



Fresh and healthy?

Well-being, health and performance of young employees with intermediate education

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671

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Abstract

Purpose – The purpose of this paper is to gain more insight into the well-being, health and performance of young intermediate educated employees. First, employees with low education (9 years or less), intermediate education (10-14 years of education), and high education (15 years or more) are compared on a number of factors related to well-being, health, and performance at work. Second, determinants of well-being, health and performance are examined for the intermediate educated group, based on the Job Demands-Resources model.

Design/methodology/approach – Data from The Netherlands Working Conditions Survey 2007 are used: the largest working conditions survey in The Netherlands. ANOVAs with *post hoc* Bonferroni corrections and linear regression analyses are used for the analyses.

Findings – Young intermediate educated employees differ from high educated employees with regard to job demands, job resources and health. They report less demands, but these demands still have an effect on well-being and performance. They also report less resources, while these resources are important predictors of their health and performance: both directly and indirectly via job satisfaction and emotional exhaustion.

Limitations/implications – Cross-sectional data are used and the theoretical model is tested using regression analyses. In a follow-up study, longitudinal data and structural equation modelling will be used.

Originality/value – The study adds to the limited knowledge on young employees with intermediate education and gives insight into the processes that are important for their well-being, health, and performance. The study shows that this group deserves the attention of both researchers and professionals.

Keywords Young adults, Employees, Education, Personal health, Performance management, The Netherlands

Paper type Research paper

Introduction

During the last decades, the labour markets have changed into dynamic, constantly changing environments in which flexibility with regard to work and career is essential. As a result, individuals nowadays have so-called “boundaryless careers”, in which they have to actively seek opportunities and take initiatives to develop their own careers (Arthur *et al.*, 2005; Eby *et al.*, 2003; Clarke, 2009). This may be difficult for specific



groups, in particular for young starting employees. Young employees that have just finished their education have to make many important career decisions during the first few years of their employment, decisions that are likely to have major consequences in their lives (Savickas, 1998). It is of critical importance to gain a better understanding of the well-being and performance at work of young starting employees. Surprisingly, a very small amount of research is available on this group. Research on career development has mainly focussed on aging employees (e.g. Shacklock *et al.*, 2009; Scholarios *et al.*, 2008; Van der Heijden *et al.*, 2009; Van Der Heijden *et al.*, 2008). Furthermore, the few studies that did focus on young employees, were mostly aimed at higher educated employees (i.e. employees that have had a total of 15 years of education or more). Hence, it can be concluded that the large group of employees that has completed an intermediate education (i.e. employees that have had a total of 10-14 years of education) has largely been ignored so far (Raad voor Werk en Inkomen, 2006).

With the previous statements in mind, it is clear that a lack of knowledge exists with respect to the challenges and problems that young employees with intermediate education face while entering the labour market. Additionally, little is known about the well-being, health, and performance of young employees with intermediate education. Since this is a relatively large group on the labour market, it would be of great importance to researchers, employers, and HR managers to gain more knowledge about this group. With this knowledge, negative outcomes such as sickness absence and absence at work might be prevented. Moreover, positive outcomes such as satisfaction and motivation at work might be fostered. This study is specifically designed to gain more knowledge about these important issues. First, young intermediate educated employees (18-25 years) are compared with their lower- and higher educated counterparts on a number of relevant factors regarding the demands and resources in their jobs, as well as their well-being, health and performance. The group with intermediate education consists of employees who have completed either a higher general secondary education, a pre-university education, or an intermediate vocational education. They have had a total of ten-14 years of total education. In contrast, a low education is considered to be nine years of education or less, having completed no education, elementary education, or lower general secondary education. A high education is considered to be 15 years of education or more, having completed a higher vocational education or university education. Second, the determinants of well-being, health and performance among young employees with intermediate education will be examined, using the Job Demands-Resources (JD-R) model (Demerouti *et al.*, 2001) as a theoretical basis.

Well-being, health and performance of young employees

The school-to-work transition can be considered as a long and challenging process. Seeking a suitable job may be a stressor for young workers (Koivisto *et al.*, 2007). The motivation to actively seek a job may also be reduced because young workers often face relatively low wages. This seems to be especially the case in The USA, the UK and The Netherlands, compared to countries like Germany and France (Ryan, 2001). Once they have found a job, young workers face many new challenges and tasks: they have less leisure time, more responsibilities, have to arrange their time in a new way, and have to be more flexible (Ryan, 2001). All these new tasks and responsibilities, as well as the socialization process in their work, can potentially lead to insecurity and stress

(Goodwin and O'Connor, 2007; Koivisto *et al.*, 2007). Furthermore, many young workers only manage to obtain temporary employment, which could potentially lead to additional uncertainty and reduced well-being (Ryan, 2001; Smulders, 2005). In line with these findings, it has been found that younger employees are less engaged in their work (Schaufeli and Bakker, 2004; Smulders, 2005). To conclude, it is clear that young employees who have just entered the labour market, or will be entering the labour market, face important transitions and challenges that deserve the attention of researchers.

It might be particularly important to investigate the intermediate educated group of young employees. Approximately 40 per cent of the Dutch labour market is intermediate educated, thereby making this the largest educational group on the labour market in The Netherlands (Van Eijs, 2003; Schouten, 2009). Additionally, in 2006 approximately 6.5 per cent of the intermediate educated employees on the Dutch labour market was unemployed, which was less than low educated employees, but more than high educated employees (Raad voor Werk en Inkomen, 2006). Moreover, employment opportunities have decreased for young employees, especially for those who have a low or intermediate education (Ryan, 2001). Sickness absence among employees with intermediate education has also been reported as relatively high, caused by factors like a high physical workload, work circumstances that are less favourable compared with higher educated employees, and fewer chances for promotions (Van Cruchten, 1997; Smulders, 2005). Also, the difference in chances on the labour market between lower and higher educated employees on the Dutch labour market seem to be increasing (Raad voor Werk en Inkomen, 2009). At the same time, both research and the media focus on the highest educated employees (i.e. high potentials) and the lowest educated employees (i.e. explicit risk groups), while the intermediate group is largely ignored (Raad voor Werk en Inkomen, 2006). Clearly, more knowledge is needed with regard to young, intermediate educated young employees.

In this study, we will examine to what extent three educational groups of young employees differ with regard to a number of factors related to stressors and resources as work, as well as well-being and performance. Furthermore, we will examine which factors are associated with the well-being, health and performance at work for employees with intermediate education, in comparison with the other two educational groups.

Determinants of well-being of intermediate educated young employees

A theoretical model that is often used to predict well-being at work and has received significant empirical support is the JD-R model (Demerouti *et al.*, 2001). The basis assumption of this model is that occupation-specific risk factors at work can be classified in two general categories: job demands and job resources. The JD-R model is an overarching model that can be applied to various occupational settings, irrespective of the specific demands and resources involved in a particular job setting.

Job demands refer to those physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort or skills and are therefore associated with certain physical and/or psychological costs (Bakker and Demerouti, 2007). Examples of job demands are a high workload and conflict at work. Job demands are not necessarily negative in themselves,

but may turn into stressors when meeting these demands requires high effort from which an employee cannot adequately recover (Meijman and Mulder, 1998).

Job resources are those physical, psychological, social, or organizational aspects of the job that are either functional in achieving work goals, reducing job demands, or stimulating personal growth, learning, and development (Bakker and Demerouti, 2007). Examples of job resources are autonomy and feedback. Job resources are important in their own right, but also help to deal with job demands. Furthermore, resources may be located at different levels: the organization at large (e.g. career opportunities), the interpersonal and social relations level (e.g. social support of the supervisor and/or colleagues), the organization of work (e.g. role clarity), and the task level (e.g. autonomy).

Two different psychological processes underlie the JD-R model: the exhaustion process and the motivation process. In the exhaustion process (or strain process), job demands lead to a state of exhaustion (i.e. burnout) and subsequently to organizational outcomes, such as health problems (Demerouti *et al.*, 2001; Bakker and Demerouti, 2007). This means that exhaustion mediates the relationship between job demands and organizational outcomes. The exhaustion process, including the mediating role of emotional exhaustion, has been found in multiple studies (e.g. Lewig *et al.*, 2007; Hakanen *et al.*, 2006). In the motivation process, job resources lead to a higher level of motivation (e.g. work engagement) and subsequently to organizational outcomes, such as higher performance (Schaufeli and Bakker, 2004; Bakker and Demerouti, 2007; Bakker and Demerouti, 2008). In this process, work engagement mediates the relationship between job resources and organizational outcomes, which has been supported by multiple studies as well (e.g. Schaufeli and Bakker, 2004; Hakanen *et al.*, 2008). In addition to these main effects, it is assumed that an interaction exists between job demands and job resources. Job resources can buffer the effect of certain job demands (Van Der Doef and Maes, 1999; Johnson and Hall, 1988). The assumptions of the JD-R model have gained widespread empirical support (e.g. Hakanen *et al.*, 2006; Xanthopoulou *et al.*, 2007).

The exhaustion process and motivation process both lead to certain organizational outcomes. Important organizational outcomes that have often been the subject of studies using the JD-R model are health (problems) and performance (Demerouti *et al.*, 2001; Bakker and Demerouti, 2007). Both general health and performance have been shown to be related to working conditions (Schreuder *et al.*, 2008; Halbesleben and Wheeler, 2008; Williams and Anderson, 1991). Therefore, these two variables will be used in this study. General health will be measured by the subjective health experience of employees. Performance will be measured by the perceived in-role performance, which refers to the degree to which an employee fulfils the specific tasks that are part of the job (Goodman and Svyantek, 1999). A graphical representation of the research model of the current study is shown in Figure 1.

The exhaustion process: burnout and job demands

Burnout is considered as the central variable in the exhaustion process described by the JD-R model and is traditionally defined as a syndrome of exhaustion, cynicism towards work and reduced personal efficacy (Maslach *et al.*, 1996; Schaufeli and Enzmann, 1998), which is an almost universally accepted definition (Schaufeli *et al.*, 2009). Emotional exhaustion is a form of strain that refers to feelings of being

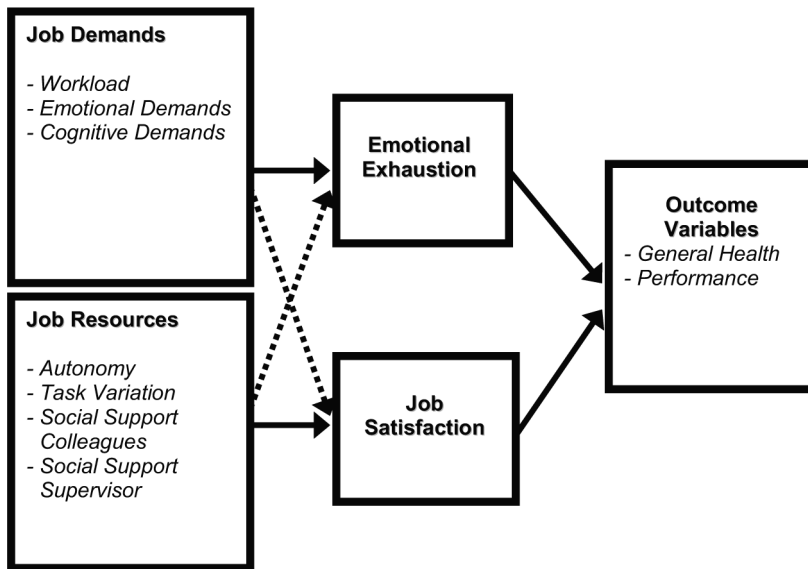


Figure 1.
The JD-R model as used in
the current study

overextended and exhausted by the emotional demands of one's work (Demerouti *et al.*, 2001). Emotional exhaustion is the component of burnout that is most often used as a measure of burnout (Wright and Bonett, 1997; Schaufeli *et al.*, 2009). Moreover, emotional exhaustion is the strongest correlate with job demands and job resources (Lee and Ashforth, 1996). Therefore, emotional exhaustion is considered as the central variable in the exhaustion process in the current study.

Three types of job demands are used in this study:

- (1) workload;
- (2) emotional demands; and
- (3) cognitive demands.

This selection is supported by previous research (e.g. Hackman and Oldham, 1980; Lee and Ashforth, 1996). The variables that are used have been used in previous studies regarding the JD-R model (e.g. Xanthopoulou *et al.*, 2007; Schaufeli and Bakker, 2004). These demands are expected to directly influence emotional exhaustion. They are also expected to indirectly influence general health and performance via emotional exhaustion.

The motivation process: job satisfaction and job resources

Job satisfaction is a construct that has been used often in occupational behaviour research and can be defined as the degree to which an employee appreciates his or her job (Spector, 1997). Although job satisfaction is most often used as an outcome variable, it has also been argued that it predicts performance and health (Gustainiene and Endriulaitiene, 2009). Job satisfaction is a positive measure of well-being and it can therefore be considered part of the motivational process of well-being at work in the JD-R model.

Four job resources were used in this study as part of the motivational process: job autonomy, task variation, social support provided by the supervisor and social support provided by colleagues. These variables have often been used in research concerning well-being and the JD-R model (e.g. Bakker and Demerouti, 2007; Xanthopoulou *et al.*, 2007; Karasek, 1979; Hackman and Oldham, 1976). These resources are expected to directly influence job satisfaction. They are also expected to indirectly influence general health and performance through job satisfaction.

In sum, the following hypotheses are formulated with regard to the determinants of well-being of intermediate educated young employees:

- H1.* Job demands (workload, emotional demands, and cognitive demands) are positively related to emotional exhaustion.
- H2.* Job resources (autonomy, task variation, social support from supervisor, and social support from colleagues) are positively related to job satisfaction.
- H3.* Emotional exhaustion is negatively related to general health and in-role performance.
- H4.* Job satisfaction is positively related to general health and in-role performance.

As mentioned above, we also expect to find evidence for an exhaustion process, as described in the JD-R model. In this process, job demands lead to a state of exhaustion, which subsequently lead to reduced organizational outcomes (Demerouti *et al.*, 2001; Bakker and Demerouti, 2007; Lewig *et al.*, 2007; Hakanen *et al.*, 2006). Hence, emotional exhaustion would mediate the relationship between the job demands and the outcome variables.

- H5a.* Emotional exhaustion mediates the relationship between job demands and general health.
- H5b.* Emotional exhaustion mediates the relationship between job demands and in-role performance.

In a similar way, we expect to find a motivation process, in which job resources lead to an increased satisfaction with work, which subsequently leads to improved organizational outcomes (Schaufeli and Bakker, 2004; Bakker and Demerouti, 2007; Hakanen *et al.*, 2008). In this process, job satisfaction is expected to mediate the relationship between the job resources and the outcome variables.

- H6a.* Job satisfaction mediates the relationship between job resources and general health.
- H6b.* Job satisfaction mediates the relationship between job resources and in-role performance.

Finally, additional analyses will be performed to check whether there are any cross-relationships present between job demands and job satisfaction, and between job resources and emotional exhaustion, for the current target group. In this way, we can explore whether earlier findings regarding the buffering effect of resources in the JD-R

model can be replicated for the group of young employees with intermediate education (Van Der Doef and Maes, 1999; Johnson and Hall, 1988).

Method

Design

Data were derived from The Netherlands Working Conditions Survey (NWCS) that was carried out in 2007 (Van den Bossche *et al.*, 2008). The NWCS is the largest survey on working conditions available in The Netherlands, and serves as a national benchmark for sector-level monitoring. The NWCS constitutes a representative sample of the Dutch workforce in the age of 15-64 years, but excludes self-employed individuals. A total of 80,000 individuals were sampled from the Dutch working population database of Statistics Netherlands. This database includes each of the almost seven million employees in The Netherlands. Sampling was random, except for a 50 per cent over-sampling of employees aged younger than 23 years and employees with a non-western background, because the response rate in these two groups was known to be relatively low.

The individuals in the sample received a written questionnaire by mail at their home address in the first week of November 2007. The questionnaires were accompanied by an answering envelope and an information leaflet in which the purpose of the study was explained and participation was asked. After three to six weeks, reminders were sent to the majority of those who had not yet responded. The questionnaire could be filled out with a pencil, or could be filled out via internet using a personal code that was printed on the questionnaire. As a compensation for participation, gift vouchers of 25 euro were raffled among respondents, resulting in a chance of one in ten to obtain a gift voucher. Instead of having a chance to gain a gift voucher, the participants could choose to donate 2.50 euro to one of the four charities that were mentioned on the questionnaire. The individuals in the sample were given nine weeks to fill out and return the questionnaire.

Participants

A total of 22,759 employees participated in the NWCS 2007. In order to be able to specifically aim this study at young employees, a sub-sample was used for the ANOVAs in this study ($n = 2535$; 50.4 per cent female) to compare the differences between three educational groups. This sub sample consisted of the age group of 18-25 and contained the low educated ($n = 460$), the intermediate educated ($n = 1.477$) and the high educated ($n = 598$) participants of this age group.

The sub-sample of intermediate educated employees ($n = 1.477$; 52 per cent female) was selected for use in the main regression analyses in this study. This sub-sample was in the age range of 18-25 years and had a total of ten-14 years of education. A majority of the participants (65.9 per cent) had completed an intermediate vocational education. Most of them had one paid job (89 per cent) and a little less than half of the respondents (48.4 per cent) had permanent employment. Trade (24.9 per cent) and health and social work (17.5 per cent) were the best represented branches in this sample.

Non-response analyses were performed to see whether the distribution of a number of background variables (e.g. gender and age) was equal to the total sample population from the Dutch working population database of Statistics Netherlands. A number of

minor differences were found, but did not pose a problem since the weighing of these variables ensured that the data were representative for the Dutch labour market. Further details about the characteristics of the participants can be found in Table I.

Measures

Workload. The first type of job demand is workload, which was assessed with a four-item scale, based on the Job Content Questionnaire (Karasek, 1985, 1998). Example items for this scale were: “Do you have to work very fast?” and “Is your work hectic?”. The items were measured on a four-point scale ranging from “never” to “always”. The alpha for this scale was 0.82 in this study.

Emotional demands. The second type of job demands are emotional demands, which were measured with three items that were based on the Copenhagen Psychosocial Questionnaire (Kristensen and Borg, 2000). Example items were: “Is your work emotionally demanding?” and “Are you emotionally attached to your work?”. The items were measured on a four-point scale, ranging from “never” to “always”. Coefficient alpha was 0.78.

Cognitive demands. The third type of job demands are cognitive demands, which were measured with three items that were based on Houtman *et al.* (1995). Example items were: “Does your work require you to think intensively” and “Does your work require you to focus a lot?”. The items were measured on a four-point scale ranging from “never” to “always”. Coefficient alpha was 0.79.

		Percentage
Gender	Male	52.6
	Female	47.4
Education	Intermediate vocational	65.9
	Higher general secondary	34.1
Working hours	< 20	37.4
	20-32	19.8
	> 32	42.8
Occupational area	Agriculture	2.4
	Manufacturing	8.2
	Building and construction	4.9
	Trade	24.9
	Hotels and restaurants	9.3
	Transport	5.4
	Financial Activities	2.0
	Business Activities	13.4
	Public Administration	4.3
	Education	2.3
Number of paid jobs	Health and social work	17.5
	Culture and other services	5.3
Terms of employment	1	89.0
	> 1	11.0
Terms of employment	Permanent	48.4
	Fixed Term	51.4
	Other	0.2

Table I.
Characteristics of
employees aged 18-25
years with intermediate
education

Note: Total $n = 1,477$

Autonomy. Autonomy was the first type of job resource in this study and this was measured using a four-item scale that was based on the Job Content Questionnaire (Karasek, 1985; Karasek *et al.*, 1998). Example items were: “Can you decide for yourself how to perform your job?” and “Can you decide the order of doing your tasks?”. The items were measured on a three-point scale ranging from “yes, most of the time” to “never”. Coefficient alpha was 0.74.

Task variation. The second type of job resource in this study was task variation, which was measured with a three-item scale, based on the Job Content Questionnaire (Karasek, 1985; Karasek *et al.*, 1998). An example item of this scale was “Does your work require creativity?”. The items were measured on a four-point scale, ranging from “never” to “always”. The coefficient alpha was 0.77.

Social support. The third and fourth types of job resources were social support by the supervisor and social support by colleagues. These were both assessed with four items that were based on the Job Content Questionnaire (Karasek, 1985; Karasek *et al.*, 1998) and were translated in Dutch by Houtman *et al.* (1995). Example items were: “My supervisor takes the well-being of the employees into account” and “My colleagues show a personal interest in me”. The items were measured on four-point scales, ranging from “completely disagree” to “completely agree”. The original scale also contained a “not applicable” category, which was not used for the analyses in this study since this category was never chosen by the participants. The alphas of the scales were 0.87, and 0.85, respectively.

Emotional exhaustion. Emotional exhaustion was measured with five items that were based on the Utrecht Burnout Scale (UBOS, Schaufeli and Van Dierendonck, 2000). An example item was: “I feel emotionally exhausted because of my work”. The items were measured on a seven-point scale, ranging from “never” to “every day”. The coefficient alpha for this scale was 0.82.

Job satisfaction. Job satisfaction was measured using two items that were created for the NWCS. An example item was: “All in all, how satisfied are you with your work?”. The items were measured on a five-point scale, ranging from “very unsatisfied” to “very satisfied”. The alpha for this scale was 0.80.

General health. General health (i.e. subjective health experience) was measured with one item: “In general, how do you rate your health?”. This item was derived from the Integrated System of Social Surveys (POLS) (Statistics Netherlands, 2003).

In-role performance. In role performance was measured using three items that were developed for the current questionnaire and were inspired by the criteria of Goodman and Svyantek (1999). An example item was: “I perform well at work”. The items were measured on a five-point scale, ranging from “completely agree” to “completely disagree”. The coefficient alpha was 0.85.

Analyses

Respondents who reported that they were not an employee, but for example worked as a freelancer or were self-employed, were excluded from the analyses, as were those with missing data on gender, age, or educational level. The responses were weighed for gender, age, professional group, ethnic origin, geographic region and educational level, to let the sample distribution correspond to the distribution of these factors of all Dutch employees. The respondents were given a weight that either increased or decreased

their value, to make sure that the data used represented the distribution in the actual labour market.

To test for differences between the three educational groups, one-way ANOVAs were performed. *Post hoc* tests with a Bonferroni correction ($\alpha = 0.05$) were performed to see which aspects differed significantly between the educational groups. Linear regression analyses were performed to test the hypotheses of this study and were performed on the sub-sample of young intermediate educated employees.

Mediation analyses were conducted in accordance with the approach suggested by Baron and Kenny (1986). According to Baron and Kenny (1986), a series of conditions should be met to establish mediation. First, the independent variable must affect the mediator variable. Second, the independent variable must affect the dependent variable. Third, the mediator variable must affect the dependent variable. Finally, the effect of the independent variable on the dependent variable should be smaller in the third condition than it was in the second condition. Sobel tests were used to test for the significance of possible (partial) mediation effects.

Results

Intercorrelations between variables are presented in Table II.

Description of the target group

To investigate possible differences between the three educational groups, ANOVAs were performed with post-hoc comparisons ($n = 2,535$). Comparisons were made between employees with low education (nine years or less education), intermediate education (ten-14 years of education), and high education (15 years or more education). An overview of these results are presented in Table III.

Job demands

With regard to workload, the omnibus ANOVA was significant ($F(2) = 5.21, p < 0.01$). The *post hoc* test showed that there was a significant difference between intermediate and higher education, with intermediate educated employees experiencing significantly less workload ($M = 2.16$ vs $M = 2.25, p < 0.05$). There was no difference between intermediate educated employees and lower educated employees. Similar results were found for cognitive demands. There were overall differences between the groups ($F(2) = 19.48, p < 0.01$) and intermediate educated employees experienced significantly less cognitive demands compared with higher educated employees ($M = 2.74$ vs $M = 3.02, p < 0.05$). Differences were also found for emotional demands ($F(2) = 48.85, p < 0.01$). Intermediate educated employees experienced more emotional demands than lower educated employees ($M = 1.49$ vs $M = 1.42, p < 0.05$), but less than higher educated employees ($M = 1.49$ vs $M = 1.76, p < 0.05$).

Job resources

A significant difference was found between the three educational groups with regard to autonomy ($F(2) = 29.06, p < 0.01$). The *post hoc* test showed that employees with intermediate education experience more autonomy than employees with lower education ($M = 2.35$ vs $M = 2.25, p < 0.05$), but less autonomy than higher educated employees ($M = 2.35$ vs $M = 2.47, p < 0.05$). Differences were also found with regard

	1	2	3	4	5	6	7	8	9	10	11
Workload	—										
Emotional demands	0.38**	—									
Cognitive demands	0.34**	0.37**	—								
Autonomy	-0.09**	-0.06*	0.15**	—							
Task variation	0.14**	0.27**	0.52**	0.23**	—						
Social support supervisor	-0.22**	-0.15**	0.01	0.11**	0.20**	—					
Social support colleague	-0.01	0.02	0.15**	0.04	0.20**	0.27**	—				
Emotional exhaustion	0.33**	0.32**	0.14**	-0.14**	-0.07**	-0.27**	-0.17**	—			
Job satisfaction	-0.20**	-0.15**	0.05	0.16**	0.18**	0.40**	0.23**	-0.39**	—		
General health	-0.05	-0.09**	-0.04	0.04	0.03	0.10**	0.11**	-0.21**	0.16**	—	
Performance	-0.03	-0.06*	-0.09**	0.09**	-0.06**	0.08**	0.06**	-0.20**	0.11**	0.13**	—

Notes: * $p < 0.05$; ** $p < 0.01$; $n=1,477$

Table II.
Intercorrelations of job demands, job resources, well-being, health and performance for young employees (aged 18-25) with intermediate education

CDI 14,7	Low		Intermediate		High		
	M	SD	M	SD	M	SD	
682	<i>Job demands</i>						
	Workload	2.13	0.60	2.16	0.58	2.25 ^b	0.54
	Emotional demands	1.42 ^a	0.56	1.49	0.53	1.76 ^b	0.60
	Cognitive demands	2.76	0.76	2.74	0.72	3.02 ^b	0.69
	<i>Job resources</i>						
	Autonomy	2.25 ^a	0.49	2.35	0.47	2.47 ^b	0.47
	Task variation	2.55	0.82	2.55	0.77	2.86 ^b	0.72
	Social support supervisor	2.95	0.72	2.98	0.64	3.06	0.61
	Social support colleague	3.30	0.53	3.34	0.50	3.42 ^b	0.47
	<i>Well-being, health, and performance</i>						
Emotional exhaustion	1.85	1.10	1.78	1.00	1.86	0.95	
Job satisfaction	3.77	0.87	3.80	0.74	3.86	0.74	
General health	3.53	0.87	3.56	0.85	3.68 ^b	0.80	
Performance	4.46	0.63	4.42	0.57	4.35	0.50	

Table III.
Differences between
intermediate educated
employees, lower
educated employees and
higher educated
employees

Notes: ^a and ^b indicate significant differences in comparison to the intermediate level measured with a *post hoc* Bonferroni test at $p < 0.05$

to task variation ($F(2) = 22.86, p < 0.01$). Intermediate educated employees experienced significantly less task variation than higher educated employees ($M = 2.55$ vs $M = 2.86, p < 0.05$). A similar result was found for social support from colleagues ($F(2) = 7.05, p < 0.01$). Intermediate educated employees experienced significantly less social support from their colleagues than higher educated employees ($M = 3.34$ vs $M = 3.42, p < 0.05$). The omnibus ANOVA did not reach full significance for social support from the supervisor ($F(2) = 2.88, p = 0.06$). Because the ANOVA was marginally significant, a post hoc test was still performed. The results show that there was no difference between intermediate and higher educated employees. The difference between lower educated and higher educated employees was significant however ($M = 2.95$ vs $M = 3.06, p < 0.05$)

Well-being, health and performance

With regard to general health, there were significant differences between the three educational groups ($F(2) = 4.10, p < 0.05$). Intermediate educated employees reported a slightly lower degree of general health than higher educated employees ($M = 3.56$ vs $M = 3.68, p = 0.051$). Finally, the omnibus ANOVA for performance was significant ($F(2) = 4.45, p < 0.05$). Intermediate educated employees did not differ from lower or higher educated employees. There was, however, a difference between lower and higher education ($M = 4.42$ vs $M = 4.35, p < 0.05$): lower educated employees perceived their performance as higher compared with higher educated employees. No differences were found between the three groups with regard to emotional exhaustion ($F(2) = 1.75, p = 0.17$) and job satisfaction ($F(2) = 1.10, p = 0.17$).

In sum, the intermediate educated group and the higher educated group differ in terms of the job demands and the job resources they experience. Intermediate educated employees experience less job demands, but also less job resources. The intermediate educated employees also feel less healthy compared with the higher educated group. The intermediate group and the lower group showed very few differences.

Determinants of emotional exhaustion and job satisfaction

The analyses regarding the determinants of well-being and performance were performed with a specific focus on the subgroup of young intermediate educated employees ($n = 1,477$). Comparisons with the low educated ($n = 460$) and high educated ($n = 598$) employees were also made. As the current study focuses mainly on employees with intermediate education, no further attention is paid to these comparisons here. The interested reader is referred to the Appendix for the tables with the comparisons between the three educational groups (Tables AI–AVIII).

Job demands

The regression analyses for the main effects of job demands on emotional exhaustion and job satisfaction are presented in Table IV. Workload and emotional demands were positively associated with emotional exhaustion ($\beta = 0.25$, $p < 0.01$ and $\beta = 0.24$, $p < 0.01$, respectively). Cognitive demands showed no relationship with emotional exhaustion. These results partially supported *H1*, which stated that job demands are positively related to emotional exhaustion.

The cross-relationships between the job demands and job satisfaction were also tested. Workload ($\beta = -0.20$, $p < 0.01$) and emotional demands ($\beta = -0.13$, $p < 0.01$) both had a negative relationship with job satisfaction. Cognitive demands were positively related to job satisfaction ($\beta = 0.18$, $p < 0.01$).

Job resources

The regression analyses for the main effects of job resources on emotional exhaustion and job satisfaction are presented in Table V. Autonomy and task variation were positively associated with job satisfaction ($\beta = 0.10$, $p < 0.01$ and $\beta = 0.06$, $p < 0.01$, respectively). Social support from the supervisor and from colleagues were also positively related to job satisfaction ($\beta = 0.34$, $p < 0.01$ and $\beta = 0.12$, $p < 0.01$, respectively). These results fully supported *H2*, which stated that job resources are positively related to job satisfaction.

The cross-relationships between job resources and emotional exhaustion were also tested. Autonomy ($\beta = -0.14$, $p < 0.01$), social support of the supervisor ($\beta = -0.22$, $p < 0.01$) and social support of the colleagues ($\beta = -0.08$, $p < 0.01$) were negatively associated with emotional exhaustion. Task variation was not associated with emotional exhaustion.

	Emotional exhaustion		Job satisfaction	
	β	ΔR^2	β	ΔR^2
Step 1		0.01*		0.00
Gender	-0.00		-0.03	
Age	0.09*		-0.05	
Step 2		0.15*		0.07*
Workload	0.25*		-0.20*	
Emotional demands	0.25*		-0.13*	
Cognitive demands	-0.05		0.18*	

Note: * $p < 0.01$

Table IV.
Gender and age adjusted
regression coefficients of
the associations of job
demands with emotional
exhaustion and job
satisfaction

Determinants of general health and performance

Job demands

The regression analyses for the associations between job demands and the outcome variables general health and performance are presented in Table VI (step 2). Contrary to the expectations, none of the job demand variables had a significant association with general health. However, without the use of gender as a control variable there was a significant and negative relationship between emotional demands and general health ($\beta = -0.08, p < 0.05$). Furthermore, only cognitive demands had a significant and negative relationship with performance ($\beta = -0.07, p < 0.05$).

Job resources

The results of the regression analyses for the associations of job resources with the outcome variables are presented in Table VII (step 2). Social support of the supervisor and social support of the colleagues were positively related to general health ($\beta = 0.08, p < 0.05$ and $\beta = 0.09, p < 0.01$, respectively). Autonomy ($\beta = 0.05, p = 0.13$) and task variation ($\beta = -0.02, p = 0.58$) were not significantly associated with general

Table V.
Gender and age adjusted regression coefficients of the associations of job resources with emotional exhaustion and job satisfaction

	Emotional exhaustion		Job satisfaction	
	β	ΔR^2	β	ΔR^2
Step 1		0.01*		0.00
Gender	0.02		-0.03	
Age	0.07*		-0.05	
Step 2		0.09**		0.19**
Autonomy	-0.14**		0.11**	
Task variation	-0.01		0.07*	
Social support supervisor	-0.22**		0.33**	
Social support colleague	-0.08**		0.12**	

Note: * $p < 0.05$; ** $p < 0.01$

Table VI.
Gender and age adjusted regression coefficients of the associations of job demands and emotional exhaustion with general health and performance

	General health		Performance	
	β	ΔR^2	β	ΔR^2
Step 1		0.02**		0.00
Gender	-0.13**		0.03	
Age	-0.07**		0.01	
Step 2		0.00		0.01*
Workload	-0.02		0.02	
Emotional demands	-0.04		-0.05	
Cognitive demands	-0.02		-0.07*	
Step 3		0.03**		0.04**
Workload	0.03		0.07*	
Emotional demands	0.01		0.01	
Cognitive demands	-0.03		-0.08**	
Emotional exhaustion	-0.21**		-0.22**	

Note: * $p < 0.05$; ** $p < 0.01$

	General health		Performance	
	β	ΔR^2	β	ΔR^2
Step 1		0.02**		0.00
Gender	-0.11**		0.03	
Age	-0.06*		-0.01	
Step 2		0.02**		0.03**
Autonomy	0.05		0.11**	
Task variation	-0.02		-0.12**	
Social support supervisor	0.08*		0.05	
Social support colleague	0.09**		0.06*	
Step 3		0.01**		0.01**
Autonomy	0.03		0.10**	
Task variation	-0.03		-0.12**	
Social support supervisor	0.04		0.03	
Social support colleague	0.08*		0.05	
Job satisfaction	0.12**		0.08*	

Note: * $p < 0.05$; ** $p < 0.01$

Table VII.
Gender and age adjusted
regression coefficients of
the associations of job
resources and job
satisfaction with general
health and performance

health. Autonomy ($\beta = 0.11$, $p < 0.01$) and social support of the colleagues ($\beta = 0.06$, $p < 0.05$) were positively related to performance.

Contrary to the expectations, task variation was negatively related to performance ($\beta = -0.12$, $p < 0.01$). Social support of the supervisor was positively related to performance, as expected, but this relationship was only marginally significant ($\beta = 0.05$, $p = 0.09$).

Testing the exhaustion process

Regression analyses were performed to check the associations of emotional exhaustion with general health and performance. Emotional exhaustion had a significant negative relationship with general health ($\beta = -0.21$, $p < 0.01$) and performance ($\beta = -0.20$, $p < 0.01$), thereby fully supporting *H3*.

As stated in *H5a* and *H5b*, it was expected that emotional exhaustion would mediate the relationship between job demands (workload, emotional demands, and cognitive demands) and the outcome variables (general health and in-role performance). As presented in Table VI (step 3), emotional exhaustion was added in the third step of the regression analysis and showed a significant negative relationship with general health ($\beta = -0.21$, $p < 0.01$). However, mediation by emotional exhaustion was not further tested since none of the job demands showed a significant relationship with general health. As stated above, emotional demands did have a significant and negative association with general health if gender was not used as a control variable. Mediation was tested for this association since it was no longer significant when emotional exhaustion was added. The indirect association of emotional demands with general health was significant (Sobel statistic $t = -6.73$, $p < 0.01$). However, this mediation effect only existed when not controlling for gender. Therefore, *H5a* was not supported by these results.

Emotional exhaustion also showed a negative relationship with performance ($\beta = -0.22$, $p < 0.01$). However, as the associations of the job demands did not decrease with the addition of emotional exhaustion, it was concluded that emotional

exhaustion did not mediate the relationship between job demands and performance. These results did not support *H5b*.

Testing the motivation process

Regression analyses were performed to check the associations of job satisfaction with the outcome variables (Table VII). Job satisfaction had a significant positive relationship with general health ($\beta = 0.16, p < 0.01$) and performance ($\beta = 0.11, p < 0.01$). The results fully supported *H4*.

As stated in *H6a* and *H6b*, it was expected that job satisfaction would mediate the relationship between job resources (autonomy, task variation, social support from the supervisor and social support from colleagues) and the outcome variables (general health and in-role performance). As can be seen in Table VII (step 3), job satisfaction had a positive association with general health ($\beta = 0.12, p < 0.01$). Social support of the supervisor did not have a significant association anymore in this third step ($\beta = 0.04, p = 0.25$). Social support of the colleagues was still significant, but the association was smaller ($\beta = 0.08, p < 0.05$). Sobel tests were performed to check if the indirect associations were indeed significant. The indirect associations of social support by the supervisor and social support by colleagues were both significant (Sobel statistic $t = 2.84, p < 0.01$ and $t = 3.07, p < 0.01$, respectively). It is concluded that job satisfaction fully mediates the relationship between social support of the supervisor and general health and partially mediates the relationship between social support of the colleagues and general health. These results partially supported *H6a*.

Table VII (step 3) further shows that job satisfaction was also positively related to performance ($\beta = 0.08, p < 0.05$). Task variation still had a significant and negative association with performance ($\beta = -0.12, p < 0.01$). The association of autonomy was still significant as well, but it was smaller ($\beta = 0.10, p < 0.01$). Social support from colleagues was reduced to a marginally significant association in this step ($\beta = 0.05, p = 0.09$). Sobel tests were performed to check for mediation by job satisfaction. The indirect association of autonomy was significant, but the indirect association of social support of colleagues only reached marginal significance (Sobel statistic $t = 2.39, p < 0.05$ and $t = 1.76, p = 0.08$, respectively). It is concluded that job satisfaction partially mediated the relationship between autonomy and performance, but it does not mediate the relationship between social support of the colleagues and performance. These results offer partial support for *H6b*.

Additional mediation analyses

Additional regression analyses were performed to check whether mediation was present with regard to the cross-relationships (i.e. job demands with job satisfaction; job resources with emotional exhaustion), as was announced in the Introduction.

Social support provided by the supervisor and by the colleagues both had a direct association with general health ($\beta = 0.08, p < 0.05$ and $\beta = 0.09, p < 0.01$, respectively). Furthermore, the indirect associations of social support by the supervisor and social support by colleagues (via emotional exhaustion) with general health were both significant (Sobel statistic $t = 3.01, p < 0.01$ and $t = 2.99, p < 0.01$, respectively). It is concluded that emotional exhaustion fully mediated the relationship between social support of the supervisor and general health and that it partially mediated the relationship between social support of the colleagues and general health.

Autonomy and social support provided by colleagues were both significantly associated with performance ($\beta = 0.11, p < 0.01$ and $\beta = 0.06, p < 0.05$, respectively). The indirect associations of autonomy and social support by the colleagues (via emotional exhaustion) with performance were also significant (Sobel statistic $t = 2.99, p < 0.01$ and $t = 2.09, p < 0.05$, respectively). It is concluded that emotional exhaustion partially mediates the relationship between autonomy and performance and that it fully mediates the relationship between social support of the colleagues and performance.

No indirect cross-relationships were found for the job demands variables, implying that job satisfaction did not mediate the relationship between job demands and the outcome variables.

Discussion

Little is known about the many challenges and changes that young employees with intermediate education face when entering the labour market and what kind of effects these challenges and changes have on their well-being, health and performance. Therefore, this study examined the well-being, health and performance of young employees (18-25 years) with intermediate education. First, as an exploration, intermediate educated employees (10-14 years of education) were compared with low educated (nine years or less) and high educated (15 years or more) employees on a number of factors related to demands, resources, well-being, health, and performance at work. Second, determinants of well-being were examined among intermediate educated young employees. It was expected that the basic assumptions of the JD-R model (Demerouti *et al.*, 2001) would be confirmed for this group. Comparisons with employees with low education and high education are shown in the Appendix.

The main conclusions of this study are that while young intermediate educated employees experience less job resources compared with their higher educated counterparts, these resources are important determinants of their well-being at work, both via an exhaustion- and a motivation process. Furthermore, employees with intermediate education experience less job demands compared with higher educated employees, but these demands do affect their well-being at work, albeit less clearly than expected.

Differences between educational levels

The results indicated that the differences between low educated and intermediate educated young employees appeared to be small. The only differences were that intermediate educated employees experienced more emotional demands and more autonomy in their jobs compared with low educated employees. Overall though, these two educational groups seem to be more alike than they are different.

The differences between intermediate educated employees and high-educated employees were more prominent. The two groups differed on all of the job demands, with intermediate educated employees experiencing less job demands (workload, emotional demands, and cognitive demands) compared with their higher educated counterparts. The groups also differed on most of the job resources, with the intermediate educated employees experiencing less job resources (autonomy, task variation, and social support given by colleagues) compared with high-educated employees. The only resource on which the groups did not differ, was social support

provided by the supervisor. This difference was marginally significant. The intermediate educated employees did not differ from high-educated employees with regard to emotional exhaustion, job satisfaction and performance. Employees with intermediate education did experience a somewhat poorer health compared with the higher educated employees.

Taken together, these results give a comprehensive overview of the similarities and differences between the three educational groups of young employees. The main conclusion is that intermediate educated employees are quite similar to low educated employees with respect to job demands, job resources, well-being, health and performance. Compared with high-educated employees however, they experience less job demands, less job resources and a poorer health.

Determinants of emotional exhaustion and job satisfaction

In line with the expectations, workload and emotional demands were associated with emotional exhaustion among young employees with intermediate education. Employees experiencing a higher level of workload and emotional demands were more likely to be emotionally exhausted. These findings are in line with the assumption that job demands lead to emotional exhaustion (Demerouti *et al.*, 2001). Cognitive demands, however, were not related to emotional exhaustion. Surprisingly, cognitive demands did have a significant and positive relationship with job satisfaction. This means that young intermediate educated employees are more satisfied about their jobs if their work is cognitively demanding. This finding is in contrast with earlier findings regarding the exhaustion- and motivation process presented in the JD-R model (Demerouti *et al.*, 2001; Bakker and Demerouti, 2007). A possible explanation could be that high cognitive demands are an indication of the opportunity to learn and develop at work for these young workers. As such, cognitive demands may be perceived as a positive aspect of one's work.

As expected, all of the job resources were related to job satisfaction. Young intermediate educated employees were more satisfied with their jobs when they experienced more autonomy, more variation in their tasks, and more social support provided by the supervisor and colleagues. These findings support the assumptions of the motivation process of the JD-R model (Schaufeli and Bakker, 2004; Bakker and Demerouti, 2007).

Determinants of health and performance

Job demands generally appeared to be hardly associated with general health and performance. We assume that this might reflect a qualitatively different process for young intermediate educated employees, compared with the higher educated and/or older groups that have been the target populations of most research so far. Apparently, job demands are of relatively little importance with regard to health and performance of young intermediate educated employees. It should be noted that this group experienced less job demands compared with higher educated employees. This might reflect a relatively high resistance to job demands for young employees, which could in turn mean that these young workers are better able to cope with demanding work conditions.

One additional comment that should be made here is that emotional demands actually seemed to have a strong association with health, but this association

disappeared when corrected for gender. It would seem that women, compared to men, are more sensitive to emotional demands and therefore, it might be interesting to focus on gender differences in future research.

Another interesting and unexpected finding was that task variation had a negative relationship with in-role performance. This means that the more variation a job requires and the more creativity is necessary to perform a job, the worse individuals perform. Given that task variation was framed as a job resource in this study, this was an unexpected finding. Apparently, for young intermediate educated employees that are starting their careers, too much variation and creativity in their jobs may have a counterproductive effect. These young employees already face many new tasks and responsibilities and may therefore be negatively affected by additional variation in their jobs. This supports the statements of Goodwin and O'Connor (2007), who claim that young employees may be overwhelmed by the large amount of new tasks and responsibilities. Task variation then, may be unsuitable to use as a job resource for young employees with intermediate education, and could even function as a job demand for this group.

An important finding was that, overall, the young intermediate educated employees value the social support provided by their colleagues more than the social support provided by the supervisor. Social support by the colleagues was more prominently related to the subjective health experience and to the in-role performance. This finding is interesting, because it is usually found that the supervisor has a stronger impact on various outcome variables (e.g. Ouweneel *et al.*, 2009; Tannenbaum, 1997). For young intermediate educated employees, it would seem that they value the support of their peers more than the support of their supervisor. This is a finding that may characterize a unique aspect of a young target group. Because our target group consists, at least partially, of adolescent employees, a parallel might be found with research on the influence of peers on adolescents. Research has indicated that adolescents are particularly susceptible for peer influence (Maxwell, 2002). This can occur both in a negative way (e.g. peers may sometimes increase risk behaviour) and a positive way (e.g. peers can act as a buffer against negative outside influences). A similar process may occur on the work floor, with the young employees being more susceptible to support from their colleagues, compared with support from their supervisor. This issue should be taken into account in future research.

The exhaustion process and motivation process

Emotional exhaustion was related to both the health of young intermediate educated employees and to their performance. Employees who reported a higher level of emotional exhaustion, felt less healthy and perceived their performance as worse. These findings are in line with earlier studies which found that emotional exhaustion was negatively related to health and performance (Demerouti *et al.*, 2001; Bakker and Demerouti, 2007).

Contrary to the expectations, however, emotional exhaustion did not mediate the relationship between job demands and general health, nor did it mediate the relationship between job demands and performance. None of the job demands (task, emotional, and cognitive demands) were related to general health, so emotional exhaustion could not mediate these relationships. In the case of performance, only the

cognitive demands showed a significant association, but this did not decrease with the addition of emotional exhaustion. These are surprising findings that contradict the basic assumptions of the JD-R model (Demerouti *et al.*, 2001).

Job satisfaction was related to health and to performance of young intermediate educated employees. Employees that were more satisfied with their jobs, felt healthier and perceived their performance as better. These findings are in line with earlier findings regarding job satisfaction (Schreuder *et al.*, 2008; Halbesleben and Wheeler, 2008; Williams and Anderson, 1991) and the motivation process described in the JD-R model (Schaufeli and Bakker, 2004).

In line with the expectations, job satisfaction mediated the relationship between social support and health of young intermediate educated employees. A higher level of perceived support provided by the supervisor was associated with a higher level of job satisfaction, and subsequently with a higher level of perceived health. The same was found for social support given by colleagues. However, the association of social support given by colleagues was only partially mediated: it also had a unique association with general health. This may again illustrate the relative importance of peers for young workers, as noted above. Job satisfaction did not mediate the associations of autonomy and task variation with general health. These results partially confirm the assumptions regarding the motivation process of the JD-R model (Schaufeli and Bakker, 2004). It should be noted however, that mixed results have been found before: not all of the job resources were consistently mediated in previous studies (e.g. Mauno *et al.*, 2007; Hakanen *et al.*, 2008).

With regard to in-role performance, job satisfaction appeared to be a mediator in the relationship between autonomy and performance. This means that a higher level of perceived autonomy was associated with higher levels of job satisfaction, which subsequently affected performance. Furthermore, an indication was found that job satisfaction mediates the relationship between social support given by colleagues and performance, but this mediation was only marginally significant. No mediation was found for task variation and social support given by the supervisor. Again, these results partially confirm the assumptions regarding the motivation process of the JD-R model (Schaufeli and Bakker, 2004; Bakker and Demerouti, 2007). The results also support the adequacy of using job satisfaction as the central variable in the motivation process, since it mediated multiple relationships between the job resources and the outcome variables.

Cross-relationships

While job resources played an important role in the motivation process among young intermediate educated employees, the job resources also proved to be relevant for the exhaustion process. A higher level of social support (both by the supervisor and the colleagues) was related to a lower level of emotional exhaustion, which was subsequently associated with a higher level of health. In addition, a higher level of autonomy and social support given by colleagues was related to a lower level of emotional exhaustion, which was subsequently associated with a higher level of performance. It seems that job resources have a buffering effect on the exhaustion process, thereby supporting earlier findings in this area regarding the buffer hypothesis (Bakker and Demerouti, 2007). It should be noted, however, that the job demands in themselves had little effect on health and performance in

the first place. Hence, job resources, compared with job demands, may be more important determinants of well-being, health and performance of young intermediate educated employees.

Importance of investigating separate groups

The determinants of well-being, health and performance were also examined for the low educated and high educated groups. Because this study focuses mainly on determinants of well-being for employees with intermediate education, we did not elaborate on the other two groups here. However, as can be seen in the Appendix, it seems clear that the determinants differ in various ways between the three educational groups. These differences illustrate the importance of distinguishing between educational levels, since the well-being, health and performance of each educational group is determined by distinct processes. It also underlines the uniqueness of the intermediate educated group and supports, in this way, the value of focussing on this often neglected group.

Limitations and suggestions for future research

Despite the large sample size and nationally representative nature of the sample, a limitation of this study was its cross-sectional nature. Cross-sectional designs only show a measure of one specific point in time and are therefore not very well suited to test for causal relationships and mediation effects: the cross-sectional design limits the interpretation of indirect relationships (Taris and Kompier, 2006). Therefore, longitudinal data are needed to confirm the findings of this study. Follow-up assessments of the sample used for this manuscript will be available in the near future (Netherlands Working Conditions Cohort Study (NWCCS)) and longitudinal analyses will be performed to verify the present findings.

A second limitation was the use of regression analyses to test the assumptions of the JD-R model, especially the mediation effects. Structural equation modelling should be more suitable for this purpose and has often been used in other in JD-R related studies (e.g. Xanthopoulou *et al.*, 2007). This was not done in the current study because the variables in the dataset were weighed to represent the Dutch labour market and structural equation modelling requires the user to undo the weights. The weights were especially important for the comparisons between the educational groups and were therefore sustained to be able to make a representative comparison with the entire Dutch labour market. In the follow-up study, using the NWCCS data, the central aim will be the testing of the theoretical model, making the weights far less important. Therefore, structural equation modelling will be used in the follow-up study to further verify the assumptions of the JD-R model for the young intermediate educated employees.

Another possible limitation was the use of job satisfaction as the central mediator variable in the JD-R model. Although it is applicable and the results were in line with our expectations, it is more common to use work engagement as the central variable of the motivation process (Schaufeli and Bakker, 2004; Bakker and Demerouti, 2008). Work engagement is assumed to be the positive counterpart of burnout and can be defined as a positive, fulfilling, work-related state of mind that is characterized by vigour, dedication, and absorption (Schaufeli *et al.*, 2002) and it is related to performance in a positive way (Bakker *et al.*, 2008a, b). Work engagement is a more

active motivational aspect of well-being and might be better suitable as the central variable of the motivation process. In the NWCCS study, work engagement is available, and will therefore be used as the central variable in the motivation process.

Self-report measures were used in this study to measure health and performance. These measures are valuable in their own right, but have an intrinsic subjective aspect. Therefore, it would be interesting to combine these with more objective measures of health and performance as outcome variables. For instance, in some professions objective sales performances could be used as an objective measure for performance (Bakker *et al.*, 2008a, b), whereas medical databases could be used as indicators of more objective health criteria.

The amount of explained variance in the current study seemed to be modest for a number of variables. A possible explanation is that a limited number of variables was used in each regression analysis, most notably that the job demands and the job resources were analyzed separately. Moreover, the job demands and job resources that were included in this study are not the only possible work characteristics to be used in JD-R related research. Other demands (e.g. conflict at work) and resources (e.g. feedback) have been studied in previous research and might add to the explained variance in this study. Future studies should explore the influence of other job demands and job resources as well, to replicate and expand the current findings.

Finally, this study made use of the NWCS 2007, which gives an overview of the working conditions in the Dutch labour market. This could possibly pose generalization problems to the working conditions of the labour markets in other countries. Therefore, generalizations of the current findings to employees outside of the Dutch labour market should be made with caution.

Practical implications

Employers and HR managers should be aware that job resources are of great importance to young intermediate educated employees. At this point, it appears that this group experiences less resources compared with higher educated employees, but at the same time these resources are important predictors for their health and performance. The balance between demands and resources at work should be monitored for this group and close attention should be paid to the provision of sufficient resources in their jobs, such as autonomy at work and social support provided both by the supervisor and the colleagues.

This study showed that the support that is provided by colleagues might be especially important for young employees. Therefore, it is important for employers and HR managers that attempts are made to optimize the social ties between colleagues, for instance by organizing informal activities. Another possibility would be to assign a colleague to be a mentor to young employees that have recently started a job in their company. This form of support could help the young employees get through their socialization process after they have just started a new job.

Another practical implication of this study is that young employees with intermediate education perform less well when they experience more variation in their tasks. This means that employers should carefully watch the job requirements of employees that are just starting a new job and should monitor whether new employees are able to adjust to their job. New employees should not have too many different tasks and responsibilities.

Theoretical implications

This study has provided insight into the working conditions, well-being, health and performance of young employees with intermediate education. We have provided an overview of the similarities and differences between three educational groups of young employees. Low and intermediate educated young employees are more similar than they are different, but higher educated employees differ from intermediate educated employees on most of the working condition and well-being indicators. Furthermore, this study has added to the theoretical knowledge of the JD-R model by showing that several assumptions are also applicable to a young intermediate educated group of employees. The study has also shown that some processes are apparently different for this specific group, most notably with respect to the (important) role of job resources. We hope that these results will serve as an impetus for future research among young employees with intermediate education.

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Appendix

In Tables AI-AVIII, B is represented in stead of β , since comparisons are made *between* groups.

Table AI.
Gender and age adjusted regression coefficients of the associations of job demands with emotional exhaustion

	Emotional exhaustion					
	Low		Intermediate		High	
	B	ΔR^2	B	ΔR^2	B	ΔR^2
Step 1		0.01*		0.01*		0.00
Gender	0.11		-0.01		0.07	
Age	0.06*		0.04*		0.03	
Step 2		0.20*		0.15*		0.20*
Workload	0.55*		0.43*		0.43*	
Emotional demands	0.50*		0.46*		0.50*	
Cognitive demands	-0.03		-0.06		-0.03	

Note: * $p < 0.01$

Table AII.
Gender and age adjusted regression coefficients of the associations of job demands with job satisfaction

	Job satisfaction					
	Low		Intermediate		High	
	B	ΔR^2	B	ΔR^2	B	ΔR^2
Step 1		0.02*		0.00		0.01
Gender	-0.15*		-0.04		-0.11	
Age	-0.05*		-0.02		0.02	
Step 2		0.08*		0.07*		0.06*
Workload	-0.29*		-0.26*		-0.15	
Emotional demands	-0.28*		-0.19*		-0.24*	
Cognitive demands	0.10*		0.18*		0.20*	

Note: * $p < 0.01$

	Emotional exhaustion					
	Low		Intermediate		High	
	B	ΔR^2	B	ΔR^2	B	ΔR^2
Step 1		0.02**		0.01*		0.00
Gender	0.19*		0.03		0.06	
Age	0.06**		0.04*		0.01	
Step 2		0.11**		0.09**		0.06**
Autonomy	0.13		-0.29**		0.03	
Task variation	-0.10*		-0.01		0.08	
Social support supervisor	-0.30**		-0.35**		-0.33**	
Social support colleague	-0.39**		-0.16**		-0.13	

Note: * $p < 0.05$; ** $p < 0.01$

Table AIII.
Gender and age adjusted regression coefficients of the associations of job resources with emotional exhaustion

	Job satisfaction					
	Low		Intermediate		High	
	B	ΔR^2	B	ΔR^2	B	ΔR^2
Step 1		0.02**		0.00		0.01
Gender	-0.24**		-0.05		-0.10	
Age	-0.03*		-0.02		0.02	
Step 2		0.16**		0.19**		0.19**
Autonomy	0.14*		0.18**		0.00	
Task variation	0.11**		0.07*		0.13*	
Social support supervisor	0.28**		0.39**		0.41**	
Social support colleague	0.31**		0.18**		0.14	

Note: * $p < 0.05$; ** $p < 0.01$

Table AIV.
Gender and age adjusted regression coefficients of the associations of job resources with job satisfaction

	General health					
	Low		Intermediate		High	
	B	ΔR^2	B	ΔR^2	B	ΔR^2
Step 1		0.02**		0.02**		0.01
Gender	-0.27**		-0.22**		-0.17	
Age	-0.01		-0.03		-0.03	
Step 2		0.02**		0.00		0.01
Workload	-0.15**		-0.03		-0.10	
Emotional demands	-0.11*		-0.06		-0.11	
Cognitive demands	0.07		-0.02		0.09	
Step 3		0.05**		0.03**		0.03**
Workload	-0.04		0.05		-0.03	
Emotional demands	-0.01		0.02		-0.04	
Cognitive demands	0.07		-0.03		0.08	
Emotional exhaustion	-0.20**		-0.18**		-0.15**	

Notes: * $p < 0.05$; ** $p < 0.01$; emotional exhaustion fully mediated the relationship between workload and general health (sobel statistic $t=6.46$, $p < 0.01$), and between emotional demands and general health (sobel statistic $t=2.89$, $p < 0.01$) for the low educated group

Table AV.
Gender and age adjusted regression coefficients of the associations of job demands and emotional exhaustion with general health

Table AVI.
Gender and age adjusted regression coefficients of the associations of job demands and emotional exhaustion with performance

	Performance					
	Low		Intermediate		High	
	B	ΔR^2	B	ΔR^2	B	ΔR^2
Step 1		0.01**		0.00		0.00
Gender	-0.13**		0.03		-0.01	
Age	0.01		0.00		-0.01	
Step 2		0.01**		0.01*		0.01
Workload	-0.05		0.02		-0.03	
Emotional demands	-0.11**		-0.05		-0.06	
Cognitive demands	0.04		-0.06*		-0.04	
Step 3		0.06**		0.04**		0.01*
Workload	0.04		0.07*		-0.00	
Emotional demands	-0.04		0.01		-0.02	
Cognitive demands	0.03		-0.07**		-0.04	
Emotional exhaustion	-0.16**		-0.13**		-0.07*	

Note: * $p < 0.05$; ** $p < 0.01$; emotional exhaustion fully mediated the relationship between emotional Demands and performance (sobel statistic $t=6.76$, $p < 0.01$) for the low educated group

Table AVII.
Gender and age adjusted regression coefficients of the associations of job resources and job satisfaction with general health

	General health					
	Low		Intermediate		High	
	B	ΔR^2	B	ΔR^2	B	ΔR^2
Step 1		0.04**		0.02**		0.01
Gender	-0.33**		-0.19**		-0.17	
Age	0.00		-0.03*		0.02	
Step 2		0.08**		0.02**		0.06**
Autonomy	-0.09		0.09		0.06	
Task variation	0.10**		-0.02		0.08	
Social support supervisor	-0.08		0.10*		0.14	
Social support colleague	0.46**		0.15**		0.22*	
Step 3		0.01*		0.01**		0.02*
Autonomy	-0.10		0.06		0.06	
Task variation	0.10*		-0.03		0.07	
Social support supervisor	-0.10*		0.05		0.08	
Social support colleague	0.44**		0.13*		0.20*	
Job satisfaction	0.07*		0.13**		0.15*	

Note: * $p < 0.05$; ** $p < 0.01$

Table AVIII.

Gender and age adjusted regression coefficients of the associations of job resources and job satisfaction with performance

	Performance					
	Low		Intermediate		High	
	B	ΔR^2	B	ΔR^2	B	ΔR^2
Step 1		0.01		0.00		0.00
Gender	-0.09*		0.04		-0.04	
Age	0.01		-0.00		0.07	
Step 2		0.05**		0.03**		0.03
Autonomy	0.06		0.14**		0.05	
Task variation	0.00		-0.09**		-0.12**	
Social support supervisor	-0.04		0.05		0.07	
Social support colleague	0.28**		0.07*		0.00	
Step 3		0.01**		0.01**		0.00
Autonomy	0.04		0.13**		0.05	
Task variation	-0.00		-0.09**		-0.12**	
Social support supervisor	-0.06		0.02		0.07	
Social support colleague	0.25**		0.06		-0.00	
Job satisfaction	0.08**		0.06*		0.01	

Note: * $p < 0.05$; ** $p < 0.01$

About the authors

Jos Akkermans is a Work and Organizational Psychologist who graduated at Utrecht University, The Netherlands. He is working on this PhD study that focuses on young employees with intermediate education (i.e. 10-14 years of education). The aims of the study are to give more insight into the well-being and performance of this specific group, and to develop the CareerSkills group intervention that will stimulate the career development of this group. Jos is working in cooperation with the Netherlands Association for Applied Scientific Research (TNO). Career Competencies and Employability will have a central role in this study. Jos Akkermans is the corresponding author and can be contacted at: t.j.akkermans@uu.nl

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