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Working in Sheltered Employment: A Weekly Diary Study

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This study examined the work outcomes of 81 individuals with a physical, cognitive, or psychological disability who worked at a sheltered workshop and filled out a total of 309 weekly questionnaires on 4 or 5 consecutive weeks. In line with the job demands–resources model, multilevel analyses showed that exhaustion was higher as participants experienced more physical demands and higher work load. Work engagement was higher as participants experienced more support and higher autonomy at work. Self-rated productivity was higher as participants experienced higher autonomy, higher work load, and lower mental demands. In addition, week-specific variations in work load contributed to these work outcomes: Weeks with relatively high work load resulted in high work engagement, high exhaustion, and high productivity. Moreover, in line with the person–environment fit theory, a good person–job fit was related to lower exhaustion and to higher work engagement. It is concluded that a good match between the job and the individual's abilities and needs with regard to job demands and job resources will benefit both the productivity and well-being of individuals with a work handicap. In addition, it is concluded that both the job demands–resources model and the person–environment fit theory are well applicable to disabled individuals in sheltered workshops, which contributes to the robustness of both theories.

Keywords: sheltered workshops, diary study, job demands–resources model, person–environment fit

Labor participation among individuals with disabilities is substantially lower than among the general population throughout the world (International Labour Organization, 2015). For those who are unable to perform regular work, employment in organizations specifically designed to employ individuals with disabilities, called sheltered workshops, may be an alternative. Most European countries, as well as other developed countries, including the United States of America, Australia, New Zealand, South Africa, and Israel, offer such sheltered employment to workers with disabilities (Akkerman, Janssen, Kef, & Meininger, 2016; International Labour Organization, 2015; Mallender et al., 2015). In the Netherlands (where this study was conducted), the Law on Sheltered Employment is meant for individuals who are unable to work without support due to a physical handicap, a cognitive impairment, or a psychiatric illness (Rijksoverheid, 2017). In general, employees of sheltered workshops do not rotate jobs, but are restricted to a limited set of tasks with little variation and limited control possibilities. Examples of these tasks are packaging, wood craft, assembly work, or park keeping. In the Netherlands and in many other countries, there is an ongoing debate about the desirability of employing disabled individuals in sheltered workshops as opposed to integrated employment in regular organizations. In 2015, the Participation Law replaced the Law on Sheltered Employment, stimulating integrated employment and restricting the entry of new workers in sheltered workshops. This Participation Law does not seem very successful yet, as labor participation of employees with a work handicap has decreased in the first few years after its introduction (Sadiraj, Hoff, & Versantvoort, 2018), and sheltered workshops may remain an important venue for employing disabled workers in the future.

There is ample evidence that good working conditions have a strong impact on the well-being and functioning of employees in general (Peeters, de Jonge, & Taris, 2014), and on individuals with a chronic disease or work handicap who work in regular jobs (Leijten, van den Heuvel, Ybema, Robroek, & Burdorf, 2013; Leijten et al., 2014; Steenbeek, Giesen, & Ybema, 2009). Considerably less research has been done on the working conditions, well-being, and productivity of disabled individuals working at sheltered workshops. This is remarkable and undesirable because we need solid knowledge about the working conditions and well-being of this specific target group for evidence-based (re)design of sheltered jobs. Moreover, such knowledge is necessary for generalizing theoretical insights and research findings to the whole range of employees.

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Theoretical Background

The first theoretical perspective that we take into account is the job demands–resources model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). The JD-R model states that the combination of job demands (e.g., work load, physical demands) and job resources (e.g., social support, autonomy) influences work outcomes, including productivity, through two interrelated processes. In the *health impairment process*, high job demands and low job resources lead to exhaustion, the energetic component of burnout (Schaufeli & Bakker, 2004; Schaufeli & Taris, 2014). In the context of a sheltered workshop, work load can highly fluctuate over time. Work load may sometimes be high, for example, when private companies outsource packaging work to the sheltered workshop, but low at other times when there is little work to be done. Other relevant job demands are the physical demands and the mental demands of the tasks that are assigned to a disabled worker. These physical demands could, for example, refer to bodily strength and stamina necessary for park keeping and wood craft, and examples of mental demands are the need to remember to package all relevant items or assemble parts of an object in the right order. In line with the JD-R model, we predict the following:

> *Hypothesis 1:* Job demands (1a: work load, 1b: physical demands, 1c: mental demands) are positively related to exhaustion.

For job resources we included social support and autonomy. The expected social support and social inclusion are reasons for disabled individuals to prefer sheltered employment over integrated employment (Migliore, Grossi, Mank, & Rogan, 2008), making social support an important variable in this study. Due to the structured nature of the work in sheltered workshops, we expect autonomy to be rather low. However, job control has a central role in many theoretical perspectives, for example, the demand control model (Karasek, 1979), and variations in autonomy could well be related to the well-being and productivity of employees with a work handicap. In line with the JD-R model, we predict the following:

> *Hypothesis 2:* Job resources (2a: social support, 2b: autonomy) are negatively related to exhaustion.

In addition, the JD-R model expects that job demands and job resources interact, such that high job resources can buffer negative effects of high job demands (Schaufeli & Taris, 2014). Experiencing high social support or high job autonomy could then protect disabled workers from exhaustion due to high work load or high physical or mental demands. We therefore predict the following:

> *Hypothesis 3:* High job resources buffer the positive relationship between job demands and exhaustion (3a: social support × work load; 3b: social support × physical demands; 3c: social support × mental demands; 3d: autonomy × work load; 3e: autonomy × physical demands; 3f: autonomy × mental demands).

The *motivational process* of the JD-R model states that high job resources lead to work engagement, which results in higher performance. Work engagement refers to a positive, fulfilling work-related state of mind that is characterized by vigor, dedication, and absorption (Schaufeli & Bakker, 2004). Resourceful work environments stimulate employees' willingness to dedicate effort and abilities to work tasks, which stimulates the achievement of work goals, increase intrinsic motivation, and enhance well-being. We therefore predict the following:

> *Hypothesis 4:* Job resources (4a: social support, 4b: autonomy) are positively related to work engagement.

The relationship between job demands and work engagement is not fully clear in the JD-R model. Some job demands are classified as challenge demands (Crawford, Lepine, & Rich, 2010), which promote mastery, personal growth, or future gains and contribute positively to work engagement. Examples are high work load or high job responsibility. Other job demands are classified as hindrance demands, which undermine personal growth, learning, and goal attainment, and lower work engagement (Crawford et al., 2010). Examples are role uncertainty and role conflict. The job demands that we focus on in the present study are work load, physical demands, and mental demands. Work load is generally regarded as a challenge demand. Having a lot of work to do is more engaging than the potentially boring condition of low work load. There are also indications that high mental demands provide a challenge rather than a hindrance. High mental demands can lead to active learning, and creativity if accompanied with adequate resources (de Jonge, Spoor, Sonnentag, Dormann, & van den Tooren, 2012). For physical demands it is not fully clear whether they will be regarded as a challenge or as a hindrance. Bad physical working conditions have been found to lower work satisfaction among individuals with intellectual disability (Flores, Jenaro, Begona Orgaz, & Martín, 2011), but working individuals may also find honor in physical labor (Meara, 1974), and we assume that if physical labor is an integral part of the job (as it is in the present study, e.g., wood craft, park keeping) it is more likely to be regarded as a challenge rather than a hindrance. We therefore expect that job demands in our study are more likely to be regarded as challenging than as hindering:

> *Hypothesis 5:* Job demands (5a: work load, 5b: physical demands, 5c: mental demands) are positively related to work engagement.

Finally, it has been argued that the relationship between job resources and work engagement is especially strong when job demands are high (Schaufeli & Taris, 2014). High autonomy and high social support are more likely to motivate disabled individuals for their work when they have a high rather than low work load and when the job is demanding rather than easy. We therefore predict the following:

> *Hypothesis 6:* High job demands strengthen the positive relationship between job resources and work engagement (6a: social support × work load; 6b: social support × physical demands; 6c: social support × mental demands; 6d: autonomy × work load; 6e: autonomy × physical demands; 6f: autonomy × mental demands).

At the heart of the JD-R model lies the assumption that job demands and job resources influence work outcomes, including work productivity, through both the health impairment process and the motivational process. This means that exhaustion and work engagement are considered mediators of the relationships between job demands and job resources on the one hand and work produc-

tivity on the other. High work load and other job demands may either increase or decrease work productivity. A meta-analysis found negative relationships between several hindrance demands—including role overload—and productivity (Gilboa, Shirom, Fried, & Cooper, 2008). However, as mentioned before we believe that job demands in our study are more likely to be regarded as challenges rather than hindrances. This means that high job demands would be related to productivity in two opposite ways: High job demands would lower productivity through exhaustion, but at the same time increase productivity through work engagement. It is unclear which of these relationships would prevail. We therefore predict the following:

Hypothesis 7a: Job demands (work load, physical demands, and mental demands) are negatively related to productivity through higher exhaustion.

Hypothesis 7b: Job demands (work load, physical demands, and mental demands) are positively related to productivity through higher work engagement.

The relationship between job resources and productivity is more straightforward. Job resources are expected to be positively related to productivity through both lower exhaustion and higher work engagement. We therefore predict the following:

Hypothesis 8: Job resources (8a: social support, 8b: autonomy) are positively related to productivity.

Hypothesis 9: The relationship between job resources (social support, autonomy) and productivity is mediated by (a) exhaustion and (b) work engagement.

The second theoretical perspective that we take into account is the person–environment fit (P-E fit) theory (Kristof-Brown, Zimmerman, & Johnson, 2005). In the work context, the role of fit between the person and his or her job (person–job fit) is an important and well-studied aspect of P-E fit (Edwards, 1991). Person–job fit refers to how well the person's abilities fit the demands of the job (demands–ability fit), and how well the needs of the person are satisfied by the job (needs–supply fit). A meta-analysis (Kristof-Brown et al., 2005) showed that a good person–job fit is strongly related to several positive work outcomes, including job satisfaction and organizational commitment, and moderately related to job performance and well-being at work.

For employees with health problems, work adjustments are often necessary to maintain their productivity (Leijten, van den Heuvel, Geuskens, et al., 2013), which could indicate that a good person–job fit is especially relevant for individuals with a work handicap. Zoer and colleagues (2012) performed a detailed assessment of the job demands and work capacities of disabled employees in sheltered workshops and the match between the two. They showed that the physical and psychosocial work characteristics often did not match the capacities of the person, resulting in both overload and underload for different work aspects. However, these authors did not assess the consequences of such a mismatch for well-being or performance. There is already some evidence that a good person–job fit is related to higher job satisfaction among employees with intellectual disabilities in integrated employment (Akkerman et al., 2016). We therefore predict the following:

Hypothesis 10: Person–job fit is (a) negatively related to exhaustion, and (b) positively related to work engagement.

In line with the previous predictions derived from the JD-R model, we additionally predict the following:

Hypothesis 11: Person–job fit is positively related to productivity.

Hypothesis 12: The relationship between person–job fit and productivity is mediated by (a) exhaustion and (b) work engagement.

The predicted relationships between the variables in our study are presented in Figure 1.

The Present Study

The present study used a diary design in which individuals in sheltered workshops filled out weekly questionnaires about their job demands, job resources, well-being, and productivity. Weekly questionnaires were chosen because we reasoned that especially the amount of work that is requested from employees at a sheltered workshop, that is, the work load, may vary from week to week

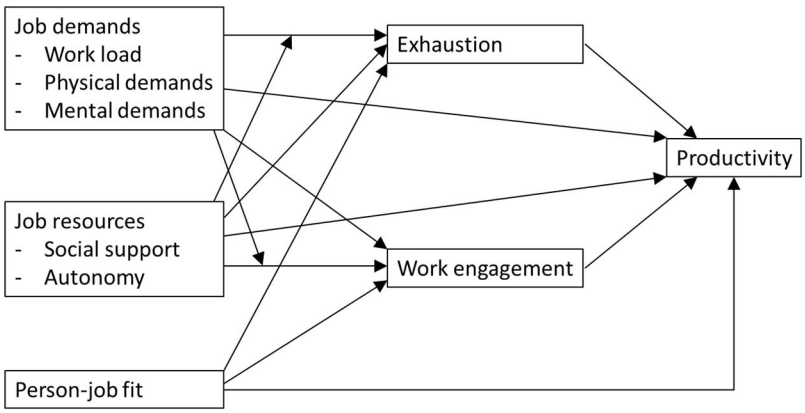

Figure 1. The research model with predicted relationships.

depending on the available outsourced work by private companies. Repeated (weekly) measurements will nicely capture such variation over time in work load. In addition, relating weekly variations in job demands and job resources to weekly variations in exhaustion, work engagement, and productivity will lead to a more detailed picture than a single measurement. However, we assumed that physical demands, mental demands, and person–job fit would not vary substantially on a weekly basis because in a sheltered workshop employees carry out a restricted set of similar tasks over time and do not rotate jobs. We therefore measured these job demands and person–job fit only twice, at the first and the last weekly measurement.

Method

Procedure and Participants

Participants were employees of two companies for sheltered work in the Netherlands. The data were collected in March (Company 1) and April (Company 2) of 2016. Participants were recruited at their workplace, and could fill out an online questionnaire in the computer rooms of their company during their regular working hours. Of the 384 eligible employees, 113 (30%) participated in the study at least once. Of these participants, 21 participated only once and were removed from the data set. Moreover, 11 participants failed to provide information about their age, gender, education, or nature of their handicap or had missing values on the variables interest. As a result, 81 participants with full data on two or more weekly measurements were entered in the analyses. They filled out weekly questionnaires over a period of 5 weeks (Company 1) or 4 weeks (Company 2), leading to a total of 309 questionnaires. In Company 2, the study started a month later than in Company 1, and to finish the project in time, data collection was restricted to four weekly measurements.

The participants included 42 males and 39 females, their educational level was generally low: 51% had primary school or no education, 25% had lower preparatory occupational education, 17% had a medium level education, and 7% had a higher education. The age of the participants ranged from 22 to 65 years of age ($M = 48$, $SD = 11.9$ years).

Ethical Issues

We conformed to ethical guidelines of American Psychological Association, and ethical approval has been obtained for a research program that builds on this study, and that includes study plans with similar diary methods and similar participant groups (i.e., working disabled individuals). Participation was voluntary and could be withdrawn at any time. Participants created their own anonymous code, which was used for matching data of different sessions. Participants gave an electronic informed consent in which they confirmed that they understood the provided information and gave permission to use their data for scientific research. Participants who had trouble operating the computer, reading, or understanding the questions were helped by research assistants. These research assistants were relatively able coworkers, who were briefed before each session, emphasizing the importance of confidentiality and trustworthiness.

Measures

Where possible, questionnaires were based on validated scales. The questionnaire was tested beforehand in a pilot study among four individuals from the target population who were not included in the main study. As several participants were cognitively impaired, and literacy was generally low, many questions were simplified to ensure that participants comprehended the questions.

In all weekly questionnaires, the following constructs were measured: autonomy, social support, work load, work engagement, exhaustion, and productivity. In the first and last questionnaire in addition person–job fit, mental demands, and physical demands were measured. For most participants ($N = 66$, 81%), both measurements were averaged to get a more reliable assessment of these twice measured variables. For the remaining 15 participants, the last measurement was missing, and values of the first measurement were used. Finally, demographics and the nature of the handicap were asked only in the first questionnaire. All questions about work characteristics were asked on 5-point scales ranging from 1 (*never*) to 5 (*always*).

Nature of the handicap. Participants were asked "what kind of handicap do you have?," and could indicate any of three answers: "psychological handicap," "cognitive handicap or learning problems," or "physical handicap." Of the participants, 17 reported a combination of two or three handicaps. Of the remaining participants, 15 participants reported a psychological handicap, 23 a cognitive handicap, and 26 a physical handicap.

Person–job fit. Person–job fit was measured with four items of a scale by Schaufeli (2011), with combined demands–ability fit and needs–supply fit. A sample item was as follows: "I have enough knowledge and skills to do my work well." Cronbach's $\alpha = .68$, and (unexpectedly) the correlation between the first and last measurement was relatively low, $r = .28$, $p < .05$. This low correlation indicates that there was more variation over time in person–job fit than we anticipated.

Job demands. *Job demands* were measured with adjusted items from the Questionnaire on the Experience and Assessment of Work (Van Veldhoven, Meijman, Broersen, & Fortuin, 2002). *Mental demands* were measured with three items, for example, "My work demands a lot of concentration." Cronbach's $\alpha = .76$, and a moderately high correlation between the first and last measurement, $r = .50$, $p < .001$. *Physical job demands* were measured with two items, for example, "My work is physically strenuous." Cronbach's $\alpha = .69$, $r = .39$, $p < .01$. *Work load* was measured weekly with two items, for example, "This week, I had to do a lot of work." Cronbach's $\alpha = .70$, intraclass correlation coefficient (ICC) = .56, which means that 56% of the variation in work load was between persons, and 41% was between weeks within persons.

Job resources. *Autonomy* was measured weekly with three adjusted items of the Work Design Questionnaire (Morgeson & Humphrey, 2006), for example, "This week, I could decide the order of work tasks myself." Cronbach's $\alpha = .88$, ICC = .71. *Social support* from coworkers and supervisor was measured weekly with six adjusted items of a scale by Peeters, Buunk, and Schaufeli (1995), for example, "This week, my coworkers cared for my feelings and problems," and "This week, my supervisor appreciated the way I did my job." Coworker support and supervisor support were highly correlated, $r = .65$, $p < .001$, and were

therefore combined into one scale for social support. Cronbach's $\alpha = .86$, ICC = .71.

Exhaustion. Exhaustion was measured with three adjusted items of the Utrecht Burnout Scale (Schaufeli & Van Dierendonck, 2000). A sample item was as follows: "This week, I felt empty at the end of a working day." Cronbach's $\alpha = .85$, ICC = .70.

Work engagement. Engagement was measured with three adjusted items of the Utrecht Work Engagement Scale (Schaufeli, Bakker, & Salanova, 2006), one from each subscale: Vigor, Dedication, and Absorption, for example, "This week, I felt like going to work when I got up in the morning." Cronbach's $\alpha = .67$, ICC = .67.

Productivity. Productivity at work was measured with three items that were derived from a validated questionnaire of productivity, the Quantity and Quality questionnaire (Brouwer, Koopmanschap, & Rutten, 1999). These items were as follows: "This week, I did more work than normal," "This week, I did more work in less time than normal," and "This week, the quality of my work was good." The first two items were combined into a scale of quantitative productivity, Cronbach's $\alpha = .75$, ICC = .59. The latter item correlated only slightly with both other items and was therefore not included in the scale.

Comprehension. Finally, every questionnaire ended with the following item measuring comprehension of the questionnaire: "I understood all questions in this questionnaire," with answers ranging from 1 (*fully disagree*) to 5 (*fully agree*). Of the 309 answered questionnaires, 85% scored a 4 (*agree*) or 5 (*fully agree*) on this question. Controlling for this variable in the analyses reported in this article did not change any of the results.

Statistical Analysis

The data were analyzed using multilevel analysis in SPSS 24, with the mixed model procedure, using maximum likelihood estimation. Growth curve modeling was applied to the weekly measured variables, that is, work load, social support, autonomy, work engagement, exhaustion, and productivity, examining both linear and quadratic trends over time. Next, the hypotheses were tested in several multilevel models, with weekly measured work engagement, exhaustion, and productivity as dependent variables. The first model contained the random intercept. In the second model, the following control variables were entered: the organization in which the participant worked, gender, educational level, age, the handicap of the participant, and the week of measurement. Age, educational level, and week were grand mean centered, whereas organization, gender, and handicap were dummy coded (0, 1), with the larger organization, males, and physical handicap as reference categories. In the third model, the participant's average values of all job demands and job resources, including person–job fit, were entered in the regression. These person-level predictors were grand mean centered. In the fourth model, *week-specific variations* in work load, autonomy, and social support were entered in the regression. These week-level predictors were person mean centered (Enders & Tofighi, 2007). In the fifth model, interaction effects were examined between person-level job resources (i.e., average social support and autonomy), and person-level demands (i.e., mental demands, physical demands, and average work load), and the interaction effects between week-level job resources (social support, autonomy) and week-level work load. This resulted in eight interaction effects, which were interpreted only when they jointly improved the fit of the model significantly. In the regression of productivity, a sixth model was tested, in which both person-level and week-level work engagement and exhaustion were entered to test the mediation hypotheses (Zhang, Zyphur, & Preacher, 2009).

Results

Descriptive Statistics and Correlations

Descriptive statistics and correlations between the work characteristics and outcome variables averaged at the person level ($N = 81$) are shown in Table 1. It can be seen that mean scores of most job demands and job resources were relatively low (below 3 on a scale from 1 to 5). Only mental demands and person–job fit were higher than the midpoint of the scale. However, there was substantial variation between persons in these work characteristics. With regard to the correlations, it can be seen that work load and physical demands were positively correlated with each other and with both exhaustion and productivity, but not with work engagement. Especially the (positive) correlation between work load and productivity was high. Person–job fit, mental demands, and job resources (autonomy and social support) were positively related to work engagement. It has to be noted that these correlations are at the person level and do not take week-specific variations in these variables into account. Correlations with the control variables can be found in the Appendix Table A1.

Table 1
Descriptive Statistics and Correlations Between the Variables at the Person Level ($N = 81$)

Person-level variable	*M*	*SD*	1	2	3	4	5	6	7	8
1. Person–job fit	3.54	0.70								
2. Mental demands	3.39	0.88	.28*							
3. Physical demands	2.40	0.85	.01	.29*						
4. Average work load	2.28	0.83	.12	.16	.55***					
5. Average autonomy	2.88	1.05	.36**	.26*	−.07	.07				
6. Average social support	2.67	0.87	.31**	.22*	−.13	−.06	.48***			
7. Average exhaustion	2.37	0.95	−.20	.10	.50***	.40***	−.24*	−.16		
8. Average work engagement	3.01	0.91	.49***	.33**	.07	.22	.47***	.50***	−.15	
9. Average productivity	2.47	0.90	.11	.08	.45***	.66***	.25*	.02	.34**	.22

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

Changes Over Time

Changes over time in the weekly measured variables, that is, work load, social support, autonomy, work engagement, exhaustion, and productivity, were examined with growth curve modeling, examining both linear and quadratic trends over time. We found no significant trends, although for some of the variables, the linear trends were marginally significant ($p < .10$), showing slight declines in social support, in work load, and in productivity. To account for these small declines, in all models testing the hypotheses, the week of measurement was controlled for.

Nature of Work Handicap and Other Control Variables

In our regression analyses of exhaustion (see Table 2), work engagement (see Table 3), and productivity (see Table 4), we controlled for the influence of the nature of the work handicap and other control variables. The overall influence of these variables is shown in Model 2 of each of the regression tables. In none of these regressions, adding the control variables improved the fit of the model significantly. This means that these variables have a limited influence on the well-being and productivity of disabled individuals. Nevertheless, there were a few noteworthy findings.

With regard to the nature of the work handicap, it was found that exhaustion (see Table 2) was higher among participants with a psychological handicap or a combination of handicaps compared with those with a physical handicap, but only after controlling for the work factors in Model 3. Other findings were that in our sample, high levels of education were related to lower work engagement (see Table 3). In addition, after controlling for differences in work factors in Model 3, work engagement was higher among older than among younger participants. Finally, also after controlling for work factors, males were lower in exhaustion (see Table 2) and higher in work engagement (see Table 3) than females.

Table 2
Multilevel Regression of Exhaustion

Predictors	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	2.36***	2.09***	1.79***	1.79***	1.73***
Organization		.15	.24	.25	.40*
Gender		.16	.33*	.33*	.39*
Education		.04	.02	.02	−.05
Age		−.00	−.01	−.01	−.01
Psychological handicap		.55	.71**	.71**	.63**
Mental handicap		−.26	.12	.12	.10
Combination of handicaps		.49	.71**	.71**	.55*
Week of measurement		−.02	−.02	−.01	−.01
Person level					
Person–job fit			−.38**	−.38**	−.24
Mental demands			.00	.00	.09
Physical demands			.41***	.41***	.21
Average work load			.36**	.36**	.48***
Average autonomy			−.12	−.12	−.18
Average social support			−.01	−.01	−.02
Mental demands × Autonomy					−.06
Mental demands × Social support					.24
Physical demands × Autonomy					.07
Physical demands × Social support					−.27
Work load × Autonomy					−.34**
Work load × Social support					.21
Week level					
Weekly work load				.22***	.24***
Weekly autonomy				.05	.05
Weekly social support				.00	.01
Work load × Autonomy					−.09
Work load × Social support					.15
Fit (−2 log L)	730.42***	718.88***	670.46***	654.12***	636.75
Δ fit		11.54	48.41***	16.34***	17.37*
df		8	6	3	8
Variance					
Random intercept (τ^2)	.81***	.69***	.33***	.34***	.32***
Residual (σ^2)	.34***	.34***	.35***	.32***	.26***
ICC	.70				
Explained variance week level		10%	41%	43%	50%
Explained variance person level		13%	53%	53%	57%

Note. ICC = intraclass correlation coefficient. Explained variance was computed following the formulae of Snijders and Bosker (1994), where (week level) $R_1^2 = \tau^2 + \sigma^2$ and (person level) $R_2^2 = \tau^2 + \sigma^2/n$, and n is the mean number of observations per person (309/81 = 3.81).
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3
Multilevel Regression of Work Engagement

Predictors	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	3.00***	3.01***	3.15***	3.15***	3.11***
Organization		.14	.02	.02	.04
Gender		−.04	−.33*	−.33*	−.35*
Education		−.14*	−.14**	−.14**	−.15*
Age		.01	.02***	.02***	.02***
Psychological handicap		−.36	−.27	−.27	−.24
Mental handicap		.11	.14	.14	.14
Combination of handicaps		−.06	−.04	−.04	.01
Week of measurement		−.03	−.03	−.02	−.02
Person–job fit			.47***	.47***	.43***
Mental demands			.16	.16	.14
Physical demands			.01	.01	.01
Average work load			.12	.12	.09
Average autonomy			.20*	.20*	.25**
Average social support			.29***	.29***	.25*
Mental demands × Autonomy					.01
Mental demands × Social support					.05
Physical demands × Autonomy					.00
Physical demands × Social support					−.05
Work load × Autonomy					.09
Work load × Social support					−.10
Weekly work load				.17**	.16*
Weekly autonomy				.10	.10
Weekly social support				.08	.08
Work load × Autonomy					−.01
Work load × Social support					−.06
Fit (−2 log L)	734.95***	724.11***	655.86***	641.36***	639.83
Δ fit		10.84	68.25***	14.50***	1.53
df		8	6	3	8
Variance					
Random intercept (person level)	.72***	.63***	.21***	.21***	.21***
Residual (week level)	.36***	.36***	.36***	.34***	.34***
ICC	.67				
Explained variance week level		8%	47%	49%	49%
Explained variance person level		11%	63%	63%	63%

Note. ICC = intraclass correlation coefficient.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Exhaustion

Table 2 shows the multilevel regression for exhaustion. Adding the person-level work factors in Model 3 showed a significant improvement of the fit. Exhaustion was higher among participants who experienced a bad person–job fit, high physical demands, and high average work load. In Model 4, adding the week-specific variation in work load, autonomy, and social support further improved the fit. The regression showed that exhaustion was higher in weeks with high work load than in weeks with low work load. Finally, adding the interactions between job demands and job resources in Model 5 further improved the fit. The explained variance in exhaustion at the week level was 50%, and at the person level 57%.

These results were largely in line with our hypotheses: Exhaustion was higher as work load and physical demands were higher (Hypotheses 1a and 1b), and as person–job fit was worse (Hypothesis 10a). However, contrary to Hypothesis 2, the job resources autonomy and social support were not related to exhaustion. Finally, in line with Hypothesis 3d, the interaction between person-level autonomy and person-level work load reached significance ($b = -.34$, $p < .01$). As shown in Figure 2, autonomy buffered negative effects of high work load: Among individuals high in autonomy, high average work load was unrelated to exhaustion ($b = .13$, *ns*), but among individual low in autonomy, high work load was related to high exhaustion ($b = .84$, $p < .001$).

Work Engagement

Table 3 shows the multilevel regression for work engagement. In Model 3, the person-level work factors were added to the regression, which significantly improved the fit. Work engagement was higher among participants with better person–job fit, and among participants who were higher in autonomy and social support. Adding the week-specific variation in work load, autonomy and social support in Model 4 further improved the fit. The regression showed that work engagement was higher in weeks with high rather than low work load. The explained variance in work engagement was 49% at the week level, and 63% at the person level for all predictors combined. Adding the interactions between job demands and job resources in Model 5 did not improve the fit.

These results were in line with our hypotheses: Work engagement was higher as participants experienced more autonomy and

Table 4
Multilevel Regression of Productivity

Predictors	Model 1	Model 2	Model 3	Model 4
Intercept	2.47***	2.75***	2.43***	2.43***
Organization		.17	.30	.31*
Gender (0 = male, 1 = female)		−.17	−.11	−.11
Education		.02	−.07	−.07
Age		−.00	−.01	−.01
Psychological handicap		−.20	.13	.13
Cognitive handicap		−.45	.01	.00
Combination of handicaps		−.51	−.23	−.23
Week of measurement		−.05	−.05	−.03
Person level				
Person–job fit			.04	.03
Mental demands			−.18*	−.18*
Physical demands			.20	.21
Average work load			.66***	.66***
Average autonomy			.24**	.24**
Average social support			−.11	−.11
Week level				
Weekly work load				.31***
Weekly autonomy				−.03
Weekly social support				.05
Fit (−2 log L)	799.75***	790.35***	727.60***	705.10***
Δ fit		9.40	62.75***	22.51***
df		8	6	3
Variance				
Random intercept (τ^2)	.69***	.63***	.22***	.23***
Residual (σ^2)	.48***	.47***	.47***	.43***
ICC	.59			
Explained variance week level		6%	41%	44%
Explained variance person level		8%	58%	58%

Note. ICC = intraclass correlation coefficient.
* $p < .05$. ** $p < .01$. *** $p < .001$.

social support (Hypotheses 4a and 4b), and as their person–job fit was better (Hypothesis 10b). Moreover, week-specific variations in work load contributed to higher work engagement (Hypothesis 5a), so work load acted as a challenge demand as predicted.

Productivity

Table 4 shows the multilevel regression for self-reported quantitative productivity. The person-level work factors in Model 3

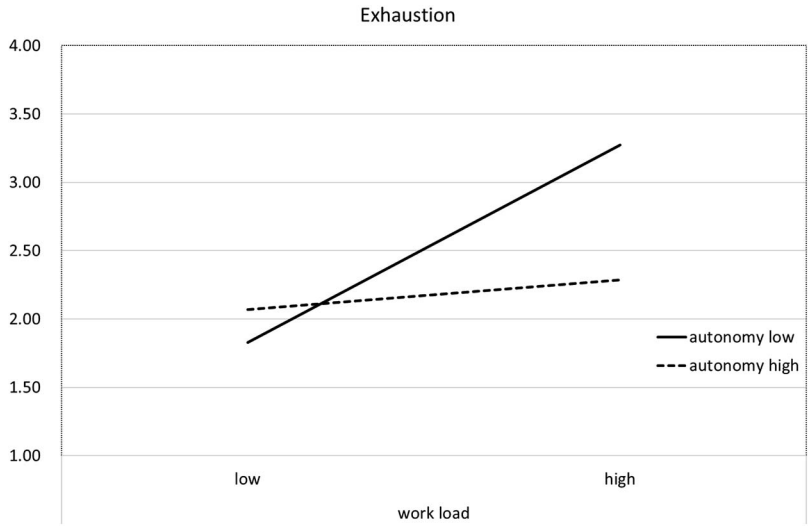

Figure 2. The relationship between (person-level) work load and exhaustion for individuals high and low in autonomy.

contributed significantly to the regression. Productivity was higher as mental demands were lower, and as average work load and average autonomy were higher. Adding the week-specific variation in work load, autonomy, and social support in Model 4 further improved the fit. The regression showed that productivity was higher in weeks with high work load. The explained variance in productivity was 44% at the week level, and 58% at the person level. Entering the interactions between job demands and job resources in Model 5 (not shown in Table 4) did not improve the fit of the model, $\Delta\chi^2(df = 8) = 13.00$, $p > .10$, and were therefore no further explored. Finally, to test the mediation hypotheses, the contribution of work engagement and exhaustion to the regression of productivity was examined in Model 6 (not shown in Table 4). Entering the averaged and week-specific variation of work engagement and exhaustion to the regression of productivity did not improve the fit, $\Delta\chi^2(df = 4) = 6.11$, *ns*. Nor was there a significant contribution of any of these predictors to productivity ($p > .10$).

These results only partly supported our hypotheses for productivity. Mental demands were related to lower productivity (Hypothesis 7a), whereas work load was related to higher productivity (Hypothesis 7b), but these relationships were not mediated by exhaustion and work engagement, which means we reject Hypothesis 7. Hypothesis 8 was confirmed for autonomy (Hypothesis 8b) but not for social support (Hypothesis 8a): Participants high in autonomy reported higher productivity. Hypothesis 11 and Hypothesis 12 were rejected: Person–job fit did not contribute to job productivity, neither directly (Hypothesis 11), nor indirectly through exhaustion (Hypothesis 12a) or work engagement (Hypothesis 12b). High work load played a central role and contributed strongly to higher productivity both at the person and the week level. Individuals who experienced higher work load were more productive than those low in work load, and participants were also more productive in weeks with relatively high work load.

Discussion

This study examined how the working conditions of individuals with a physical, cognitive, and/or psychological disability who worked at a sheltered workshop are related to their well-being and productivity. To collect data close to real-work processes and natural fluctuations over time (Bolger, Davis, & Rafaeli, 2003), we used a weekly diary-like methodology. The results showed that—as predicted—exhaustion was higher among individuals who experienced high physical demands and high work load. In addition, week-specific variation in work load also contributed to higher exhaustion. Contrary to the hypothesis, no direct relationships of job resources (autonomy and social support) were found with exhaustion. This seems to suggest that job resources—although important for the motivation and productivity of individuals with a work handicap—do not generally prevent fatigue. However, in line with the hypothesis, autonomy *buffered* exhaustion due to high work load: Among disabled individuals who experienced high autonomy, the average work load was unrelated to exhaustion, whereas for those low in autonomy, high work load was related to high exhaustion. This shows that autonomy is an important job resource to prevent fatigue resulting from high work load.

In line with the hypotheses, work engagement was higher among individuals who experienced more support and higher autonomy at work, and higher in weeks with high work load. This shows that high work load acts as a challenging job demand, which both enhances the motivation of individuals with a work handicap and increases their fatigue (Crawford et al., 2010). Partly in line with the hypotheses, self-rated productivity was higher among individuals with a work handicap who experienced high work load, low mental demands, and high autonomy, with work load also contributing to week-specific variations in productivity. However, contrary to the hypothesis, the relationship between job resources and job demands on the one hand and productivity on the other were direct relationships rather than indirect through work engagement and exhaustion.

The results of the present study are largely in line with the JD-R model. As far as we know, this is one of the first tests of this model among individuals working at sheltered workshops (see for a notable exception Flores et al., 2011). It is noteworthy that the job resources in our study were related to work engagement (autonomy, social support) and productivity (autonomy), but unrelated to exhaustion (i.e., burnout). This is in line with the earliest version of the JD-R model (Demerouti et al., 2001), but more recent versions (Schaufeli & Bakker, 2004) do predict negative relationships between job resources and burnout. Although autonomy did not reduce feelings of exhaustion in general, high levels of autonomy did offset exhaustion due to high work load for employees working in sheltered employment. This finding supports recent recommendations (Taris & Schaufeli, 2016) to examine interactions between specific job demands and job resources in the JD-R model. This is of theoretical interest, but also of practical relevance because it is important to understand whether high levels of a specific demand can indeed be buffered by high levels of resources and whether it matters which type of resource is offered. As our study only included autonomy and social support as job resources, it is possible that other job resources, such as task variation or growth opportunities, can reduce fatigue among individuals working in sheltered employment (cf. Taris, Ybema, & van Beek, 2017). Taken together, as many of the predictions based on the JD-R model were supported, we tentatively conclude that the model has proven its suitability for studying the productivity and well-being of employees with disabilities. Special points of attention for future studies are the lacking direct association between job resources and exhaustion and the absence of a mediating role of well-being (i.e., exhaustion and engagement) in the relationships between job characteristics and productivity.

Finally, in our study we found that a good person–job fit was strongly related to higher work engagement and to lower exhaustion. This shows that if job demands are in line with the abilities of the individual, and the job satisfies the needs of the individual, work motivation is boosted and fatigue is prevented. Therefore, a good match between the individual and the job at sheltered workshops is highly important (Zoer et al., 2012). With regard to the P-E fit theory, it would be worthwhile to separately examine demands–ability fit and needs–supply fit (Edwards, 1991; Kristof-Brown et al., 2005), and also different kinds of fit, including how well the person fits the group of coworkers (person–group fit). This is important, as earlier research shows that the social environment, and the expectation that one would not be accepted as a worthy coworker are important concerns for individuals with a

work handicap, leading them to prefer working in a sheltered workshop rather than in integrated employment (Migliore et al., 2008). Given the intended transition to integrated employment in the Netherlands and many other countries, this issue will be even more important in the years to come.

Theoretical implications of our study are that both the JD-R model and the P-E fit theory are applicable to our sample of disabled individuals in sheltered employment. Moreover, many organizations struggle with the need to include individuals with health conditions, both to keep up organizational productivity in times of labor scarcity, as well as for reasons of corporate social responsibility. Yet, the larger part of research in the area of work and stress is still done on a nonrepresentative sample of the labor force: highly educated, healthy, white employees. Less dominant segments of the labor force, including those with a health condition or work handicap, are largely missing from research. We strongly believe it contributes to the robustness of our theoretical perspectives to examine whether our theories also apply to such diverging samples of participants.

The present study has a number of important strengths but also some limitations. A strength is the adequate sample size of 81 participants given our study design and analytical strategy. Moreover, our sample was heterogeneous with regard to the nature of the work handicap, including physical handicaps, psychological handicaps, and cognitive impairment. This promotes generalizability of our findings. Most other studies among individuals in sheltered workshops focus solely on individuals with psychiatric disease (Reker, Hornung, Schonauer, & Eikelmann, 2000) or cognitive impairment (Migliore et al., 2008). A second major strength is the diary design, in which individuals filled out a questionnaire on a weekly basis. This made it possible to examine week-specific variations in job demands, job resources, and work outcomes. It has to be noted that the majority of the variance in the weekly assessed variables was at the person level. Nevertheless, our results showed that especially the week-specific variation in work load contributed to work outcomes, with higher motivation, higher exhaustion, and higher productivity in weeks with high work load. This underscores the value of the diary design of our study.

A limitation of the present study is that the measure of work load (e.g., "This week, I had to do a lot of work") and quantitative productivity (e.g., "This week, I did more work than normal") showed overlap in wording, which may have inflated the relationship between both constructs. This may also have reduced the likelihood for exhaustion and work engagement to mediate the relationships between job characteristics and productivity. It is advisable to select a different productivity measure to better distinguish both constructs in future studies.

Another limitation is that we did not measure all work characteristics on a weekly basis. We especially regret our choice not to measure person–job fit on a weekly basis, as it apparently was less stable than anticipated, with only a modest correlation between the first and last measurement. It is not fully clear why this was the case. Perhaps the participants' needs varied over time, which definitely was the case for the amount of work (i.e., work load). Both aspects may have led to variations in the experienced person–job fit. Given the relatively large impact of person–job fit on both work engagement and exhaustion, our measure clearly captured an important construct for the participants, and we advise future diary studies to measure person–job fit repeatedly.

A final limitation is that some participants were helped by research assistants. This procedure made it possible to include participants who had trouble operating the computer or understanding the questions, who were illiterate or could not read due to a visual handicap. However, such help in filling out the questionnaire may have led to biased answers due to social desirability. The research assistants in our study were relatively able coworkers of the participants, which may have increased social desirability further. In future research, we advise help provided by assistants who are not affiliated to the sheltered workshop themselves.

Despite these limitations the present study generated some practical implications that can be valuable for practitioners working with employees in sheltered employment and for those responsible for the job design of sheltered workshops. First of all, it is important to create an optimal balance between work load and autonomy. Employees in sheltered workshops like to have enough work to do: they experience a relatively high work load as engaging and it stimulates productivity. If a high work load is accompanied with sufficient autonomy, it does not increase exhaustion. Supportive relationships at work and a good person–job fit also appear to improve the work engagement for employees in sheltered workshops. Especially these latter two job conditions can be threatened when disabled workers need to integrate in regular workplaces where there may be less special attention for their specific needs and abilities and where they will have few colleagues who are "similar others." However, for the moment these statements are speculative and we need studies that can compare the well-being of disabled employees in sheltered workshops with those in integrated employment.

We would like to conclude that this study shows that the theoretical perspective on the job demands, job resources, and fit between the person and the job improves our understanding of the well-being and performance of individuals in sheltered employment. Especially a good match between the job and the individual's abilities and needs, and a suitable work load will benefit the motivation, well-being, and productivity of individuals with a work handicap.

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Appendix

Correlations Between Control Variables and Variables in the Model at the Person Level

Table A1
Correlations With the Control Variables

Person-level variable	1	2	3	4	5	6	7	8
1. Organization								
2. Gender	.16							
3. Education	.12	−.13						
4. Age	−.13	−.07	.02					
5. Psychological handicap	−.04	−.15	.19	.01				
6. Mental handicap	−.07	.09	−.11	−.25*	−.30**			
7. Combination of handicaps	−.03	−.08	−.16	−.04	−.25*	−.32**		
8. Week of measurement	.13	.16	−.06	.06	−.08	−.21	.35**	
9. Person–job fit	−.07	.24*	−.08	−.24*	−.02	.05	.10	.10
10. Mental demands	.16	.23*	.03	−.14	−.06	.08	−.04	.12
11. Physical demands	−.07	−.01	.10	.13	.09	−.22	−.06	.02
12. Average work load	−.06	−.07	.09	.18	−.05	−.20	.02	.04
13. Average autonomy	.22	.15	.21	−.08	−.08	.06	−.15	.08
14. Average social support	.25	.17	−.21	−.21	−.11	.13	.00	.11
15. Average exhaustion	.10	.03	.08	−.01	.22	−.26*	.17	.04
16. Average work engagement	.04	.05	−.24*	.12	−.21	.08	.03	.25*
17. Average productivity	.14	−.06	.09	−.01	.05	−.13	−.13	.02

Note. $N = 81$.
* $p < .05$. ** $p < .01$.

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