



## ***High-involvement HRM and employee energy at work:***

*The counteracting mediating effects of challenge and hindrance demands*

### **Master Thesis – Human Resource Studies**

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**Project period:** January – August 2013

**Project theme:** High-Involvement HRM, Employee Energy at work and Performance

## **Abstract**

Currently, two competing views stand out in the literature regarding the relationship between HRM and employee well-being. The 'mutual gains' perspective argues that HRM is beneficial to both organizations and employees while the 'conflicting outcomes' perspective argues that HRM has a positive effect on organizations but it has no or even a negative effect on employees. This study investigates two possible counteracting mediating mechanisms, in line with the two competing views. These mechanisms investigate the relation between employee's perceptions of high-involvement HRM, two different types of job demands namely, challenge and hindrance demands, and employee's feelings of energy at work. Furthermore, this study investigates the alignment between manager ratings of high-involvement HRM and employee's perceptions of high-involvement, since research shows that there is likely to be a disconnect. In order to test the hypotheses in this study data were gathered by means of a questionnaire within 14 different organizations. The final sample consisted of 348 employees from 38 work units. The main findings are that the relation between high-involvement HRM and employee's feelings of energy at work is positively mediated by the challenge demand job responsibility and that manager-rated high-involvement HRM has a moderate positive association with employee-rated high-involvement HRM. Based on these results, recommendations for future research and some practical implications are provided.

**Keywords:** high-involvement HRM; feelings of energy at work; challenge demands; hindrance demands; employee perceptions; manager ratings

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## 1. Introduction

Being positively energized at work benefits both organizations and its members, for example in terms of productivity and psychological well-being (Cole, Bruch, & Vogel, 2012; Dutton, 2003; Quinn, Spreitzer, & Lam, 2012). Recently, energy at work emerged as a focal topic and interest in this topic has increased congruent with the emphasis on the research area of positive psychology (Cole et al., 2012; Seligman, Steen, Park, & Peterson, 2005; Shirom, 2011). Employee energy at work is often referred to as a positive affect (Cole et al., 2012; Quinn & Dutton, 2005) and it can be defined as “individuals’ feelings that they possess physical strength, emotional energy, and cognitive liveliness” (Shirom, 2003; 2011, p.50). Research suggests that energy at work can be associated with a variety of positive outcomes, for example more productive and motivated employees (Quinn et al., 2012; Schippers & Hogenes, 2011; Shirom, 2011). According to Shirom (2011) energy at work may be considered as an indicator of employees’ optimal psychological functioning. Therefore, it is interesting for organizations to know how they can build employee energy at work and in order to reach this it is useful to investigate possible antecedents.

Research has shown that perceived working conditions influence employee energy at work (Cole, Walter, Bedeian, & O’Boyle, 2012; Crawford, LePine & Rich, 2010). Research investigating working conditions as antecedents is largely grounded in the job demands-resources model (JD-R model; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) which divides working conditions into two overarching categories – job demands and job resources. In many contemporary jobs it is common that employees are confronted with high levels of quantitative job demands, such as high workload and time pressure (Sonnentag, Binnewies, & Mojza, 2010). Therefore the focus of this research will be on the link between job demands and employee energy at work. It is suggested that the demands organizations face contribute to the depletion of human energy at work (Fritz, Lam, & Spreitzer, 2011; Quinn et al, 2012; Schwartz, 2007). However, research has shown inconsistent findings on relationships between demands and work outcomes (Cavanaugh, Boswell, Roehling, & Boudreau, 2000; LePine, LePine, & Jackson, 2004). This could be explained by the existence of multiple types of demands. Therefore, this research will follow the work of Lazarus (e.g. Lazarus & Folkman, 1984) by suggesting that job demands can be appraised by employees as either challenging or hindering. Challenge demands such as high levels of job responsibility are generally viewed as rewarding work experiences and produce positive feelings, therefore challenge demands are expected to be positively related to feelings of energy at work. On the contrary, hindrance demands such as role overload tend to be appraised as undesirable constraints and are expected to be negatively associated with feelings of energy at work (Cavanaugh et al., 2000; Crawford et al., 2010). Because of

the potential differentiating effects of these two types of job demands, it is important to study them both in relation to employee energy at work.

In turn, both challenge and hindrance demands are expected to be influenced by high-involvement HRM (DeJoy et al., 2010). High-involvement HRM refers to practices that offer employees opportunities for organizational involvement, either directly through for example teamwork or flexible job designs, or indirectly through for example information sharing or skill acquisition (Wood & Bryson, 2008; Wood & de Menezes, 2011). With respect to the relationship between HRM and employee well-being, two competing views stand out in the literature. The 'mutual gains' perspective is also described as the 'optimistic perspective' (Peccei, 2004) and holds that HRM has positive outcomes for both the organization and the employees. On the other hand, the 'conflicting outcomes' perspective holds that HRM is beneficial for organizations but it has no or even a negative effect on employees in terms of their well-being (Van de Voorde, Paauwe, & Van Veldhoven, 2012). Based on these two different perspectives it is argued in this study that high-involvement HRM can have different effects on employees via challenge and hindrance demands. High-involvement practices can be positively associated with challenge demands by stimulating employees to do more complex tasks and to take more responsibility (Liao, Toya, Lepak, & Hong, 2009). On the other hand, high-involvement practices can also be positively associated with hindrance demands because there is the risk that these practices intensify work which can result in role overload (Jensen, Patel, & Messersmith, 2012; Kroon, Van de Voorde, & Van Veldhoven, 2009). So, it can be expected that the use of high-involvement HRM increases the experience of both challenge and hindrance demands.

Moreover, Van Veldhoven (2012, p.11) proposes that 'policies, routines and actions on behalf of management will only translate into the required employee discretionary effort after they have translated into the job demands and job resources necessary to get the job done'. In addition, research on the antecedents of job demands and resources could lead to new insights in the link between HRM and active health concepts such as energy at work (Van Veldhoven, 2012). These new insights might for example include the possible mediating role of job demands and resources in the relation between HRM and employee outcomes. Therefore it is relevant to investigate the mediating role of job demands in the relationship between high-involvement HRM and employee energy at work. More specifically, this study investigates the two counterbalancing mediating mechanisms of challenge and hindrance demands. As already mentioned, it can be argued that challenge and hindrance demands have different effects on employee's feelings of energy at work. For the challenge demand job responsibility it is expected that the use of high-involvement HRM increases the experience of job responsibility which in turn produces positive feelings and an increase in

employee's feelings of energy. On the other hand, for the hindrance demand role overload it is also expected that the use of high-involvement HRM increases the experience of role overload, however this will be associated with less feelings of energy. Because of these potential counteracting mediating mechanisms it is interesting to investigate the effects of both challenge and hindrance demands on the relation between high-involvement HRM and employee's feelings of energy at work. The above leads to the following research question:

*To what extent do challenge and hindrance demands mediate the relationship between high-involvement HRM and employee energy at work?*

In answering this research question, this study will focus on employee perceptions of high-involvement HRM. This is in line with the growing body of literature that emphasizes the effect of experiences of HR practices on employee perceptions (Jensen et al., 2012; Liao et al., 2009; Nishii, Lepak & Schneider, 2008). Prior research has primarily focused on managerial reports of the use of HR practices, however this might not adequately represent reality since it ignores the variability in employee perceptions regarding those practices (Liao et al., 2009; Nishii & Wright, 2008). Researchers argue that there is likely to be a disconnect between intended HR practices as reported by managers and how employees perceive and interpret those practices (Den Hartog, Verburg & Croon, 2012; Nishii et al., 2008). Therefore, this study investigates the alignment between manager ratings of high-involvement HRM and employee's perceptions of high-involvement HRM and thereby it contributes to the current discussion in the literature.

In addition, this research will contribute to the limited existing literature on employee energy at work in several ways. First of all, relationships between job demands and engagement have been found (Crawford et al., 2010) but the relationship with the specific concept of energy at work has not yet been examined (Shirom, 2011). Secondly, there is also support for the relationship between high-involvement HRM and employee working conditions (DeJoy et al., 2010). However, new in this research is that the mediating effects of both challenge and hindrance demands between high-involvement HRM and employee energy at work will be examined. It might be relevant for organizations to know which high-involvement practices and working conditions predict higher levels of employee energy because both organizations and employees benefit from higher levels of energy at work (Cole, et al., 2012; Dutton, 2003; Quinn, et al., 2012).

## **2. Theoretical framework**

### *2.1 Employee Energy at work*

Employee energy at work is often referred to as a positive affect or a positive affective arousal (Cole et al., 2012; Quinn & Dutton, 2005) and it can also be labeled as vigor (Shirom, 2003; 2011). Energy at work can be defined as “a positive affective response to one’s on going interactions with significant elements in one’s job and work environment that comprises the interconnected feelings of physical strength, emotional energy, and cognitive liveliness” (Shirom, 2003, p. 12). Largely based on the Conservation of Resources (COR) theory (Hobfoll, 2001), this definition suggests that energy at work can be conceptualized as consisting of three facets. The first facet is physical strength which refers to an individual’s physical capabilities. The second facet is emotional energy, according to Shirom (2011) this refers to “one’s ability to express sympathy and empathy to significant others” (p. 51). Cognitive liveliness is the third facet and refers to an individual’s thought processes and mental agility. According to Shirom (2011) employee energy at work is closely related to work motivation which captures individuals’ decisions about how and how long to expend energy over time (Quinn et al., 2012). Vigor or energy at work is also frequently conceptualized as a component of engagement (Shirom, Toker, Berliner, Shapira, & Melamed, 2008) and within the engagement literature it is defined as implying a high level of energy, a willingness to invest effort, and mental resilience (Schaufeli & Bakker, 2004; Shirom et al., 2008; Sonnentag, Binnewies, & Mojza, 2010).

### *2.2 Differentiating Job Demands*

Job demands refer to “the physical, psychological, social, and organizational aspects of a job that require sustained physical or mental effort and are therefore associated with certain physiological and psychological costs” (Demerouti et al., 2001, p. 501). The relationship between high job demands and impaired psychological well-being or strain is most frequently researched (Boswell, Olson-Buchanan, & LePine, 2004; LePine, Podsakoff, & LePine, 2005; Sonnentag et al., 2010). However, Cavanaugh and colleagues (2000) found modest or no relationships between self-reported work stress and negative work outcomes. An explanation for these inconsistent findings may be that there are multiple types of job demands, some of which are associated with negative and others with positive work outcomes (Boswell et al., 2004; Cavanaugh et al., 2000). Crawford et al. (2010) suggest for example that meaningful relationships between job demands and engagement emerge when a distinction is made among types of demands and the way they tend to be appraised by employees. The distinction between job demands appraised as challenges and hindrances can be made based on the work of Lazarus and Folkman (1984) and Cavanaugh et al. (2000). Challenge demands are those

demands that, although potentially stressful, are viewed as rewarding work experiences that produce positive feelings. In this research job responsibility will be examined as a challenge demand. Based on the work of Cavanaugh et al. (2000) and Hackman and Oldham's (1976) definition, in this research job responsibility will be referred to as the amount of responsibility employees experience for both the work itself and work outcomes. Hindrance demands tend to be appraised as excessive or undesirable constraints that interfere with or hinder an individual's work achievement. The hindrance demand examined in this research is role overload and can be referred to as work expectations that exceed the available time, resources, or personal capability of the employee (Jensen, et al., 2012).

Research findings showed opposing effects for these two types of job demands on positive work outcomes, Crawford et al. (2010) for example found challenge demands to be positively and hindrance demands to be negatively related to engagement. Employee energy at work can also be referred to as a positive work outcome and therefore opposing effects of challenge and hindrance demands can be expected. Challenge demands produce positive feelings (Cavanaugh et al., 2000) and the experience of positive emotions and meaningfulness from being challenged are associated with greater levels of motivation and engagement (Crawford et al., 2010; May, Gilson & Harter, 2004). The positive emotions and feelings resulting from being challenged might lead to more feelings of energy. Therefore, challenge demands should have a positive relationship with employee energy at work. On the contrary, hindrance demands tend to trigger negative emotions and a passive or emotional coping style that reflects withdrawal from the situation and reduced employee engagement (Crawford et al., 2010). Hindrance demands tend to be perceived by employees as hindering for their ability to achieve valued goals (Cavanaugh et al., 2000) and employees might feel that they will be frustrated in their efforts to overcome these hindrances. This might lead to an energy depletion process that causes less feelings of energy. Therefore, it can be expected that hindrance demands have a negative relationship with employee energy at work. Based on this reasoning and the mentioned empirical evidence the following hypothesis will be examined:

Hypothesis 1a: The challenge demand job responsibility is positively associated with employee feelings of energy at work

Hypothesis 1b: The hindrance demand role overload is negatively associated with employee feelings of energy at work

### *2.3 High-involvement HRM*

According to Lawler's (1986) 'PIRK' model high-involvement processes include workplace power, information, rewards, and knowledge. High-involvement processes aim to empower



employees to make more decisions, enhance the information and knowledge they need to do so, and reward them for doing so. This view parallels the AMO framework, which suggests that every HR system works through its impacts on the abilities, motivations, and opportunities of individual employees (Boxall & Macky, 2009). Prieto and Pérez Santana (2012) refer to a high-involvement HR system as “a coherent set of HR practices that enhance employees’ abilities, motivation, and opportunities to put forth discretionary effort” (p. 189). Researchers agree that the impact of HR practices on individuals as well as organizations is best understood by examining a system of HR practices rather than individual HR practices (Lepak, Liao, Chung, & Harden, 2006; Prieto & Pérez Santana, 2012). Therefore, in this research high-involvement HRM will be investigated as a system of high-involvement HR practices. More specifically, for investigating job demands and employee energy at work the focus is on employee perceptions of high-involvement HRM.

In the literature, two competing views stand out with respect to the effects of HRM on employees (Van de Voorde, Paauwe, & Van Veldhoven, 2012). On the one hand, the mainstream perspective or the ‘mutual gains’ perspective holds that HRM and HPWSs have positive outcomes for both the organization and the employees. On the other hand, the ‘conflicting outcomes’ perspective holds that HPWS and high-involvement systems, which are aimed at creating organizational benefits, do so through eliciting greater effort from employees, resulting in negative consequences for individual employees (Jensen et al., 2012; Kroon et al., 2009; Macky & Boxall, 2008). Research suggests that high-involvement HR systems can be associated with employee work intensification and higher levels of job demands (Godard, 2004; Jensen et al., 2012; Kroon et al., 2009).

Related to the two competing perspectives, this research makes a distinction between job demands perceived as challenges and hindrances. Although challenge demands can be viewed as rewarding work experiences they still tend to be appraised as stressful (Crawford et al., 2010). It can be argued that more use of high-involvement HRM will lead to more challenging demands. For example, by involving operating employees in decisions previously made by managers, work will be intensified for those employees but at the same time it can be appraised as a challenge (Macky & Boxall, 2008). In the case of job responsibility, it can be argued that high-involvement practices that empower employees and that create more flexible job designs will stimulate employees to take more responsibility. This reasoning suggests that when employees perceive more high-involvement HRM, they will also experience more challenge demands in terms of job responsibility, which can be experienced as a positive outcome.

Turning to the effect of high-involvement HRM on hindrance demands, Macky and Boxall (2008) argue that work intensification caused by high-involvement HR practices can be expressed in terms of role overload. Based on the labour process theory, it can be argued that the benefits of

HRM tend to diminish because employees can experience higher levels of work intensification (Godard, 2001; Ramsay et al., 2000). In addition, the research of Jensen et al. (2012) showed a positive relationship between HPWS and role overload. This suggests that when employees perceive more high-involvement HRM, they will also experience more hindrance demands in terms of role overload. Therefore, it is expected that as employee perceptions of high-involvement HRM increase, perceptions of both challenge and hindrance demands will increase.

Hypothesis 2a: Employee's perceptions of high-involvement HRM are positively associated with the challenge demand job responsibility

Hypothesis 2b: Employee's perceptions of high-involvement HRM are positively associated with the hindrance demand role overload

#### *2.4 Counteracting mechanisms: High-involvement HRM, Job Demands and Energy at work*

In line with the 'conflicting outcomes' perspective, the relationship between high-involvement HRM and employee energy at work is expected to be negative when examining the potential mediating effect of hindrance demands. Research of Kroon and colleagues (2009) has shown that HPWPs increase the experience of job demands in terms of the amount and speed of work, which in turn increases emotional exhaustion. They state that when an organization invests in employees (for example by using more high-involvement practices), employees feel the urge to put in more effort and commitment to the organization. These expectations of increased performance make employees experience a continuous feeling of high hindrance demands, for example in terms of role overload. In turn, the experience of high hindrance demands (role overload) will increase the risk of emotional exhaustion (Bakker, Demerouti, & Verbeke, 2004; Kroon et al., 2009). Schaufeli and Bakker (2004) suggest that burnout and engagement can be considered as each other's opposites when concerning the components exhaustion and vigor. Their research has shown that burnout and emotional exhaustion are mainly predicted by job demands such as workload and emotional demands and therefore it can be expected that these types of job demands are negatively related to engagement and energy at work. In line with this reasoning, it is expected that the hindrance demand role overload as investigated in this research will be negatively related to energy at work. So, it can be argued that higher employee perceptions of high-involvement HRM will lead to the experience of role overload which will decrease feelings of energy at work.

However, besides this negative perspective there might also be a positive effect via challenge demands. When examining the potential mediating effect of challenge demands (job responsibility), the relationship between high-involvement HRM and employee energy is expected to be positive which is in line with the 'mutual gains' perspective. This positive effect can be explained by

psychological empowerment which can be referred to as “individual’s self-motivating mechanisms and consists of meaning, competency, self-determination, and impact” (Liao et al., 2009, p. 374). Psychological empowerment can be influenced by external practices, such as high-involvement practices, and it reflects the intrinsic task motivation of employees (Liao et al., 2009; Spreitzer, 1995). According to Conger and Kanungo (1988) empowerment implies increasing employees’ convictions of their own effectiveness in successfully executing desired behavior. Since the use of high-involvement HRM will increase employees’ empowerment, this will also increase their convictions of their own effectiveness and this in turn might increase employees’ believe that they are able to meet the challenges. In line with Spreitzer (1995), it can be argued that empowered employees see themselves as competent and able to influence their jobs and this will stimulate them to take more responsibilities. As a consequence employees will experience meaningfulness and responsibility, which are associated with internal work motivation and engagement (Crawford et al., 2010; May et al., 2004). These experiences will make employees more willing to invest energy which should be reflected in increased feelings of energy (Crawford et al., 2010). So, it can be expected that higher employee perceptions of high-involvement HRM will lead to more job responsibility which in turn will increase feelings of energy. These expected counteracting mechanisms lead to the following hypotheses:

Hypothesis 3a: The link between employee perceptions of high-involvement HRM and employee energy is positively mediated by the experience of the challenge demand job responsibility

Hypothesis 3b: The link between employee perceptions of high-involvement HRM and employee energy is negatively mediated by the experience of the hindrance demand role overload

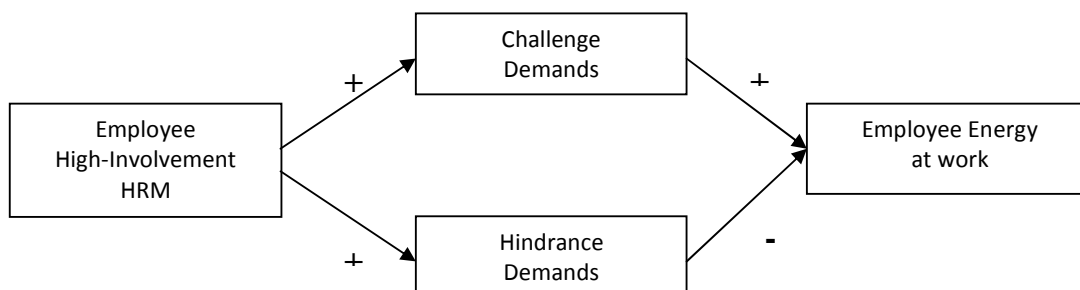


Figure 1. Conceptual model on the individual level of the mediating effects of challenge and hindrance demands between high-involvement HRM and employee energy at work.

## 2.5 Employee and Line-manager perceptions of High-involvement HRM

As mentioned above, within the research model on the individual level of analysis high-involvement HRM is investigated in terms of employee perceptions. However, recent literature pays attention to the way in which intended HR practices and (line)management actions to implement these practices translate into HR perceptions of employees (Nishii & Wright, 2008). According to Liao et al. (2009) prior research has primarily focused on managerial reports of the use of HPWS. However, researchers argue that is important to take employee perceptions of HRM into account since it is assumed that HR systems have their effect through their impact on employees, as was hypothesized before (Den Hartog, Boon, Verburg, & Croon, 2012; Nishii & Wright, 2008). Employee perceptions of HR practices are formed within the context of manager's interpretations of those HR practices, therefore managers' and employees' reports of HR are likely to be related. However, their perceptions are not necessarily the same, there may exist a disconnection between what managers say they do as formal HR practices and what individual employees actually experience (Den Hartog et al., 2012; Liao et al., 2009). In line with this assumption, Liao et al. (2009) only found a moderate relationship and Den Hartog et al. (2012) found a weak overall correlation between employee and manager perceptions of HR practices in the same units. Therefore, it is interesting to relate manager and employee ratings of high-involvement HRM. It can be expected that when a line-manager of a work-unit implements more high-involvement HR practices, employees will also perceive more high-involvement HRM. In line with Liao et al. (2009) and Den Hartog et al. (2012) the following hypothesis is stated:

Hypothesis 4: Line-manager rated high-involvement HRM is positively related to employee rated high-involvement HRM

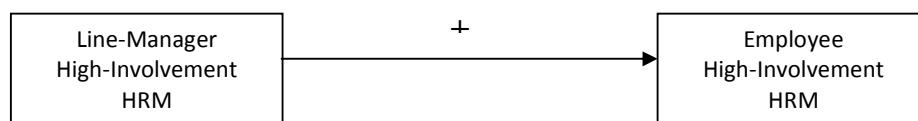


Figure 2. Conceptual model on the work unit level of the relationship between line-manager and employee ratings of high-involvement HRM.

### **3. Methods**

#### *3.1 Research design and procedure*

In this cross sectional study, quantitative data were gathered at one moment in time by setting out questionnaires. The data were collected within work units of different organizations by 8 students of the Master Thesis circle on employee energy at work. The work units should consist of at least 3 employees and a line-manager who is responsible for those employees and their work processes as well as for the enactment of HR practices within the work unit. Further there were no restrictions considering the type of organization. All the students mainly used personal contacts to approach organizations to participate in this study. A leaflet was developed to explain the purpose of the study and what participation in the study means. After organizations agreed to participate in the study the questionnaires were distributed either on paper or online via Qualtrix. The questionnaires did not only contain variables proposed in this study but they contained questions on a broad range of topics since all students in the Master Thesis circle studied a different topic.

#### *3.2 Sample*

The convenience sampling used in this study resulted in a dataset consisting of data received from 428 employees of 53 work units within 14 different organizations. Of those asked to participate, 467 employees and 56 managers returned the questionnaire, providing a total response rate of 64%. Respondents who did not fill in anything at all (27 respondents) or who did not complete the questionnaire on the variables of interest in this study (28 respondents) were excluded from the dataset. After removing these respondents, the dataset was checked on work units of which less than 3 employees filled in the questionnaire, 15 work units with less than 3 employee respondents were not taken into account. This procedure has resulted in a dataset consisting of data from 348 employees of 38 work units, providing a response rate of 47.2%. The average number of employees per work unit was 9.16 and the majority of participating work units operates in the sectors industry (28.9%), financial services (23.7%), public administration (13.2%), and business services (13.2%).

Of the employee respondents 59.2% indicated to be male and 40.8% to be female. The age of the employee participants varied between 18 years and 63 years with an average age of 40.3 years. Most of the employees completed higher secondary school/middle vocational education (38.2%) or higher vocational education (40.2%). The average unit and organizational tenure were respectively 5.44 years (SD = 6.49) and 9.72 years (SD = 9.46) and the average working hours per week were 35.5 hours per employee. Most of the employees in the sample were employed on a permanent basis (82.8%), whereas 14.7% has a temporary contract and 1.1% has a temporary contract via a recruitment agency.

The sample of managers consists of 73.7% male and 26.3% female respondents. The age of the manager respondents ranged between 29 years and 63 years with an average age of 43.8 years. The majority of the managers completed higher vocational education (57.9%) and almost all of them have a permanent contract (94.7%). The average unit and organizational tenure are respectively 7.05 years (SD= 6.32) and 12.95 years (SD= 8.29). Managers were asked to indicate the number of employees within the work unit they supervises and the average work unit size was 21 employees.

### *3.3 Measures*

This study investigates the relationship between high-involvement HRM and employee energy at work via challenge and hindrance demands at the individual level of analysis. In addition, the relationship between line-managers and employees ratings of high-involvement HRM is investigated at work unit level. This section provides an overview of the used measures per construct (see Appendix A for the used questionnaire items in this study). All the measures are based on scales used in previous research, however some of the original measures were shortened in order to reach a more convenient length for the questionnaire. In addition, the scales were translated into Dutch because most of the participating organizations were Dutch-speaking.

#### **Employee Energy at work**

In this study, feelings of employee energy at work were measured with the Shirom-Melamed Vigor Measure (SMVM; Shirom, 2003). This scale consists of 14 items and asks respondents about the frequency of experienced energetic feelings at work. In order to obtain a respectable length for the total employee questionnaire we decided to not take into account the following items from the SMVM: 'I feel full of pep'; 'I feel I can think rapidly'; 'I feel able to be creative'; and 'I feel I am capable of investing emotionally in coworkers and customers'. The main reasons for not taking into account these items were that the items were overlapping with other items and that it was hard to translate them into Dutch in an appropriate way. This resulted in a scale consisting of 10 items to measure feelings of energy at work. An example item of this scale is; 'I feel I have physical strength'. Employees were asked to indicate on a 7-point scale, ranging from 1- "never or almost never" to 7- "always or almost always", how often they experienced certain feelings.

Reliability analysis was conducted on the 10-item scale measuring feelings of employee energy at work. The results revealed a Cronbach's alpha of  $\alpha = .895$  and all 'corrected item total correlations' exceeded .500, implying good reliability of this adapted scale. Principal Axis Factoring (PAF) was conducted on the 10 items to check the underlying factor structure of the scale. The results showed a KMO value of .850 and Bartlett's test of sphericity was significant ( $p = .000$ ) which

indicated that factor analysis is appropriate for this scale. PAF initially revealed a two factor solution with Eigenvalues of 5.319 and 1.604; these factors explained respectively 53.19% and 16.04% of the variance. However, according to Shirom (2003) the scale consists of three subscales namely; physical strength, emotional energy, and cognitive liveliness. Since it was not possible to find a similar structure within the current study, PAF with a forced solution of one factor has been conducted. This one factor solution explained 53.19% of the variance and the results showed factor loadings above .30 for all items (Appendix B, table 1). Therefore, there was chosen for a one factor solution for the construct feelings of employee energy at work.

### **Challenge demand – Job responsibility**

For the measurement of job responsibility in terms of both the work itself and work outcomes there was no appropriate scale available. The work of Cavanaugh et al. (2000) was used as a starting point to develop a scale to measure job responsibility. Webster, Beehr and Christiansen (2010) argued that the response scale used by Cavanaugh et al. (2000), ranging from 1- “produces no stress” to 5- “produces a great deal of stress” might create inflated correlations with strain measures. Also in the context of the current study it was not appropriate to incorporate the term “stress” in the response scale. Therefore, it was decided to use a 4-point scale ranging from 1- “always” to 4- “never” which is consistent with the VBBA and the other job demands and resources in the questionnaire. This response scale was reversed in order to obtain a scale in which a higher score on the items means more experience of job responsibility. Cavanaugh et al. (2000) included only two items about responsibility in their measure of challenge demands; therefore, the item ‘The amount of responsibility I have’ was separated into two items concerning both the work itself and work outcomes. This resulted in a scale of three items and an example item is; ‘I have a considerable amount of responsibility for the work I do on this job’.

The reliability of the scale was sufficient ( $\alpha = .820$ ). The KMO value appeared to be .698 and the Barlett’s test of sphericity was significant ( $p = .000$ ), therefore factor analysis was appropriate. PAF revealed a single factor solution with an Eigenvalue of 2.210, explaining 73.66% of the variance and the factor loadings of all three items exceeded .60 (Appendix B, table 2).

### **Hindrance demand – Role overload**

For measuring role overload, the research of Jensen et al. (2012) was followed by using items from the 8-item scale of Cousins et al. (2004). In addition, items of the VBBA subscale ‘pace and amount of work’ were included. The most significant items of both scales in the context of this study were selected. In particular, items that emphasize problems with the available time and

resources were selected because this is in line with the provided definition of role overload. This resulted in a 6-item scale with 3 items of the VBBA scale and 3 items of the scale of Cousins et al. (2004). An example item of the composed scale is; 'I have to neglect some tasks because I have too much to do'. The items were scored on a 4-point scale (1= always; 2= often; 3= sometimes; 4= never). Also for the role overload scale this response scale was reversed so that a higher score on the items means more experienced role overload.

Reliability analysis on the 6 items showed that the scale was sufficient reliable with a Cronbach's alpha of  $\alpha$  .837 and all 'corrected item total correlations' were higher than .500. PAF was conducted to determine the underlying structure of the 6 items measuring role overload. The scale was suitable for factor analysis, the KMO value was .839 and the Bartlett's test of sphericity was significant ( $p=$  .000). The results revealed a single factor solution with an Eigenvalue of 3.339, explaining 55.65% of the variance. In addition, the factor loadings of the 6 items were all higher than .60 (Appendix B, table 3).

### **Employee rated High-Involvement HRM**

To measure employee rated high-involvement HRM, employees were asked to indicate the extent to which they agree with statements about the enactment of HR activities within their department. A 31-item scale was developed based on the work of Prieto and Pérez Santana (2012) and Patel, Messersmith and Lepak (2011). The scale was mostly based upon Prieto and Pérez Santana (2012) who divided high-involvement HR practices into ability-enhancing (staffing, training), motivation-enhancing (compensation, performance appraisal), and opportunity-enhancing (work design, participation) practices. In this study, the scale contained 4 items on recruitment and selection, 7 items on training, 4 items on compensation, 5 items on performance appraisal, and 11 items on participation and communication (Appendix A). An example item of this scale is; 'My department is spending a great effort in selecting the right person for every position'. The items were scored on a 5-point scale, ranging from 1- "strongly disagree", to 5- "strongly agree".

The Cronbach's alpha coefficient indicated good reliability for this scale, namely  $\alpha=$  .920. The KMO value was .898 and Bartlett's test of sphericity was significant ( $p=$  .000), indicating that factor analysis is appropriate for this scale. First, PAF was conducted on all 31 items of the high-involvement HRM scale, this resulted in 7 factors with an Eigenvalue above 1. Both varimax and oblimin rotation did not provide a clear structure between the items, the 7 factors did not represent the HR activities. Therefore, it was decided to conduct separate factor analyses for the 5 HR activities. First, PAF was conducted for the 4 items of the recruitment and selection practice. The results showed an Eigenvalue of 2.644, explaining 66.09% of the variance, and the factor loadings of all 4 items were



above .60. Secondly, PAF was conducted for the training practice which also resulted in a one factor solution. This factor explained 66.09% of the variance and the results showed factor loadings above .50 for all 7 items. Next the 4 items of the compensation practice were factor analyses. The results showed one factor with an Eigenvalue of 3.094, explaining 77.35% of the variance, and the factor loadings were above .70. Fourth, PAF was conducted for the performance appraisal practice and the results showed a one factor solution. This factor had an Eigenvalue of 2.762, explaining 55.24% of the variance, for all 5 items the results showed factor loadings above .50. Finally, PAF conducted on the 11 items of the participation and communication practice revealed 2 factors with Eigenvalues above 1. However, the factor loadings of all 11 items showed values above .30 on the first factor. Since factor analyses of the separate HR practices showed sufficient results and this study aims to investigate the effects of a high-involvement HRM system, PAF was conducted with a forced one factor solution. The first factor had an Eigenvalue of 9.488, explaining 30.61% of the variance, and the results provided factor loadings above .30 for all items (Appendix B, table 4). These results indicate that the investigation of high-involvement HRM as one construct is appropriate.

In order to test hypothesis 4 on the relationship between line-manager rated high-involvement HRM and employee rated high-involvement HRM, the individual level data on employee rated high-involvement HRM should be aggregated into work-unit level data. The intra class correlations (ICC's; Bliese, 2000) were calculated to justify the aggregation of employee ratings of high-involvement HRM. There are two forms of ICC's, ICC(1) is the proportion of individual-level variance that can be explained by group membership (interrater reliability) and ICC(2) provides an estimate of the reliability of the group means (group-mean reliability). When calculating the ICC(1) the results showed that 19.2% of the variance in an individual's ratings of high-involvement HRM is shared within the group. The ICC(2) has a value of 0.686, which is a sufficient estimate of group-mean reliability (Appendix C). Both values suggest that aggregation is allowed and thus were the individual level data on ratings of high-involvement HRM aggregated to the unit-level.

### **Line-manager rated High-Involvement HRM**

Line-managers were asked to indicate the coverage of employees in terms of the set of high-involvement HR practices. Also based on the work of Prieto and Pérez Santana (2012) and Patel et al. (2011), a 31-item scale was developed to measure line-manager rated high-involvement HRM. The items of this scale had the same content but different wording as the items of the employee rated high-involvement HRM scale. An example item of this scale is; 'My department provides training focused on teambuilding and teamwork skills'. The items were scored on the following 6-point scale: 1- "I don't know"; 2- "None of the employees of my department"; 3- "Less than half of the

employees of my department”; 4- “About half of the employees of my department”; 5- “More than half of the employees of my department”; 6- “All employees of my department”. In this study, the answering category “I don’t know” was indicated as a missing value since there was only 8 times responded with this answering category.

Since it was not possible to run reliability and factor analyses on the adjusted dataset with 38 manager respondents, it was decided to run these analyses on the data received from all 53 managers. Reliability analysis showed that the line-manager rated high-involvement scale was sufficient reliable with a Cronbach’s alpha of  $\alpha = .889$ . The scale was suitable for factor analysis since the KMO value was .632 and the Bartlett’s test of sphericity was significant ( $p = .000$ ). For this scale similar steps have been taken as for the employee rated high-involvement scale. PAF was conducted on all 31 items, this resulted in 9 factors with Eigenvalues above 1. Therefore, separate factor analyses were conducted for the 5 HR practices. For the practices recruitment and selection, compensation and performance appraisal the results showed a one factor solution with factor loadings for all items above .30. PAF conducted on the training practice revealed 2 factors with Eigenvalues of respectively 3.363 and 1.219, explaining 65.46% of the variance. The item ‘Employees have opportunities for upward mobility’ was the only item with a factor loading below .30 on the first factor. Finally, PAF was conducted on the participation and communication practice. The results showed 3 factors with Eigenvalues above 1 and there are two items with factor loadings below 0.30. However, since the practice participation and communication used in this study contains items on participation, communication and job design it was decided to retain these items in the subscale. Since the factor analyses of the separate HR practices showed sufficient result, PAF was conducted with a forced one factor solution. The results showed a first factor with an Eigenvalue of 7.598, explaining 24.5% of the variance, and all factor loadings, except one, were above .30. However, since this one item did not show any deviations within the employee rated high-involvement scale, it was decided to keep this item also in the manager rated high-involvement scale.

### **Control variables**

In order to control for confounding effects the following control variables were included. At the individual level of analysis, the general control variables gender, age and education were included. Education was measured with the following 6-point response scale: 1- “Elementary (primary school)”; 2- “Basic (lower secondary school or lower vocational education)”; 3- “Middle (higher secondary school, middle vocational education)”; 4- “Higher (higher vocational education)”; 5- “Academic (university)”; 6- “other”. Responses in category 6- “other” were when possible classified within the other response categories, when this was not possible this response was coded

as a missing value. Especially gender is interesting to control for in the context of the current study because researchers have argued that men and woman may differ in their appraisal of job demands (Cavanaugh et al., 2000; Geller & Hobfoll, 1994). In addition, work-unit tenure was included as a control variable at the individual level of analysis because this might affect employee's views of the HR system (Jensen et al., 2012; Nishii, Lepak, & Schneider, 2008). At the work unit level of analysis work unit size and manager's work-unit tenure were controlled for (Prieto & Pérez Santana, 2012).

#### *3.4 Statistical Analysis*

Hierarchical multiple regression was conducted to test the hypotheses. The guidelines of MacKinnon, Fairchild and Fritz (2007) for testing mediation were applied to test the conceptual model on the individual level of analysis with the mediating mechanisms of challenge and hindrance demands (hypothesis 3). In the first step control variables were added in order to check whether they have an effect on the proposed hypotheses. The next step was to test whether there is a significant relationship between the independent variable (high-involvement HRM) and mediator variables (challenge and hindrance demands) (hypothesis 2). Another requirement for mediation concerns a statistical significant relationship between the mediator variables (challenge and hindrance demands) and the dependent variable (employee energy at work) (hypothesis 1). In addition, a Sobel (1982) test to assess the significance of the proposed mediating mechanisms was performed. In order to test the fourth hypothesis on the relationship between line-manager and employee ratings of high-involvement HRM regression analysis at the work unit level was used.

## 4. Results

This section consists of two parts, the results at the individual level of analysis and the results at the work unit level of analysis. First, the descriptive statistics will be provided and secondly, the results of regression analysis will be presented.

### 4.1 Descriptive statistics at the individual level of analysis

The means, standard deviations and Pearson correlations of the research variables at the individual level of analysis in this study, including the control variables, are displayed in table 1. Preliminary analyses did not show any outliers in the sample used in this study and after screening and cleaning the data there were no high numbers of missing data left in the dataset. Concerning the distribution of scores on the research variables, the mean score of job responsibility represented in table 1 was noticeable. Job responsibility was scored on a 4-point scale and the mean score was 3.16, which can be considered as relatively high. Also the histogram (Appendix D, figure 1) shows that the scores on this variable are not normally distributed. For the other research variables in this study the histograms (Appendix D) show relative normal distributions of the scores.

The results in table 1 show that the correlations between the research variables in the conceptual model are relatively low ( $r < .3$ ). There is a significant positive correlation between employee rated high-involvement HRM and feelings of energy ( $r = .219$ ;  $p < .01$ ), indicating that the more enactment of high-involvement HR activities employees perceive, the more feelings of energy they have. The challenge demand job responsibility shows significant positive correlations with all other research variables ( $r = .138$ ,  $p < .01$  for H-I HRM;  $r = .272$ ,  $p < .01$  for energy feelings;  $r = .227$ ,  $p < .01$  for role overload), while the hindrance demand role overload is negatively but not significant related to both high-involvement HRM ( $r = -.036$ ) and feelings of energy ( $r = -.097$ ). The significant positive correlation between the two types of job demands suggests that employees who have more responsibility will also experience more role overload. When looking at the results for the control variables it turns out that age and unit tenure are positively correlated ( $r = .428$ ,  $p < .01$ ) which is fairly obvious. It is notable that there is no relationship at all between work unit tenure and employee rated high-involvement HRM. However, there exists a significant negative correlation between age and employee ratings of high-involvement HRM ( $r = -.116$ ,  $p < .05$ ), suggesting that the older employees get, the lower they rate the enactment of high-involvement HRM within their department.

Table 1. Means (M), Standard Deviations (SD) and Pearson correlations of research variables at the individual level of analysis (N=348).

Variable	M	SD	Correlations								
			1.	2.	3.	4.	5.	6.	7.	8.	
1. Employee rated H-I HRM	3.28	.49	1								
2. Job responsibility	3.16	.64	.138**	1							
3. Role overload	2.18	.45	-.036	.227**	1						
4. Feelings of energy	5.31	.76	.219**	.272**	-.097	1					
5. Gender	1.41	.49	-.005	-.242**	-.074	-.140**	1				
6. Age	40.32	10.76	-.116*	.127*	.105	.010	.089	1			
7. Educational level	3.48	.83	.054	-.102	.030	.088	-.036	-.203**	1		
8. Work unit tenure	5.44	6.49	.000	-.057	.089	-.057	.150**	.428**	-.068	1	

\*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)

(Employee rated H-I HRM was measured on a scale ranging from 1 to 5, Job responsibility and Role overload were measured on a scale ranging from 1 to 4, Feelings of energy was measures on a scale ranging from 1 to 7, Gender score 1 represented men and score 2 represented woman, Age was measured in years, Educational level was measured on a scale ranging from 1 to 5, and Work unit tenure was measured in years).

#### 4.2 Regression analyses at the individual level of analysis

In order to test hypothesis 1a en 1b multiple regression analysis has been conducted consisting of three models in which employee feelings of energy at work is the dependent variable. In the first step, the control variables gender, age, educational level and work unit tenure are enclosed, the results (table 2) show that none of the control variables has a significant effect on employee's feelings of energy. In model two, the independent variable employee rated high-involvement HRM was added. This model explains 6.4% of the variance in employee's feelings of energy at work and indicated a significant change with the model containing only the control variables (F change = 16.416,  $p < .01$ ). Table 2 shows that employee rated high-involvement HRM has a significant positive effect on energy feelings ( $\beta = .226$ ,  $p < .01$ ). The third model, in which the mediators job responsibility and role overload were included, explains 13.3% of the variance in employee's feelings of energy. This is a significant change in explained variance ( $R^2$  change = .074,  $p < .01$ ). Table 2 shows that both types of job demands have a significant effect on energy feelings, the effect of job responsibility is positive ( $\beta = .256$ ,  $p < .01$ ) and the effect of role overload is negative ( $\beta = -.176$ ,  $p < .01$ ). Hypothesis 1a stated that the challenge demand job responsibility is positively associated with employee energy at work and hypothesis 1b stated that the hindrance demand role overload is negatively associated with employee energy at work. Both hypotheses are confirmed within the data since job responsibility has a significant positive effect and role overload a significant negative effect on employee's feelings of energy.

Table 2. Results regression analysis of employee's feelings of energy: regression coefficients ( $\beta$ ), proportion explained variance ( $R^2$  and  $R^2$  change) and the corresponding F-values (F and F Change)

Variables	Employee's feelings of Energy					
	Model 1		Model 2		Model 3	
	$\beta$	P	$\beta$	P	$\beta$	P
Gender	-.095	.098	-.096	.088	-.060	.274
Age	.090	.160	.118	.060	.090	.142
Education	.110	.058	.104	.067	.133*	.015
Unit Tenure	-.073	.254	-.085	.170	-.046	.440
High-Involvement			.226**	.000	.181**	.001
Job responsibility					.256**	.000
Role overload					-.176**	.002
$R^2$	.029		.064		.133	
F	2.246	.064	5.172**	.000	7.733**	.000
$R^2$ Change	.029		.050		.074	
F Change	2.246	.064	16.416**	.000	13.095**	.000

\*\* Significant at the 0.01 level; \* Significant at the 0.05 level

The second hypothesis concerns the relationships between high-involvement HRM and the challenge demand job responsibility and the hindrance demand role overload. First, regression analysis with job responsibility as dependent variable has been conducted. In model one, the control variables were entered and in model two the independent variable employee rated high-involvement HRM was added. Table 3 shows that the first model explains 6.6% of the variance in job responsibility and is significant ( $F = 5.348, p < .01$ ). The control variable gender has a significant negative effect on job responsibility ( $\beta = -.197, p < .01$ ) and the control variable age has a significant positive effect on job responsibility ( $\beta = .158, p < .05$ ). Adding the independent variable employee rated high-involvement HRM in the second model leads to a significant increase in  $R^2$  of 2.8%, and the model does provide a significant explanation of the variance in job responsibility ( $R^2 = .094, p < .01$ ). The results in table 3 show that employee rated high-involvement HRM has a significant positive effect on job responsibility ( $\beta = .167, p < .01$ ). This finding is in line with hypothesis 2a which stated that employee's perceptions of high-involvement HRM are positively associated with the challenge demand job responsibility.

Table 3. Results regression analysis of job responsibility: regression coefficients ( $\beta$ ), proportion explained variance ( $R^2$  and  $R^2$  change) and the corresponding F-values (F and F Change)

Variables	Job responsibility			
	Model 1		Model 2	
	$\beta$	p	$\beta$	p
Gender	-.197**	.001	-.197**	.000
Age	.158*	.012	.179**	.004
Education	-.042	.458	-.047	.404
Unit Tenure	-.097	.120	-.106	.085
High-Involvement			.167**	.003
$R^2$	.066		.094	
F	5.348**	.000	6.224**	.000
$R^2$ Change	.066		.028	
F Change	5.348**	.000	9.148**	.003

\*\* Significant at the 0.01 level; \* Significant at the 0.05 level

The results of regression analysis with the mediator variable role overload as dependent variable are shown in table 4. In the first step the control variables are enclosed, the results show that none of the control variables has a significant effect on role overload. However, the model explains 3.2% of the variance in role overload and presented a significant model ( $F = 2.469, p < .05$ ). In the second model, the independent variable employee rated high-involvement HRM was added. The

results (table 4) show that high-involvement HRM did not has a significant effect on role overload ( $\beta = -.013, p > .05$ ). Model two did not explain any additional variance in role overload ( $R^2$  change = .000,  $p > .05$ ). Hypothesis 2b proposed that employee’s perceptions of high-involvement HRM are positively associated with the hindrance demand role overload. This hypothesis could not be confirmed within the current data since a non-significant negative effect of high-involvement HRM on role overload was found.

Table 4. Results regression analysis of role overload: regression coefficients ( $\beta$ ), proportion explained variance ( $R^2$  and  $R^2$  change) and the corresponding F-values (F and F Change)

Variables	Role overload			
	Model 1		Model 2	
	$\beta$	p	$\beta$	p
Gender	-.085	.139	-.085	.140
Age	.102	.110	.100	.119
Education	.101	.081	.102	.080
Unit Tenure	.065	.307	.066	.303
High-Involvement			-.013	.815
$R^2$	.032		.032	
F	2.469*	.045	1.980	.081
$R^2$ Change	.032		.000	
F Change	2.469*	.045	.000	.815

\*\* Significant at the 0.01 level; \* Significant at the 0.05 level

When testing mediation, there are two requirements that need to be fulfilled. The first requirement for mediation concerns a significant relationship between the mediator variables and the dependent variable. The second requirement for mediation concerns a statistical significant relationship between the independent variable and the mediator variables. Based on the above, it can be concluded that the requirements for mediation are fulfilled for the mediating mechanism of job responsibility since there is a significant relationship between job responsibility and feelings of energy (hypothesis 1a) and there is a significant relationship between high-involvement HRM and job responsibility (hypothesis 2a). In order to test hypothesis 3a, the Sobel test has been used to calculate if the mediation effect of job responsibility is significant. The results of the Sobel test ( $T= 2.502; p= 0.012$ ) showed that there is a significant positive mediation effect of job responsibility in the relation between high-involvement HRM and employee’s feelings of energy at work. However, for the mediator variable role overload the requirements for mediation are not fulfilled since there is no significant relationship between high-involvement HRM and role overload



(hypothesis 2b). This means that it is not necessary to perform a Sobel test to assess the significance of the indirect effect of role overload. Therefore, hypothesis 3b is rejected.

#### 4.3 Descriptive statistics at the work unit level of analysis

The means, standard deviations and Pearson correlations of the research variables at the work unit level of analysis in this study, including the control variables, are displayed in table 5. The results in table 5 show that there is a significant positive correlation between employee rated and manager rated high-involvement HRM ( $r = .468, p < .01$ ). This suggests that the higher the manager's ratings of high-involvement HRM, the higher the employee's ratings of high-involvement HRM. Furthermore, it is noticeable that the control variable work unit size is significant positively correlated with manager rated high-involvement HRM ( $r = .319, p < .05$ ), indicating that when work units consist of more employees, managers report higher ratings of high-involvement HRM.

Table 5. Means (M), Standard Deviations (SD) and Pearson correlation of the research variables at the work unit level of analysis (N=38).

Variable	M	SD	Correlations			
			1.	2.	3.	4.
1. Employee rated H-I HRM	3.23	0.32	1			
2. Manager rated H-I HRM	4.72	0.70	.468**	1		
3. Unit tenure (Manger)	7.44	6.43	-.427**	-.104	1	
4. Work unit size	21	18.60	.254	.319*	-.227	1

\*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)

(Employee rated H-I HRM was measured on a scale ranging from 1 to 5, Manager rated H-I HRM was measured on a scale ranging from 1 to 6, Unit tenure (Employee and Manager) was measured in years, and Work unit size was measured in number of employees).

#### 4.4 Regression analysis at the work unit level of analysis

In order to test the fourth hypothesis on the relationship between manager and employee ratings of high-involvement HRM regression analysis has been conducted consisting of two models in which employee rated high-involvement HRM is the dependent variable. In the first model, the control variables work unit tenure of employees and managers and work unit size were enclosed. The results represented in table 6 show that model one explains 21% of the variance in employee

rated high-involvement HRM, however the model is not significant ( $F = 2.657, p > .05$ ). Adding the independent variable manager rated high-involvement HRM in the second model leads to a significant increase in explained variance ( $R^2$  change = .156,  $p < .05$ ). Table 6 shows that manager rated high-involvement HRM has a significant positive effect on employee ratings of high-involvement HRM ( $\beta = .418, p < .05$ ). The second model explains 36.6% of the variance in employee rated high-involvement HRM, which is significant ( $F = 4.191, p < .01$ ). Hypothesis 4 stated that manager rated high-involvement HRM is positively related to employee rated high-involvement HRM. Based on the described results, this hypothesis can be confirmed within the current data.

Table 6. Results regression analysis of employee rated H-I HRM: regression coefficients ( $\beta$ ), proportion explained variance ( $R^2$  and  $R^2$  change) and the corresponding F-values (F and F Change)

Variables	Employee rated high-involvement HRM			
	Model 1		Model 2	
	$\beta$	p	$\beta$	p
Unit tenure (Manager)	-.389*	.024	-.375	.018
Work unit size	.166	.320	.036	.821
Manager rated high-involvement HRM			.417*	.011
$R^2$	.208		.364	
F	4.078*	.027	5.735**	.003
$R^2$ Change	.208		.156	
F Change	4.078*	.027	7.372*	.011

\*\* Significant at the 0.01 level; \* Significant at the 0.05 level

## 5. Discussion and conclusion

The main purpose of this study was to examine the counteracting mediating effects of challenge and hindrance demands within the relationship between high-involvement HRM and employee's feelings of energy at work. The positive perspective predicted that high-involvement HRM leads to more challenge demands with more feelings of energy as a result, whereas the critical perspective predicted that high-involvement HRM intensifies the experience of hindrance demands with less feelings of energy as a result. These effects were examined at the individual level of analysis and the focus was on employee perceptions of the high-involvement HRM system. Furthermore, in line with the call of Nishii, Lepak, and Schneider (2008) for research on the differences between managerial and employee reports of HR, this study investigated the relationship between manager and employee ratings of high-involvement HRM at the work unit level of analysis. The sample used in this study consisted of 428 employees and 38 managers and the data was collected by means of a questionnaire.

In this section, the results on the hypotheses at both levels of analyses will be discussed. In addition, limitations of this study, recommendations for future research and practical implications will be provided.

### *5.1 Discussion of results at the individual level of analysis*

The first two hypotheses of this study are concerned with the relationships between the two different types of job demands, challenge and hindrance demands, and employee's feelings of energy at work. Hypothesis 1a, stating that the challenge demand job responsibility is positively associated with employee's feelings of energy at work, was supported by the results of this study. A significant positive effect has been found, indicating that when employees experience that they have more job responsibility, they have more feelings of energy at work. This finding is in line with previous research (Cavanaugh et al., 2000; Crawford et al., 2010) suggesting that challenge demands produce positive feelings which are associated with higher levels of engagement. Also hypothesis 1b was confirmed in this study, a significant negative effect of the hindrance demand role overload on employee's feelings of energy at work has been found. The negative effect found in this study supports existing research suggesting that hindrance demands tend to trigger negative emotions and might lead to an energy depletion process (Cavanaugh et al., 2000). The found support for hypotheses 1a and 1b implies that there are indeed different types of job demands that are associated with different work outcomes. Previous research suggests that job demands are not associated with engagement (Bakker, Demerouti & Verbeke, 2004; Schaufeli & Bakker, 2004), however the results of this study show that the challenge demand job responsibility is positively

associated with employee's feelings of energy and that the hindrance demand role overload is negatively associated with employee's feelings of energy. These results reinforce the underlying theory that suggests that job demands can be appraised as challenges and hindrances (Cavanaugh et al., 2000). In addition, the results support the research of Crawford et al. (2010) by showing that the effects they found of challenge and hindrance demands on engagement are also found in relation to employee energy at work.

In line with the proposed positive perspective, hypothesis 2a is concerned with the effect of employee's perceptions of high-involvement HRM on challenge demands and hypothesis 3a is concerned with the mediating effect of the challenge demand job responsibility. The results of this study supported the existence of a significant positive effect of high-involvement HRM on the challenge demand job responsibility (hypothesis 2a). This positive effect can be explained by the fact that high-involvement HRM provides employees with psychological empowerment which in turn stimulates employees to take more responsibilities (Liao et al., 2009).

Hypothesis 3a, stating that the link between employee perceptions of high-involvement HRM and employee's feelings of energy is positively mediated by the experience of the challenge demand job responsibility, was also confirmed within this study. Since significant effects were found for both the relationship between high-involvement HRM and job responsibility and the relationship between job responsibility and employee's feelings of energy at work, a Sobel test was performed to test for mediation and the results showed a significant positive relationship. This finding is in line with the theory of psychological empowerment (Liao et al., 2009; Spreitzer, 1995). The use of high-involvement HRM might increase employee's empowerment, this in turn might increase employees' believes that they are able to meet challenges and it will stimulate them to take more responsibilities. Consequently, employees will experience meaningfulness and responsibility, which can be associated with engagement, which in turn is associated with increased feelings of energy (Crawford et al., 2010; Liao et al., 2009, May et al., 2004).

On the other hand, in line with the critical perspective hypotheses 2b and 3b are concerned with the hindrance demand role overload. Hypothesis 2b, stating that employee's perceptions of high-involvement HRM are positively associated with the hindrance demand role overload, could not be confirmed within this study. The results showed a very small negative and non-significant ( $\beta = -.013, p > .05$ ) effect of high-involvement HRM on role overload. A possible explanation for this non-significant effect may be found in the fact that it is possible that for some employees the perception of high-involvement HRM leads to less experience of role overload while for other employees the perception of high-involvement HRM may lead to more experience of role overload. This is in line with the statement of Nishii and Wright (2008) that the same HR practices can be perceived quite

differently by employees. They argue that employee's perceptions and evaluations of HR systems depend on different factors such as their values, personalities, needs, past experiences, and expectancies. This in turn suggests that there may exist great variability in the way that employees respond to HR systems (Nishii & Wright, 2008). In addition, when considering the hindrance demand role overload it can also be argued that the extent to which employees experience role overload depends on how much stress or pressure the person can handle. In other words, it might be expected that the relationship between employee perceptions of high-involvement HRM and the hindrance demand role overload is moderated by the extent to which the employee experiences stress or pressure from the high-involvement system (employee's loadability).

Another possible explanation for the non-significant effect of high-involvement HRM on the hindrance demand role overload may be found in previous research (Jensen et al. 2012) showing that the level of employee job control has an influence on the relationship between HR practices and the consequences for individual employees. More specifically, Jensen et al. (2012) argue that when HPWS practices are not implemented with a sufficient amount of job control and autonomy to individual employees this may have negative effects on employee perceptions of role overload. Their results showed that with increasing employee perceptions of HPWS, role overload is almost flat at high levels of job control, while at lower levels of job control, role overload is significantly greater. This study investigates employee perceptions of high-involvement HRM and it can be argued that high-involvement practices already include some degree of job control and autonomy. Therefore, it can be argued that the level of job control has an influence on the relationship between employee perceptions of high-involvement HRM and role overload and this might explain the non-significant effect.

These explanations for the non-significant effect of high-involvement HRM on the hindrance demand role overload can also explain why there was not found a mediating effect of role overload. Hypothesis 3b stated that the link between employee perceptions of high-involvement HRM and employee energy is negatively mediated by the experience of the hindrance demand role overload. This hypothesis is rejected since no significant relationship was found between high-involvement HRM and role overload and therefore a Sobel test did not provide a significant result for the mediating effect. Another explanation for this result might be that previous research shows that role overload can be considered as both a challenge and hindrance demand and that threat and challenge appraisals are not mutually exclusive (Gilboa, Shirom, Fried & Cooper, 2008). The fact that role overload can be differently appraised by employees might also contribute to the non-significant mediation effect of role overload.

Overall, the results of this study supported the positive perspective. A positive mediation effect of the challenge demand job responsibility on the relationship between HRM and employee's energy at work was found, which is in line with the mutual gains perspective. However, no significant effect was found for the relationship between high-involvement HRM and the hindrance demand role overload and the mediation effect of role overload. Therefore, the critical perspective was not supported within this study.

### *5.2 Discussion of results at the work unit level of analysis*

The last hypothesis within this study was examined at the work unit level of analysis. Hypothesis 4 proposed that line-manager rated high-involvement HRM is positively related to employee rated high-involvement HRM. In order to test this hypothesis, the individual level data on employee ratings of high-involvement HRM were aggregated into a unit level construct. The results showed that manager rated high-involvement HRM related positively but moderately ( $\beta = .418$ ,  $p < .05$ ) to employee's perceptions of high-involvement HRM. Therefore, hypothesis 4 is confirmed within this study and this result supports findings in previous research (Den Hartog et al., 2012; Liao et al., 2009). The found correlation ( $r = .468$ ) and regression coefficient ( $\beta = .418$ ) in this study are comparable to the results found by Jensen et al. (2012) ( $r = .59$ ;  $\beta = .46$ ). Compared with the results found by Den Hartog et al. (2012) ( $r = .13$ ;  $\beta = .32$ ) and Liao et al. (2009) ( $r = .39$ ), the correlation and regression coefficient in this study are somewhat higher. The found moderate relation between manager and employee ratings of high-involvement HRM is in line with the idea that manager ratings of implemented HRM may not fully overlap with employee ratings of perceived HRM (Nishii & Wright, 2008). Thereby this study supports the literature by replicating this important finding and suggesting that it should not be assumed that employee and manager perceptions of HRM are aligned.

### *5.3 Limitations*

The current study has several limitations that should be considered when interpreting the results. First of all, the cross sectional nature of this study makes it difficult to draw conclusions regarding causality. It implies that the direction of effects is argued theoretically rather than tested. For example, this study does not make clear whether higher ratings of high-involvement HRM lead to more experience of job responsibility and this in turn leads to more feelings of energy or whether employees with more feelings of energy are more likely to take responsibilities and provide higher ratings of high-involvement HRM. The second methodological issue is concerned with the multiple levels of analyses used in this study. Since this study combines individual and work unit level data it

was chosen to aggregate the individual level data on employee ratings of high-involvement HRM in order to perform the analysis on work unit level. The intra class correlations (ICC's) were calculated to test whether aggregation is valid, these values were sufficient (ICC(1)= 19.2%, ICC(2)= 0.686). Aggregating the data has resulted in a sample consisting of 38 work units, which is a relatively small sample. Multilevel analysis would have served this research probably best and could overcome issues concerning the aggregation of individual level data.

There are some limitations in this study regarding the measurement scales and conceptualization. The first limitation has to do with the job responsibility scale. This scale consists of only three items and two of these items are quite similar. Another limitation within this study concerns the conceptualization of the role overload construct. For the measurement of role overload an adjusted scale was used composed of separate items from two different scales. These two different scales were based on different constructs, namely 'role overload' (Cousins et al., 2004) and 'pace and amount of work' (VBBA subscale). It might be the case that the concept role overload was not clearly enough defined since there are multiple definitions. In this study, role overload is regarded as a hindering stressor because it is defined as work expectations that exceed the available time, resources, or personal capability of the employee. However, Gilboa et al. (2008) argue that role overload can be considered as both a challenge and a hindrance demand. For example, role overload may also occur when high performers take on more tasks and responsibilities, in this situation role overload can be perceived as a challenging demand. Despite these issues concerning the conceptualization of role overload, factor analysis on the 6 item scale provided a one factor solution and reliability analysis showed good results.

Finally, there is a limitation concerned with the measurement of employee- and manager-ratings of high-involvement HRM. Within the employee questionnaire, employees were asked to indicate the extent to which they agree with statements about the enactment of high-involvement HR practices within their department. However, managers were asked to indicate the coverage of employees in terms of the high-involvement HR practices. The use of different answering scales might have an influence on the results of the relationship between employee perceptions and manager-ratings of high-involvement HRM.

#### *5.4 Future research*

First of all, some recommendations for future research can be formulated based upon the limitations of this study. Future research can build upon the findings of this study by investigating the effects through longitudinal research. This design makes it possible to draw conclusions about the causality of the relationships between high-involvement HRM, challenge and hindrance demands and

feelings of energy at work. Secondly, it would be strongly recommended for future research to consider performing multilevel analysis instead of aggregating individual level data to the unit level. Multilevel analysis makes it possible to include both manager- and employee-ratings of HRM in the research model. This is in line with previous research suggesting that employee perceptions of HRM can have an important mediating effect in the relationship between HR systems and HR outcomes (Den Hartog et al., 2012; Liao et al., 2009).

Another recommendation concerns the conceptualization and measurement of high-involvement HRM. In this study, the focus was on an overall high-involvement HRM system combining integrated sets of HR practices. However, recent research (e.g. Prieto & Pérez Santana, 2012) shows that it is useful to divide high-involvement HR practices in the three domains of ability-enhancing practices, motivation-enhancing practices, and opportunity-enhancing practices (the AMO framework). In order to address the ability-enhancing domain, the practices staffing and extensive training can be assessed, the practices of incentive-based compensation and performance appraisal can be used to measure the motivation-enhancing domain, and finally the opportunity-enhancing domain can be addressed with practices as flexible work design and participation and communication (Prieto & Pérez Santana, 2012). Future research could make use of the division of high-involvement HR practices into these domains. This might provide a better understanding of the effects of specific types of HR practices on challenge and hindrance demands. In addition, it is also interesting to investigate whether there is more alignment between manager and employee ratings of high-involvement HRM for some practices than for others (Den Hartog et al., 2012). Especially for practices such as job design and participation where individual differences and preferences may play a stronger role, it might be the case that there is less agreement between the perceptions of managers and employees. Related to this, it is recommended to investigate the effects of different types of HR practices in order to get a better understanding of the effect of HRM on employee well-being.

Finally, it is acknowledged that there are several other variables that possibly have an influence on the findings of this study. When investigating the relationship between manager-rated HRM and employee-rated HRM, it was not taken into account how effectively the high-involvement HRM system had been implemented. It can be argued that variables such as managerial style and manager's communication have an influence on employee's perceptions of HRM (Den Hartog et al., 2012; Jensen et al., 2012). Therefore, when investigating employee perceptions of HRM, it is recommended for future research to investigate the role of managerial characteristics more fully since managers often have a strong influence over employees' day-to-day experiences. As already mentioned, it is expected that the loadability of employees or the extent to which they can handle



the experience of stress/pressure has an influence on the relationship between employee perceptions of HRM and the hindrance demand role overload. Therefore, it might also be interesting for future research to investigate which specific variables moderate the relationship between employee perceptions of HRM and the experience of job demands as a challenge or hindrance.

### *5.5 Practical implications*

Despite the limitations of this study as noted above, there are some potentially useful practical implications as well. The results of this study showed that the challenge demand job responsibility is positively associated with employee's feelings of energy at work. This result opens the possibility that employees' feelings of energy (as a component of engagement) could be influenced by managers through changing the level of job demands with which employees are confronted. In addition, based upon the positive mediation effect found in this study it is a possibility for managers to influence employee's feelings of energy through HR practices aimed at changing the level of job demands. It is useful for organizations to have insight in antecedents that have an influence on employees' feelings of energy at work since this might provide the organization with several positive outcomes such as higher productivity and motivation of employees (Quinn et al., 2012; Schippers & Hogenes, 2011; Shirom, 2011).

This study shows that employee perceptions of high-involvement HRM are not necessarily aligned with manager ratings of high-involvement HRM. Therefore, it is important for organizations to be aware of the perceptions that employees have regarding HRM. When implementing an HR system, managers need to make sure that there is good communication about the HR system and that employees understand the system as intended by management. Organizations have to pay attention to the way employees perceive HR practices in order to get insight in the way employees experience the practices and to what kind of job demands this might lead.

Another implication of this study concerns the found significant negative effect of the hindrance demand role overload on employee energy at work. Up to a certain point it might not be harmful to increase work and time pressure, however when employees experience it as role overload and hindering for their ability to achieve valued goals it might lead to an energy depletion process. Therefore, it is important for organizations to monitor the extent to which employees experience job demands as hindering.

### *5.6 Conclusion*

In this study the two counteracting mediating mechanisms of challenge and hindrance demands were investigated. The results show that the challenge demand job responsibility positively mediates

the relation between high-involvement HRM and employee's feelings of energy. This result supports the positive perspective, indicating that HRM has benefits for both the organization and the employees. The results also showed a significant negative effect of the hindrance demand role overload on employee energy at work. However, no significant effect was found for the mediating effect of the hindrance demand role overload. Another important finding of this study concerns the moderate positive relation between manager ratings and employee perceptions of high-involvement HRM. This indicates that the HR practices managers intend to implement do not fully overlap with the way employees perceive these HR practices, which is an important practical implication for organizations.

## 6. References

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## 7. Appendices

### Appendix A: Questionnaire items

#### Employee Energy at work

*Instruction: The following statements relate to how you feel at work. Please indicate how often, in the past 30 workdays, you have experienced each of the following feelings;*

1. I feel I have physical strength (Phys)
2. I feel vigorous (Phys)
3. I feel energetic (Phys)
4. A feeling of vitality (Phys)
5. I feel mentally alert (CL)
6. I feel I am able to contribute new ideas (CL)
7. A feeling of flow (CL)
8. I feel able to show warmth to others (EE)
9. I feel able to be sensitive to the needs of coworkers and customers (EE)
10. I feel capable of being sympathetic to coworkers and customers (EE)

#### Challenge demand – Job responsibility

*Instruction: Below you will find a number of statements related to your work. Please indicate the extent to which these statements are applicable.*

1. I have a considerable amount of responsibility for the work I do on this job
2. I have a considerable amount of responsibility for the results of my work on this job
3. My position entails a broad scope of responsibility

#### Hindrance demand – Role overload

*Instruction: Below you will find a number of statements related to your work. Please indicate the extent to which these statements are applicable.*

1. I have unrealistic time pressures
2. I have unachievable deadlines
3. Do you have problems with the work pace?
4. I have to neglect some tasks because I have too much to do
5. Do you find that you are behind in your work activities?
6. Do you have problems with the work pressure?



### Employee rated High-involvement HRM

*Instruction: The following questions relate to the HR activities enacted within your department.*

*Please indicate per statement the extent to which you agree with the statement;*

#### **Staffing**

1. My department is spending a great effort in selecting the right person for every position.
2. My department uses extensive procedures in recruitment and selection, including a variety of tests and interviews.
3. Recruiting employees emphasizes the potential of new hires to learn and grow with the department.
4. Selecting employees is based on their overall fit with the department.

#### **Training and development**

1. Employees will normally go through ongoing training programs
2. My department provides training focused on team building and teamwork skills
3. My department provides specialized training and development for its employees
4. My department initiates and provides various kinds of training and development for its employees
5. Formal training programs are provided to teach new hires the skills they need to perform their job
6. Employees have clear career paths
7. Employees have opportunities for upward mobility

#### **Compensation**

1. Within my department, team members are financially rewarded based on their individual performance in addition to their basic salary
2. Within my department, team members are financially rewarded based on team performance in addition to their basic salary
3. Within my department, team members are financially rewarded based on organizational performance in addition to their basic salary
4. My department's pay system reflects employee's contribution to the department

#### **Performance appraisal**

1. Employees' performance appraisal is based on individual behaviors and attitudes at work
2. Employees' performance appraisal is oriented toward their development and progress at work
3. Employees' performance appraisal emphasizes collective and long-term-based results
4. Employees receive performance feedback on a routine (multiple times a year) basis

5. Performance appraisals are based on objective quantifiable results

**Participation and communication**

1. My department emphasizes employees' job rotation and flexible work assignments in different work areas
2. My department transfers extensively different tasks and responsibilities to employees
3. My department emphasizes employees' teamwork and network collaboration
4. Employees in my department have broadly designed jobs requiring a variety of skills
5. Employees in my department are allowed to make decisions
6. The job duties of employees are clearly defined
7. Employees are provided the opportunity to suggest improvements in the way things are done
8. Employees are invited to participate in a wide range of issues, including performance standards, quality improvement, benefits, etc
9. Employees are invited to participate in problem solving and decisions
10. Employees receive information on the relevant concerns of the company (goals, performance, etc.)
11. Supervisors keep open communication with the department

## Appendix B: Factor analyses

**Table 1.** PAF energy feelings scale, forced one factor solution

Item	Factor 1
I feel energetic (Phys)	.840
I feel I have physical strength (Phys)	.828
I feel vigorous (Phys)	.809
I feel mentally alert (CL)	.793
A feeling of vitality (Phys)	.773
I feel I am able to contribute new ideas (CL)	.611
I feel able to be sensitive to the needs of coworkers and customers (EE)	.598
I feel able to show warmth to others (EE)	.548
A feeling of flow (CL)	.529
I feel capable of being sympathetic to coworkers and customers (EE)	.526
Eigenvalue	5.319
Explained variance	53.19 %
KMO Index	.850
Bartlett's test of sphericity	.000

Extraction Method: Principal Axis Factoring  
a. 1 factors extracted. 5 iterations required.

**Table 2.** PAF job responsibility scale

Item	Factor 1
My position entails a broad scope of responsibility	.845
I have a considerable amount of responsibility for the work I do on this job	.828
I have a considerable amount of responsibility for the results of my work on this job	.664
Eigenvalue	2.210
Explained variance	73.657 %
KMO Index	.820
Bartlett's test of sphericity	.000

Extraction Method: Principal Axis Factoring.  
a. 1 factors extracted. 9 iterations required.

**Table 3.** PAF role overload scale

Item	Factor 1
Do you have problems with the work pace?	.770
Do you have problems with the work pressure?	.740
I have to neglect some tasks because I have too much to do	.683
Do you find that you are behind in your work activities?	.649
I have unachievable deadlines	.644
I have unrealistic time pressures	.612
Eigenvalue	3.339
Explained variance	55.647 %
KMO Index	.839
Bartlett's test of sphericity	.000

Extraction Method: Principal Axis Factoring  
a. 1 factors extracted. 4 iterations required.

**Table 4.** PAF employee-rated high-involvement HRM scale, forced one factor solution

Item	Factor 1
My department provides specialized training and development for its employees (Training)	.670
My department initiates and provides various kinds of training and development for its employees (Training)	.667
Employees have opportunities for upward mobility (Training)	.623
My department provides training focused on team building and teamwork skills (Training)	.621
Formal training programs are provided to teach new hires the skills they need to perform their job (Training)	.608
Recruiting employees emphasizes the potential of new hires to learn and grow with the department. (Staffing)	.598
My department uses extensive procedures in recruitment and selection, including a variety of tests and interviews. (Staffing)	.593
Employees have clear career paths (Training)	.588
Employees will normally go through ongoing training programs (Training)	.573
Performance appraisals are based on objective quantifiable results (Performance appraisal)	.569

Employees are provided the opportunity to suggest improvements in the way things are done (Participation and communication)	.567
Employees receive information on the relevant concerns of the company (goals, performance, etc.) (Participation and communication)	.565
My department is spending a great effort in selecting the right person for every position. (Staffing)	.560
Employees are invited to participate in a wide range of issues, including performance standards, quality improvement, benefits, etc (Participation and communication)	.558
Supervisors keep open communication with the department (Participation and communication)	.551
The job duties of employees are clearly defined (Participation and communication)	.520
Employees' performance appraisal is oriented toward their development and progress at work (Performance appraisal)	.518
Employees' performance appraisal emphasizes collective and long-term-based results (Performance appraisal)	.518
Employees in my department have broadly designed jobs requiring a variety of skills (Participation and communication)	.511
Employees receive performance feedback on a routine (multiple times a year) basis (Performance appraisal)	.509
Selecting employees is based on their overall fit with the department. (Staffing)	.506
My department emphasizes employees' teamwork and network collaboration (Participation and communication)	.497
Employees are invited to participate in problem solving and decisions (Participation and communication)	.475
Employees in my department are allowed to make decisions (Participation and communication)	.471
My department's pay system reflects employee's contribution to the department (Compensation)	.461
Within my department, team members are financially rewarded based on team performance in addition to their basic salary (Compensation)	.439
My department emphasizes employees' job rotation and flexible work assignments in different work areas (Participation and communication)	.438
Within my department, team members are financially rewarded based on their individual performance in addition to their basic salary (Compensation)	.428

Within my department, team members are financially rewarded based on organizational performance in addition to their basic salary (Compensation)	.397
Employees' performance appraisal is based on individual behaviors and attitudes at work (Performance appraisal)	.371
My department transfers extensively different tasks and responsibilities to employees (Participation and communication)	.355
<hr/>	
Eigenvalue	9.488
Explained variance	30.61%
<hr/>	
KMO Index	.898
Bartlett's test of sphericity	.000
<hr/>	

Extraction Method: Principal Axis Factoring  
a. 1 factors extracted. 4 iterations required.

## Appendix C: ICC

**Table 1.** ANOVA employee-rated high-involvement HRM

	Mean square	F	Sig.
Between groups	.614 (MSB)	3.182	.000
Within groups	.193 (MSW)		

**Table 2.** Calculating mean number of group members

	Valid	Missing
N	38	0
Mean	9.16	

## Appendix D: Histograms

Figure 1. Histogram job responsibility

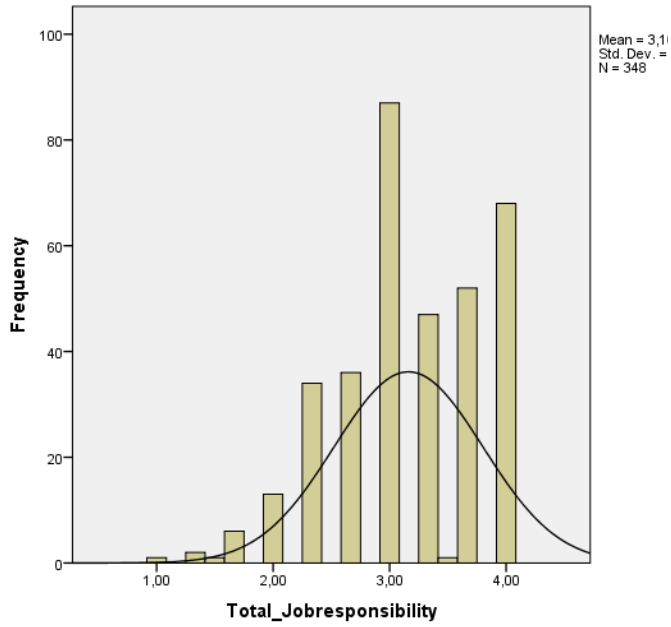


Figure 2. Histogram role overload

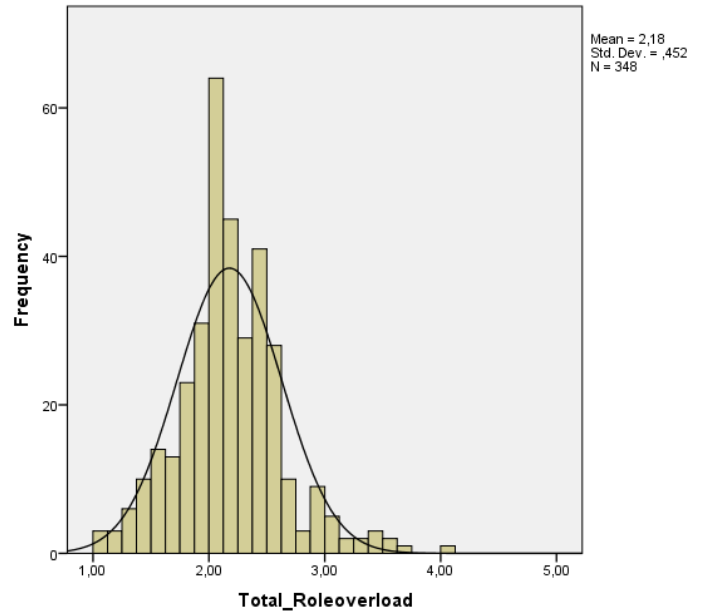


Figure 3. Histogram energy feelings

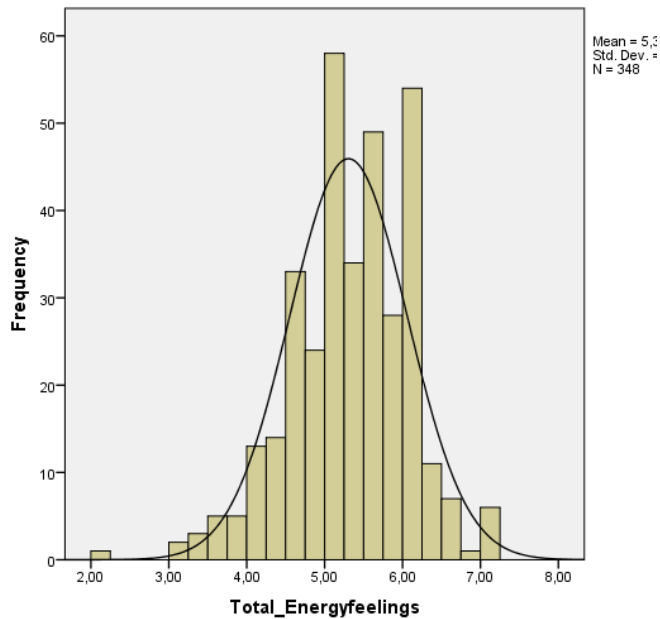


Figure 4. Histogram high-involvement HRM

