Chapter 9
The Job Demand-Control (-Support) Model in the Teaching Context

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Abstract This chapter focuses on the Job Demand-Control (JDC) model and its expanded version, the Job Demand-Control-Support (JDCS) model, and stress in teachers. First, we elaborate on the JDC(S) model and its main hypotheses: the *(iso) strain hypothesis*, the *learning hypothesis* and the *buffer hypothesis.* In addition, two important issues in research on the model are discussed: the value of occupation-specific assessment and the so-called 'matching hypothesis'. The majority of studies on teachers have examined the (iso)strain hypothesis and the buffer hypothesis in relation to a variety of stress outcomes, ranging from physiological stress responses to reduced physical and mental well-being indicators such as somatic complaints, low job satisfaction, and burnout. Overall, there is substantially more support for the (iso)strain hypothesis than for the buffer hypothesis. The learning hypothesis has only been examined in a few studies, yielding mixed results. More recent developments, such as the incorporation of individual characteristics (e.g., job tenure, time management behavior) and additional work aspects (e.g., emotion work) in the model are discussed. Finally, conclusions regarding the contribution of the model in the explanation of teachers' stress are drawn taking methodological aspects into account, and suggestions for future research and practice are provided.

Keywords Job demand-control (-support) model • Teachers • Occupational stress • Burnout • Job satisfaction

Teaching is generally considered as a stressful occupation (see e.g., Gugliemi & Tatrow, 1998) and this recognition has triggered substantial research to illuminate which factors contribute to teachers' stress. To explain and examine occupational stress various theoretical models have been developed. This chapter will review the research on teachers' stress that has been conducted using one of the most prominent occupational stress models: the Job Demand-Control (JDC) model, and its expanded version, the Job Demand-Control-Support (JDCS) model. The original

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JDC model was developed by Karasek in 1979, and has since prompted numerous studies involving employees from diverse occupational groups, and examining a multitude of different outcomes.

In this chapter, we will start with a description of the JDC(S) model and its hypotheses. In addition, the main findings of research using this model will be summarized. Within this context, the focus will be on the operationalization and assessment of the constructs, and the value of occupational-specific measures will be discussed. Furthermore, the so-called 'matching hypothesis' will be introduced. Next, we will shift to research focusing on teachers, and provide an overview of the studies done in this occupational group based on the JDC(S) model. It will be indicated to which extent the JDC(S) model receives support in teachers' samples, in relation to outcomes ranging from physiological measures, to burnout and mental disorders. The more recent studies extending the JDCS model with other job characteristics, and studies examining the role of potential moderators in the model will also be presented. General conclusions regarding the value of JDC(S) research for this specific occupational group will be drawn and issues for future research will be addressed.

9.1 Job Demand-Control (-Support) Model

In 1979, Karasek published a seminal article describing the Job Demand-Control model and providing the findings of a first test of this model on national survey data from Swedish and United States employees. Karasek developed this model to explain the contradictory findings reported in the literature regarding the impact of job demands. Whereas some studies indicated a positive relationship between job demands and negative outcomes, other studies failed to find this association. This led Karasek to believe that a moderator should be in place, which determined the impact of job demands. He put forward job control as a crucial factor at play, and developed the JDC model.

The key premise in the JDC model is that employee outcomes are considered to be a consequence of two job characteristics: the level of job demands and the amount of job control an employee has (see Fig. 9.1). Job demands refer to the workload,

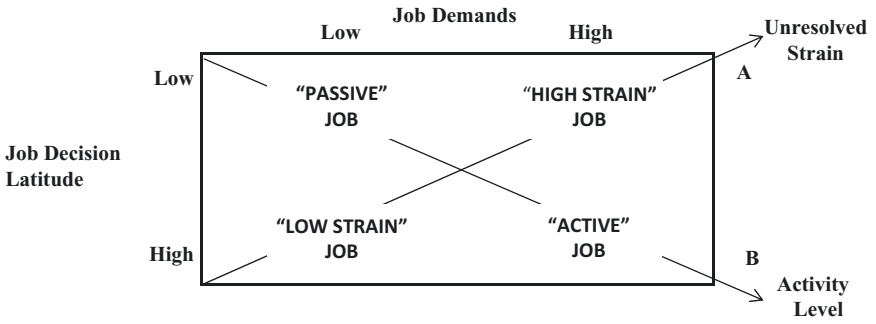

Fig 9.1 Job strain model (Reproduced from Karasek, 1979, p. 288)

and have been operationalized mainly in terms of time pressure and conflicting demands (Karasek, 1985). Job control, also labeled as decision latitude, refers to the opportunities an employee has to control his work activities. Decision latitude includes two elements: the breadth of skills used by the employee on the job (skill discretion) and the employee's authority to make decisions on the job (decision authority). Both elements are considered to enable the employee to influence his work, have been shown to co-occur in jobs, and were therefor initially often combined in one global measure of job control (Karasek & Theorell, 1990; van der Doef & Maes, 1998, 1999b).

It is important to highlight that the focus of the JDC model is exclusively on the work situation, i.e. the psychosocial job characteristics, as a determinant of employee outcomes. The two central assumptions of the model are represented by the diagonals in the figure. The first process (diagonal A) influences the (ill-)health of an employee, whereas the second process (diagonal B) influences the work motivation and learning behavior of an employee. On the basis of job demands and job control, four different job types can be described: the passive job, combining low demands with low control, the active job combining high demands with high control, the low strain job combining low demands with high control, and the high strain job, combining high demands with low control (see Fig. 9.1). On the one hand, this combination of demands and control predicts the employee's physical and mental health, with the highest risks for health endangerment in the high strain job. On the other hand, the combination of demands and control predicts to what extent a job fosters learning and the motivation to develop new behaviors, with the most positive outcomes being expected in the active job. As such, the active job is considered to be the most desirable job type, as it enables learning and stimulates motivation, without the drawback of ill health.

This simple model has been embraced by scientists, practitioners and employers, making this model the most widely applied model of occupational stress (De Lange, Taris, Kompier, Houtman, & Bongers, 2003). One of its charms is that it considers the possibility that high demands may be placed on employees (resulting in high productivity), as long as sufficient job control is provided, not only without detrimental effects on health, but even with positive effects when considering learning and motivation. One of the debates regarding the JDC model, revolves around the issue of interaction of demands and control. Karasek (1989) has indicated that the interaction refers to the assumption that the different combinations of these two job characteristics are able to predict two different sets of outcomes, i.e. strain and learning. As such, with this perspective, the testing of the model may consist of examining to what extent employees working in a high strain situation experience worse health than employees in a non-high strain or in a low strain situation. In contrast, other researchers (e.g., Kasl, 1996) consider the moderating effect of job control on the relationship between job demands and outcomes as being the crucial aspect of the model. In the latter, the model is supported when job control buffers the negative impact of high demands on employee health and well-being. The most common way to examine this buffering effect is by evaluating the effect of the multiplicative term of demands and control, after controlling for the main effects of

these job characteristics. In reviewing the research on the JDC model it is essential to discriminate between these different approaches, as they test somewhat different hypotheses and the practical implications might differ (e.g., van der Doef & Maes, 1998, 1999a).

On the basis of empirical research conducted by Johnson and colleagues (Johnson & Hall, 1988; Johnson, Hall, & Theorell, 1989) the JDC model was expanded with a second job resource: workplace social support. Social support refers to the existence of good relationships with coworkers and supervisor, which provide the employee with a positive social atmosphere, in which he, or she, can feel supported, experience emotional or practical support, and can count on others. A job lacking such a supportive environment has been labeled as "isolated", resulting in the labeling of the most detrimental job type as an "iso-strain" job. The "iso-strain' job combines high demands, with low control and low support.

9.2 The Job Demand-Control-Support Model in Relation to Employee Health and Well-Being

In the 35 years of empirical research on the JDC(S) model, many studies examined cardiovascular disease (CVD) as an outcome. In epidemiological studies on large samples from the general working population, evidence was found for a higher prevalence and incidence of cardiovascular disease in employees working in high strain jobs (Schnall, Landsbergis, & Baker, 1994; van der Doef & Maes, 1998). As such, high job strain has been identified as a risk factor for CVD, beyond socio-demographic characteristics (e.g., SES) and standard risk factors such as health behaviors and high blood pressure (Kivimäki et al., 2012).

The "iso-strain' job (combining high demands, with low control and low support) has also been identified as being associated with the highest levels of ill-health. For instance, in their research on cardiovascular disease, Johnson and Hall (1988) showed that employees in the "iso-strain" job had more than twice the risk of a cardiovascular event, in comparison to employees working in a job characterized by low demands, high control and high social support. Studies on the JDC and the JDCS models have covered a broad array of outcomes ranging from psychological outcomes such as job dissatisfaction, depressive complaints, and burnout to physical outcomes such as pregnancy outcomes and metabolic syndrome (for reviews, see De Lange et al., 2003; Häusser, Mojzisch, Niesel, & Schulz-Hardt, 2010; van der Doef & Maes, 1998, 1999a). Two main conclusions can be drawn. First, most of the JDC(S) model research focuses on the prediction of employees' physical or psychological health and well-being. Only a few studies have addressed and found support for the learning hypothesis, focusing on outcomes such as learning and mastery (e.g., Taris, Kompier, De Lange, Schaufeli, & Scheurs, 2003). Second, although the (iso)strain hypothesis receives substantial support, much of the research fails to find the moderating effect of job control and social support on the demands – physical/psychological health association (e.g., De Lange et al., 2003; Häusser et al., 2010; Taris, 2006).

The inconsistency in the support for the moderating effect of control and support has generated debate, and researchers have tried to pinpoint the crucial issues that discriminate the studies that do find these moderating effects from the studies that do not (Häusser et al., 2010; van der Doef & Maes, 1998, 1999a;). Two of these issues will be addressed here: the generic versus occupation-specific assessment of the job characteristics, and the matching hypothesis, the notion that resources such as job control and support need to match the type of demand in order to exert a buffering effect.

9.2.1 Occupation-Specific Versus Generic Measurement

The most commonly used instrument to assess the psychosocial job characteristics of the JDCS model is the Job Content Questionnaire (JCQ; Karasek, 1985). The JCQ has been developed to measure the key components psychological demands, decision latitude, social support, complemented with scales assessing amongst others physical demands and job insecurity (Karasek et al., 1998). Research has shown that the JCQ scales provide a reliable assessment, and the instrument is cross-nationally valid (Karasek et al., 1998). The items in the questionnaire are formulated such that they are applicable to employees across occupational groups. For instance, items for the Psychological Demands scale refer to work pace (e.g., My job requires working very fast) and conflicting demands (e.g., I am free from conflicting demands that others make). Also the items concerning job control and social support are generic (e.g., My job allows me to make a lot of decisions on my own; My supervisor is helpful in getting the job done). One of the strengths of a generic assessment approach is that it is suitable for multi-occupational research, and allows for comparisons across occupational groups (Kasl, 1987). On the other hand, this approach has the drawback that it might be lacking specificity when it comes to the particular occupation-specific demands, control, and support aspects of jobs. It appears likely that these occupation-specific aspects are crucial in explaining differences in, for instance, burnout levels between various occupational groups. On this basis various scholars (e.g., Kasl, 1987; Schaefer & Moos, 1993) have called for the development of occupation-specific measures, to get a better representation of the work situation, and a more accurate view of the occupational stressors that have negative health and well-being consequences. Specifically with regard to the JDC(S) model, it has been suggested that the limited support for the buffer hypotheses of the model could be attributed to the use of generic scales to assess the JDCS dimensions (De Jonge, Van Vegchel, Shimazu, Schaufeli, & Dormann, 2010; De Lange et al., 2003). Occupation-specific measures, which are able to capture the relevant demands, control and support aspects of a job, might be required to adequately test the hypotheses postulated by the JDCS model.

This notion has led to the development of occupation-specific measures for various professional groups, often on the basis of the generic Job Content Questionnaire (Karasek, 1985). Such instruments have been used, for instance, in JDC(S) studies on nurses (Gelsema, van der Doef, Maes, Akerboom, & Verhoeven, 2005), and teachers (van der Doef & Maes, 2002). To illustrate this approach, the development

and value of such an occupation-specific measure for teachers is described in more detail. In 1993, Maes and colleagues developed a comprehensive instrument to assess quality of work: the Leiden Quality of Work Questionnaire (LQWQ; Maes, van der Doef, & Verhoeven, 1993; van der Doef & Maes, 1999b). This questionnaire was based on the JDC(S) model as assessed by the JCQ, the Michigan model (Caplan, Cobb, French, Van Harrison, & Pinneau, 1975) as assessed by the Questionnaire for Organizational Stress, version Doetinchem (Bergers, Marcelissen, & De Wolff, 1986), and the Wellness at Work approach developed to evaluate whether working conditions are in agreement with the Dutch Act on Working Conditions (Maes, Kittel, Scholten, & Verhoeven, 1989). The LQWQ is a generic questionnaire, assessing eleven job characteristics, Work and Time Pressure, Role Ambiguity, Skill Discretion, Decision Authority, Task Control, Social Support from Supervisor and Social Support from Coworkers, Physical Exertion, Hazardous Exposure, Job Insecurity, and Lack of Meaningfulness, and the outcome variable of Job Satisfaction in a reliable way (van der Doef & Maes, 1999b). On the basis of this generic instrument, Maes and van der Doef (1997) developed a teacher-specific instrument. To construct the item pool, the two authors and two experienced secondary school teachers formulated teacher-specific items for each job characteristic measured by the LQWQ. This resulted in an item pool of 111 items, which on the basis of confirmatory factor analysis and reliability analyses was reduced to a 74-item questionnaire covering fourteen job characteristics and two outcome variables (see Table 9.1). The LQWQ – teacher version has been translated in many languages (e.g., French, German, Italian) and has demonstrated good validity and reliability in a cross-national study on stress in secondary school teachers conducted in 13 European countries (Verhoeven, Maes, Kraaij, & Joekes, 2003). In Sect. 9.3 we will further elaborate on the results of this study.

To examine whether this teacher-specific assessment would indeed be a better predictor of teachers' health and well-being than the generic assessment, a study was set up in which 454 teachers in secondary vocational schools filled in both the general LQWQ and the teacher-specific LQWQ (van der Doef & Maes, 2002). Burnout, anxiety, depression, somatic complaints, and job satisfaction were included as indicators of teacher health and well-being. Analyses indicated that across all outcomes under study, the teacher-specific assessment outdid the generic assessment, explaining more variance in the outcomes. To illustrate, the job characteristics assessed by the general LQWQ explained 40% of the variance in emotional exhaustion, with high work and time pressure, high role ambiguity, low decision authority, high job insecurity and lack of meaningfulness being the strongest predictors. In comparison, the teacher-specific assessment yielded a 47% (in other words, +7%) explained variance in emotional exhaustion. Besides indicating partly the same job characteristics as playing a role in emotional exhaustion (work and time pressure, role ambiguity), the teacher-specific assessment highlighted the following teacher-specific predictors: student (mis)behavior (e.g. Students behave aggressively in this school), training (e.g. My job requires that I continuously refresh my knowledge on my teaching subject), lack of task variety (e.g. I have to teach the same courses year after year), and physical exertion (e.g. I often have to stand for long periods of time).

Table 9.1 The scales of the Leiden Quality of Work Questionnaire – teacher version (Maes & van der Doef, 1997; van der Doef & Maes, 2002)

Concept	Scale	Number of items	Cronbach alpha	Example items
Job demands	Work and time pressure	7	.83	I have limited time to prepare my courses; I lack the time to counsel individual students
	Role ambiguity	5	.81	In this school, it is not clear what is expected of a teacher; When I encounter problems with my students it is not clear what I may and may not do
	Interaction with students/ aggression	4	.81	During my courses, I constantly have to keep an eye on a number of difficult students; Students behave aggressively in this school
Decision latitude	Training	3	.84	My job requires that I continuously refresh my knowledge on my teaching subject; My job requires that I am familiar with educational innovations
	Task variety	3	.77	I have to teach the same courses year after year; My job involves a variety of tasks
	Decision authority	6	.70	I can choose the educational method I want to use in my courses; I get consulted when educational material for the courses I teach are purchased
Social support	Social support management	4	.84	The school management pays attention to what I say; I experience a lot of support from the school management
	Social support supervisor	5	.87	When in contact with others (parents, school management) my direct supervisor looks after my interests; I can ask my direct supervisor for help when I have problems at work
	Social support colleagues	5	.77	At my school, colleagues stick to what has been agreed upon; In the process of educational innovation, I experience a lot of support from my colleagues

(continued)

Table 9.1 (continued)

Concept	Scale	Number of items	Cronbach alpha	Example items
Additional job characteristics	Physical exertion	4	.79	Teaching is a physically tiring profession; I often have to stand for prolonged periods of time
	Physical work environment	5	.69	The climatological conditions (coldness, heat, lack of fresh air, humidity) in our school are bad; The building I teach in has annoying shortcomings
	Job insecurity	4	.81	It is questionable whether I will keep my current number of teaching classes in the future; Every school year it is uncertain how many teaching hours I will get
	Future prospects	6	.69	As a teacher one has limited prospects for career development and promotion; Being a teacher one can always find a job
	Lack of meaningfulness	5	.79	I think I do valuable work as a teacher; I get a lot in return from my students
Outcome: job satisfaction	Job satisfaction	4	.76	I enjoy my work as a teacher; Being a teacher is the best profession there is
Outcome: turnover intention	Turnover intention	4	.70	If the opportunity arose, I would quit the teaching profession; If the opportunity arises, I would like to work at an other school

Furthermore, in the context of the JDCS model, it was expected that "Training" would be an aspect related to skill discretion, and as such would be associated with positive outcomes, such as high job satisfaction and low emotional exhaustion. However, in this sample of teachers, "Training" emerged as an additional demand of the job, and was a significant predictor of emotional exhaustion. As such, this study shows that using a teacher-specific assessment does provide a more refined and complete picture of the job characteristics that play a role in teachers' health and well-being. It highlights specific job characteristics such as student (mis)behavior and continuous training as demands that are important for teachers' well-being, and therefore need to be considered in efforts to limit and reduce teachers' stress.

This study also examined whether this more refined assessment of the JDCS dimensions would yield more support for the buffering hypotheses of this model. Contrary to expectations, only limited support was found for moderating effects of the various teacher-specific measures of control (Task Variety, Decision Authority) and support (Social Support from Management, Department Supervisor, and Colleagues) on the impact of the diverse demands (Work and Time Pressure, Role Ambiguity, Student Aggression) on the outcomes. More recently, Brough and Biggs

(2015) also examined whether an occupation specific assessment of job demands would explain a larger proportion of variance for both direct effects and job demands x job control/support interaction effects, in comparison to the examination of generic job demands. In a sample of 746 correctional workers, they did find support for the first notion: correctional specific job demands were more strongly associated with job satisfaction, work engagement, turnover intentions, and psychological strain, in comparison to generic job demands. However, an occupation-specific assessment of demands did not yield more support for moderating effects than a generic assessment did. Both studies underscore the value of examining job characteristics taking into account occupation-specific measures. Their findings however do not identify this tailored assessment as being the core issue for detecting the moderating role of control and support.

9.2.2 The Matching Hypothesis

A second issue that has been put forward as an explanation for the lack of support for the moderating effect of control and support in the demands – health/well-being association is the so-called "matching hypothesis" (Cohen & Wills, 1985). Already, in 1985, Cohen and Wills argued that social support should match the demands, or needs, in order to exert its moderating effect. For example, social stressors might be more strongly reduced by emotional social support, than high work demands. This "matching hypothesis" can be extended to job control, the other resource in the JDCS model. Wall, Jackson, Mullarkey, and Parker (1996) conducted a study to examine for which aspect of job control (e.g. task variety, skill use) the buffer hypothesis would be supported. In a sample of 1,451 manufacturing employees, they found support for the moderating effect of job control on the demands – strain relationship when using a job control scale including timing control and method control. In contrast, they found no support for the buffer hypothesis when analyzing a broader decision latitude scale, incorporating method control, skill use and task variety. Based on these results the authors argue that the measurement of job control should cover those aspects that adequately represent the control an employee can exert over the demands encountered.

More recently, De Jonge and Dormann (2003) have formulated a theory incorporating this notion: the so-called Demand-Induced Strain Compensation (DISC) Model. In this model, three types of demands and resources are defined: physical, cognitive, and emotional demands and resources. It is predicted that job resources will be more likely to counteract the negative impact of high job demands when they both relate to the same domain. However, the model does not focus solely on the match between demands and resources, but also expands this specificity hypothesis to the strain outcomes. The Triple Match Principle (TMP) proposes that the strongest, interactive relationships between demands and resources are observed when demands *and* resources *and* strains are based on the same dimension. For instance, emotional support provided by colleagues is most likely to moderate the relation-

ship between emotional demands (e.g. dealing with aggression of pupils) and emotional exhaustion. As such the TMP goes a step further than the matching hypothesis from Cohen & Wills (1985) in that not only stressors and resources should match, but that stressors are also expected to match the strains. For example, being confronted with emotionally demanding situations in dealing with pupils, is more likely to cause emotional exhaustion than physical complaints. This relatively recent model has been examined in a number of studies; however, to this point, only two studies have focused specifically on teachers (Feuerhahn, Bellingrath, & Kudielka, 2013; Van den Tooren, De Jonge, Vlerick, Daniels, & Van de Ven, 2011).

In their recent review incorporating DISC studies on diverse occupational groups, De Jonge, Dormann, and Van den Tooren (2008) found substantial support for the principles of the DISC model. Eight of the eleven studies showed evidence for the Triple Match Principle. The two studies on teachers found mixed results. One of these studies (Van den Tooren et al., 2011), examining the TMP in 317 Belgium primary and secondary school teachers in the beginning of their teaching career, did not find support for the matching hypothesis. In this longitudinal study, baseline demands and resources and their interaction were examined as predictors for cognitive strain, emotional exhaustion, and physical complaints one year later, controlling for initial levels of these outcomes. Support for moderating effects on these outcomes was found in only one out of nine tests on matching demands and resources, and in one out of 18 tests on non-matching demands and resources. Furthermore, there was virtually no support for main effects of demands and resources at baseline predicting the outcomes one year later. In contrast, the study of Feuerhahn et al. (2013), examining emotional exhaustion in 177 German teachers, found both cross-sectional and longitudinal support for the TMP. They studied emotional demands (parents' criticism, conflicts with colleagues, and emotional dissonance) and cognitive job demands (time pressure and classroom disruptions) in combination with the emotional resource emotional support, and the cognitive resource teacher self-efficacy. At baseline, high emotional demands and high cognitive demands were associated with higher emotional exhaustion. Furthermore, in cross-sectional analyses moderating effects of the emotional and cognitive resources were found in line with the TMP. A follow-up after 21 months in a subsample of 56 teachers showed that for teachers experiencing low emotional support, conflicts with colleagues and emotional dissonance at baseline predicted higher levels of emotional exhaustion at the later time point, controlling for baseline levels of emotional exhaustion. In line with the TMP, the impact of emotional demands on emotional exhaustion was moderated by the availability of emotional support. However, the data gathered in this study did not include a cognitive outcome, and as such could not test the TMP in full. Given the cross-sectional and longitudinal findings thus far, the matching principle seems relevant for occupational stress in various occupational groups, including teachers, and the DISC model seems a promising pathway for further research.

9.3 Review of Teachers' Stress Studies Based on the JDC(S) Model

The goal of this section is to provide an overview of the research based on the JDC(S) model in teachers. As such, our focus lies on highlighting the main themes and findings, instead of covering all JDC(S) studies conducted.

A review of the literature on the JDC(S) model in relation to stress outcomes in teachers indicates that this occupational group has been the subject of quite a number of studies. By far the majority of these studies have been conducted in Europe, e.g. the U.K., Finland, and the Netherlands (e.g., Verhoeven et al., 2003). More recently, studies have examined teachers' stress in other regions, including Australia (Bradley, 2007, 2010), Malaysia (Masilamani et al., 2012), Brazil (Porto et al., 2006), South Africa (Peltzer, Shisana, Zuma, Van Wyk, & Zungu-Dirwayi, 2009), Canada (Fernet, Guay, Senécal, & Austin, 2012), and the U.S. (Fox & Stallworth, 2010; McIntyre et al., 2014).

The vast majority of studies focuses on the (iso-)strain or buffer hypothesis, and examines stress-related outcomes. As one might expect, given the nature of the profession, burnout is the most studied outcome. Furthermore, the JDC(S) model in teachers has been examined in relation to mental disorders, job (dis)satisfaction, and (psycho)somatic complaints. Research on more objective health indicators is rather limited, and is restricted to physiological stress indicators such as cortisol levels. In only a few instances has the learning hypothesis, focusing on positive outcomes that could result from working in an active job, such as mastery and work engagement, been addressed (e.g., Taris et al., 2003).

9.3.1 The (Iso)-Strain Hypothesis and the Buffer Hypothesis

Focusing on stress-related outcomes, the majority of studies have examined the (iso) strain hypothesis, and/or the buffer hypothesis. In a first section (9.3.1.1), we will present the studies testing the JDC(S) model in the prediction of various health and well-being outcomes (e.g., burnout, somatic complaints, job satisfaction), which is its largest body of research as applied to teachers. In a second section (9.3.1.2), we will address the few studies that have focused on the potential pathways through which working in a high (iso)strain situation could exhibit its effects on teachers' health and well-being. The studies reviewed here have either used physiological measures (e.g., Steptoe, Cropley, Griffith, & Kirschbaum, 2000), or a diary approach to examine the stress process (e.g., Cropley, Dijk, & Stanley, 2006). Whereas in large epidemiological studies the JDC(S) model has been examined in relation to disease endpoints such as cardiovascular disease and mortality (e.g., Johnson & Hall, 1988), this has not been the case in teachers. One underlying reason for this is that single occupation studies do not yield enough variance in the predictors, and heterogeneous multi-occupational samples are considered necessary to examine these types of outcomes.

9.3.1.1 Indicators of Health and Well-Being

Soon after the publication of the JDC model by Karasek in 1979, a test of the model was conducted in a sample of 148 secondary and middle school teachers in the UK (Payne & Fletcher, 1983). It is important to mention that the measures used to assess demands, supports, and constraints in this study, were quite different from the generic scales of Karasek. In this study the measures were specifically designed to differentiate within the professional group, and capture variation among teachers. This study failed to support the model, finding no significant additive or interactive effects of demands and control on depression, anxiety, obsession, somatic symptoms, and minor cognitive impairments (e.g., forgetting, indecisiveness). However, two more recent cross-sectional studies did find higher risk for mental disorders in high strain situations. In their study on psychiatric morbidity in 160 primary and secondary school teachers, Cropley, Steptoe, and Joekes (1999) found that high strain teachers were 3.5 times more likely than low strain teachers to have a score on or above the cut-off for psychiatric complaints as assessed by the Revised Clinical Interview Schedule (CIS-R; Lewis & Pelosi, 1990). Similar findings were reported by Porto et al. (2006) for their sample of 1,024 public and private elementary school teachers in Brazil: the prevalence of self-reported mental disorders as assessed by the Self-Reporting Questionnaire was 1.5 times higher among the high strain teachers (prevalence: 53%) than among the low strain teachers (prevalence: 36%). However, the teachers in active work (high demands – high control) had a similar elevated prevalence (54%), suggesting that high demands might be the crucial factor. As such, some cross-sectional evidence has been found which identifies high strain work as a potential risk factor for mental disorders in teachers. Whether or not the crucial factor is the high level of demands, the lack of control, or their combination, remains an issue for further study. Furthermore, prospective studies are clearly needed to substantiate the causality involved.

As already mentioned, the majority of studies on the JDCS model in teachers have focused on indicators of reduced mental and physical well-being such as burnout, (psycho)somatic symptoms and job (dis)satisfaction. One of the largest studies on the JDCS model and teachers' stress was a cross-national study conducted in Europe, including 2,796 secondary school teachers in 13 European countries (Verhoeven et al., 2003). This project became known as EUROTEACH. The project was initiated in 1997 at an advanced postgraduate course in Health Psychology. A group of researchers started a European research project, focusing on quality of work and wellness/health outcomes in teachers. Using an analogous research protocol and questionnaire (see below), data were gathered from secondary school teachers in Belgium, England, Greece, Ireland, Italy, the Netherlands, Spain, Switzerland, Finland, France, Germany, the Czech Republic, and Slovakia. The survey included the Leiden Quality of Work Questionnaire – Teachers version (Maes & van der Doef, 1997; van der Doef & Maes, 2002), described earlier in this chapter. In all samples, both the (iso-)strain hypothesis and the buffer hypothesis of the Job Demand-Control-Support model were tested on the outcomes burnout, somatic complaints, and job satisfaction.

Besides testing the model in the different countries, the project also yielded an overall test of the model in the full sample of nearly 2,800 teachers (Verhoeven et al., 2003). Generally, the results supported the (iso-)strain hypothesis, yielding additive effects of demands, control and social support for emotional exhaustion and job satisfaction, and additive effects of demands and control on personal accomplishment and somatic complaints. In contrast, there was virtually no support for moderating effects of control and/or support on the demands – health/well-being relationship. This pattern was also reflected in the studies per nation: support for the additive effects of demands, control, and support was substantial, whereas support for moderating effects was virtually absent (e.g., Griva & Joekes, 2003). To further examine the cross-cultural validity of the JDCS model (Verhoeven et al., 2003), analyses were done separately for three European regions: West (including e.g. the Netherlands, Finland, Germany), South (including e.g. Italy, Spain, Greece), and East (including Czech Republic and Slovakia). The main finding was that the JDCS model predicts outcomes best in the West-European region, and worst in the East-European region, with the South-European region taking an intermediate position. To illustrate this, the main effects of demands, control, and support explained 33% of the variance in emotional exhaustion in the West-European region, 23% in the South European region, and only 17% in the East European region. These European findings highlight the relevance of further examining the validity of the JDCS model in a worldwide cross-cultural perspective.

In line with the results from the EUROTEACH study, the iso-strain hypothesis (high demands, low control, and low support being associated with higher levels of burnout, (psycho)somatic complaints, and dissatisfaction) has been confirmed in other cross-sectional studies (e.g., Kosir, Tement, Licardo, & Habe, 2015; Skaalvik & Skaalvik, 2009; Taris, Schreurs, & Van Iersel-Van Silfhout, 2001). However, the few studies that have examined this relationship in a longitudinal design are less supportive. For example, in a sample of 806 French-Canadian teachers in public elementary and high schools, Fernet et al. (2012) found that changes between the beginning (October) and the end of the school year (June) in demands (workload, students' disruptive behavior) and in social support (the school principal's leadership behaviors) were predictive of changes in burnout over this time period. Changes in self-efficacy and autonomous motivation seemed to play a mediating role. However, in this study, changes in job control were unrelated to changes in burnout, yielding no support for the strain hypothesis.

The buffering effects of control and support were less often investigated for these outcomes and studies have yielded inconsistent results. As was the case in the EUROTEACH project, several studies have failed to find support for the buffer hypothesis (e.g., McClenahan, Giles, & Mallett, 2007; Payne & Fletcher, 1983; Taris, Schreurs, & Schaufeli, 1999). Some studies however did find support for buffer effects (e.g., Fox & Stallworth, 2010; McIntyre et al., 2014; Näring, Briët, & Brouwers, 2006; Santavirta, Solovieva, & Theorell, 2007). McIntyre et al. (2014) examined the JDCS model in a sample of 186 middle school teachers, using paper-and-pencil measures as well as ecological momentary assessment (EMA). Teachers filled in an iPod-based diary with multiple assessments per day taking place at three

time points over one academic year during three consecutive days in the Fall, one day in the Winter, and two days in the Spring. The questionnaire data showed that cross-sectionally the JCQ measures of demands, control, and coworker support predicted psychological distress, and job control exerted a marginal buffer effect on the demands – distress association. In the EMA data, however, both the main and moderating effects of the JDCS variables were supported in the prediction of negative affect and subjective stress. Other studies have also found support for buffering effects of job control, although not consistently across outcomes. For instance, in the study of Näring et al. (2006) the buffer hypothesis was supported for depersonalization, but not for emotional exhaustion or personal accomplishment. Likewise, in the study of Santavirta et al. (2007) buffering effects of job control were found regarding emotional exhaustion, but not for vitality or emotional well-being. Not surprisingly, support for moderation is furthermore not always consistent across the various potential moderators under study. In the research of Fox and Stallworth (2010) the buffer effect was only found for one of the two potential buffers. In this latter study on U.S. teachers, specific emphasis was put on the matching hypothesis in the prediction of job satisfaction, job-related negative emotions, physical symptoms and burnout. Fox and Stallworth (2010) examined to what extent the impact of the stressors pervasive bullying (by co-worker(s), principal or students) and experienced acts of violence in/around school was buffered by satisfaction with the way the school administration handled acts of violence (considered as a specific form of control over the stressor under study), as well as social support from co-workers and the school principal. They found support for the moderating effect of this matching form of job control: Experiencing violent acts predicted strains (e.g. low job satisfaction, negative emotions, physical symptoms), but only when satisfaction with how violence was handled was low. Contrary to expectations, social support did not have similar buffering effects on the relationship between bullying/violence and strain.

Furthermore, it is interesting to note that some studies do find moderating effects, but only for subgroups of teachers. For example, in their study on burnout in 398 university staff members, Fernet, Guay, and Senécal (2004) found that job control did moderate the impact of demands on burnout, but only for teachers high on work self-determination, a measure reflecting the level of intrinsic work motivation. In this study, job control was assessed with a 3-item measure of opportunities for control and decision derived from the JCQ, and job demands were assessed in a comprehensive way including work overload, role ambiguity, role conflict and stress related to research activities. The study from Peeters and Rutte (2005) on burnout in 123 elementary teachers identified time management behavior as an important moderator. Engaging in time management behaviors (setting and prioritizing goals, planning tasks, and monitoring progress) seemed to compensate for low levels of autonomy, especially when demands were high. Bradley (2007) examined subjective stress, job dissatisfaction, and turnover intention in a sample of 422 experienced and 248 beginning schoolteachers in primary and secondary public schools in Australia. His results show that the moderating effect of control on the demands – strain relation was only present among new-start teachers. As such, these studies

suggest that individual characteristics, such as motivation, time management behavior, and tenure might determine whether a teacher profits from high levels of job control or whether a teacher is negatively affected by low levels of job control.

Interestingly, quite in contrast with the strict focus on the work environment as a determinant of health, these studies introduce individual characteristics to the JDC(S) model, promoting the perspective that teachers' outcomes are a consequence of job characteristics in combination and in interaction with personal characteristics. Along with this development, recent research has also expanded the JDC(S) model in another way. As mentioned, one of the criticisms on the JDCS model has been its focus on only three psychosocial job aspects. Various authors have labeled this focus as a strength of the model; however, others have indicated that the model fails to incorporate other relevant job aspects. Not surprisingly, a number of studies have broadened the job characteristics, as the EUROTEACH study did by incorporating characteristics such as lack of meaningfulness, physical exertion, and job insecurity. Incorporation of these job characteristics in the analyses increased the explained variance in the outcomes, and as such indicated that other job characteristics beyond the JDCS model play a role in health and well-being in teachers. For example, Näring et al. (2006) found that emotional labor contributed to teachers' stress in addition to the JDCS dimensions. In a similar vein, in other studies based on the JDCS model, the relationship to parents (Skaalvik & Skaalvik, 2009), and the relation to students (Van Droogenbroeck, Spruyt, & Vanroelen, 2014) were significant predictors of teachers' health and well-being, next to the JDCS dimensions. This acknowledgement of other relevant job characteristics for employee health and well-being beyond the dimensions of demands, control, and support, is also reflected in more recently developed occupational stress models, such as the Job Demands – Resources model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001, see Chap. 11).

9.3.1.2 Physiological Indicators of Stress and the Stress Process

Only a few studies have examined the JDC's hypotheses in the prediction of physiological indicators of stress in teachers and those show mixed results. Based on an assessment of job demands, job control and skill utilization derived from the JCQ, Steptoe et al. (2000) classified 105 junior and high school teachers as working in a high strain or low strain job based on the ratio between demands and the combined score of control and skill utilization. High strain jobs were those situations were high demands were coupled with low control and skill utilization. One year later, on one working day eight saliva samples were gathered at two-hour intervals to determine fluctuations in levels of the stress hormone cortisol. The first sample was taken in the morning, between 8:00–8:30 a.m., and the last sample of the day in the evening, between 10:00–10:30 p.m. One of the main findings was that the high strain teachers had elevated cortisol levels on the first measurement point early in the working day in comparison to low strain teachers, whereas there were no differences later in the working day or in the evening. The authors suggest that the elevated cortisol levels

early in the morning in the high strain teachers might reflect an anticipatory psychobiological response to the high demands – low control day they face at work. Interesting in this respect is the suggestion from Rystedt et al. (2008) that morning cortisol levels may be more sensitive to specific daily changes in job strain, whereas evening cortisol levels may be more reflective of chronic exposure.

In a more recent study, Serrano, Moya-Albiol, and Salvador (2014) assessed cortisol and testosterone levels in 34 full-time female school teachers of 4–14 year old pupils on public schools during two working days. Higher cortisol levels and lower testosterone levels are considered to reflect higher physiological stress. Contrary to expectations, both high strain and high demands proved unrelated to these indicators. Only high job control was associated with higher testosterone levels, hence lower physiological stress, before work. In a recent study in secondary school teachers in Malaysia the association between working in a high strain job and two biomarkers of chronic stress, salivary cortisol (indicator of activation of the hypothalamic-pituitary-adrenal (HPA) axis) and salivary IgA (indicator of depression of the immune function) was studied. In their sample of 302 teachers, both indicators proved to be unrelated to Karasek's job strain categories (Masilamani et al., 2012).

Although not focusing explicitly on the JDC model, the studies from Ritvanen, Louhevaara, Helin, Halonen, and Hänninen (2003) and Ritvanen, Louhevaara, Helin, Väisänen, and Hänninen (2006) are also interesting in this context. In their studies among teachers they examined psychophysiological stress indicators (e.g. blood pressure, static muscle tension, and neuroendocrine reactivity) over the school year. One of their main findings is that among teachers psychophysiological stress varies across the year, in line with the varying workload, and that recovery takes place during the summer holidays.

Focusing particularly on the process of recovery, Cropley et al. (2006) studied the relationship between job strain, rumination, and sleep quality. In this study, 143 primary and secondary school teachers completed an hourly record of their work-related thoughts over one workday evening between 5 p.m. and bedtime, and rated their sleep quality the following morning in a structured rumination and sleep diary. Using a 10-item scale for demands, job control and skill utilization based on the JCQ, job strain was based on the ratio job demand / (job control + skill utilization). Findings showed that high strain teachers, in comparison to low strain teachers, took longer to unwind after work and that they ruminated about work-related issues during the whole evening, including bedtime. Whereas total sleep time did not differ between these two groups, the high strain teachers did report a poorer sleep quality than their counterparts. Given the impact of rumination on physiological stress responses (Brosschot, Gerin, & Thayer, 2006) and the importance of sleep for the recovery process (Åkerstedt, Nilsson, & Kecklund, 2009), this study might pinpoint an important pathway through which high strain work could affect teachers' health and well-being.

Summarizing these studies on physiological indicators of stress and the stress process reveals some interesting issues. First of all, none of these studies have examined the full JDCS model incorporating the social support dimension. Secondly, the focus has been on the strain hypothesis, examining either additive

effects of demands and control, or using a categorization in high strain – low strain jobs on the basis of the ratio between demands and control. As such, the moderating role of job control on the demands – physiological strain relationship has thus far not been examined. Furthermore, given the discrepant results and the limited number of studies, it seems too early to draw any firm conclusions on the impact of demands and control on physiological stress and the stress process in teachers. However, there is substantial evidence linking the JDC(S) model to physiological stress indicators in other occupations (for a review, see Ganster & Rosen, 2013). This calls for a more thorough examination of the JDCS model in relation to physiological responses, including the process of stress reactions and recovery, in teachers. An interesting study design would be to combine ecological momentary assessment of demands, control, and support, with multiple assessments of physiological and subjective stress indicators over a number of days at various time points in the academic year. Such a study will enhance our understanding of how fluctuations in demands, control, support and their interactions affect the process of (physiological) stress and recovery in teachers.

9.3.2 The Learning Hypothesis

In line with the overall JDC(S) model research, the learning hypothesis, which highlights positive outcomes such as learning motivation and mastery, received limited attention in research on teachers. The cross-sectional study of Kwakman (2001) was one of the first studies to examine this hypothesis in a sample of teachers. In her study on 542 secondary school teachers, she assessed work pressure, emotional demands, and job variety as indicators of demands, autonomy and participation as indicators for job control, and social support from management and colleagues. Note that characterizing job variety as a demand seems at odds with the JDCS model, where job variety is considered as one of the elements of decision latitude. In terms of outcome, the teachers were asked to indicate to which extent they exhibited specific professional development activities, which were considered to provoke learning. The results showed limited support for additive effects of high demands, high control, and high support on the exertion of learning activities. Contributing positively to learning activities, job variety indeed seemed to act as a resource, and not as a demand. Further sub-analyses on teachers with high demands indicated that teachers combining high emotional demands with high control exerted more professional learning activities than teacher with low control; a result in line with the learning hypothesis. In addition to this cross-sectional study, the learning hypothesis was also examined in a longitudinal design by Taris et al. (2003). In their study on 876 primary and secondary Dutch school teachers, Taris et al. (2003) assessed demands (burden resulting from the interaction with students) and control (combining items based on the work of Warr (1990) with items that focused on specific aspects of the work situation of teachers) twice with a one-year interval. As outcomes they incorporated two indicators for learning: a measure of motivation for

learning new behavior patterns (based on the definition by Karasek & Theorell, 1990), and the personal accomplishment scale of the Maslach Burnout Inventory. After one year, the highest levels of learning were found in the low demands-high control (low strain) group, and not in the high demands-high control (active) group. Examining changes in job characteristics over a period of one year showed that the transition from a low demands-low control (passive) to a high demands-low control (high strain) was related to a strong deterioration in learning motivation and personal accomplishment. As such, the study failed to support the learning hypothesis, and mimics more the results one would expect on the basis of the strain hypothesis, highlighting the negative impact of high job demands and low job control on learning. In contrast, a longitudinal study examining active learning and mastery in 657 elementary and secondary teachers from Australian public schools found support for the learning hypothesis (Bradley, 2010). In this study, it was postulated that increased job demands and job control would increase active learning, and through this pathway enhance feelings of mastery. Active learning was assessed using the vigor-activity subscale from the profile of mood states, and teachers indicated to which extent they had experienced states such as feeling active, energetic, and lively during work in the previous week. Feelings of mastery were assessed by the Pearlin and Schooler's (1978) Mastery Scale, referring to the extent to which one regards one's life-chances as being under one's own control. The results indicated that, next to a small effect of demands, job control predicted change in feelings of mastery over an eight month period, and active learning seemed to play a mediating role. As such, the learning hypothesis was supported: under conditions of high control, increasing job demands were associated with an increase in mastery, whereas this was not the case in low control situations.

The assessment of job demands and job control in this study is noteworthy. An occupation-specific measure was used, constructed specifically for this study (see Bradley, 2010): for demands, teachers were asked to indicate the requirements of their job as objectively as possible on various facets of their job of as teachers, incorporating for instance quantitative workload, classroom management, relationships with superiors, colleagues and parents. For the job control scale, respondents were asked to indicate the extent to which they felt able to exert control over these aspects. As such, the operationalization is in line with the "matching hypothesis"; the measure of job control used in this study adequately reflects the control possibilities over the demands experienced. This was not the case in the study of Taris et al. (2003), which might explain their different findings. Another issue that is clearly visible in these studies, is that the operationalization of the concept "active learning" is not a straightforward matter. Taris et al. (2003) used two job-related conceptualizations, learning motivation and personal accomplishment. Kwakman (2001) focused on the job by examining professional development activities undertaken at work. Using in contrast two more general indicators of learning, the mood states vigor-activity and general feelings of mastery, Bradley (2010) was the single study finding longitudinal support for the learning hypothesis.

Another study focusing on positive outcomes in the context of the JDC(S) model is worth mentioning here. In their study on teachers based on the Job Demands-

Resources model (see Chap. 11) Bakker, Hakanen, Demerouti, and Xanthopoulou (2007) examined to what extent job control moderated the impact of job demands on work engagement. In a sample of 805 Finnish teachers working in elementary, secondary, and vocational schools, they found additive effects of their measure of demands (pupil misbehavior) and job control (a general measure assessing the influence one has over one's work, derived from the Finnish Healthy Organization Barometer). Lower levels of pupil misconduct and higher job control, hence the low strain situation, were associated with higher work engagement. As such the study does not provide support for the learning hypothesis. Furthermore, job control did not exert a moderating effect on the demands – work engagement relationship. As mentioned previously, in this study a global measure of the amount of influence one has over one's work and issues related to one's work might not have adequately matched the type of demands assessed. This is further substantiated by the finding that other more matching job resources, such as supervisory support and appreciation, did buffer the negative impact of this specific demand (Bakker et al., 2007).

Summarizing, it is evident that the research on the learning hypothesis in samples of teachers is rather limited and results are quite mixed. The longitudinal study from Bradley (2010) supported the learning hypothesis, which is clearly in contrast with the longitudinal study from Taris et al. (2003) that indicated that learning is highest in low strain situations. Given the differences in the studies regarding the conceptualization of on the one hand demands and control, and on the other hand the outcome representing learning, further research is required to determine what is the optimal job situation to enhance learning and motivation in teachers.

9.4 Conclusion

Overall, the research on teachers based on the JDC(S) model indicates that working in a high (iso)strain situation is associated with reduced health and well-being. High job demands, low job control, and lack of worksite support seem to contribute to teachers' mental and physical state, as indicated by outcomes such as mental disorders, somatic symptoms, burnout, and job dissatisfaction. Evidence for the moderating effects of job control and worksite social support on the demands – outcomes relationship is far more limited. A few studies do find the assumed moderating effects, and in some studies the moderating effect has only been found for subgroups of teachers. This encourages further research, taking the 'matching hypothesis' into account and looking at the role of individual characteristics in the JDC(S) model. Consistent with research in other occupational groups and the strong focus on employee strain, the learning hypothesis has received little attention in studies on teachers, and results thus far have been mixed. Given the importance of having up-to-date knowledge on both content and teaching methods, learning motivation seems a very relevant outcome for teachers. As such, dedicating further research to identify what characterizes a job that fosters learning seems worthwhile.

Another issue addressed in this chapter is the value of occupation-specific assessment of job characteristics. A comparison of a general and a teacher-specific measure of job characteristics has underlined the added value of occupation-specific assessment (van der Doef & Maes, 2002). Looking at the teachers studies in general, it is clear that relevant job demands for teachers go well beyond the across-occupational demands time pressure and role conflict indicated in the original JDC(S) model. The research findings stress the importance of occupation-specific demands, such as (mis)behavior of students, violence/bullying, conflicts with parents and/or colleagues, and the demand of continuous training, in explaining teachers' stress. It would be worthwhile to examine in future research whether, in line with the matching hypothesis and the DISC model (De Jonge et al., 2008), specific forms of job control and worksite support could limit the impact of these demands.

Furthermore, research indicates that besides demands, control, and support, other work aspects are relevant for teachers' stress, such as emotion work, physical exertion, and lack of meaningfulness. More recently, a new theoretical model has been developed, evolving from among others the JDC(S) model: the Job Demands-Resources model (Demerouti & Bakker, 2011; see also Chap. 11 in this book). This model encompasses a broader array of job demands and job resources, and as such integrates the perspectives of the JDCS model with other job characteristics that have been shown to have an impact on employee health and motivation.

Our overview also highlights a number of methodological limitations in the research applying the JDCS model to teachers' stress. First of all, a substantial part of the research is of a cross-sectional nature, which hampers the conclusions regarding the causality involved. In addition to that the majority of studies have relied on self-report measures for the assessment of the job characteristics as well as the outcomes, yielding associations that might be inflated by for instance common method bias, social desirability, and negative affectivity. This calls for a shift from mono-method cross-sectional research towards more multi-method longitudinal studies, and diary/ecological momentary assessment studies. Whereas the former can provide a better view on the causality involved in longer term outcomes, the latter studies will further clarify the stress process by illuminating the impact of temporal changes in demands, control, and support on stress responses (see e.g., McIntyre et al., 2016).

Keeping these methodological limitations in mind, some practical implications can be formulated based on the findings in this review and the broader literature on stress management in the workplace. An important feature of the JDC(S) model is that it focuses exclusively on the psychosocial working environment and as such aims at job (re)design to ameliorate jobs and improve employee health and well-being and enhance learning. As such, it clearly steers interventions to target the job characteristics, specifically towards enhancing job control and social support. Hence the focus is on reducing the negative impact of the stressors through enhancing buffering factors in the workplace, instead of focusing on the individual teacher and trying to improve his/her resistance to the work stressors. This organizational approach has a preventative nature, whereas the latter is often reactive and offered to employees who show initial stress reactions. Unfortunately, a recent overview of

stress management in the workplace indicates that individual interventions (e.g. relaxation training, cognitive behavioral interventions) are far more often implemented than organizational interventions including job redesign (Tetrick & Winslow, 2015). Some authors have stressed the ethical aspect involved indicating that we should refrain from teaching employees to deal with an unfavorable work situation if it is feasible to remove or reduce the stressor, reduce exposure to the stressor, and/or put into place effective buffers to limit its negative impact (see e.g., Heaney & Van Rijn, 1990). Reviews of interventions focusing on job redesign, more specifically aiming at enhancing job control in diverse employee populations, show it is possible to improve employee well-being through this type of organizational interventions (Bambra, Egan, Thomas, Tetticrew, & Whitehead, 2007; Egan et al., 2007). However, although it is clear that higher job control and stronger worksite support is associated with lower strain levels, there is less evidence both in research on teachers and in other occupational groups for their buffering effects on the demands-strain relationship. As such, focusing on these buffering job characteristics is likely to have positive effects on health and well-being, but might not be sufficient. Additional interventions and measures to limit the level of demands might be necessary as well to reduce teachers' stress.

Now is the time to put theory into practice in the teachers' work environment, and develop, implement and evaluate organizational interventions aiming at reducing job demands, and enhancing job control and worksite social support. A number of scholars have given concrete ideas in this regard. Teachers' control could be improved by providing them freedom, independence, and discretion in e.g. scheduling work, curriculum development, selection of textbooks, and selection of teaching and pedagogical methods (Rinehart, Short, Short, & Eckley, 1998; Sweetland & Hoy, 2000). Also at the team level, job control can be achieved by creating a team-oriented environment, which includes setting shared purposes and goals, enhancing collective decision-making, and developing professional learning communities (Sweetland & Hoy, 2000). This could also contribute to creating a more supportive work environment, with more opportunities to provide emotional and instrumental support among colleagues. Such measures might also help teachers deal with the emotional demands of the job, in terms of emotion work and pupil misbehavior. With regard to the quantitative demands, measures can be taken to reduce the overall workload, for instance by involving teaching assistants, reducing bureaucracy, and scheduling sufficient time for the different tasks the teaching job entails (e.g., preparation of lessons, grading of assignments). Furthermore, it might be worthwhile to target the distribution of work over the academic year, and try to minimize high peak workloads. On the basis of the current research findings regarding the JDC(S) model, one would expect these types of interventions to be effective in reducing teachers' stress levels and improving their health and well-being, as they have been able to do in other work settings.

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