

# A 35-Year Follow-Up Study on Burnout Among Finnish Employees

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This three-wave 35-year prospective study used the Job Demands-Resources model and life course epidemiology to examine how life conditions in adolescence (1961–1963) through achieved educational level and working conditions in early adulthood (1985) may be indirectly related to job burnout 35 years later (1998). We used data ( $N = 511$ ) from the Finnish Healthy Child study (1961–1963) to investigate the hypothesized relationships by employing structural equation modeling analyses. The results supported the hypothesized model in which both socioeconomic status and cognitive ability in adolescence (1961–1963) were positively associated with educational level (measured in 1985), which in turn was related to working conditions in early adulthood (1985). Furthermore, working conditions (1985) were associated with job burnout (1998) 13 years later. Moreover, adult education (1985) and skill variety (1985) mediated the associations between original socioeconomic status and cognitive ability, and burnout over a 35-year time period. The results suggest that socioeconomic, individual, and work-related resources may accumulate over the life course and may protect employees from job burnout.

*Keywords:* burnout, life course, job demands-resources model, longitudinal research, socioeconomic status, working conditions

Research has shown that job burnout, a syndrome characterized by high levels of exhaustion, negative attitudes toward work (cynicism), and reduced professional efficacy (Maslach, Schaufeli, & Leiter, 2001), is most likely when job demands are high and job resources limited (for reviews, see Bakker & Demerouti, 2007; Halbesleben & Buckley, 2004; Lee & Ashforth, 1996). However, little is known about life conditions in childhood and early adulthood (e.g., socioeconomic status, cognitive ability, and education) that may render individuals likely to pursue jobs

later in life that increase or decrease the likelihood of burnout. Can some of the roots of burnout be found in individual and socioeconomic resources (or lack of them) prior to working age?

The central aim of the present study was to examine burnout from the life course perspective. More specifically, we investigated how life conditions at childhood (mean age 12–14 years) and early adulthood (mean age 36) were related to working conditions (mean age 36) and job burnout during late adulthood (mean age 49 years). We integrated two streams of literatures. First, we used the Job Demands-Resources (JD-R) model, which proposes that burnout is the result of high job demands and lack of job resources (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Next, to extend the JD-R model beyond immediate working conditions we used the literature on life course epidemiology (Kuh, Ben-Shlomo, Lynch, Hallqvist, & Power, 2003), and particularly the *unhealthy life career hypothesis* (Lundberg, 1993) that may be informative regarding the impact of unfavorable life conditions on burnout. Life course epidemiology typically focuses on a chain of risk factors, whereas the JD-R model emphasizes not only the risk factors (high demands) but also the role of resources in preventing burnout and enhancing health. Therefore, these two approaches may augment each

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other in understanding the development of burnout during the life course.

### **Job Demands–Resources Model and Burnout**

The central tenet of the JD-R model is the assumption that regardless of the type of job, psychosocial work characteristics can be categorized into two broad categories: job demands and job resources (e.g., Bakker & Demerouti, 2007; Demerouti et al., 2001; Hakanen & Roodt, 2010). *Job demands* refer to the aspects of a job that require sustained effort and are therefore associated with certain psychological and physiological costs. *Job resources* refer to the aspects of the job which may help in reducing job demands, assist in achieving work goals, and even lead to personal growth and development. The JD-R model further posits that high job demands and lack of job resources may exert a negative influence on well-being and health, for example by increasing symptoms of burnout. Thus, the JD-R model with its assumptions is an extension of the influential demand-control model (Karasek, 1979; see also Bakker, Van Veldhoven, & Xanthopoulou, 2010) in which the combination of high job demands and low job control (consisting of two resources, namely decision authority and skill discretion) are expected to predict job strain.

Recent research findings have supported these assumptions (see for reviews, Bakker & Demerouti, 2007; Halbesleben & Buckley, 2004; Lee & Ashforth, 1996). For example, Hakanen, Schaufeli, and Ahola (2008) showed that both job demands and lack of job resources had positive cross-lagged effects on burnout 3 yr later among Finnish dentists. Similarly, Schaufeli, Bakker, and Van Rhenen (2009) found that both increases in job demands and decreases in job resources predicted burnout among Dutch managers and executives over a 1-yr time period.

However, the existing studies on burnout and the JD-R model also have limitations: namely, research has usually focused only on working conditions as antecedents of burnout. However, it is likely that burnout may also be a symptom of broader social concerns that reach beyond the particular organizational environment (Schaufeli & Enzmann, 1998). In the present study, we aim to go beyond existing burnout research and the JD-R model, and investigate the role of preemployment socioeconomic (socioeconomic status [SES] of origin, education) and personal resources (cognitive ability) in the quality of work

characteristics and burnout later in adulthood. Next, we will introduce the unhealthy life career hypothesis, which sheds light on how early life conditions may be related to burnout in later life.

### **Unhealthy Life Career Hypothesis**

The extensive epidemiological research on social inequalities in health and economic and health disparities has well demonstrated the relationship between socioeconomic status and health (e.g., Adler et al., 1994; Braveman, 2006). Individuals higher in the social and economic hierarchy usually enjoy better health than do those low in that hierarchy (Adler et al., 1994). Most of the studies linking socioeconomic status (SES) and health have been cross-sectional and paid attention to SES in adulthood (Power & Matthews, 1997). However, several authors have argued that health differences in adult life are partly explained by childhood socioeconomic conditions (Kuh & Ben-Shlomo, 1997; Lundberg, 1993). According to Lundberg's (1993) unhealthy life career (ULC) hypothesis, impaired health during adulthood is the consequence of a chain of unhealthy living conditions, which together lead to illness in adulthood. For example, a disadvantageous social background may lead to low educational attainment, with decreasing opportunities in work life such as poor working conditions. Research has shown that poor working conditions with high job demands and low job resources entail several health risks, including low back pain (e.g., Bongers, De Winter, Kompier, & Wildebrandt, 1993; Burdorf & Sorock, 1997), musculoskeletal problems (e.g., Hannah, Monteilh, Gerr, Kleinbaum, & Marcus, 2005; Vanroelen, Leveque, & Louckx, 2009), and psychosomatic problems (e.g., De Jonge, Bosma, Peter, & Siegrist, 2000; Van Daalen, Willemssen, Sanders, & Van Veldhoven, 2009).

Furthermore, consistent with the ULC hypothesis, much of the effect of childhood socioeconomic status (SES of origin) is cumulative and may be mediated by factors in adulthood (Bäckman & Palme, 1998; Elovainio et al., 2007; Hintsä et al., 2006; Kristensen, Bjerkedal, & Irgens, 2007; Lundberg, 1997). For example, research has shown that a person's own education may partially mediate the impact of parental socioeconomic position on musculoskeletal sickness absence (Kristensen et al., 2007) and on job strain (Hintsä et al., 2006) in adulthood. Furthermore, Bäckman and Palme (1998) showed that the effects of low socioeconomic status and financial hardship in early life on sickness absence in later life were mediated by career variables such as school perfor-

mance, educational level, and current socioeconomic status, thus supporting the ULC hypothesis.

Thus far, there are some studies showing that working conditions may mediate the relationship between childhood or adult SES and adult health (e.g., Borg & Kristensen, 2000; Link, Lennon, & Dohrenwend, 1993; Marmot, Bosma, Hemingway, Brunner, & Stansfeld, 1997; Schrijvers, Van de Mheen, Stronks, & Mackenbach, 1998). For example, Elovainio et al. (2007) found that father's low SES and poor academic achievements in adolescence were related to low job control and high job strain at age 31, and low job control and high job strain, in turn, were associated with concurrent psychological distress. However, the present study is the first to test the ULC hypothesis in investigating job burnout and including work and nonwork-related information regarding childhood, adolescence and adult middle-aged life.

### Overview of the Present Study

The ULC literature suggests that resources early in life may have a favorable effect on the quality of the jobs and burnout, because these resources are likely to be predictive of additional resources (cf. Hobfoll, 1989). In addition, according to the JD-R model, high job demands and lacking job resources are the primary antecedents of burnout. We tested our hypotheses on the indirect mediated relationships between socioeconomic and individual resources in adolescence and burnout 35 years later by integrating the life course perspective with the JD-R model and using the data of a three-wave 35-year longitudinal

study among a nearly representative sample of Finnish middle-aged workers.

Our theoretical model is graphically presented in Figure 1. First, SES of origin at T1 and cognitive ability at T1 are assumed to act as resources and to be associated with basic and vocational educational attainment at T2. There are several plausible mechanisms for these relationships. For example, with high parental SES and cognitive ability one has easier access to educational systems, career aspirations are more likely to be high, and one may be more ready and have more opportunities to invest resources in long-term education. Indeed, the positive relationship between SES of origin and educational achievements is well-established (e.g., Ishida, Muller, & Ridge, 1995; Power & Matthews, 1997). In addition, Bond and Saunders (1999) demonstrated that out of several background resources individual ability had the strongest impact on future academic performance and on occupational achievement.

Second, the level of education, in turn, is hypothesized to be related with essential aspects of working conditions during young adulthood at T2. Several studies have shown that education in adulthood (a proxy of adult SES) is strongly associated with occupational position and exposure to psychosocial work characteristics (Kuh & Ben-Shlomo, 1997; Power & Matthews, 1997). Particularly, employees in higher social classes consistently report more job resources, such as high skill discretion and nonrepetitive work, possibilities for development, meaningful work, and influence (Borg & Kristensen, 2000; Kristensen, Borg, & Hannerz, 2002; Marmot, Bosma et al., 1997; Schrijvers et al., 1998). With better educa-

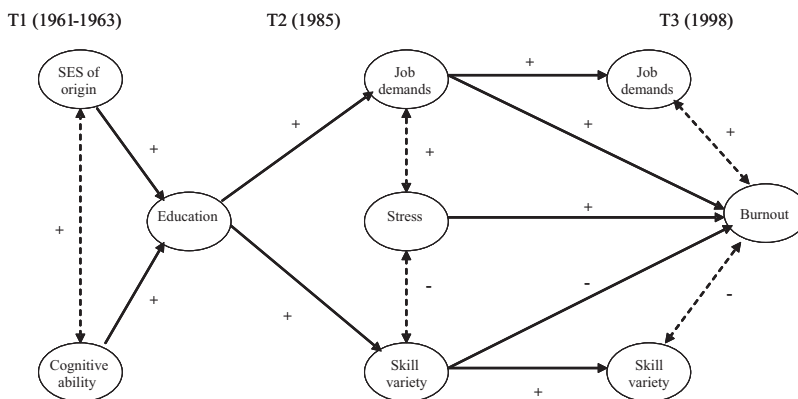


Figure 1. Theoretical model of accumulative risks and resources.

tion one is more qualified and thereby may have more opportunities to choose between jobs and to find a meaningful job with more resources, for example, skill variety. Moreover, according to the Job Characteristic Model (Hackman & Oldham, 1980) employees who can use their professional experiences, talents, and skills at work (high skill variety) usually find their jobs more meaningful, which in turn may increase motivation and satisfaction and decrease the development of negative outcomes such as burnout. Indeed, skill variety is known to be among the key job resources protecting from burnout (Schaufeli & Enzmann, 1998). For example, Hakanen and his colleagues (2008) found that job resources such as skill variety, negatively predicted burnout in a 3-year follow-up, after controlling for baseline levels of burnout. Similarly, studies by Rafferty, Friend, and Landbergis (2001), and by Taris, Schreurs, and Schaufeli (1999) have shown that burnout is positively associated with high job demands and negatively with skill variety. In addition, according to previous research and the ULC hypothesis (Lundberg, 1993) preemployment resources can be expected to lead to more resourceful jobs and consequently to less burnout in the long-term.

On the basis of the UCL hypothesis, the JD-R model, and related earlier research reviewed above, we formulated two hypotheses on the indirect relationships between preemployment and job-related resources and burnout over the life course (see also Figure 1):

**Hypothesis 1a.** SES of origin at T1 is positively associated with educational attainment at T2, which in turn is positively associated with skill variety at T2, which is negatively related to burnout at T3.

**Hypothesis 1b.** Cognitive ability at T1 is positively associated with educational attainment at T2, which in turn is positively associated with skill variety at T2, which is negatively related to burnout at T3.

In addition to job resources, we suggest that quantitative job demands—so called challenge stressors—are more typical among well-educated employees and will be positively related to job strain variables such as job burnout (e.g., LePine, Podsakoff, & LePine, 2005). Those with higher education are more likely to have jobs with more responsibility and thereby also more workload and time pressure. Indeed, previous studies have shown that quantitative and cognitive job demands are more prevalent among those with higher SES (Kristensen et al., 2002; Schrijvers et al., 1998). Moreover, quantitative job demands such as time pressure and workload are, in turn, important antecedents of burnout (Schaufeli et al., 2009; Schaufeli & Enzmann, 1998). Although job demands are not

necessarily negative they may become stressors in situations that require high effort to sustain the expected performance level (Hockey, 1997) and/or does not allow for sufficient recovery (Sonnentag & Zijlstra, 2006). Consequently, job demands may elicit negative responses, such as burnout. For example, Hakanen and his colleagues (2008) found that job demands such as workload predicted burnout in a 3-year follow-up, after controlling for baseline levels of burnout. Similarly, studies by Rafferty et al. (2001), and by Taris et al. (1999) showed that not only was burnout associated with lack of skill variety but also with high levels of job demands. Thus, the process of cumulative life course aggregation of resources may also include threats to employees. Therefore, we formulated two additional hypotheses on the mediated indirect relationships between preemployment resources, job demands, and job burnout:

**Hypothesis 2a.** SES of origin at T1 is positively associated with educational attainment at T2, which in turn is positively associated with job demands at T2, which is positively related to burnout at T3.

**Hypothesis 2b.** Cognitive ability at T1 is positively associated with educational attainment at T2, which in turn is positively associated with job demands at T2, which is positively related to burnout at T3.

Burnout was only measured at T3. Therefore, we added earlier stress symptoms at T2 as a covariate in our model but did not formulate any hypothesis related to it.

## Method

### Participants

The source of the data is the so-called Healthy Child Study, which included three study points conducted in Finland during 1955–1963 (see Figure 2). The Finnish population on 31 December 1950 was the basis for the original sample ( $N = 2,900$ ), which represented all Finnish-speaking children under the age of 14 years. The third study point (1961–1963) was selected for the basis of the follow-up studies because, in contrast to the first and second phases of this otherwise mainly medical investigation, it included valid psychological measures and indicators of social conditions. In 1961–1963 (T1), 1,084 participants underwent a cross-sectional examination at an average age of 12 years in 1961.

All the 1,084 participants were identified in 1985 (T2), and 1,059 addresses were located. These persons formed the target group of a questionnaire study carried out in 1985 (Kalimo & Vuori, 1991). Alto-

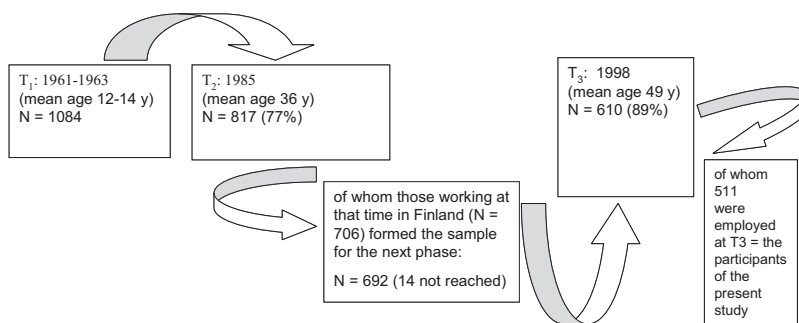


Figure 2. The sample and the study design.

gether 817 persons responded to a questionnaire (77%). 706 of them (361 men and 345 women) were working at the time of the study. At that time their mean age was 36 years.

Of these 706 employed people, 692 could be located in 1998 (T<sub>3</sub>), and they formed the sample basis for this study (Hakanen, 2004). The response rate of the follow-up was 89%, as 614 persons responded to a postal questionnaire. Those 511 who were employed also in 1998 formed the sample used in the present study. The mean age of these respondents was 49 (range 44 to 57) years. The data represented evenly both genders, as there were 257 women and 254 men among the respondents.

Originally in 1955, in order to reach a sample corresponding with the population and socioeconomic structure of Finland, children from 14 rural communities and the capital of Finland—Helsinki—were selected. In rural areas, the focus of sampling was the elementary school districts, and in Helsinki the city blocks. After this, variability between the strata was sought in order to have representatives from all different social classes. However, unfortunately, the explicit sampling procedures of the 1950s–1960s have not been properly reported. The largest sample loss occurred already during the original Healthy Child study, as the original sample in the first phase of the study in 1955 was almost three times bigger than in the third phase in 1961–1963. It turned out to be impossible to evaluate the sample loss directly from the data (Kalimo & Vuori, 1991).

The evaluation of the representativeness of the data is based on official statistics in Finland (Statistics Finland, 1998a; 1998b). The proportion of those with high SES is overrepresented in the study: there are nearly twice as many upper white-collar workers in the sample as in the same-aged population (36%

vs. 19%). The proportion of blue-collar workers is 21% in the study sample compared with 30% in the population. The participants of this study had slightly poorer self-rated health (T<sub>3</sub>) than in the corresponding employed population in Finland (Pirainen et al., 2000): 60% of the participants of the present study reported their health as very good' or "fairly good" compared with 66% in the general and in the employed (70%) population of Finland at T<sub>3</sub>. Moreover, the reported mean levels of symptoms of burnout among the respondents were approximately on the same level or slightly higher than in a representative sample of Finnish employees (see Ahola et al., 2006). Thus, it is unlikely that there would be a notable bias in the direction of the "healthy worker" effect.

In addition, we compared the demographics and the study variables of the respondents who participated at T<sub>3</sub> with the dropouts after T<sub>2</sub>. The dropouts were somewhat older (49.5 vs. 48.8 years old;  $p < .05$ ) and had received less basic (3.0 vs. 3.6;  $p < .001$ ) and vocational (2.8 vs. 3.4;  $p < .01$ ) educational training at T<sub>2</sub> than the study participants. Moreover, at T<sub>1</sub> the dropouts scored lower on cognitive ability ( $-.39$  vs.  $.06$ ;  $p < .001$ ), on parents' education (2.36 vs. 2.63;  $p < .01$ ), and on parents' source of income (2.70 vs. 2.85;  $p < .05$ ). However, there were no differences between the two groups in relation to gender, level of housing at T<sub>1</sub>, stress at T<sub>2</sub>, job demands at T<sub>2</sub>, and skill variety at T<sub>2</sub>. Therefore, and also because the response rate at T<sub>3</sub> was high (89%), we believe that selective drop-out did not form a serious threat to our findings.

### Measures in Adolescence (T1)

The socioeconomic status of origin was measured with three indicators. Parents' educational level was

based on the mean of fathers' and mothers' educational level; if either father's or mother's educational attainment was missing we used the available information with five options (1 = has not completed compulsory basic education; 2 = comprehensive school; 3 = vocational school; 4 = vocational college; 5 = academic education). Source of parents' income was rated on a 5-point scale (1 = income from social benefits; 2 = irregular weekly salary; 3 = regular monthly salary (officials, well-to-do farmers); 4 = income from independent practice (e.g., doctors, lawyers, and tradesmen); 5 = income mainly from interest on investments (big business, large farms). The level of housing was rated on a 5-point scale (1 = defective lodging, e.g., room with a stove, or a large family in the countryside living in an attic; 2 = rented living quarters without a toilet and a separate kitchen, and the parents and children not having their own bedrooms; 3 = rented living quarters which fulfill the former conditions; 4 = own apartment or house; 5 = luxurious housing). A local health nurse who knew the children and their families conducted the ratings. The percentage of missing cases for socioeconomic variables was 3.5% for both parents' education and for income and 3.7% for the level of housing. Only 1.2% of the respondents lacked any information concerning SES of origin. Thus, the small proportion of missing SES values is unlikely to influence our analyses. The categorizations of SES indicators were used in the 1960s in Finland and they are based on the social and economic hierarchies of that time. Their psychometric properties have been scrutinized in earlier studies (Kalimo & Vuori, 1991; Viikari-Juntura et al., 1991). In addition, the measurement model for socioeconomic status of origin showed that all the indicators had quite similar and acceptable loadings on the latent factor: .59, .62, and .70.

Cognitive ability was assessed with Raven's standard progressive matrices (SPM; reliability 0.90; Raven, Court, & Raven, 1988; Kalimo & Vuori, 1991). This widely applied test has been used as a culture-free test of intellectual ability, but it is associated with socioeconomic background and it correlates most clearly with "nonverbal" tests and assesses especially reasoning in the visuospatial modality (Lezak, Howieson, & Loring, 2004). More specifically, SPM is an untimed test which measures abstract nonverbal reasoning ability. It consists of a sequence of designs (60 items), and the individual is required to fill in a missing design from a number (6 or 8) of choices. Similarly, the latest version of the most widely used test to measure intelligence, that is, the Wechsler

Adult Intelligence Scale includes the Matrix Reasoning (MR) subtest, which is modeled on Raven's Progressive Matrices (Wechsler, 2008). With 60 items the potential range of the test results was from 0 to 60. The raw scores of the test were standardized by age but not by gender, as there were no differences between boys and girls in the mean level of the test scores.

### Measures in Adulthood (T2 and T3)

Adult education was measured with the levels of basic and vocational education at T2. Basic educational attainment included three categories (1 = elementary school; 2 = lower secondary school or part of upper secondary school; 3 = matriculation examination). Vocational educational attainment was categorized into seven classes (1 = no vocational education; 2 = vocational course; 3 = vocational school certificate; 4 = vocational institute certificate; 5 = lower academic degree; 6 = upper academic degree; 7 = licentiate or doctoral degree). In Finland, high basic education has traditionally been a prerequisite for high vocational education, for example, matriculation is requested for academic career. Thus, basic and vocational education correlate highly with each other (in this study,  $r = .63$ ) and for example, with income. Consequently, educational attainment is often used as an indicator of adult socioeconomic status, that is, the more educated one is, the higher is her/his socioeconomic status.

Job demands and skill variety were measured at T2 and at T3 with the Occupational Stress Questionnaire (OSQ; Elo, Leppänen, Lindström, & Ropponen, 1992). The reliability and predictive validity of OSQ items concerning various indicators of stress has been found to be satisfactory in Finnish studies among a wide range of occupational groups (Elo et al., 1992; Kalimo & Vuori, 1991). OSQ has been used, for example, in several epidemiological studies (recently, e.g., Väänänen et al., 2008; Väänänen et al., 2003). Job demands was assessed by two items covering time pressure and having too much work to do (correlation between the variables T2 = .49 and T3 = .53). Skill variety was assessed with three items referring to the opportunity to use one's knowledge and skills in one's work, nonrepetitiveness of work tasks, and the variety of tasks (alpha T2 = .77 and alpha T3 = .73). The items were scored on 5-point scales, ranging from 1 (*never*) to 5 (*always*). The scale scores were based on the mean of the items. Higher scores reflect higher job demands and higher skill variety.

Stress at T2 was measured with one item (Elo et al., 1992): "Stress means the situation when a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his mind is troubled all the time. Do you feel that kind of stress these days?" This item was scored on 5-point scale ranging from 1 (*not at all*) to 5 (*very often*). The item has converged with validated measures of well-being (including job burnout) and it has had theoretically grounded associations with health and work characteristics (Elo, Leppänen, & Jahkola, 2003).

The level of burnout at T3 was measured with 16 items using the General version of the Maslach Burnout Inventory (Kalimo, Hakanen, & Toppinen-Tanner, 2006; Schaufeli, Leiter, Maslach, & Jackson, 1996). The MBI-GS consists of three subscales: exhaustion was measured with five items ( $\alpha = .93$ ), cynicism with five items ( $\alpha = .83$ ), and (lack of) professional efficacy with six items ( $\alpha = .81$ ). All items were scored on a 7-point rating scale, ranging from 0 (*never*) to 6 (*daily*). The scale scores were based on the mean of the items. High scores of exhaustion and cynicism and low levels of professional efficacy are indicative of burnout. Educational achievements, work characteristics, stress, and burnout were based on self-reports.

With every question at T1, T2, and T3, the participants (or the other sources of information) were instructed to answer according to the present, actual situation of the respondent or her/his parents.

## Statistical Analyses

In order to test our hypotheses, structural equation modeling (SEM) methods were employed by using AMOS 17.0 software package (Arbuckle, 2008). Several complementary fit indices were used to examine the overall quality and fit of the models: goodness-of-fit index (GFI), comparative fit index (CFI), normed fit index (NFI), Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA). For GFI, CFI, NFI, and TLI, values between .90–1.0 indicate a good fit between the model and the data. An RMSEA value of .05 or less indicates a close fit, and values up to .08 would still indicate a reasonable error of approximation. The fit of nested models was compared by examining the significant changes in the chi-square values and degrees of freedom.

In the structural models, SES of origin had three indicators: parental education, source of parents' income, and level of housing; cognitive ability at T1 had one indicator, adult education at T2 was indi-

cated by level of basic and vocational education, job demands at T2 and at T3 were indicated by two items, whereas skill variety at T2 and at T3 had three items as indicators, stress at T2 had one indicator, and finally burnout at T3 was indicated by the scales of exhaustion, cynicism, and professional efficacy. The error term of each indicator of working conditions at T2 was allowed to correlate with the error term of the corresponding indicator at T3. In addition, correlations were allowed between the synchronously measured variables except for adult education, which was assumed to predict work characteristics also measured at T2. In testing the hypotheses, we controlled for the impact of previous stress level (T2), and concurrent (T3) levels of job demands and skill variety.

The recommended procedure for testing the significance of the indirect effects on three-path ("double mediation") mediated models using SEM is bootstrapping (e.g., Shrout and Bolger, 2002; Taylor, MacKinnon, & Tein, 2008). We created 1,000 bootstrap samples to test whether the hypothesized indirect relationships between preemployment factors at T1, education and working conditions at T2, and burnout at T3 as specified in M2 were significant. Thus, we tested the significance of four mediated processes which all had two successive mediators (e.g., SES of origin  $\rightarrow$  adult SES  $\rightarrow$  skill variety  $\rightarrow$  burnout).

Finally, in our data, 484 employees worked full-time and only 25 worked part-time. In addition, 210 employees had changed jobs between T2 and T3, whereas 301 employees had stayed in the same job. We investigated the impact of these variables (part-time vs. full-time employees and job changers vs. "stayers") by adding them as covariates to our structural models. However, these variables did not significantly associate with burnout and adding these variables did not change the model fit and findings reported below. In addition, multigroup analysis of the final structural model distinguishing between job changers and "stayers" showed that the free model did not improve the model fit compared with the constrained model,  $\Delta\chi^2(10) = 17.68$ , *ns.*, thus supporting the robustness of the model.

## Results

### Descriptive Statistics

Means, standard deviations, and intercorrelations between the study variables are presented in Table 1. Before testing the research model, the measurement

Table 1  
Means, Standard Deviations, and Correlations Between the Observed Variables (N = 511)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Variables in adolescence, T <sub>1</sub>																
1. Parents' educational level	2.65	.97	—													
2. Source of parents' income	2.87	.71	.41	—												
3. Level of housing	3.23	.80	.38	.45	—											
4. Cognitive ability	.13	.94	.38	.18	.22	—										
Variables in early adulthood, T <sub>2</sub>																
5. Basic educational attainment	3.67	1.42	.42	.32	.30	.41	—									
6. Vocational educational attainment	3.49	1.74	.44	.34	.31	.34	.63	—								
7. Job demands	2.78	.82	.06	.00	.07	.10	.13	.13	—							
8. Skill variety	4.02	.79	.23	.20	.19	.16	.27	.41	.22	—						
9. Stress	2.12	.92	.02	-.03	.04	.03	.02	.10	.23	-.06	—					
Variables in later adulthood, T <sub>3</sub>																
10. Job demands	2.92	.82	.07	.03	.15	.01	.06	.11	.37	.03	.19	—				
11. Skill variety	4.11	.70	.21	.17	.16	.17	.28	.38	.08	.61	-.06	.08	—			
12. Exhaustion	1.47	1.26	-.02	-.09	.03	-.03	-.02	.04	.19	-.07	.29	.45	-.11	—		
13. Cynicism	1.18	1.98	-.10	-.13	-.04	-.05	-.04	-.06	.08	-.16	.19	.23	-.29	-.55	—	
14. Reduced professional efficacy	1.46	1.12	-.07	-.06	-.01	-.04	-.04	-.09	.02	-.23	.07	.17	-.27	.22	.30	—

Note. Correlations between .09–.11 are significant at  $p < .05$ ; correlations between .12–.15 are significant at  $p < .01$ ; and correlations over  $> .16$  are significant at  $p < .001$ .



model for all observed and latent variables was estimated simultaneously. Showing the fit of the measurement model is necessary to ensure that the (intercorrelating) latent variables are adequately representing the observed variables. The results revealed an acceptable fit of the measurement model to the data,  $\chi^2(132) = 283.58$ , GFI = .95, CFI = .95, NFI = .91, TLI = .93, and RMSEA = .047.

**Testing the Structural Model**

After demonstrating the fit of the overall measurement model, the hypothesized model (M1) was tested by using SEM (see Table 2). The fit of M1 to the data was acceptable,  $\chi^2(152) = 323.79$ , GFI = .94, CFI = .94, NFI = .89, TLI = .92, and RMSEA = .047. As expected, both SES of origin and cognitive ability at T1 positively associated with adult education at T2. Adult education, in turn, was positively related to both skill variety and job demands in young adulthood at T2. In addition, T2 skill variety (negatively) and T2 job demands (positively) were associated with burnout 13 years later at T3, after controlling for the impact of T2 stress and concurrent experiences of skill variety and job demands at T3.

The modification indices suggested two additional associations in M1: Adult education was not only associated with skill variety at T3 indirectly through skill variety at T2, but also directly (adults SES → skill variety at T3, standardized  $\beta = .16$ ). This path suggests that educational achievements in young adulthood may not only immediately lead to certain types of occupations and working conditions which then would be rather stable over time. In addition, acquired educational attainment may operate as a resource that can be harnessed to influence the quality of work characteristics even over a longer time period.

In addition, stress at T2 was positively related to job demands at T3 (standardized  $\beta = .14$ ). This path is an indication of a reversed relationship between stress symptoms and perceived job demands: those with high levels of stress may also perceive higher job demands in the future, either because of a negatively biased perception or because of actual changes in the work environment. We compared this slightly modified model M2 to M1. It was found that M2 (see Figure 3) fit even better to the data than M1,  $\Delta\chi^2(2) = 15.40^{***}$ , and, perhaps more importantly that M2 neither changed the significance, nor the direction of the hypothesized associations.

Table 2  
*Goodness-of-Fit Indices for Alternative Structural Equation Models, N = 511*

Model	Model description	$\chi^2$	df	GFI	CFI	NFI	TLI	RMSEA	Model comparisons	$\Delta\chi^2$	$\Delta df$
MM	Measurement model	283.58	132	.95	.95	.91	.93	.047			
M1	Hypothesized model	323.79	152	.94	.94	.89	.92	.047			
M2	Final modified model (two additional paths added)	308.39	150	.94	.95	.90	.93	.046	M1 vs. M2	15.40***	2
M <sub>alt1</sub>	Health impairment process model (M2 without the path from T2 skill variety on T3 burnout)	316.05	151	.94	.94	.90	.93	.046	M <sub>alt1</sub> vs. M2	7.67**	1
M <sub>alt2</sub>	Motivational process model (M2 without the paths from T2 stress and T2 job demands on T3 burnout)	354.54	152	.93	.94	.89	.91	.051	M <sub>alt2</sub> vs. M2	46.15***	2
M <sub>alt3</sub>	Only direct effects from pre-employment factors on T3 burnout	354.72	150	.93	.93	.89	.91	.052			

Note. GFI = goodness of fit index; CFI = comparative fit index; NFI = normed fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation.

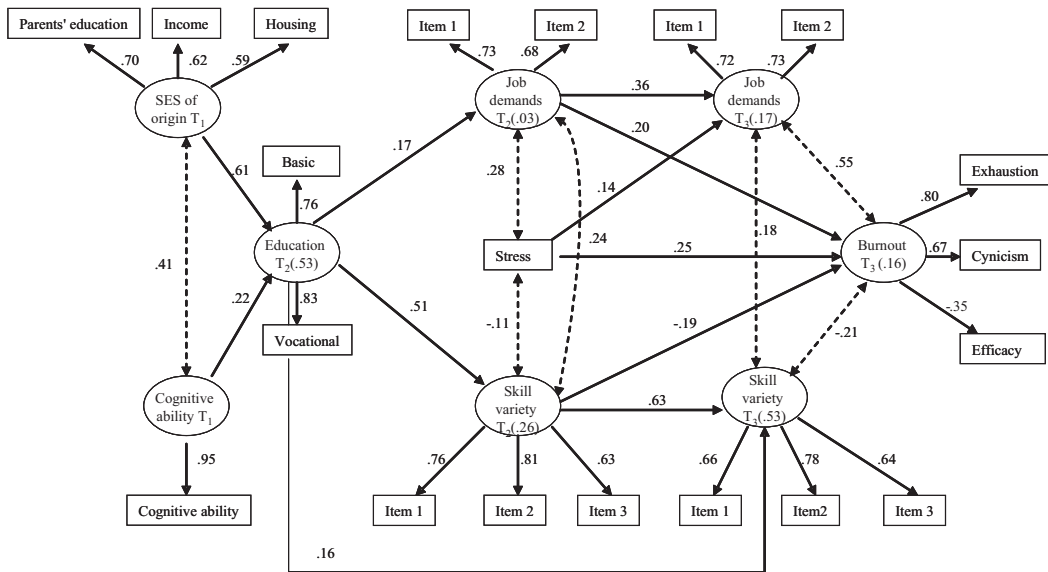


Figure 3. The final structural equation model: Maximum likelihood estimates of the path coefficients and explained variances,  $N = 511$ .

**Testing the Hypothesized Indirect and Mediated Relationships**

As regards to our hypotheses on indirect relationships between life course factors and burnout, we used bootstrapping analyses to test the significance of the three-path mediated associations. The results (see Table 3) showed that the indirect relationships starting from SES of origin at T1 through adult education at T2 and further via skill variety at T2 to (reduced) burnout at T3 were significant ( $p < .01$ ). Similarly, the mediated associations leading from cognitive

ability at T1 through adult education and skill variety at T2 to burnout later in work life (T3) were significant ( $p < .05$ ). However, the two other hypothesized three-path mediated associations (SES of origin  $\rightarrow$  education  $\rightarrow$  job demands  $\rightarrow$  burnout and cognitive ability  $\rightarrow$  education  $\rightarrow$  job demands  $\rightarrow$  burnout) were not significant which lead us to reject Hypotheses 2a and 2b. These findings suggest that the cumulative resource processes as stated in Hypotheses 1a and 1b (SES of origin/cognitive ability  $\rightarrow$  education  $\rightarrow$  skill variety  $\rightarrow$  [less] burnout) could be more salient than the “resource threat” processes including

Table 3  
Indirect Effects in the Final Model Using Bootstrapping ( $N = 511$ )

Indirect effects $x \rightarrow m1 \rightarrow m2 \rightarrow y$	Bootstrapping		95% CI		
	Est.	SE	Lower	Upper	$p$
SES of origin T1 $\rightarrow$ education T2 $\rightarrow$ skill variety T2 $\rightarrow$ burnout T3	-.140	.054	-.246	-.034	$p < .01$
Cognitive ability $\rightarrow$ education T2 $\rightarrow$ skill variety T2 $\rightarrow$ burnout T3	-.025	.011	-.046	-.003	$p < .05$
SES of origin T1 $\rightarrow$ education T2 $\rightarrow$ job demands T2 $\rightarrow$ burnout T3	.048	.026	-.003	.096	N.s. ( $p = .065$ )
Cognitive ability T1 $\rightarrow$ education T2 $\rightarrow$ job demands T2 $\rightarrow$ burnout T3	.009	.005	-.001	.019	N.s. ( $p = .086$ )

Note. CI = confidence interval; Est = unstandardized coefficients.

job demands (SES of origin/cognitive ability → education → job demands → burnout) as stated in Hypotheses 2a and 2b.

Finally, we also tested three alternative models to investigate the robustness of our findings. The so-called “health impairment” model ( $M_{alt1}$ ) was similar to the final model M2 except that we constrained the path from T2 skill variety to T3 burnout to zero. Theoretically, this model emphasizes the role of high job demands in gradually leading to burnout. Further, the “motivational” model ( $M_{alt2}$ ) was different from M2 in that the paths from T2 job demands and T2 stress to T3 burnout were constrained to zero.  $M_{alt2}$  is based on the assumption that skill variety as an important and motivating job resource would protect employees from burning out regardless of the job demands. Both these models showed a worse fit to the data than M2 (see Table 2). Since several studies have shown that childhood factors may also independently associate with adult health, we constructed a third alternative model ( $M_{alt3}$ ). This model included the paths from T1 SES of origin, T1 cognitive ability, and T2 education to T3 burnout but no paths from job demands, job resources, and stress to T3 burnout. The fit indices reported in Table 2 show that this alternative model also had a poorer fit to the data compared with M2.

To sum up, we found support for the slightly modified life course model on burnout. We also found support for the hypothesized mediated relationships between SES of origin and cognitive ability in adolescence, a higher level of adult education, skill variety in early adulthood, and reduced job burnout among participants once they were middle-aged employees.

## Discussion

In the present article we aimed to combine life course epidemiology and the JD-R model in order to investigate potential life course antecedents of job burnout. Using a three-wave 35-year follow-up data from the Finnish Healthy Child Study, we found that despite the relatively modest indirect effect sizes, life conditions at adolescence (SES of origin) and personal resources (cognitive ability in 1961–1963) were significantly associated with education at early adulthood (in 1985), which in turn were related to the working conditions participants encountered in 1985 and 1998. Working conditions in 1985 were, in turn, associated with job burnout 13 years later in 1998. This study contributes both to burnout and life course epidemiology research by combining the JD-R model

and life course epidemiology. First, there has been little research focusing on burnout from a life course perspective. Second, according to Kuh and her colleagues (2003), one challenge for life course epidemiology is to develop testable theoretical models that elucidate both risks and protective factors in different life stages and the underlying processes that link these together.

Specifically, the JD-R model (Bakker & Demerouti, 2007; Demerouti et al., 2001) emphasizes that high job demands and lacking job resources are the main drivers of burnout, whereas life course epidemiology typically focuses on a chain of risk factors for health and well-being. The results of the present study suggest that the two approaches supplement each other in understanding the development of burnout during the life course. In what follows, we will discuss the contributions of our study in more detail.

## Accumulative Resources and Risks

In line with our hypotheses, our findings support a resource accumulation explanation by showing that resources in young adulthood (education and skill variety) mediated the relationships between socioeconomic and personal (cognitive ability) resources in adolescence and job burnout 35 years later. In detail, the more favorable the socioeconomic status and cognitive ability in adolescence (at the mean age of 12–14), the higher was the level of education in the next 10–20 years. Furthermore, those with higher levels of education reported the highest levels of skill variety. Thus, those with higher intellectual ability, higher parental SES, and higher academic degrees ended up in jobs in which they had many opportunities to use their knowledge and skills (e.g., technicians, managers, and teachers). In contrast, those with lower intellectual abilities, lower parental SES, and lower basic and vocational education ended up in jobs in which the variety of tasks was limited and the work repetitive (e.g., care assistants, repairers, cashiers). Skill variety as a job resource, in turn, was negatively associated with burnout as assessed 13 years later. Those with high skill variety reported the lowest levels of burnout, after controlling for previous levels of stress symptoms. It is likely that when employees use different talents and skills at work (high skill variety) they usually find their jobs more meaningful, which in turn may increase motivation and satisfaction and decrease the development of negative outcomes such as burnout (Hackman & Oldham, 1980). In line with this explanation, earlier research has shown that skill variety is related to

competence need satisfaction (Van den Broeck, De Witte, Lens, & Vansteenkiste, 2008), self-efficacy and self-esteem (cf. Hobfoll, 2002; Salanova, Schaufeli, Xanthopoulou, & Bakker, 2010; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009), and to overall job satisfaction (Fried & Ferris, 1987).

These findings support the existence of cumulative effects of socioeconomic factors operating over a lifetime (cf. Ben-Shlomo & Kuh, 2002; Kuh et al., 2003; Pollitt, Rose, & Kaufman, 2005; Power, Standfeld, Matthews, Manor, & Hope, 2002). Moreover, the results add to the literature on unhealthy life careers by illuminating that certain conditions early in life act as resources that accumulate over time and help to prevent burnout.

The current findings also partially replicate and expand previous research that focused on accumulation of risks and health problems. We found that higher SES of origin and cognitive ability were positively related to basic and vocational education attained at early adulthood, and (in addition to skill variety) consequently was associated with the job demands individuals encountered in their jobs. Thus, although those with better living conditions were more likely to end up in jobs with more resourceful work environments, they were also more likely to be confronted with higher demands, indicative of higher responsibility. These job demands in turn were positively related to burnout 13 years later, even after controlling for previous levels of stress symptoms, and concurrent levels of job demands and skill variety. However, although high job demands in young adulthood were positively related to educational level and job burnout, they did not significantly mediate the relationship between preemployment resources and burnout. This finding suggests that skill variety at work may be more closely linked to prior life course resources (particularly to educational level) than to job demands. However, comparing the salience of skill variety and job demands in our model is restricted by the fact that we only measured job demands with two items—which implies limited reliability. Despite the measurement limitations, the role of job demands and skill variety in our life-course model also lends support to the salience of the two work characteristics included in the demand-control model (Karasek, 1979). However, we did not measure decision authority which is the third defining work characteristic in the demand-control model.

These findings also shed light on previous studies that have found mixed results regarding the relationship between educational level and burnout (Ahola et al., 2006; Schaufeli & Enzmann, 1998, p. 77). Higher

education often results in higher levels of both workload and skill variety which will then differently associate with burnout.

Furthermore, the present findings are consistent with but also expand previous studies on the ULC hypothesis applied to strain and health problems. For example, Kristensen et al. (2007), in their register-based cohort study of all live-born in Norway between 1967 and 1976, found that parental education level was associated with musculoskeletal sickness absence in 2000–2003, and this relationship was partly mediated by own educational attainment. In a similar vein, Hintsala et al. (2006) in their 18-year follow-up of Finnish children (aged 6–21 years), found that lower parental socioeconomic position and higher parental life dissatisfaction independently predicted job strain 18 years later, and these relationships were partly mediated by participants' own education. Finally, Link, Lennon, and Dohrenwend (1993) found that occupations involving direction, control, and planning explained at least partly the association between SES and depression.

All in all, our findings also support previous studies showing the associations between preemployment resources (or lack of them) and later job career. For example, Judge, Higgins, Thoresen, and Barrick (1999) reported that general mental ability in childhood was related to salary level and occupational status in adulthood. Furthermore, earlier research has shown that parental SES is related to one's work career later on (see for a review, Brown, Fukunaga, Umemoto, & Wicker, 1996). For example, parental SES is related to career aspirations and interests which in part channel people's career development through adolescence and adulthood (Brown et al., 1996). Furthermore, parents' SES is related to their involvement in adolescents' career choice situations which further support educational transitions and career development (Schnabel, Alfeld, Eccles, Köller, & Baumert, 2002). Consequently, those with more favorable life conditions in adolescence are likely to report better well-being at work much later in life.

Finally, in addition to life-course epidemiology this study also makes a contribution to the socioeconomic and health disparities literature in general by addressing three research needs raised in the field: We focused on cumulative effects of socioenvironmental factors over a life-time (e.g., Kuh & Ben-Shlomo, 1997; Power et al., 2002); we aimed at identifying some of the intervening psychosocial mechanisms between SES and health (Adler et al., 1994; Carroll et al., 1996; Peck, 1994); and we used a subjective measure of psychological well-being,

that is, burnout, which could show that an inequality gap in health can be much more profound and persistent than assumed on the basis of for example, mortality studies (Marmot, Ryff, Bumpass, Shipley, & Marks, 1997).

### Strengths and Limitations

A major strength of the present study is its longitudinal life course design. We followed individuals for 35 years, and nevertheless were able to retain a good response rate. In addition, an important contribution is that we integrated two different streams of literature, namely life course epidemiology and the JD-R model to investigate job burnout. However, there are several limitations that must be noted as well. First, our model is after all simplistic. For example, it included only two specific measures of working conditions, that is, skill variety and job demands and even those we could only measure with a few items. There are many other job characteristics that may influence burnout, including high emotional demands, lack of autonomy, and lack of performance feedback (see Demerouti et al., 2001; Halbesleben & Buckley, 2004). Therefore, we could not fully test the JD-R model using several different job demands and resources (Bakker et al., 2010). Moreover, we focused only on burnout as an outcome whereas many previous studies testing the JD-R model have also included some positive outcome, typically work engagement (Hakanen & Roodt, 2010). In addition, factors such as hours worked per week, marital status, and number of children could have played a role in the relationships of the study variables.

Furthermore, it was not possible to use full panel design and control for previous levels of all model variables. In our structural equation model we were able to use scales for working conditions that were measured twice. We also corrected for previous stress symptoms, but not for previous burnout. In addition, although our stress symptom measure is well validated (Elo et al., 2003), the fact that it is a single item measure is an additional limitation. Strictly speaking, however, it would not even be appropriate to call this a longitudinal study which according to Ployhart and Vandenberg (2010) would require at least three repeated observations on at least one of the substantive constructs of interest. Because of the imperfect study design and weak effect sizes one definitely should not draw the conclusion from this study that burnout would be determined by preemployment factors. Our study, however, did show that they may be related to each other. Future research on the role of life course

factors and employee well-being would benefit from study designs that enable modeling change over time.

Moreover, we used self-report measures to investigate working conditions and employee well-being. Therefore, we do not know whether preemployment resources actually lead to higher quality jobs or whether they rather predicted perceptions of working conditions. However, it should be noted that socioeconomic conditions and cognitive ability were other-rated and it can be assumed that levels of adult basic and vocational education can be fairly reliably measured with self-reports. Furthermore, the third wave of data collection took place in 1998 and one may question whether the changes in work life, for example in the form of new technologies, render this part of the data outdated. However, although many jobs have changed over the past years, quantitative workload and skill variety have repeatedly been found to be important antecedents of burnout, irrespective of the specific nature of the job and technologies used at work. Moreover, the central role of both the job demands and job resources in the development of burnout is also a basic assumption in the JD-R model (e.g., Bakker & Demerouti, 2007). A final limitation is that our model included only one individual difference variable, cognitive ability. It would have been interesting to investigate whether personality characteristics in early adulthood—for example, self-efficacy—would have an additional impact on later burnout.

### Practical Implications and Conclusion

We tested the unhealthy life career hypothesis and the JD-R model in a 35-year longitudinal study among Finnish employees. The results mainly supported our assumptions based on these two approaches. In line with the JD-R model, the results showed that both quantitative job demands and skill variety were associated with burnout later on. In addition, in accordance with the unhealthy life career hypothesis, the results showed that lack of resources from adolescence to early adulthood were associated with working conditions in an unfavorable way which, in turn were related to burnout later on. Moreover, in the life course processes (three-path mediations) associated with burnout, skill variety (a specific job resource) acted as a mediator between preemployment resources and burnout. The results add to the burnout literature by suggesting that individuals' parental and present SES and cognitive ability may be related particularly to the resources they

encounter in their work and how these resources (and demands) in work are related to burnout later on.

From a practical point of view, this study suggests that different resource domains over the life course are salient for employees in staying well throughout their work career. Therefore and in accordance with the unhealthy life career hypothesis, preventive efforts should be targeted at increasing people's resource pools and interrupting cumulative resource losses leading to burnout and other health problems. The present study showed that adverse working conditions, particularly lack of skill variety were the major correlates of burnout, and that life course factors prior employment had a minor albeit significant indirect association with burnout. Therefore, these resource enhancing efforts should primarily take place in the organizations which can aim at reducing too high job demands and increasing job resources, such as skill variety (Hakanen & Roodt, 2010). For example, organizations might develop employees' work resources by supporting training for skills and competence development (see Tharenou, 2009). In addition, building decent working conditions for everyone may compensate for earlier adverse life conditions.

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