals with mild intellectual deficits. In addition to investigating the effects of postsecondary education achieved by the sample members with mild intellectual deficits, we also examined the effects of postsecondary education of their spouses, because spousal education has been shown to be a distinct predictor of life success (Vaillant & Davis, 2000).

Finally, in the past researchers have suggested that midlife psychological functioning is enhanced by achieving the goals that one sets in early adulthood. Achievement of occupational aspirations has been shown to predict better midlife adjustment for men (Brim, 1976; Drebing & Gooden, 1991; Levinson, Darrow, Klein, Levinson, & McKee, 1978) and women (Carr, 1997). In addition, achievement above personal goals has been shown to be predictive of better psychological functioning (Carr, 1997), suggesting that an individual's happiness is strongly related to relative as well as absolute standards of success. Therefore, we expected that individuals with mild intellectual deficits who attained occupational success that exceeded their earlier occupational aspirations would have better midlife psychological functioning than would those who failed to meet their earlier aspirations.

Based on past research summarized above, we examined seven sets of predictors of midlife occupational achievement and midlife psychological functioning. We estimated models separately for men and women due to known gender differences in patterns of occupational attainment and psychological functioning, and we advanced one hypothesis for each of the seven sets of predictors: (a) Having greater intellectual resources, as indicated by IQs assessed during the junior year of high school, would be predictive of greater midlife occupational achievement and psychological functioning in individuals with mild intellectual deficits. (b) Exposure during high school to role models of occupational achievement would predict midlife occupational achievement and psychological functioning. Father's occupational prestige while the sample member was in high school is one example of a role model of achievement, and we hypothesized that it would predict midlife outcomes. In addition, whether the mother was working while the sample member was in high school was conceptualized as a role model of achievement that we expected would predict midlife outcomes, particularly for women. (c) Achievement influences during high school, such as discussing future plans with parents and teachers, and receiving encouragement from parents and teachers to pursue postsecondary education, would be predictive of midlife occupational achievement and psychological functioning. (d) Setting higher occupational aspirations while in high school would predict higher occupational attainment in midlife for men and women. (e) Educational resources, including having more years of postsecondary education and being married to a spouse with more education, will be predictive of greater occupational success and psychological functioning in midlife. (f) Social participation, including organizational and religious participation, would be predictive of better occupational achievement and psychological functioning in midlife. (g) Exceeding earlier occupational aspirations would be predictive of the highest levels of midlife psychological functioning.

Method

Wisconsin Longitudinal Study

The WLS investigators have mapped the life course of a random sample of 10,317 women and men who were first studied in 1957 during their senior year of high school. Follow-up surveys were conducted in 1975 with 9,138 (90.1%) surviving members of the original sample when they were, on average, 36 years old, and again in 1992 with 8,493 (87.2%) of the surviving original respondents when they were in their early 50s. Data were collected in 1957 via a questionnaire administered in school as well as from school records (e.g., the measure of IQ). In 1975 and 1992, data were collected via a telephone interview and a self-administered mail-back questionnaire. An additional WLS survey was conducted in 2004–2006, but because these data focus on aging and retirement planning, they were not relevant to our focus on midlife. Although the WLS also includes data about siblings of the respondents, the measures of high school encouragement and aspirations were not available on siblings, and, therefore, the present analysis was focused on the 1957 graduates only.

Study Sample

The present study involved 730 individuals with mild intellectual deficits who met the following criteria: they had high school IQs of 85 or below, they participated in the 1992 wave of the WLS, and they had complete data on occupational status. Scores on the Henmon-Nelson Test of Mental Ability (Henmon & Nelson, 1937), administered at age 17, were available for all WLS respondents. The lowest possible score on the Henmon-Nelson intelligence test is 61. Individuals with IQs between 61 and 75 ($n = 129$ or 17.7% of the present sample) fall in the IQ range of mild intellectual disability, whereas those with IQs between 75 and 85 constitute a group historically categorized as having borderline intellectual functioning (Heber, 1959) but who are not currently diagnosed as having an intellectual disability. The WLS does not contain information about special education services that may have been provided to the sample members.

The sample members in the present analysis averaged 53.45 years of age ($SD = 0.75$) at the 1992 point of data collection; 49.2% were male ($n = 359$). The mean IQ for the men was 77.8 ($SD = 5.9$) and for women, 78.5 ($SD = 5.4$).

In contrast to prior studies of individuals with mild intellectual deficits, in which researchers tended to draw their samples from low income urban families, the individuals in our sample came from socioeconomically diverse family backgrounds. Table 1 presents the family characteristics of these individuals as measured when they were high school seniors.

Approximately one fourth (25.6%) came from families in which one or both parents graduated high school, and an additional 17.6% came from families in which at least one parent attended some college. The mean family income in 1957 was \$5,162, which was 13% below the mean family income of \$5,926 in Wisconsin in 1960. Although about one fourth of the families in the present sample lived in poverty, 4.8% had incomes above \$10,000. About 15% of the sample members grew up in rural areas of less than 2,500 people, but one fourth lived in cities with populations of 50,000 or more. Sample members had about 3.5 siblings and were either Catholic or Protestant. All members of the present sample were Caucasian, reflective of the vast majority of Wisconsin's population at mid-century.

Measures

Dependent Variables

Occupational attainment in midlife: From the 1992 WLS interviews, we obtained data about the occupational prestige of the respondent's current/last job. Occupational prestige was measured using Duncan's Socio-Economic Index (Stevens & Featherman, 1981). Scores range

from 13 to 90, with higher scores indicating higher SES (e.g., a score of 75 indicates a professional or technical job, 57 is the score for a manager or official, 17 is the score for a service worker). Because this index does not contain a code for housewives, respondents who never worked outside of the home ($n = 35$) could not be included in these analyses.

Psychological functioning: We used two measures of psychological functioning in midlife: depressive symptoms and psychological well-being. The Center for Epidemiological Studies–Depression Scale CES-D (Radloff, 1977) has been used extensively in samples of midlife and older adults (Gatz & Hurwicz, 1990) and was included in the WLS self-administered questionnaire. For each of 20 depressive symptoms, the respondent was asked to indicate how many days in the past week the symptom was experienced. The data were recoded into four categories (0 = *never* to 3 = 5 to 7 days), consistent with the conventional scoring of the CES-D. The total score is the sum of the category ratings for the 20 items, $\alpha = .89$. The mean score for the present sample was 10.10 ($SD = 8.79$). The 1992 self-administered questionnaire also included a modified version of Ryff's (1989) Psychological Well-Being measure, which includes three subscales that serve as dependent measures in this analysis: Personal Growth, Purpose in Life, and Autonomy. Each subscale consists of 7 items rated on a scale of 1 to 6 (1 = *agree strongly* to 6 = *disagree strongly*). Autonomy reflects such qualities as self-determination, independence, and internal regulation of behavior ($M = 29.75$, $SD = 5.75$). $\alpha = .62$; Purpose in Life indicates the belief that there is a purpose to and a meaning in life ($M = 32.55$, $SD = 6.55$), $\alpha = .79$; and Personal Growth shows that the individual is continuing to develop his or her potential and growing and expanding as a person ($M = 30.95$, $SD = 6.49$), $\alpha = .74$.

Independent Variables

IQ: The Henmon-Nelson Test of Mental Ability: Grades 7–12 (Henmon & Nelson, 1937) was used to assess IQ. This is a group-administered intelligence test that in the past was given to all Wisconsin high school students during their junior year of high school. The Henmon-Nelson measures a wide variety of mental abilities, including verbal, spatial, and numerical knowledge and reasoning, the composite of which reflects general intellectual functioning. Reliability coefficients for the Henmon-Nelson are consistently around .90 (Buros, 1940). The scores on the original version of the test show good predictive validity in forecasting academic success in college (Drake & Henmon, 1937), and scores on a later revision were correlated .83 with IQs from an individually administered intelligence test (Wagner, 1981). Within the entire WLS sample, Henmon-Nelson IQs were correlated .60 with high school grade rank, which is consistent with the usual associations found between IQ and school achievement (Gregory, 2004). Thus, although it is important to be cautious in making inferences about general intellectual deficits on the basis of a group-administered intelligence test, the psychometric data support the validity of doing so.

Occupational role models in high school: We used the Duncan Socio-Economic Index score for the father's occupation when the respondent was a senior in high school as one indicator of occupational role models and whether the mother was working at that time (0 = no, 1 = yes) as the second indicator of occupational role models.

Achievement influences in high school: When they were in high school, respondents were asked whether they discussed their plans for the future with their teachers and parents as well as whether parents and teachers had encouraged them to pursue postsecondary education. The two measures of having discussed future plans (with parents, with teachers) were coded as 1 (*not at all*) to 3 (*very much*). The encouragement variable was a count of the number of sources of encouragement and, thus, ranged from 0 (*no encouragement from parents or teachers*) to 2 (*encouragement from both*) to pursue postsecondary education.

Postsecondary education: Years of education for the respondent and his or her spouse were recorded. Although this variable was recorded in 1975 and updated in 1992, the vast majority of the sample (94.5%) completed their education within 5 years after finishing high school.

Social participation in adulthood: Because of the importance of social participation in earlier research (Argyle & Lu, 1990; Pulkkinen, Ohanen, & Tolvanen, 1999; Shiner et al., 2003; Vaillant & Davis, 2000; Werner & Smith, 2001), it was a critical variable for the present study. However, it was not measured in the WLS during high school; the first measurement of this variable was in 1975. Therefore, we used 1975 measures of social participation in the present research. Measures of social participation included the number of social organizations in which the respondent participated at age 36 (from a list of 17 organizations, such as charity or welfare organizations, civic groups, labor unions, neighborhood organizations, sports teams, parent–teacher associations). In addition, attending religious services while the respondent was age 36 was measured with a single item, using a scale of 1 (*never*) to 6 (*once a week or more*).

1957 aspiration–1992 achievement gap: In their senior year in high school, respondents were asked about their occupational aspirations and reported the specific type of job they hoped to obtain eventually. These aspired jobs were coded according to the Duncan Socio-Economic Index, the same measure as used to quantify actual occupational attainment in midlife. For each sample member, the gap between his or her aspired job when a high school senior (age 18) and the type of occupation attained in midlife (at age 53) was computed as the difference between these scores (i.e., attained in midlife minus aspired in high school). We used this difference score to classify the sample into three groups. If the difference was negative, indicating that the age 53 score for attained occupation fell below the aspired score as expressed when age 18, the sample member was assigned to the achievement below aspirations category. If the attained score at age 53 corresponded to the aspired score from age 18, the sample member was assigned to the matched category. If the age 53 score exceeded the aspiration, the sample member was assigned to the achievement above aspiration category. Note that women who aspired to be housewives and did not name any other occupational aspiration ($n = 3$) were not included in this analysis because the Duncan Socio-Economic Index does not contain an appropriate code.

Plan for Data Analysis

We first describe the personal characteristics and ecological factors of the sample members earlier in adulthood, which we hypothesized would be related to midlife occupational attainment and psychological functioning. We then use these measures of the sample members' earlier life as independent variables in OLS regression analyses to predict midlife outcomes 35 years after the sample members graduated from high school. The sample sizes in the regression models varied due to listwise deletion.

Results

Descriptive Findings

The sample of individuals with mild intellectual deficits was characterized by great heterogeneity in the resources available to them in young adulthood that we hypothesized would contribute to midlife achievement and psychological functioning. Regarding role models for occupational achievement, for both the men and the women, the average Socio-Economic Index score for fathers' occupational prestige was 26.5, equivalent to jobs such as a mechanic or a repairman. There was considerable variability in fathers' occupational prestige, as slightly less than half (44.5%) of the fathers had a job rated 17 or below (i.e., lower than a service worker), but about 10% of the fathers had a job whose Socio-Economic Index score was 57 or above (i.e., higher than a manager). Regarding mothers as role models for

occupational achievement, mothers of about one third of the sample were employed outside of the home when their son or daughter was a high school senior, with mothers of the women significantly more likely to hold jobs (39.4%) than were mothers of the men (31.8%), $\chi^2(1, N = 729) = 4.48, p < .05$.

Regarding achievement influence on sample members when they were high school seniors, the majority of the sample said that they frequently turned to their parents to discuss their future plans, although this type of discussion was more prevalent among the women (63.7%) than the men (46.1%), $\chi^2(2, N = 710) = 23.91, p < .001$. The participants were much less likely to turn to their teachers to discuss their post high school plans; fully 43.6% of the men and 33.8% of the women had never talked with their teachers about future plans, and the gender difference was significant, $\chi^2(1, N = 684) = 6.8, p < .01$. Regarding encouragement for continued education, a significantly higher proportion of the men than the women (42.9% vs. 35.3%) received encouragement from at least one source (parents or teachers) to continue their education after high school, $\chi^2(1, N = 703) = 4.24, p < .05$.

However, regarding actual educational achievement, relatively few of the sample members (17.0% of the men and 15.1% of the women) continued on with *postsecondary education* (defined as completing at least one year of college), with no significant difference between men and women. On average, men and women had 12.5 and 12.4 years of education, respectively, again with no significant difference. Similarly, few of the spouses of sample members had postsecondary education; the average years of education was 12.3 years for wives of sample members and 12.2 years for husbands of sample members.

With regard to social participation, in 1975 when they were in their mid-30s, men participated in an average of 2.04 organizations and women, in an average of 1.86, a nonsignificant difference. Their pattern of social participation varied, however, with men most likely to belong to labor unions (41.2%) and sports teams (34.3%) and women, in parent-teacher associations (41.2%) and church-connected groups (35.0%). The women were more likely to attend religious services, $\chi^2(5, N = 730) = 23.65, p < .001$. More than half of the women (52.3%) and 44.6% of the men attended religious services as frequently as once a week or more; however, almost as many men (41.5%) attended services only a few times a year or less, whereas only 22.9% of the women attended services this infrequently.

Regarding the gap between high school occupational aspirations and midlife occupational achievement, there was considerable heterogeneity in the extent to which sample members achieved their aspirations. Although in midlife, a few members of the sample obtained relatively high prestige jobs, such as school teachers, accountants, and owners of small businesses, the majority were not as successful. The average midlife Duncan Socio-Economic Index score for the men was 32.0, which is equivalent to a job such as a mechanic, and the significantly lower average for the women was 29.3, which is equivalent to a clerical job, $t(728) = 2.44, p < .05$. In comparison with high school aspirations, in midlife 40% of the men were in occupations that were above the level of their high school aspirations; 13%, at the same level as their high school aspirations; and 47%, in occupations below their aspirations. Women were significantly less likely to achieve this level of success, with 35% having occupations that exceeded high school aspirations; 9%, matched high school aspirations, and 56%, occupations below their aspirations, $\chi^2(2, N = 730) = 6.46, p < .05$.

Prediction of Midlife Occupational Attainment

Table 2 presents the results of the OLS regression models predicting occupational success in midlife. As shown in this table, fully 25% of the variance in both the men's and women's midlife occupational attainment was explained by their resources and experiences several decades earlier.

Regarding intellectual resources and their influence on midlife occupational attainment, the hypothesis that having a higher IQ in high school would be predictive of more prestigious jobs in midlife was supported for men but not for women.

Regarding exposure to role models of occupational achievement, counter to our hypothesis, fathers' occupational attainment did not predict midlife occupational attainment for either men or women. However, as predicted, mothers' employment status while the respondent was in high school was a significant predictor of women's occupational attainment in midlife; the daughters of employed mothers achieved higher prestige jobs in midlife than did the daughters of mothers not employed outside of the home.

Although discussing future plans with parents and teachers were not significant predictors for either men or women, receiving more encouragement from parents and teachers to pursue post-secondary education was a significant predictor of greater midlife occupational attainment for men. Counter to our expectation, the level of occupational aspirations as expressed by the sample member while in high school was not predictive of the actual level of occupation attained in midlife for either men or women.

Importantly, as hypothesized, the number of years of education was a highly significant predictor of midlife occupational attainment for both men and women. Although few sample members continued their education past high school, this was the strongest predictor of midlife success in the present study. Also consistent with the hypothesis for women, the number of years of their husband's education was a significant predictor of the sample members' midlife occupational attainment, net of their own level of education.

Social participation had its predicted effects for women; higher levels of participation by women in organizations in 1975 when they were age 36 predicted higher midlife occupational attainment, but this pattern was not evident for men, and religious participation was not predictive of midlife occupational attainment for either men or women.

Prediction of Midlife Psychological Functioning

Table 3 presents the results for the models predicting midlife depressive symptoms and Table 4 shows psychological functioning as measured by CES-D scores and Ryff's measures of personal growth, purpose in life, and autonomy. Predictor variables measured earlier in adulthood accounted for between 6% and 14% of the variance in these measures of midlife psychological functioning for the sample of individuals with mild intellectual deficits.

For women, high school IQs were significant predictors of all four measures of psychological functioning. Higher IQs predicted significantly lower levels of depression and higher levels of personal growth, purpose in life, and autonomy for women. None of these effects, however, were evident for men.

Regarding exposure to role models of occupational achievement, father's occupational attainment while the sample member was in high school predicted significantly higher levels of midlife autonomy for men but, unexpectedly, predicted higher levels of depression for women. Furthermore, mother's employment while the sample member was in high school predicted significantly higher levels of personal growth for men but was not predictive of any measure of psychological functioning for women.

With regard to achievement influences, discussing future plans with parents predicted significantly lower levels of midlife depressive symptoms for both men and women. However, discussing future plans with teachers had no effect for men. Unexpectedly, for women, discussions with teachers about their future plans predicted significantly elevated levels of

depression and lower autonomy in midlife. Men who received encouragement from parents and teachers to pursue postsecondary education had significantly lower levels of midlife depressive symptoms, but there were no effects of encouragement for the women.

When the sample members were in their mid-30s, social participation was predictive of higher levels of midlife autonomy for women but not men, and religious participation was predictive of higher levels of midlife personal growth and purpose in life for men. For women, however, higher levels of earlier religious participation was unexpectedly predictive of lower levels of autonomy at midlife.

The educational attainment of the sample member was not predictive of midlife psychological functioning for either men or women. For women, however, being married to a husband with more years of education predicted significantly lower levels of midlife depressive symptoms and significantly higher levels of midlife purpose in life. The educational achievement of their wives was not predictive of midlife psychological functioning for men.

Regarding occupational aspirations as expressed in high school, men who had higher aspirations had significantly higher levels of autonomy in midlife. Moreover, the gap between high school occupational aspirations and midlife occupational achievement was a more prominent predictor of midlife psychological functioning. Men whose midlife occupation exceeded their high school aspirations had significantly higher levels of purpose in life and autonomy than did men who fell below their high school aspirations. Similarly, women who exceeded their aspirations had significantly higher levels of personal growth in midlife than did those who achieved below or who met their high school aspirations.

Discussion

Our analyses both confirmed the findings of past research and extended the identification of factors that explain variability in midlife patterns of occupational attainment and psychological functioning in individuals with mild intellectual deficits. For both men and women, by far the most important predictor of midlife occupational success was postsecondary education. Although comparatively few sample members continued with their education beyond high school (only about 15% of men and women), this was a very powerful predictor of occupational attainment. In addition, receiving encouragement for postsecondary education (for men) and marrying a spouse who had a greater level of postsecondary education (for women) were predictive of occupational success, net of the sample member's own level of education. These findings are consistent with past research in which investigators also found evidence supporting the importance of years of postsecondary education (Caspi et al., 1998; Kokko et al., 2000; Sanford et al., 1994; Weisner et al., 2003), encouragement of postsecondary education (Sewell & Shah, 1968; Werner, 1996), and having a better educated spouse (Vaillant & Davis, 2000) for midlife achievement. It was notable that educational factors were this highly predictive for the present sample, even though IQ was controlled and even though there was a considerable restriction of range in educational attainment. These findings have considerable relevance today because they underscore the importance of encouragement of education after high school, including college-based programs, for individuals with mild intellectual deficits. Although the contemporary literature on the transition from school to work for students with disabilities contains policy recommendations supportive of postsecondary education (Fisher, Sax, & Pumpian, 1999; Hart, Pasternack, Mele-McCarthy, Simbrich, & Parker, 2004; Stodden & Whelley, 2004), there is little empirical evidence about the long-term value of education beyond high school for this population. The present analysis shows the lasting benefits of such education, with these effects extending well into midlife. Although the nature, amount, and quality of education has changed since 1957 for individuals with mild intellectual deficits, and

will continue to evolve with future social changes, there is no reason to expect that education has become less important over time or that it will in the future.

In addition to the realm of education, the only other notable predictor of midlife occupational attainment for men was intellectual resources. Even within the narrow range that defined the present sample, those whose IQs were closer to 85 had greater midlife occupational success than those with IQs closer to 60. However, for women, the most important other predictor of midlife occupational attainment was social participation. Participating in social organizations, such as parent–teacher associations and organizations connected with the church, may have given women with mild intellectual deficits access to a broader social network as well as experience in navigating organizational contexts, both of which may have been useful to women in obtaining and keeping good jobs. These findings also have considerable relevance for today, as they suggest the importance of encouragement of social involvement as a pathway to greater occupational success for women with mild intellectual deficits.

Past research has shown that individuals with mild intellectual deficits are at considerably elevated risk of depressive symptoms relative to the general population (Maughan et al., 1999; Tymchuk, 1994). In the present research we identified factors that may point to strategies for lowering this risk. For men, discussing future plans with parents and receiving encouragement from parents and teachers for postsecondary education were predictive of significantly lower levels of depressive symptoms in midlife. For women, discussing future plans with parents was predictive of lower midlife levels of depressive symptoms and higher midlife levels of purpose in life. The persistence of the effects of these supportive interactions over multiple decades speaks to the power of positive messages delivered during the formative years of young adulthood for individuals with mild intellectual deficits.

However, we also found evidence that not all discussions about an individual's future plans had positive outcomes; for women, discussing future plans with their high school teachers was predictive of significant elevations in depressive symptoms and significantly lower self-assessments of autonomy 35 years later. Perhaps teachers were discouraging of these women's hopes and dreams, and this discouraging experience may have had a lasting impact. Other resources appear to have had more positive influences on women, most prominently having a higher IQ, which was predictive of all four psychological outcomes in midlife, and marrying a man with a greater level of postsecondary education, which predicted lower levels of midlife depressive symptoms and higher levels of life purpose.

The divergent role of religious participation for men and women was an unexpected finding. For men, as expected, attending religious services was a significant predictor of higher midlife self-assessments of personal growth and purpose in life, whereas for women religious participation was a significant predictor of lower midlife self-assessments of autonomy. Past research on religious values has found that individuals with high levels of religiosity tend to endorse values associated with conformity and tradition (Saroglou, Delpierre, & Dernelle, 2004), which might place constraints on the development of autonomy, particularly for women. Future researchers should further investigate these gender differences in the role of religion in the lives of people with mild intellectual deficits.

Past research has shown that the transition from school to adulthood for individuals with disabilities is facilitated by multiple factors, at least in the short run, including postsecondary education, employment, social participation (Cummings, Maddux, & Casey, 2000), and parental involvement (Morningstar, Turnbull, & Turnbull, 1995). Our findings offer a longer lens on these issues, extending into midlife, and thus underscore the lasting importance of key social institutions in the lives of individuals with mild intellectual deficits. The positive influence of the family is evident in these analyses, as is the lasting benefit of continuing

education beyond high school. The importance of encouragement of postsecondary education suggests that communicating an ethic of achievement pays off for individuals with mild intellectual deficits, as has been found in past research (Benz, Lindstrom, & Yovanoff, 2000). Furthermore, the current findings show that it is achieving beyond the goals set in high school that was predictive of having a greater sense of life purpose and autonomy for men and a greater sense of personal growth for women in midlife. Therefore, it may be important to provide encouragement on an ongoing basis throughout adulthood so that such individuals might continue to achieve and even exceed their initial aspirations. However, encouraging aspirations that are not likely to be attained may have the opposite effect, as not living up to aspirations was predictive of lower levels of psychological functioning in midlife.

This analysis provides new insights about the factors that account for heterogeneity in two life domains that past research identified as areas of particular vulnerability for individuals with mild intellectual deficits. Although this population is also heterogeneous in other life domains, such as marriage and parenting, evaluation of the impacts of these factors was beyond the scope of the present research. There were several other limitations of this study, including the lack of racial diversity in the sample, reflecting Wisconsin's population at mid-century. In addition, all members of the present sample were high school graduates, reflecting the WLS design, again limiting generalizability. Further, although this study was based on a longitudinal design, many decades elapsed between the measurement of independent and dependent variables, and causal inferences cannot be firmly drawn because of the possibility of unmeasured intervening factors. Many of the significant effects were small; however, the fact that they were predictive over the intervening decades speaks to their lifelong importance. Finally, having a *mild intellectual deficit* (which we defined as an IQ between 61 and 85) is not synonymous with an *intellectual or developmental disability* (defined as an IQ score of 75 or below accompanied by deficits in adaptive behavior), so caution should be exercised in interpreting the findings reported here.

This study continues the long tradition of other life course studies that spanned several decades in researchers' quest for the identification of earlier life predictors of later outcomes for individuals with intellectual and developmental disabilities. In addition to the 51-year follow-up period in the Vaillant and Davis (2000) study cited earlier, a number of other notable studies in our field have spanned long stretches in the life course, including those of Borkowski and colleagues (Sommer et al., 2000; Whitman, Borkowski, Keogh, & Weed, 2001; Whitman, Borkowski, Schellenbach, & Nath, 1987) and Edgerton (1967, 1888; Edgerton & Bercovici, 1976). The most recent point of data in each of these studies reflects outcomes that are somewhat unique to their earlier life experiences and, as such, cannot be assumed to be identical to the experience of successive cohorts. Nevertheless, there is no alternative to prospective longitudinal studies in the investigation of earlier life predictors of subsequent outcomes. It is only through such studies and their replication with successive cohorts that maturational processes can be separated from period or cohort effects. Although the WLS represents one cohort from a particular historical period, maturational processes are identified that warrant continued investigation and confirmation in younger cohorts. Indeed, more recent cohorts warrant the same intensive and long-term scrutiny in order to determine whether patterns observed in earlier generations continue to hold in those who are finishing high school today.

In conclusion, this analysis yielded encouraging insights about the life course of individuals with mild intellectual deficits. Certain resources were identified that may have lasting influences on midlife occupational attainment and psychological functioning. Some of these resources, such as encouragement for postsecondary education, support for social involvement, and setting achievable occupational goals, lend themselves to interventions and inclusion in transition planning and should be tested in future experimental investigations.

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Table 1Background Characteristics of Individuals With Mild Intellectual Deficits in 1957 ($N = 730$)

Background characteristic	Mean/%
Father's years of education (mean)	9.0
8 th grade or less (%)	56.7
Some high school (%)	17.4
High school graduate (%)	14.9
Some college (%)	8.5
College graduate (%)	2.3
Mother's years of education (mean)	9.6
8 th grade or less (%)	45.2
Some high school (%)	20.0
High school graduate (%)	24.8
Some college (%)	6.0
College graduate (%)	4.0
Family income (mean annual \$)	5162
Living in poverty (%)	26.3
Population size (%)	
<2,500	14.5
2,500–10,000	28.8
10,000–49,999	31.5
>50,000	25.2
No. of living siblings	3.5
Religion (%)	
Catholic	39.9
Protestant	57.9
Other	2.2

Note: Background characteristics are from the family of origin.

Table 2

Prediction of Midlife Occupational Attainment by Earlier Life Resources

Predictor	Men (<i>n</i> = 320)	Women (<i>n</i> = 336)
	Beta	Beta
Intellectual resources		
High school IQ	.10 [*]	.07
Role models of achievement		
Father's occupational attainment in 1957	.06	.03
Mother was working in 1957	-.01	.10 [*]
Achievement influences		
Discussed future plans with parents	.05	-.04
Discussed future plans with teachers	.03	-.01
Encouragement for postsecondary education by parents and teachers	.19 ^{**}	.05
Aspirations		
Occupational aspirations in 1957	-.01	.05
Educational resources		
Educational attainment of sample member	.31 ^{***}	.28 ^{***}
Educational attainment of spouse	.10	.14 [*]
Social participation		
Organizational participation in 1975	.03	.12 [*]
Attended religious services in 1975	.06	-.07
<i>R</i> ² (Adj.)	.269 (.243)	.245 (.219)

*
p < .05.**
p < .01.***
p < .001.

Table 3

Prediction of Midlife Depressive Symptoms by Earlier Life Resources

Predictor	Depressive symptoms	
	Men (<i>n</i> = 308)	Women (<i>n</i> = 329)
	Beta	Beta
Intellectual resources		
High school IQ	.00	-.17**
Role models of achievement		
Father's occupational attainment in 1957	.09	.11*
Mother was working in 1957	.00	-.01
Achievement influences		
Discussed future plans with parents	-.16**	-.11*
Discussed future plans with teachers	.06	.18**
Encouragement for postsecondary education by parents and teachers	-.16*	.05
Aspirations		
Occupational aspirations in 1957	-.02	-.04
Educational resources		
Educational attainment of sample member	-.00	.07
Educational attainment of spouse	-.03	-.19**
Social participation		
Organizational participation in 1975	-.05	-.02
Attended religious services in 1975	-.05	.00
Gap score (Achievement – Aspiration)		
Achievement above vs. below aspiration	.03	.05
Achievement above vs. matches aspiration	.05	.06
<i>R</i> ² (Adj.)	.07 (.03)	.11 (.07)

*
p < .05.**
p < .01.

Table 4

Prediction of Midlife Psychological Functioning by Earlier Life Resources

Predictor	Personal growth		Purpose in life		Autonomy	
	Men (n = 317)	Women (n = 317)	Men (n = 317)	Women (n = 335)	Men (n = 317)	Women (n = 335)
	Beta	Beta	Beta	Beta	Beta	Beta
Intellectual resources						
High school IQ	.04	.13*	.01	.15**	-.00	.11*
Role models of achievement						
Father's occupational attainment in 1957	.03	-.04	.00	-.04	.12*	-.05
Mother was working in 1957	.11*	.07	.05	.04	.02	.10
Achievement influences						
Discussed future plans with parents	.10	.11	.09	.15**	-.08	.11
Discussed future plans with teachers	-.03	-.07	-.02	-.08	-.04	-.13*
Encouragement for postsecondary education by parents and teachers	.03	.02	.05	-.00	.06	-.05
Aspirations						
Occupational aspirations in 1957	.13	.10	.09	.02	.17*	-.08
Educational resources						
Educational attainment of sample member	.10	.05	-.01	-.01	-.07	.08
Educational attainment of spouse	.00	.10	.06	.13*	.05	.10
Social participation						
Organizational participation in 1975	.00	.08	.01	.06	.05	.15**
Attended religious services in 1975	.19**	-.02	.19**	-.02	.04	-.14*
Gap score (achievement – aspiration)						
Achievement above vs. below aspiration	-.11	-.18**	-.16*	-.12	-.14*	-.00
Achievement above vs. matches aspiration	-.02	-.11*	.03	-.07	-.06	-.07

Predictor	Personal growth		Purpose in life		Autonomy	
	Men (<i>n</i> = 317)	Women (<i>n</i> = 317)	Men (<i>n</i> = 317)	Women (<i>n</i> = 335)	Men (<i>n</i> = 317)	Women (<i>n</i> = 335)
	Beta	Beta	Beta	Beta	Beta	Beta
<i>R</i> ² (Adj.)	.11 (.07)	.14 (.10)	.09 (.05)	.10 (.06)	.06 (.02)	.11 (.08)

* *p* < .05.
** *p* < .01.