

Job demands and resources of workers in a South African agricultural organisation

Authors:

Doris N. Asiwe¹
Carin Hill²
Lené I. Jorgensen¹

Affiliations:

¹WorkWell, Research Unit for Economic and Management Sciences, North-West University, Potchefstroom Campus, South Africa

²Department of Industrial Psychology and People Management, University of Johannesburg, South Africa

Correspondence to:

Lené Jorgensen

Email:

10094598@nwu.ac.za

Postal address:

Private Bag X6001, Internal Box 114, Potchefstroom 2520, South Africa

Dates:

Received: 13 Feb. 2014
Accepted: 28 Nov. 2014
Published: 26 Mar. 2015

How to cite this article:

Asiwe, D.N., Hill, C., & Jorgensen, L.I. (2015). Job demands and resources of workers in a South African agricultural organisation. *SA Journal of Human Resource Management/SA Tydskrif vir Menslikehulpbronbestuur*, 13(1), Art. #634, 16 pages. <http://dx.doi.org/10.4102/sajhrm.v13i1.634>

Copyright:

© 2015. The Authors.
Licensee: AOSIS
OpenJournals. This work is licensed under the Creative Commons Attribution License.

Read online:



Scan this QR code with your smart phone or mobile device to read online.

Orientation: Understanding the job demands and resources experienced by workers in an agricultural organisation.

Research purpose: The objective of this study was to examine the validity and reliability of the Adapted Job Demands and Resources Scale (AJDRS) as well as to establish prevalent job demands and resources of employees in an agricultural organisation. Demographic differences were also investigated.

Motivation of the study: The agricultural sector of any national economy plays a very important role in the overall welfare of the country. Identifying the prevalent job demands and resources in an agricultural organisation is therefore of paramount importance since the negative consequences of employees experiencing very demanding jobs with few resources have been well documented in stress literature.

Research approach, design and method: A cross-sectional survey design was used. The sample consisted of 443 employees in an agricultural organisation. The AJDRS was used to measure the research variables.

Main findings: The findings of this research show evidence for the factorial validity and reliability of the AJDRS. Statistical differences were found with regard to the job demands and resources experienced by employees in different positions.

Practical/managerial implications: Interventions to improve the perceived job demands and resources in the organisation should focus on physical resources (equipment).

Contribution/value-add: This study contributes to knowledge concerning the job demands and resources that are prevalent in an agricultural organisation in South Africa.

Introduction

The workplace has undergone tremendous changes over the last few decades. Organisations must survive in highly competitive local and global economies. The extent to which an organisation is able to attain organisational goals and objectives through the dedication of its workforce is an important factor in the organisation's ability to remain in business (Fay & Buhrmann, 2004). Whilst most organisations now expect employees to put in extra time, effort, skills and to be flexible with regard to working hours, these organisations are not ready to offer these employees opportunities to grow, continued employment and job security (Cooper, Dewe & O'Driscoll, 2001; Maslach, Schaufeli & Leiter, 2001). Employees experience increased workloads and intense pressure to perform, as well as decreased job control (Häusser, Mojzisch, Niesel & Schulz-Hardt, 2010). These organisational changes also have an impact on individuals' jobs and could possibly influence workers' safety, health and well-being (Schaufeli & Bakker, 2004). Consequently, the once predictable and controlled work environment has become complex and unpredictable, impacting employees' energy and motivational levels, physical health and well-being (Bakker & Demerouti, 2007; French, Du Plessis & Scrooby, 2011; Nelson & Simmons, 2003; Rothmann & Jordan, 2006; Schaufeli & Bakker, 2004; Welthagen & Els, 2012).

The above discussion concurs with Rothmann, Mostert and Strydom (2006) that it is of paramount importance to investigate employees' experiences of the demands and resources in their work. The objective of this study was to investigate the job demands and resources of workers in a South African agricultural organisation. Specifically, the study aimed to (1) assess the validity and reliability of the Adapted Job Demands and Resources Scale, (2) to establish the prevalent job demands and resources of employees in an agricultural organisation and to (3) investigate differences in employees' job demands and resources that may exist based on the employees' demographic variables.

Literature review

Job demands and job resources

Different models have been propounded to explain the interaction between the demands of a job and the resources available to the employee. These models include the Job Characteristics model (Hackman & Oldham, 1976, 1980), the Job Demands Control model (Karasek, 1979), the Person-Environment Fit model (Lazarus & Folkman, 1984) and the Job Demands-Resources model (Demerouti, Bakker, Nachreiner & Schaufeli, 2001), to name a few.

The Job Characteristics model of Hackman and Oldham (1976, 1980) suggests that enriched or complex jobs are principally linked with employees' positive disposition to work and the work environment. These positive dispositions result in positive organisational outcomes such as increased job satisfaction, motivation and work performance. The Job Demands Control model of Karasek (1979) was developed in order to better understand job stress. The central assumption of this model is that the negative consequences of job stress could be moderated by an employee's total control over all aspects of their job, especially with regard to decision-making (Karasek & Theorell, 1990). According to this model, employees experience satisfactory control and job responsibility when they participate in organisational decision-making and have control of work conditions, the work setting and the amount of work (Mueller & McCloskey, 1990).

Another model of work-related stress is the Person-Environment Fit model, which was developed by Lazarus and Folkman (1984). This model views stress as resulting from a misfit between the requirements of the job (e.g. demands and resources) and the values, skills and traits of the individual (Cooper *et al.*, 2001; Winefield *et al.*, 2003). Implicit in this model is the assumption that such misfit may or may not take place depending on the person's ability to handle or cope with the situation.

A fourth model of job stress is the Job Demands-Resources model, which extends previous job stress models (Karasek, 1979; Siegrist, 1996) by incorporating ideas regarding different demands and resources, irrespective of the professional group being considered (Hakanen, Bakker & Demerouti, 2005). According to the developers of the Job Demands-Resources model (Demerouti *et al.*, 2001), every working condition can be categorised into two broad components, labelled job demands and job resources.

Job demands refer to aspects of the job that could possibly cause strain in situations where they surpass the individual's adaptive skills (Rothmann *et al.*, 2006). Job demands are therefore those physical, social or organisational aspects of the job that require sustained physical or mental effort and are associated with certain physiological and psychological costs (Demerouti *et al.*, 2001; Schaufeli & Bakker, 2004). Quantitative job demands refer to the amount of work required and the available time frame, whilst qualitative workload concerns the employees' affective responses to their jobs (Cooper

et al., 2001). Work overload or high demands may also occur if an individual does not have the necessary skills, abilities and support to meet these demands. Therefore, individuals who are overloaded with work could experience stress (Demerouti *et al.*, 2001; Karasek, 1979; Schaufeli & Bakker, 2004). Examples of excessive quantitative job demands that employees may be exposed to include feeling overwhelmed by perceived time pressures and deadlines, excessive work demands and informational overload (Montgomery, Peeters, Schaufeli & Den Ouden, 2003).

Job resources refer to the degree to which individual employees are offered career or growth opportunities by their jobs (Rothmann *et al.*, 2006). Job resources refer to those physical, psychological, social or organisational aspects of the job that may be functional in achieving work goals, reducing job demands, and the associated physiological and psychological costs, and stimulating personal growth and development (Bakker & Demerouti, 2007; Demerouti *et al.*, 2001; Schaufeli & Bakker, 2004). Job resources include social support (supervisory and collegial), job enhancement opportunities in the form of increased control, participation in decision-making, reinforcement (Richardsen & Burke, 1993), as well as recognition, opportunities for growth and rewards (Rothmann, 2002).

According to Rothmann *et al.* (2006), job resources exist at the following levels within an organisation: (1) at the organisational level (growth opportunities, remuneration, job security), (2) at the level of the organisation of work role (role clarity, participation in decision-making), (3) at the interpersonal level (team climate, supervisory and collegial support) and (4) at the task level (task significance, task performance feedback, task identity).

Job demands and resources in different organisations

Work-related stress research in the South African context indicates that different organisations experience different types of job demands and job resources (Rothmann, 2005). Previous researchers in South Africa have identified specific job demands and resources which could be potential causes of stress in different occupations. Specific professions and industries studied include emergency workers (Naudé & Rothmann, 2003), quantity surveyors (Bowen, Cattell & Edwards, 2013), local government (Rothmann, Jackson & Kruger, 2003), engineering (Rothmann & Malan, 2004), mining workers (Hodgskiss & Edwards, 2013), educators (Jackson & Rothmann, 2005; De Witt & Lessing, 2013), insurance (Coetzer & Rothmann, 2006), reformed church ministers (Buys & Rothmann, 2010), the South African Police Service (Pienaar & Rothmann, 2006; Rothmann, Kleyn, Louw & Makgala, 2003), nursing (Rothmann, Van der Colff & Rothmann, 2006), pharmacists (Rothmann & Malan, 2007) and academics (Rothmann & Barkhuizen, 2008; Rothmann *et al.*, 2006).

Most of these research studies highlighted the most prevalent job demands as being work overload, excessive paperwork,

insufficient time to meet deadlines, performing tasks not in their job description (role ambiguity), working long hours and having little control over their work; meanwhile, insufficient remuneration, lack of recognition, lack of growth and advancement opportunities, poorly motivated staff members, colleagues not doing their jobs, staff shortages, job insecurity, lack of control and lack of organisational, managerial and collegial support were identified as problems in terms of job resources (cf. Barkhuizen & Rothmann, 2008; Coetzer & Rothmann, 2006; Jackson & Rothmann, 2005; Naudé & Rothmann, 2003; Pienaar & Rothmann, 2006; Rothmann, 2005; Rothmann, Kleyn, Louw & Makgala, 2003; Rothmann & Malan, 2004).

The agricultural sector: The agricultural sector of a country is important in providing food and revenue for its populace as well as raw materials and fibre for a variety of industries. Agriculture also provides the opportunity to assure food security for the poor and to contribute to a climate of low inflation (Zuma, 2008). According to the Alliance for Commodity Trade in Eastern and Southern Africa (ACTESA, 2013) it is vital that the agricultural sector of South Africa functions optimally since it contributes to the economy of the nation. Apart from farmers and farm workers, the agricultural sector also includes agricultural organisations whose primary objective is to promote all agricultural-related sectors through research and technological development (Agricultural Research Council [ARC], 2007).

Researchers in agricultural research continue to strive for excellence in their pursuit of scientific solutions aimed at improving people's quality of life (Moephuli, 2008). However, they also face many challenges, such as the fact that the recruitment and retention of skilled scientists has become increasingly difficult for research institutes. There is also evidence of a decline in the number of applicants to research posts, leading in some cases to an inability to appoint scientists (ARC, 2008). The main factors contributing to difficulties in recruiting and retaining scientists include remuneration (the agricultural institutions offer low pay levels in comparison with other science councils, universities, government departments and the private sector), competitors remaining the main contributors, a shrinking pool of scientists from which to draw, competition from other employers, poor retention policy, inadequate recognition and appreciation, lack of fit with company culture and inappropriate fit for the role (ARC, 2008).

Another challenge in agricultural research includes the presence of unforeseen crisis situations such as attempting to modernise some of the laboratories and equipment so that new crops and animals and new techniques can be researched (ARC, 2005). In order to achieve organisational goals, teams or work groups need adequate equipment (Robbins, 2005). According to Guest (2004), advances in technology lead to the speeding up of the world of work. Thus, speed and flexibility of response form a vital basis for having a competitive advantage (Guest, 2004). According to a recent report by an

agricultural research institution, the allocation of funds for infrastructure renewal and equipment replacement remains highly inadequate and presents a challenge for the relevant workers (ARC, 2013). This lack of adequate equipment could place high levels of physical and psychological demands on the workers, which may potentially predispose them to strain and consequently affect their performance on the job.

However, to date no research studies have investigated these job demands and resources experienced by workers in the agricultural sector in South Africa. Research studies have mostly focused on stress and to date the research population has been mostly farmers (Deshpande & Shah, 2007). This finding is indicative of the importance of investigating job demands and resources in this sector as the negative effects of demands and lack of resources have clearly been demonstrated in the stress literature and have serious implications for the employees' well-being as well as that of the organisation.

Measuring job demands and resources

South African studies have reported results in support of the Job Demands Resources model (Bakker & Demerouti, 2007; Demerouti *et al.*, 2001; Schaufeli & Bakker 2004). These results suggest that different work characteristics can be grouped into two categories, corresponding to the theoretical categories of job demands and job resources, in different organisations. Studies by Fourie (2003), Jackson, Rothmann and Van de Vijver (2006), Koekemoer and Mostert (2006), Rothmann and Jordan (2006), Rothmann *et al.* (2006), Rothmann and Jorgensen (2007), and Barkhuizen and Rothmann (2008) all yielded two-factor structures, suggesting that job demands and job resources are characteristics of work environments.

However, Rothmann *et al.* (2006) state that more research is needed in order to develop a valid measure that could be used in a wide variety of contexts. This research needs to focus specifically on job demands and resources in different occupations and organisations in South Africa and is necessary in order to allow for comparisons between different occupations and organisations (Rothmann *et al.*, 2006). Jackson and Rothmann (2005) developed the Job Demands and Resources Scale (JDRS) for educators. The scale consists of seven reliable factors, namely Organisational support, Insecurity, Reward, Overload, Growth opportunities, Control and Relationship with colleagues (Jackson & Rothmann, 2005). Hill, Mostert and De Bruin (2012) adapted the instrument for use with police members in the North West and found it to be reliable.

The following definitions of the factors provided by Jackson and Rothmann (2005) were adopted for this study:

1. *Organisational support* is defined as the employee's relationship with their supervisor, receiving information on their work, communication and participation in decisions about the nature of their work.
2. *Insecurity* refers to a person's uncertainty about the future.

3. *Reward* refers to whether the employee can live comfortably on their pay, whether the employee thinks they are paid enough for the work and whether the job offers opportunities for the employee to progress financially.
4. *Overload* refers to physical, mental and emotional demands, time pressure, pace and amount of work.
5. *Growth opportunities* refers to having access to opportunities for personal growth and development, including learning on the job.
6. *Control* implies having opportunities for independent thought and action, taking part in planning activities, freedom in carrying out work and making a significant contribution to the organisation.
7. *Relationship with colleagues* refers to availability of colleagues to help, contact possibilities with colleagues, whether the employee can count on colleagues and whether the employee gets on well with colleagues.

Other South African studies have obtained similar results to those reported by Jackson and Rothmann (2005). These studies provide support for the following constructs: Organisational support (Barkhuizen & Rothmann, 2008; Hill *et al.*, 2012; Phale, 2008; Rothmann & Jordan, 2006; Rothmann *et al.*, 2006; Rothmann & Jorgensen, 2007), Job insecurity (Barkhuizen & Rothmann, 2008; Bosch, Ribeiro & Becker, 2012; Hill *et al.*, 2012; Rothmann *et al.*, 2006), Reward (Hill *et al.*, 2012; Jackson & Rothmann, 2005), Overload (Barkhuizen & Rothmann, 2008; Bosch *et al.*, 2012; Hill *et al.*, 2012; Phale, 2008; Rothmann *et al.*, 2006), Growth opportunities (Barkhuizen & Rothmann, 2008; Jackson & Rothmann, 2005; Phale, 2008; Ribeiro, Bosch & Becker, 2013; Rothmann & Jordan, 2006; Rothmann *et al.*, 2006; Rothman & Jorgensen, 2007) and Control (Jackson & Rothmann, 2005).

In order to determine the nature of the job demands and resources experienced in the agricultural organisation, the JDRS was adapted specifically for the agricultural sector. Subsequently, the following hypotheses were formulated regarding the adapted JDRS (AJDRS):

- **Hypothesis 1a:** The AJDRS is a valid instrument for use in a sample of agricultural workers in South Africa.
- **Hypothesis 1b:** The AJDRS is a reliable instrument for use amongst a sample of agricultural workers in South Africa.

Job demands, job resources and demographic variables

Agricultural workers are not a homogeneous group of employees. It would therefore be inappropriate to examine the job demands and resources of the employees in an agricultural organisation without taking cognisance of their demographic differences. Vokic and Bogdanic (2007) have drawn attention to the fact that the stress process is not a simple phenomenon, but rather a complex process that results from the interaction of various variables.

Previous researchers have examined the differences between various demographic groups in terms of how they perceive

their job-related occupational stressors and resources. Variables that have been studied include: (1) gender (e.g. Antoniou, Polychroni & Vlachakis, 2006; Bonke, Deding & Lausten, 2009; Fotinatos-Ventouratos & Cooper, 2005; Sverke, Hellgren, Näswall, Chirumbolo, De Witte & Goslinga, 2004; Vakola & Nikolaou, 2005; Van Zyl, 2005), (2) age (e.g. Antoniou *et al.*, 2006; Buitendach, 2004; Buitendach, Oosthuyzen & Van Wyk, 2005; Marinaccio *et al.*, 2013; Rannona, 2003; Vakola & Nikolaou, 2005), (3) race, nationality and ethnic background (e.g. Bosch *et al.*, 2012; Buitendach *et al.*, 2005; Pienaar & Rothmann, 2006; Lu, Cooper, Kao & Zhou, 2003; Ribeiro *et al.*, 2013), (4) hierarchical level or rank (e.g. Barkhuizen, 2005; Coetzer & Rothmann, 2006; Naudé & Rothmann, 2003; Pienaar & Rothmann, 2006; Ribeiro *et al.*, 2013; Winefield *et al.*, 2003; Winter, Taylor & Sarros, 2000), (5) educational level (e.g. Barkhuizen & Rothmann, 2008; Buitendach, 2004; Buitendach *et al.*, 2005; Marinaccio *et al.*, 2013; Näswall & De Witte, 2003; Vakola & Nikolaou, 2005), (6) marital status (e.g. Bosch *et al.*, 2012; Marinaccio *et al.*, 2013; Ribeiro *et al.*, 2013) and (7) number of years in a position (e.g. Buitendach *et al.*, 2005; Winefield *et al.*, 2003).

With regard to gender, researchers have found that men and women working in the same job level differ significantly in their perception of work stressors and resources. Antoniou *et al.* (2006) and Fotinatos-Ventouratos and Cooper (2005) found that female employees experienced higher levels of occupational stress than their male counterparts. There have been conflicting findings concerning the perceived job insecurity of men and women. Van Vuuren (1990) distinguishes between affective insecurity, which refers to the employee's subjective interpretation of a situation, and cognitive insecurity, which refers to uncertainty about the future. Sverke *et al.* (2004) found that women experienced higher levels of job insecurity than men. In addition, a stronger correlation was identified between the resultant stress due to insecurity and its adverse effects for men than for women. Sverke, Hellgren, Näswall and Chirumbolo, De Witte and Goslinga (2001) attribute this to the fact that men are likely to experience more strain in relation to job insecurity because they traditionally bear the burden of supporting their families financially. However, Buitendach *et al.* (2005) and Van Zyl (2005) found no difference in the insecurity levels of women and men. Women tend to report greater job satisfaction with regard to job resources such as pay and career opportunities than men (Bonke, Deding & Lausten, 2009; Clark, 1997), possibly considering the intrinsic characteristics of the job and work-life balance as higher priority than pay and career opportunities (Bender, Donohue & Heywood, 2005; Clark, 1997). Additionally, job resources such as control and peer support were more prevalent amongst men than amongst women (Marinaccio *et al.*, 2013).

In relation to age, De Witte (1999) found that employees between the ages of 30 and 50 years are more likely to experience strain at the likelihood of job loss than younger and older employees. This may be due to the fact that younger employees have fewer financial obligations and better chances of finding alternative employment than their

older colleagues. In relation to older employees, it is possible that employees over the age of 50 are already preparing for retirement and are therefore less concerned with job security. However, research by Rannona (2003), Buitendach (2004) and Buitendach *et al.* (2005) found that older employees do experience high levels of job insecurity, frequently related to the fact that they are often the first victims of downsizing in any organisation. Concerning the prevalence of job resources amongst different age groups, Marinaccio *et al.* (2013) found that older employees (> 50 years) experienced higher levels of job control than the younger employees (< 30 years).

Pienaar and Rothmann (2006) found that race had an impact on the experience of occupational stress. In their study on the South African Police Service (SAPS), race impacted significantly on the experience of occupational stress, with white and Indian employees experiencing stress more intensely than their black and mixed-race counterparts. In their study of the mining industry, Buitendach *et al.* (2005) found evidence of differences in the job insecurity of white and black employees, with white employees experiencing higher levels of cognitive job insecurity than their black colleagues. These authors speculated that the differing levels may be due to the implementation of the *Employment Equity Act* (No. 55 of 1998), which created more employment opportunities for black employees than for their white and mixed-race counterparts. These findings differ from those reported by Manski and Straub (2000) and Elbert (2002), who found that fear of possible job loss was higher for black persons than white persons. According to Jacobson (1991) these conflicting findings may be due to the fact that although insecurity is a perceptual phenomenon (which varies between employees working in the same organisation, because of the different ways in which people perceive things due to circumstantial factors and personal traits), employees do not exist in isolation, and so an employee's understanding of a situation will be shared by other employees in an organisation.

With regard to work overload Bosch *et al.* (2012) found significant differences in the work overload experiences of female chartered accountants in relation to race, with white participants feeling the most overload, followed by Asian, black, mixed race and Indian participants. However, in terms of reward and growth opportunities, female white chartered accountants reported higher levels of financial advancement and career growth opportunities than black female chartered accountants (Ribeiro *et al.*, 2013). This may be due to the fact that white qualified chartered accountants previously experienced advantages from exposure to client and job experience (Ribeiro *et al.*, 2013). These previous experiences have primed them to exploit growth and development opportunities and consequently these employees rate their current and future earning potential in their organisation higher than their black counterparts. However, these black employees may well be more highly paid as a result of motivational packages aimed at retaining them in the organisation (Ribeiro *et al.*, 2013).

In terms of job resources, Ribeiro *et al.* (2013) found differences between the white and black research participants in terms of reward and growth opportunities, with white participants reporting higher levels of financial advancement and career growth opportunities than black participants. This perception may be due to the fact that white participants previously experienced advantages from exposure to client and job experience, preparing them to utilise growth and development opportunities and causing them to rate their current and future earning potential in their organisation higher than their black counterparts, although in reality black employees may well be more highly paid as a result of motivational packages aimed at retaining them in the organisation (Ribeiro *et al.*, 2013).

Barkhuizen (2005) and Winter *et al.* (2000) investigated the effects of rank on employees' perceived strain. They found that rank impacted significantly on job demands. In the study by Winefield *et al.* (2003) it was found that academics differed in terms of the level of job demands associated with rank, with associate professors experiencing higher levels of job demands than junior lecturers and lecturers. In addition, the study found that working hours for associate professors and professors increased in relation to occupational level (Winefield *et al.*, 2003). Similarly, Pienaar and Rothmann (2006) found that rank impacted significantly on the experience of occupational stress in the police. Constables experienced lower degrees of stress in relation to job demands and a lack of support than other police members. Constables also experienced stress less often because they were not exposed to the demands and lack of support to the same degree and duration as other police members (Pienaar & Rothmann, 2006). Other studies have found that, as people's age, experience and rank within their organisation increase, they tend to take on more responsibility and as a result experience an increase in job demands (Osipow, Doty & Spokane, 1985). This is in keeping with the findings reported by Sager (1990), who suggested that the particular extra job responsibilities of managers in comparison to those of salespeople should be considered stress factors.

According to Roskies and Louis-Guerin (1990), managers might react more negatively than their employees to the threat of job loss, because they are more likely to feel guilt, self-doubt and despair when they experience career setbacks. With regard to growth opportunities, trainee chartered accountants reported lower levels of opportunity for growth than qualified chartered accountants (Ribeiro *et al.*, 2013). In explaining this finding Ribeiro *et al.* (2013) suggest that trainees function in apprentice roles and are therefore likely to be overcome by feelings of lack of confidence in their ability to grow, possibly as a result of the amount of work they have to complete. In addition, trainees have limited opportunities for promotion whilst in training and only qualified chartered accountants are able to attain senior management positions. Coetzer and Rothmann (2006) found that, when compared with professional and managerial staff, clerical staff scored significantly higher on stressors

associated with resources and communication, work relationships, control, overload and job characteristics. Naudé and Rothmann (2003) also found that emergency workers and management reported higher levels of job demands than medical specialists and support services.

Differences have been found recently in terms of job resources and rank or job position: employees in manager or high seniority positions tend to score lower on job resources such as job control, positive work relationships and supervisory support, whilst scoring high on growth opportunities and role clarity (Marinaccio *et al.*, 2013; Ribeiro *et al.*, 2013).

In relation to the connection between education and workers' perception of stress, Dua (1994) reported that academics with a 5-year to 7-year degree experienced higher levels of job demands than their colleagues with lower qualifications. These results suggest that level of education is related to the level of perceived job demands. However, this finding was not supported in a study by Barkhuizen and Rothmann (2008). According to Näswall and De Witte (2003), educational level plays a vital role in an employee's perception of job insecurity as it may determine the employee's chance of finding alternative employment. Employees with higher levels of education are considered better equipped with the necessary expertise needed for employment. Buitendach *et al.* (2005) also found level of education could impact perception of job insecurity, with employees with lower than Grade 12 certificates showing higher levels of affective job insecurity than those with at least a degree. However, employees with a degree experienced higher levels of cognitive job insecurity. This result was confirmed in a study conducted by Buitendach (2004). These results may be due to the fact that highly educated employees may struggle to find alternative employment due to being overqualified or expecting high levels of remuneration (Buitendach *et al.*, 2005). Lastly, in terms of job resources and education, Marinaccio *et al.* (2013) found that employees with a post-school education tend to have more positive perceptions and scores on job control than those with only a school qualification. The reason for this could be adduced to the fact that whilst their rank increases, workers are more likely to attain higher levels of autonomy (Marinaccio *et al.*, 2013).

Marital status has also been found to be significantly related to perceived occupational stress levels. Married people, possibly because of their work-home conflict, experience higher levels of stress than single people (Vokic & Bogdanic, 2007). This was confirmed in a research study conducted by Bosch *et al.* (2012), who found significant differences in the work overload levels of employees based on marital status. In this study, female accountants who were either married or in a relationship experienced more work overload than their single colleagues. Ribeiro *et al.* (2013) found that qualified chartered accountants who were in a relationship reported greater satisfaction with their remuneration than what was reported by their single colleagues. This may be due to the fact that individuals in a relationship share

costs with their partners (Ribeiro *et al.*, 2013). In addition, chartered accountants in relationships reported higher levels of growth opportunities than those reported by their single colleagues. According to Ribeiro *et al.* (2013), this could be attributed to the fact that the employees in a relationship 'are more comfortable and feel more able to access growth opportunities' (p. 24). Marinaccio *et al.* (2013) also found that married employees perceived higher levels of job autonomy and role ambiguity than unmarried counterparts, ascribing the results to the closer societal integration and acceptance of married individuals over unmarried individuals.

Researchers have also identified number of years spent in a workplace as an important variable in relation to employees' perceptions of stress. This is because new employees first have to understand the organisational structures and ethics, then understand the organisational expectations in relation to performance and then find a balance between various workplace demands (Sorcinelli, 1994). Based on the age of employees Osipow *et al.* (1985) conclude that younger academics are less likely to cope with occupational stressors than their older counterparts. However, older academics tend to have more responsibilities and frequently report increasing pressure and work overload (Winefield *et al.*, 2003). However, a study by Buitendach *et al.* (2005) found no evidence for differences in insecurity based on tenure amongst employees in the mining industry. With regard to job resources, Marinaccio *et al.* (2013) found that employees with more than 5 years in their current job reported more negative perceptions of relationships, peer and managerial support.

Based on the aforementioned, the following hypothesis is presented:

- **Hypothesis 2:** There are significant differences in the perceived job demands and resources of employees in an agricultural organisation based on differences in demographic variables.

Method

Research approach

For the purposes of the adaptation phase of the measuring instrument, a quantitative methodological design was used. In this approach, the researcher is interested in the development of new methods (such as questionnaires, scales and tests) of data collection (Mouton, 2001). In order to test the research hypotheses, an explorative research design was used. The exploratory research approach was deemed relevant to this study because it allowed for the generation of insight into the reliability and validity of the adapted measuring instrument (see Durrheim, 2007). It also allowed for the identification of prevalent job demands and resources as well as the investigation of differences in the perceived job demands and resources of different demographic groups of workers in an agricultural organisation.

Measures

Research participants

A survey design, specifically a cross-sectional design, in which a sample is drawn from the target population at a particular time (Shaughnessy, Zechmeister & Zechmeister, 2006), was used to achieve the research objectives. The sample consisted of employees from a South African agricultural organisation based in various locations across South Africa. Participation was voluntary. Employees from all departments, job groups and educational levels were included. The biographical characteristics of the participants are presented in Table 1.

Table 1 illustrates that an almost equal number of men (49.9%) and women (49.0%) participated in the survey. More than half of the participants (55.8%) were African and 52.4% were married. Most of the participants' first language was an African language (53.8%), whilst 37.2% indicated Afrikaans as their first language. A total of 62.3% participants were between the ages of 31 and 50 and 19.4% had a master's degree. The majority of the sample ($n = 356$) were employed as research assistants, research technicians or researchers and had been in their current position as well as in the organisation for mostly between 1 and 5 years. Missing cases were present due to incomplete biographical questionnaires.

Measuring instrument

The JDRS (Jackson & Rothmann, 2005) was adapted for use in this study and was used to measure the job demands and resources of employees in an organisation within the agricultural sector. The JDRS was originally developed to measure the job demands and resources of educators (Jackson & Rothmann, 2005). The scale consists of 48 items measuring pace and amount of work, mental load, emotional load, variety in work opportunities to learn, independence in work, relationship with colleagues, relationship with immediate supervisor, ambiguities about work, information,

TABLE 1: Biographical information of participants ($N = 443$).

Item	Category	<i>f</i>	%
Gender	Male	221	49.9
	Female	217	49.0
	Missing cases	5	1.1
Race	African	247	55.8
	Mixed race	19	4.3
	Indian	3	7.0
	White	170	38.4
	Missing cases	4	0.9
Marital status	Single	124	28.0
	Engaged	18	4.1
	Married	232	52.4
	Living together	16	3.6
	Separated/Divorced	24	5.4
	Widow/Widower	16	3.6
	Other	5	1.1
	Missing cases	8	1.8

Table 1 continues →

TABLE 1 (Continues...): Biographical information of participants ($N = 443$).

Item	Category	<i>f</i>	%	
Language	Afrikaans	165	37.2	
	English	21	4.7	
	isiNdebele	5	1.1	
	isiXhosa	6	1.4	
	isiZulu	26	5.9	
	Sepedi	64	14.4	
	Sesotho	59	13.3	
	Setswana	38	8.6	
	siSwati	14	3.2	
	Tshivenda	18	4.1	
	Xitsonga	8	1.8	
	Other	14	3.2	
	Missing cases	5	1.1	
Age	20–25	28	6.3	
	26–30	53	12.0	
	31–35	73	16.5	
	36–40	60	13.5	
	41–45	72	16.3	
	46–50	71	16.0	
	51–55	37	8.4	
	55+	44	9.9	
	Missing cases	5	1.1	
	Education	Grade 9–11	59	13.3
Grade 12		60	13.5	
Certificate/Diploma		70	15.8	
Bachelor's degree		44	9.9	
Honours degree		42	9.5	
Master's degree		86	19.4	
PhD		51	11.5	
Other		24	5.4	
Missing cases		7	1.6	
Position		Research assistant	124	28.0
	Research technician	122	27.5	
	Researcher	110	24.8	
	Programme manager/ Specialist scientist	17	3.8	
	Support staff	62	14.0	
	Missing cases	8	1.8	
	Years in position	1–5	195	44.0
6–10		79	17.8	
11–15		48	10.8	
16–20		37	8.4	
21–25		33	7.4	
26–30		35	7.9	
30+		12	2.7	
Missing cases		4	0.9	
Years in organisation		1–5	152	34.6
		6–10	75	16.9
	11–15	49	11.1	
	16–20	51	11.5	
	21–25	51	11.5	
	26–30	39	8.8	
	30+	22	5.0	
	Missing cases	4	0.9	

f, frequency.

participation, contact possibilities, remuneration and career possibilities. Jackson and Rothmann (2005) found that the dimensions of the JDERS consisted of seven reliable factors, namely Organisational support ($\alpha = 0.88$), Growth opportunities ($\alpha = 0.80$), Overload ($\alpha = 0.75$), job Insecurity ($\alpha = 0.90$), Relationship with colleagues ($\alpha = 0.76$), Control ($\alpha = 0.71$) and Rewards ($\alpha = 0.78$).

Adaptation of the JDERS: In adapting the JDERS for the purposes of the current study, the word 'children' was consistently replaced by the word 'clients' because the organisation deals with clients and not children, as is the case of educational settings. In addition, the words 'education department' were replaced by 'organisation/institute/division' and 'school' was replaced by 'organisation/institute'. Seven original JDERS items were rephrased to better suit the sample environment. An additional 12 items were added in order to access more information concerning job demands and resources within the agricultural sector. The final instrument consisted of 60 items and the questions were rated on a seven-point scale ranging from 1 (never) to 7 (always).

Research procedure

A South African agricultural organisation was approached and asked to participate in the study. Once the researcher received written permission from the director of human resources of the organisation to conduct the research, the research procedure commenced. The research procedure consisted of two phases: (1) adaptation of the JDERS and (2) data collection.

In order to adapt Jackson and Rothmann's (2005) JDERS, interviews were conducted with employees in the organisation. The goal of these interviews was to obtain information concerning the job characteristics of employees within the organisation. This information was used to adapt the JDERS items and to write additional, context-relevant items to add to the JDERS.

Following the adaptation of the JDERS a letter requesting participation in the survey was emailed to the employees within the organisation. The letter explained the objective of the survey, which was to investigate work-related well-being in the agricultural sector, with specific reference to levels of wellness and the ways in which employees personally evaluate different aspects of their work and work environment.

The data was collected by means of convenience sampling. Convenience sampling involves selecting participants primarily on the basis of their willingness and availability to participate in the research (Fink, 2009). Paper-and-pencil questionnaires were distributed to 511 participants who indicated their willingness to participate in this project. The participants were given a 6-week period to complete the questionnaires. At the end of this period the questionnaires were collected by the researcher. A total of 472 questionnaires were collected, resulting in a 92% response rate. However,

29 of the 472 questionnaires collected were either not properly completed or were incomplete. Subsequently, 443 questionnaires were used for statistical analysis.

Analysis

The statistical analysis was carried out with the Statistical Package for the Social Scientist (SPSS; 2011). Descriptive statistics (e.g. means, standard deviations, skewness and kurtosis) were used to determine the distribution pattern of the data. To ensure that the data were normally distributed, a cut-off point of 2.00 was set for skewness (Finch & West, 1997) and 4.00 for kurtosis (Field, 2009). A skewed variable is a variable whose mean is not in the centre, whilst a kurtosed variable indicates the presence of clustering of scores (Tabachnick & Fidell, 2001). Tabachnick and Fidell (2001, p. 73) state that it is necessary to examine the skewness and kurtosis of scores before analysis as 'solutions from analysis are usually degraded if the variables are not normally distributed'.

Exploratory factor analysis was conducted to determine the construct validity of the AJDERS. Firstly, a simple principal component analysis was conducted on the items of the AJDERS and the eigenvalues and scree plot were studied to determine the number of factors to extract. Kaiser (1960) recommends extracting factors with eigenvalues higher than 1.00. Additionally, the scree plot can also be used to determine the number of factors. Cattell (1966) advises that the point of inflection of the scree plot be considered. Secondly, a maximum likelihood analysis with a direct oblimin rotation was conducted and the pattern matrix was inspected to analyse the possible factor solutions. The following criteria were considered in deciding which factors to retain: (1) as a rule of thumb, item loadings had to be more than 0.32; (2) an item was not allowed to load on more than one factor as this was considered to indicate that the item either tapped more than one factor (poor item) or that there was an overlap of factors or components; (3) a factor needed to have at least three substantive item loadings and (4) the retained factor needed to make theoretical sense (Field, 2009; Tabachnick & Fidell, 2001).

The reliability of the obtained factors was investigated using the Cronbach's alpha coefficient. Nunnally and Bernstein (1994) recommend a guideline of 0.70 as an acceptable cut-off point. The obtained factors were consequently used as input in a second-order factor analysis. Varimax rotation was used in extracting the factors because the factors were not correlated ($r < 0.30$).

Multivariate analysis of variance (MANOVA) was used to determine differences between demographic groups with regard to job demands and resources. The demographic variables included were gender, race, marital status, language, age, education, unit, position, years in organisation and years in position. MANOVA is the multivariate equivalent of analysis of variance (ANOVA) methods, and is used in instances where there is more than one dependent

variable and where the dependent variables cannot simply be combined (see Pallant, 2010). It is also used to ascertain whether changes in the independent variables have a significant effect on the dependent variables. According to Pallant (2010), when conducting a MANOVA preliminary assumption, testing should be conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance and multicollinearity. MANOVA is at its best when these assumptions are met and also when there is a substantial correlation between the dependent variables (Kerlinger & Lee, 2000). Wilks's lambda was used to test the likelihood of the data under the assumption of equal population mean vectors for all groups, against the likelihood under the assumption that the population mean vectors are similar to those of the sample mean vectors for the different groups. When an effect was significant in MANOVA, one-way analysis of variance was used to discover which dependent variables had been impacted.

The Bonferroni adjustment was used to prevent inflated type 1 error, which is the possibility of finding a significant difference when there is actually none (Pallant, 2010). According to Pallant (2010, p. 295), 'a Bonferroni adjustment in its simplest form, involves dividing your original alpha level of .05 by the number of analysis that you intend to do'. Therefore, because there were eight dependent variables in this study, the level of significance was set at 0.006. The Games-Howell procedure was used to determine whether there were any statistical differences between the groups. This procedure was chosen because sample sizes were different (Field, 2009). Although the *p* value demonstrates whether an effect actually exists, it does not disclose the size of the effect; therefore, it is imperative to report both the statistical significance and the substantive significance (effect size) (Sullivan & Feinn, 2012). According to Cohen (1988), when determining statistical significance the following guidelines should apply: a value between 0.10 and 0.50 indicates a small effect, a value between 0.50 and 0.80 indicates a medium effect and a value above 0.80 indicates a large effect. In terms of the current study, a cut-off point of 0.50 (medium effect) was set for the practical significance of the differences between group means. According to Kirk (1996), statistical significance determines whether research results are attributable to chance or sampling variability, whilst practical significance determines whether the results can be used within real life. Due to this reasoning, only results that are both statistically and practically significant will be reported.

Ethical considerations

Ethical aspects attended to included obtaining written permission from the organisation as well as from the individual participants. Participation in the study was voluntary and participants were assured of confidentiality. The objectives of the study were explained to the participants at their place of work and each questionnaire and consent form was accompanied by a letter explaining the rationale

of the study and indicating the participant's voluntary participation in the research.

Results

In order to examine the distribution pattern of the scores, descriptive statistics (means, standard deviation, skewness and kurtosis) were used to explore the data on the initial 60 items of the AJDRS (see Table 2).

TABLE 2: Descriptive statistics of the initial 60 adapted Job Demands and Resources Scale items (*N* = 443).

Item	M	SD	Skewness	Kurtosis
Item 1	4.99	1.52	-0.52	-0.09
Item 2	4.79	1.49	-0.48	-0.01
Item 3	4.84	1.49	-0.19	-0.57
Item 4	5.59	1.26	-0.82	0.63
Item 5	4.38	1.65	-0.26	-0.42
Item 6	2.65	1.66	0.85	-0.05
Item 7	4.83	1.49	-0.35	-0.27
Item 8	5.63	1.34	-0.99	0.90
Item 9	5.52	1.49	-0.99	0.56
Item 10	3.53	1.58	0.17	-0.53
Item 11	3.21	1.75	0.45	-0.55
Item 12	3.11	1.49	0.37	-0.33
Item 13	4.24	1.79	-0.27	-0.77
Item 14	4.15	1.69	-0.19	-0.60
Item 15	4.80	1.75	-0.60	-0.48
Item 16	6.20	1.19	-1.95	4.26
Item 17	5.09	1.51	-0.56	-0.20
Item 18	4.64	1.86	-0.39	-0.88
Item 19	5.67	1.43	-1.13	0.88
Item 20	6.14	1.14	-1.70	3.38
Item 21	5.46	1.42	-0.83	0.18
Item 22	5.46	1.43	-1.04	0.99
Item 23	5.77	1.40	-1.29	1.44
Item 24	5.36	1.58	-0.90	0.18
Item 25	5.27	1.46	-0.56	-0.16
Item 26	5.62	1.36	-0.86	0.40
Item 27	6.00	1.16	-1.78	4.39
Item 28	5.75	1.41	-1.35	1.69
Item 29	6.05	1.13	-1.42	2.40
Item 30	5.49	1.55	-0.99	0.57
Item 31	6.07	1.20	-1.81	4.14
Item 32	5.93	1.26	-1.48	2.32
Item 33	5.05	1.70	-0.78	-0.15
Item 34	5.35	1.39	-0.72	0.33
Item 35	5.32	1.55	-0.85	0.15
Item 36	4.92	1.77	-0.55	-0.59
Item 37	4.59	1.64	-0.24	-0.49
Item 38	4.09	1.72	0.04	-0.77
Item 39	5.04	1.66	-0.60	-0.41
Item 40	5.52	1.63	-1.08	0.45
Item 41	5.04	1.69	-0.67	-0.31
Item 42	3.11	1.86	0.59	-0.66
Item 43	5.74	1.34	-1.02	0.70
Item 44	5.79	1.31	-1.08	0.83
Item 45	5.08	1.41	-0.46	0.13
Item 46	5.43	1.40	-0.79	0.43
Item 47	4.62	1.99	-0.36	-1.03
Item 48	4.77	2.05	-0.50	-1.03
Item 49	4.48	1.97	-0.27	-1.07
Item 50	4.51	1.94	-0.27	-1.01

Table 2 continues on the next page →

TABLE 2 (Continues...): Descriptive statistics of the initial 60 adapted Job Demands and Resources Scale items ($N = 443$).

Item	M	SD	Skewness	Kurtosis
Item 51	3.05	1.74	0.42	-0.72
Item 52	3.06	1.70	0.45	-0.59
Item 53	2.84	1.75	0.64	-0.51
Item 54	2.78	1.73	0.79	-0.19
Item 55	4.50	1.80	-0.35	-0.66
Item 56	4.85	1.62	-0.40	-0.39
Item 57	2.89	1.80	0.79	-0.22
Item 58	4.75	1.63	-0.38	-0.49
Item 59	4.84	1.60	-0.40	-0.38
Item 60	4.56	1.75	-0.33	-0.68

Bold indicates the items that displayed kurtosis exceeding 4.00. M, mean; SD, standard deviation.

The results indicated that three items (16, 27 and 31) displayed kurtosis exceeding 4.00. This suggested that these items deviated from the normal distribution and indicated the presence of clustering of scores. These items were therefore removed from further analysis. The remainder of the items presented data that was fairly normally distributed.

A principal component analysis was conducted on the remaining 57 items to determine the number of factors that could be extracted. An initial analysis of the Eigen values (larger than 1) suggested that 14 factors could be extracted, explaining 68% of the variance. However, the scree plot (see Figure 1) suggested that only seven factors (explaining 52% of the variance) should be extracted.

A maximum likelihood factor analysis with a direct oblimin rotation was then conducted on the proposed 14-factor solution. After investigating various factor solutions, a decision was taken to retain eight factors based on the criteria set out in the statistical analysis section of this article. Five items did not load on any of the factors (e.g. 'Do you have enough time to complete your work?') and three items had double loadings (e.g. 'Does your job give you the opportunity to be promoted?'). In addition, item 42 ('Do you have direct influence on your institute's/organisation's decisions?') was also removed as it lowered the Cronbach's alpha of the factor

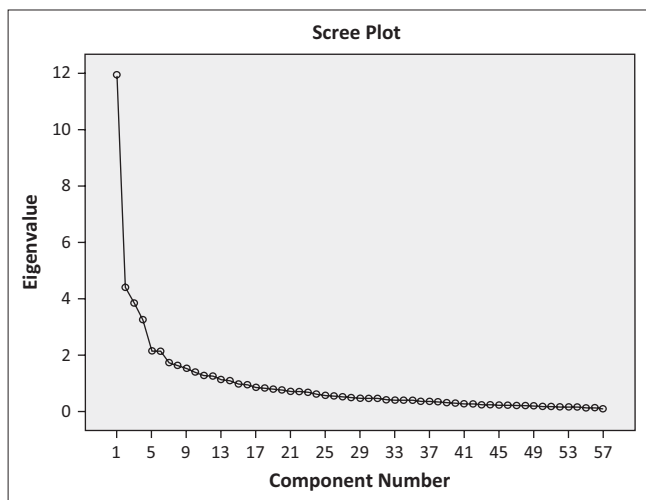


FIGURE 1: Scree plot of the adapted Job Demands and Resources Scale items.

and did not match the rest of the items on the scale. These items were all excluded from further analysis. The results of the factor loadings and communalities of the retained items are presented in Table 3.

TABLE 3: Factor loadings and communality of items ($N = 443$).

Factor	Item	F	h ²
Organisational Support	Do you feel appreciated by your supervisor?	0.74	0.68
	Does your direct supervisor inform you on how well you are doing your work?	0.72	0.73
	Can you discuss work problems with your direct supervisor?	0.71	0.68
	Do you receive sufficient information on the results of your work?	0.68	0.72
	Can you count on your supervisor when you come across difficulties in your work?	0.67	0.68
	Do you know exactly what your direct supervisor thinks of your performance?	0.66	0.62
	Do you get on well with your supervisor?	0.60	0.65
	Do you receive sufficient information on the purpose of your work?	0.58	0.71
	Are you kept adequately up to date about important issues in your organisation/institute/division?	0.64	0.66
	Is it clear whom you should address within the organisation/institute for specific problems?	0.49	0.59
	Can you participate in decisions about the nature of your work?	0.36	0.57
	Do you know exactly for what you are responsible and what not?	0.42	0.60
	Is the organisation's/institute's decision-making process clear to you?	0.33	0.72
	Job Insecurity	Do you need to be more secure that you will keep your current job next year?	0.95
Do you need to be more secure that you will keep the same function level next year?		0.84	0.76
Do you need to be more secure that you will still be working in one year?		0.83	0.78
Do you need to be more secure that you will be working on a funded project after the current one ends?		0.62	0.52
Financial Rewards	Do you think that you are paid enough for the work that you do?	0.89	0.74
	Can you live comfortably on your pay?	0.88	0.76
	Do you think your organisation pays good salaries?	0.87	0.73
Work Overload	Does your job offer you the possibility to progress financially?	0.66	0.58
	Does your work put much demand on you mentally?	0.62	0.54
	Do you have to be attentive to many things at the same time?	0.58	0.46
	Do you work under time pressure?	0.57	0.43
	Do you have to remember many things in your work?	0.54	0.55
	Does your work put you in emotionally upsetting situations?	0.52	0.47
	Are you confronted in your work with many things that affect you personally?	0.51	0.47
	Does your work put much demand on you physically?	0.48	0.46
	Do you have to put in extra hours beyond your working time?	0.48	0.40
	Do you have contact with difficult clients in your work?	0.44	0.47
	Do you have too much work to do?	0.44	0.42
	Do you have to give continuous attention to your work?	0.43	0.51
	Work-related Resources	Is/Are the equipment/implements you use in your work in good working condition?	0.94
Do you have all the equipment/implements you need to accomplish your work?		0.78	0.67
Do you have modern equipment/implements to do your work?		0.67	0.65

Table 3 continues on the next page →

TABLE 3 (Continues): Factor loadings and communality of items ($N = 443$).

Factor	Item	<i>F</i>	<i>h</i> ²
Growth opportunities	Does your organisation/institute give you opportunities to follow training courses/workshops/conferences?	0.84	0.66
	Does your work offer you opportunities to learn on the job?	0.68	0.63
	Does your work offer you opportunities for personal growth and development?	0.42	0.58
Control	Does your job offer you opportunities for independent thought and action?	0.75	0.67
	Do you take part in the planning of your work activities?	0.74	0.70
	Can you participate in decisions about when a piece of work must be completed?	0.70	0.61
	Do you have freedom in carrying out your work activities?	0.63	0.62
	Do you think you are doing important work people can benefit from?	0.53	0.54
	Does your work contribute significantly to the growth of your institute/organisation?	0.35	0.45
Relationship with colleagues	Do you have enough contact with colleagues during working hours?	0.68	0.54
	Can you have a chat with colleagues during working hours?	0.60	0.48
	Do you talk with your colleagues regarding work-related matters?	0.49	0.62
	Do you have contact with colleagues as part of your work?	0.41	0.61

F, *F*-value.

The remaining 50 items represented the eight extracted factors well. These items were labelled Organisational support (13 items), job Insecurity (four items), financial Rewards (four items), work Overload (11 items), work-related resources (three items), Growth opportunities (three items), Control, (six items) and Relationship with colleagues (four items). The factor loadings for the eight AJDRS factors ranged between 0.33 and 0.95, with communalities ranging between average (0.42) and high (0.83).

The descriptive statistics, reliabilities and Pearson's product moment correlation coefficients of the obtained factors are presented in Table 4.

Table 4 shows that all the factors obtained from the AJDRS were reliable when using Nunnally and Bernstein's (1994) guideline of α values above 0.70, ranging between 0.77 and 0.92. The results also indicated that organisational support was practically and significantly related to work-related resources, growth opportunities, relationship with colleagues (medium effect) and control (large effect). Financial rewards was practically and significantly related to work-related

resources and growth opportunities (medium effect). Work-related Resources correlated practically and significantly with growth opportunities (medium effect). Growth opportunities were practically and significantly related to control (medium effect). Finally, control was practically and significantly related to relationship with colleagues (medium effect). All the reported correlations were statistically significant at the p values over 0.010 level (two-tailed).

Next, the factors were subjected to a second-order factor analysis. Principal component analysis showed that two factors, which accounted for 50% of variance, could be extracted. Oblimin rotation showed that the two factors were not related ($r = 0.08$) and varimax rotation was therefore used to extract the factors.

Table 5 shows that five factors (Organisational support, financial Rewards, work-related Resources, Growth opportunities and Control) loaded on the first factor, which was labelled job Resources. Two factors (job Insecurity and work overload) loaded on the second factor, which was labelled job demands. The eighth factor, relationship with colleagues, loaded substantially on both job resources and job demands. Hypothesis 1b is therefore accepted.

To test Hypothesis 2, MANOVA was then used to determine differences between demographic groups with regard to job demands and job resources. Firstly, preliminary assumption checking was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices and multicollinearity. No serious violations were noted with regard to the above criteria. The demographic groups included were gender, race, marital status, language, age, education, position, years in organisation and years in position. The results of the MANOVA analysis are presented in Table 6.

An analysis of Wilks's lambda (see Table 6) showed statistically significant differences in education ($F = 1.48$; $p = 0.012$) and position ($F = 1.60$; $p = 0.019$). However, when the results for the dependent variables were examined separately using a Bonferroni adjusted level of 0.006, none of the dependent variables for education recorded a significance value less than the cut-off value. The p values for Organisational support ($p = 0.028$) and Growth opportunities ($p = 0.039$) exceeded the adjusted level of 0.006. This suggests

TABLE 4: Descriptive statistics, reliabilities and Pearson's correlations of the factors.

Factor	Mean	SD	α	1	2	3	4	5	6	7
1. Organisational support	68.15	14.33	0.92	1.00	-	-	-	-	-	-
2. Job insecurity	18.37	6.85	0.87	0.03	1.00	-	-	-	-	-
3. Financial rewards	11.73	6.04	0.89	0.23*	-0.02	1.00	-	-	-	-
4. Work overload	48.91	10.05	0.80	0.03	0.13*	0.03	1.00	-	-	-
5. Work-related Resources	14.15	4.35	0.84	0.46* ^a	0.10*	0.35* ^a	0.02	1.00	-	-
6. Growth opportunities	14.00	4.41	0.78	0.49* ^a	0.04	0.31* ^a	0.09	0.36* ^a	1.00	-
7. Control	33.86	6.19	0.83	0.58* ^b	0.04	0.17*	0.16*	0.27*	0.47* ^a	1.00
8. Relationship with Colleagues	22.04	4.19	0.77	0.39* ^a	0.17*	0.12*	0.15*	0.28*	0.25*	0.41* ^a

*, correlation is significant at the 0.01 level (two-tailed).

^a, correlation is practically significant $r > 0.30$ (medium effect).

^b, correlation is practically significant $r > 0.50$ (large effect).

TABLE 5: Second-order factor loadings of the obtained adapted Job Demands and Resources Scale dimensions.

Factors	Job resources	Job demands
Organisational support	0.80	-
Job insecurity	-	0.68
Financial Rewards	0.54	-
Work Overload	-	0.65
Work-related Resources	0.69	-
Growth opportunities	0.75	-
Control	0.70	-
Relationship with colleagues	0.51	0.48

TABLE 6: Multivariate analysis of variance – differences in job demands and job resources of demographic groups.

Variable	Value	F	df	p	Partial eta-squared
Gender	0.94	1.10	8.00	0.361	0.03
Race	0.93	1.05	24.00	0.393	0.03
Marital status	0.85	0.12	48.00	0.268	0.03
Language	0.74	1.19	88.00	0.119	0.04
Age	0.81	1.28	56.00	0.079	0.03
Education	0.78	1.48	56.00	0.013	0.04
Position	0.86	1.60	32.00	0.019	0.04
Years in position	0.88	0.92	48.00	0.622	0.02
Years in organisation	0.85	1.15	48.00	0.225	0.03

F, F-value; df, degrees of freedom.

that no significant difference exists with regard to the educational level of the workers. However, when the dependent variables for position were examined, the p value for job resources was below the adjusted level ($p = 0.002$). This implies that there was a significant difference with regard to the position of the employees.

Lastly, an ANOVA was performed to further investigate the relationship between the dependent variable (job resources) with regard to the position of the employees (see Table 7).

A one-way between-groups ANOVA was conducted to explore the impact of position on the perceived job resources as measured by the AJDRS. Participants were divided into five groups according to their position in the organisation (research assistants, research technicians, researchers, programme managers or specialist scientists and support staff). There was a statistically significant difference at the p less than 0.05 level in resources scores for the groups based on position [$F(4,429) = 4.7$; $p = 0.001$]. However, despite the fact that the results were statistically significant the actual difference in mean scores between the groups was relatively small. The effect size, which was calculated using eta-squared, was 0.04. Post-hoc comparison using Games-Howell indicated that the mean score for research technicians ($M = 13.85$; $SD = 4.13$) was significantly different from that of research assistants ($M = 15.03$; $SD = 5.14$) and support staff ($M = 15.29$; $SD = 3.46$).

TABLE 7: Analysis of variance – differences in resources in relation to position.

Item	Research assistant	Research technician	Researcher	Programme manager or Specialist scientist	Support staff	p	Partial eta-squared
Job Resources	15.03	13.03	13.85	14.18	15.29	0.001	0.04

*, The mean difference is significant at $p < 0.05$.

Discussion

Outline of results

This study aimed to investigate the validity and reliability of the AJDRS as well as to identify the job demands and resources that are prevalent amongst employees in an agricultural organisation. Additionally, the possible existence of differences related to various demographics was also investigated.

With regard to the first objective of the study, the results indicated that an eight-factor solution fitted the data best, explaining 54.58% of total variance. The eight factors were labelled Organisational support (F1), job Insecurity (F2), financial Rewards (F3), Overload (F4), physical Resources (equipment) (F5), Growth opportunities (F6), Control (F7) and Relationship with colleagues (F8).

The main difference between this study and Jackson and Rothmann's (2005) study was the identification of an additional factor in this study, which was labelled Physical Resources (equipment). Although this factor was not identified in Jackson and Rothmann's initial study using a sample of educators, it has been identified in various subsequent studies, including studies by Rothmann and Malan (2007, 2011), which made use of samples of hospital pharmacists. The presence of a factor relating to physical resources might be due to the fact that the majority of the participants in the present study (85.3%) were employed as research staff. In order to effectively discharge their duties, these categories of employees require specific equipment (such as planting, harvesting and storage implements and facilities) that needs to be both modern and functional (ARC, 2009). This finding clearly confirms that each organisation has its unique job demands and resources as pointed out by Rothmann *et al.* (2006).

A second-order factor analysis was carried out using the eight observed factors and resulted in a two-factor structure. The first factor was labelled Job Resources (organisational support, financial rewards, physical resources, growth opportunities and control), whilst the second factor was labelled job demands (overload and job insecurity). These findings are in accordance with findings reported by research on the Job Demands-Resources model (Bakker & Demerouti, 2007; Demerouti *et al.*, 2001; Schaufeli & Bakker 2004) as well as with the results of other South African studies (Barkhuizen & Rothmann, 2008; Fourie, 2003; Jackson *et al.*, 2006; Koekemoer & Mostert, 2006; Rothmann & Jordan, 2006; Rothmann *et al.*, 2006; Rothmann & Jorgensen, 2007). These results indicate that the AJDRS is a valid instrument for use in a sample of agricultural workers in South Africa, confirming Hypothesis 1a.

In the current study, relationship with colleagues loaded on both the job demands and job resources factors. This dual finding is supported by the literature. Literature (see Demerouti *et al.*, 2001; Schaufeli & Bakker, 2004) suggests that support from a colleague, especially within a team climate (such as the one in the agricultural organisation under investigation), could be instrumental in an employee achieving work goals. In this case support from colleagues would be viewed as a job resource. However, relationship with colleagues has also been identified as an interpersonal stressor (Basson & Van der Merwe, 1994), which could place demands on the employee. It appears that in the current study the participants perceived relationship with colleagues to be both a job resource and a job demand. This could mean that whilst relationship with colleagues could provide a participant with the necessary support in the working environment (job resource), the maintenance of good collegial relationships could place unnecessary demands on a participant.

The internal consistency of the AJDRS was assessed using the Cronbach's alpha coefficient test for reliability. The items of each of the obtained eight factors were analysed for reliability. In previous research by Jackson and Rothmann (2005), the JDRS showed good internal consistency for all the subscales. The results of the reliability tests for the current study suggest that the AJDRS is also a reliable instrument, confirming Hypothesis 1b.

Next, the differences within groups based on various demographic variables were examined. MANOVA was used to determine these differences with regard to job demands and resources. The demographic groups included were gender, race, marital status, language, age, education, position, years in organisation and years in position.

The results from the study provide partial support for Hypothesis 2, which was to examine differences in the perceived job demands and resources. No significant differences were found in the perceived job demands and resources of the employees based on gender, race, marital status, language, age, education, position, years in position or years in organisation. Although it initially seemed that there was significant difference in perceived organisational support based on education, no statistically significant difference was observed when the results for the dependent variables were examined separately using a Bonferroni adjusted level of 0.006. This result indicates that all the employees perceived organisational support in the same way. The mean score of the employees with regard to organisational support showed that the employees often experience organisational support. The organisation under investigation communicates with its employees through a centralised email system and strives to ensure that employees are aware of all developments in the organisation as well as in the various institutes. Employees are also given written job descriptions, thus ensuring that all employees are aware of their responsibilities. Finally, the management

of the organisation places a premium on good employee relations and provides a good environment to bring out the best potential of all its employees.

The results of the MANOVA showed a significant difference in the perceived Physical Resources (equipment) of research technicians, research assistants and support staff, with research technicians perceiving lower levels of Physical Resources than research assistants and support staff. This may be due to the fact that support staff generally have the resources they need to work with (e.g. computer, printer, fax machines) and research assistants generally perform jobs that do not require sophisticated equipment. In contrast, research technicians require sophisticated equipment which may not be readily available or in good working condition. In terms of resources, the organisation faces challenges in relation to modernising some of the laboratories and equipment in order to effectively research new crops and animals as well as new techniques.

Practical implications

Firstly, work characteristics within the agricultural sector can be measured reliably and in a valid manner using the AJDRS. Also, physical resources (i.e. equipment) are deemed to be very important within the agricultural sector not only because literature (see ARC 2005) indicates the need for agricultural organisations to keep abreast with modernisation of equipment but also considering the significant differences in the mean score between groups (i.e. research technicians on the one hand and research assistants as well as support staff on the other hand) found in this current research. The necessity of appropriate physical resources should therefore be taken into account when developing interventions aiming to improve the perceived job demands and resources in the organisation.

Limitations

The major limitation of this study is that it made use of a cross-sectional survey design for data collection. The disadvantage of this type of design is that it does not allow the researcher to examine how variables manifest on different occasions. The results were also obtained only from self-report questionnaires and this increases the probability of contamination of reported relationships.

Recommendations

It is recommended that future research studies further examine the reliability and validity of the AJDRS in other agricultural organisations in South Africa. It is also recommended that research be conducted on the construct equivalence of the AJDRS, as this could not be undertaken in the present study because of the limitations in terms of the demographic makeup of the participants. Furthermore, it is recommended that the AJDRS be used in research studies with other samples of agricultural organisations outside of South Africa in order to provide a point of reference for

comparison of the job demands and resources of agricultural organisations worldwide.

In addition, based on the fact that the items in the relationship with colleagues subscale loaded on both job demands and job resources, it is recommended that this factor be refined in future studies. These studies should examine the relationship between job demands and resources and other well-being variables such as burnout and work engagement. Refinement of the relationship with colleagues subscale could involve rephrasing the items to better reflect the individual employee's experience of relationship with colleagues as either a demand or a resource. Future research studies should also involve a diary study of the job demands and resources of employees within a South African agricultural organisation in order to establish how workers' experiences of job demands and job resources vary over time. It is also recommended that the findings of this research study be utilised by agricultural organisations and managers in relation to job design.

Conclusion

The Job Demands-Resources model suggests that two vital processes at work are caused by job demands and resources, which is of relevance in the industrial psychology profession especially: (1) jobs that are poorly designed (i.e. high demands including overload) could deplete mental and physical resources, which could ultimately result in exhaustion of energy and ill health in the workplace and (2) jobs that have high job resources could reduce the experience of job demands and enhance goal achievement. The results of this study should therefore be used to assist managers in agricultural organisations in ensuring that employees in every category have sufficient resources to cope with the job demands of their positions so as to ensure that all employees are engaged in their work.

Acknowledgements

Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

D.N.A. (North-West University) was the lead author, wrote up the article and was responsible for data collection and data analysis. C.H. (University of Johannesburg) was the associate postgraduate supervisor of the lead author and provided data analysis and editorial input. L.I.J. (North-West University) is the postgraduate supervisor of the lead author and gave editorial input.

References

Alliance for Commodity Trade in Eastern and Southern Africa (ACTESA). (2013). How agriculture can be promoted in South Africa. Retrieved October, 2013, from <http://www.comesa.int>

Antoniou, A.S., Polychroni, F., & Vlachakis, A.N. (2006). Gender and age differences in occupational stress and professional burnout between primary and high-school teachers in Greece. *Journal of Managerial Psychology*, 21(7), 682–690. <http://dx.doi.org/10.1108/02683940610690213>

Agricultural Research Council (ARC). (2005). *Agricultural research council strategic plan, 2005–2008*. Pretoria, RSA: ARC.

Agricultural Research Council (ARC). (2007). *Agricultural research council annual report, 2006–2007*. Pretoria, RSA: ARC.

Agricultural Research Council (ARC). (2008). *Agricultural research council annual report, 2006–2007*. Pretoria, RSA: ARC.

Agricultural Research Council (ARC). (2009). *Agricultural research council annual report, 2007–2008*. Pretoria, RSA: ARC.

Agricultural Research Council (ARC). (2013). *Agricultural research council annual report, 2006–2007*. Pretoria, RSA: ARC.

Bakker, A.B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology*, 22, 309–328. <http://dx.doi.org/10.1108/02683940710733115>

Barkhuizen, E.N. (2005). *Work wellness of academic staff in South African higher education institutions*. Unpublished doctoral thesis, Industrial Psychology Department, North-West University, Potchefstroom, RSA.

Barkhuizen, N., & Rothmann, S. (2008). Occupational stress of academic staff in South African higher education institutions. *SA Journal of Psychology*, 28, 321–336. <http://dx.doi.org/10.1177/008124630803800205>

Basson, C.J., & Van der Merwe, T. (1994). Occupational stress and coping in a sample of student nurses. *Curationis*, 17(4), 35–43.

Bender, K.A., Donohue, S.M., & Heywood, J.S. (2005). Job satisfaction and gender segregation. *Oxford Economic Papers*, 57(3), 479–496. <http://dx.doi.org/10.1093/oep/gpi015>

Bonke, J., Deding, M., & Lausten, M. (2009). Time and money. *Journal of Happiness Studies*, 10(2), 113–131.

Bosch, A., Ribeiro, S., & Becker, J. (2012). *Keeping South African female chartered accountants in public practice: The impact of job demands. Women in the Workplace research report*. Johannesburg, RSA: University of Johannesburg.

Bowen, P., Cattell, K., & Edwards, P. (2013). Workplace stress experienced by quantity surveyors. *Acta Structura*, 20(2), 1–29.

Buitendach, J.H. (2004). *Job insecurity and job satisfaction of employees in selected organisations in South Africa*. Unpublished doctoral thesis, Industrial Psychology Department, North-West University, Potchefstroom, RSA.

Buitendach, J.H., Oosthuizen, A., & Van Wyk, C. (2005). Predicting job insecurity from background variables. *SA Journal of Industrial Psychology*, 31(3), 70–78.

Buys, C., & Rothmann, S. (2010). Burnout and engagement of reformed church ministers. *SA Journal of Industrial Psychology/SA Tydskrif vir Bedryfsielkunde*, 36(1), Art. #825, 11 pages.

Cattell, R.B. (1966). The Scree plot for the number of factors. *Multivariate Behavioural Research*, 1, 245–276. http://dx.doi.org/10.1207/s15327906mbr0102_10

Clark, A.E. (1997). Job satisfaction and gender: Why are women so happy at work? *Labour Economics*, 4(4), 341–372. [http://dx.doi.org/10.1016/S0927-5371\(97\)00010-9](http://dx.doi.org/10.1016/S0927-5371(97)00010-9)

Coetzer, W.J., & Rothmann, S. (2006). Occupational stress of employees in an insurance company. *South African Journal of Business Management*, 37(3), 29–39.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences*. (Rev. edn.). Orlando, CA: Academic Press.

Cooper, C.L., Dewe, P.J., & O'Driscoll, M.P. (2001). *Organisational stress: A review of critique of theory, research and application*. Thousand Oaks, CA: Sage.

Demerouti, E., Bakker, A.B., Nachreiner, F., & Schaufeli, W.B. (2001). The Job Demands-Resources model of burnout. *Journal of Applied Psychology*, 86, 499–512. <http://dx.doi.org/10.1037/0021-9010.86.3.499>

Deshpande, R.S., & Shah, K. (2007). Agrarian distress and agricultural labour. *Indian Journal of Labour Economics*, 50(2), 257–272.

De Witt, M.W., & Lessing, A.C. (2013). Teachers' perceptions of the influence of learners' undisciplined behaviour on their working life and of the support of role-players. *Koers – Bulletin for Christian Scholarship*, 78(3), Art. #458, 9 pages. <http://dx.doi.org/10.4102/koers.v78i3.458>

De Witte, H. (1999). Job insecurity and psychological well-being: Review of the literature and exploration of some unresolved issues. *European Journal of Work and Organizational Psychology*, 8, 155–177. <http://dx.doi.org/10.1080/135943299398302>

Dua, J.K. (1994). Job stressors and their effects on physical health, emotional health and job satisfaction in a university. *Journal of Educational Administration*, 32, 59–78. <http://dx.doi.org/10.1108/09578239410051853>

Durrheim, K. (2007). Research design. In M. Terre Blanche, K. Durrheim, & D. Painter (Eds.), *Research in practice: Applied methods for the Social Sciences* (pp. 33–59). Cape Town, RSA: UCT Press Ltd.

Elbert, J. (2002). *Job insecurity and psychological strength of service workers in a parastatal*. Unpublished master's dissertation, Humanities Department, Potchefstroom University for Christian Higher Education, Vaal Triangle Campus, RSA.

Fay, D., & Buhrmann, H. (2004). Current themes in organizational change. *European Journal of Work and Organizational Psychology*, 13(2), 113–119. <http://dx.doi.org/10.1080/13594320444000029>

Field, A. (2009). *Discovering statistics using SPSS*. (4th edn.). London, UK: SAGE.

Finch, J.F., & West, S.G. (1997). The investigation of personality structure: Statistical models. *Journal of Research in Personality*, 31, 439–485. <http://dx.doi.org/10.1006/jrpe.1997.2194>

- Fink, A.G. (2009). *How to conduct surveys: A step-by-step guide*. Thousand Oaks, CA: Sage.
- Fotinos-Ventouratos, R., & Cooper, C. (2005). The role of gender and social class in work stress. *Journal of Managerial Psychology*, 20(1), 14–23. <http://dx.doi.org/10.1108/02683940510571612>
- Fourie, L.A. (2003). *Burnout and work engagement of nonprofessional counsellors in South Africa*. Unpublished doctoral thesis, Industrial Psychology Department, Potchefstroom University for CHE, Potchefstroom, RSA.
- French, H., Du Plessis, E., & Scrooby, B. (2011). The emotional well-being of the nurse within the multi-skill setting. *Health SA Gesondheid*, 16(1), Art. #553, 9 pages. <http://dx.doi.org/10.4102/hsg.v16i1.553>
- Guest, D.E. (2004). The psychology of the employment relationship: An analysis based on the psychological contract. *Applied Psychology: An International Review*, 53, 541–555. <http://dx.doi.org/10.1111/j.1464-0597.2004.00187.x>
- Hackman, J.R., & Oldham, G.R. (1976). Motivation through the design of work: Test of a theory. *Organisational Behavior and Human Performance*, 16, 250–279. [http://dx.doi.org/10.1016/0030-5073\(76\)90016-7](http://dx.doi.org/10.1016/0030-5073(76)90016-7)
- Hackman, J.R., & Oldham, G.R. (1980). *Work redesign*. Reading, MA: Addison-Wesley.
- Hakanen, J.J., Bakker, A.B., & Demerouti, E. (2005). How dentists cope with their job demands and stay engaged: The moderating role of job resources. *European Journal of Oral Science*, 113, 479–487. <http://dx.doi.org/10.1111/j.1600-0722.2005.00250.x>
- Häusser, J.A., Mojzisch, A., Niesel, M., & Schulz-Hardt, S. (2010). Ten years on: A review of recent research on the Job demand–control (–Support) model and psychological well-being. *Work & Stress*, 24(1), 1–35. <http://dx.doi.org/10.1080/02678371003683747>
- Hill, C., Mostert, K., & De Bruin, G.P. (2012). Job characteristics and work-home interaction: Does race moderate the relationship for South African Police members? *Policing: An International Journal of Police Strategies & Management*, 35(3), 566–592. <http://dx.doi.org/10.1108/13639511211250802>
- Hodgskiss, J.L., & Edwards, A.L. (2013). Job strain in the South African mining industry: Original research. *Occupational Health Southern Africa*, 19(5), 8–10.
- Jackson, L.T.B., & Rothmann, S. (2005). Work-related well-being of educators in a district of the North West province. *Perspectives in Education*, 23(3), 107–122.
- Jackson, L.T.B., Rothmann, S., & Van de Vijver, A.J.R. (2006). A model of work-related wellbeing for educators in the North West province. *Stress and Health*, 22, 263–274. <http://dx.doi.org/10.1002/smi.1098>
- Jacobson, D. (1991). Toward a theoretical distinction between the stress components of the job insecurity and job loss experience. *Research in the Sociology of Organisations*, 9, 1–19.
- Kaiser, H.F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, 20, 141–151. <http://dx.doi.org/10.1177/001316446002000116>
- Karasek, R.A. (1979). Job demands, job decision latitude and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24, 285–308. <http://dx.doi.org/10.2307/2392498>
- Karasek, R., & Theorell, T. (1990). *Healthy work, stress, productivity and the reconstruction of working life*. New York, NY: Basic Books.
- Kerlinger, F.N., & Lee, H.B. (2000). *Foundations of behavioural research*. (4th edn.). Orlando, FL: Harcourt College Publishers.
- Kirk, R.E. (1996). Practical significance: A concept whose time has come. *Educational and Psychological Measurement*, 56(5), 746–759. <http://dx.doi.org/10.1177/0013164496056005002>
- Koekemoer, F.E. & Mostert, K. (2006) Job characteristics, burnout and negative work-home interference in a nursing environment. *SA Journal of Industrial Psychology*, 32(3), 87–97. <http://dx.doi.org/10.4102/sajip.v32i3.441>
- Lazarus, R.S., & Folkman, A.S. (1984). *Stress, appraisal and coping*. New York, NY: McGraw-Hill.
- Lu, L., Cooper, C.L., Kao, S.-F., & Zhou, Y. (2003). Work stress, control beliefs and well-being in Greater China – An exploration of sub-cultural differences between the PRC and Taiwan. *Journal of Managerial Psychology*, 18(6), 479–510. <http://dx.doi.org/10.1108/02683940310494359>
- Manski, D.F., & Straub, J.D. (2000). Worker perceptions of job insecurity in the mid-90s. *Journal of Human Resources*, 35, 447–479. <http://dx.doi.org/10.2307/146388>
- Marinaccio, A., Ferrante, P., Corfiati, M., Di Tecco, C., Rondinone, B.M., Bonafede, M. et al. (2013). The relevance of socio-demographic and occupational variables for the assessment of work-related stress risk. *BMC Public Health*, 13, 1157–1165. <http://dx.doi.org/10.1186/1471-2458-13-1157>
- Maslach, C., Schaufeli, W.B., & Leiter, M.P. (2001). Job burnout. *Annual Review of Psychology*, 52, 397–422. <http://dx.doi.org/10.1146/annurev.psych.52.1.397>
- Moephuli, S.R. (2008). *Message from the president and CEO: ARC annual report 2007–2008*. Pretoria, RSA: ARC.
- Montgomery, A.J., Peeters, M.C.W., Schaufeli, W.B., & Den Ouden, M. (2003). Work-home interference among newspaper managers: Its relationship with burnout and engagement. *Anxiety, Stress and Coping*, 16(2), 195–211. <http://dx.doi.org/10.1080/10615806.2003.10382973>
- Mouton, J. (2001). *How to succeed in your masters and doctoral studies: A South African guide and resource book*. South Africa: Van Schaik Publishers.
- Mueller, C.W., & McCloskey, J.C. (1990). Nurses' job satisfaction: A proposed measure. *Nursing Research*, 39(2), 113–116. <http://dx.doi.org/10.1097/00006199-199003000-00014>
- Näswall, K., & De Witte, H. (2003). Who feels insecure in Europe? Predicting job insecurity from background variables. *Economic and Industrial Democracy*, 24(2), 189–215. <http://dx.doi.org/10.1177/0143831X03024002003>
- Naudé, J.L.P., & Rothmann, S. (2003). Occupational stress of emergency workers in Gauteng. *South African Journal of Industrial Psychology*, 29(4), 92–100.
- Nelson, D.L., & Simmons, B.L. (2003). Health psychology and stress: A more positive approach. In J.C. Quick, & L.E. Tetrick (Eds.), *Handbook of occupational health and psychology* (pp. 97–117). Washington, DC: American Psychological Association. <http://dx.doi.org/10.1037/10474-005>
- Nunnally, J.C., & Bernstein, I.H. (1994). *Psychometric theory*. (3rd edn.). New York, NY: McGraw-Hill.
- Ospow, S.H., Doty, R.E., & Spokane, A.R. (1985). Occupational stress, strain and coping across the life span. *Journal of Vocational Behavior*, 27, 98–108. [http://dx.doi.org/10.1016/0001-8791\(85\)90055-7](http://dx.doi.org/10.1016/0001-8791(85)90055-7)
- Pallant, J. (2010). *SPSS survival manual A step by step guide to data analysis using SPSS program*. (4th edn.). Berkshire, UK: McGraw Hill.
- Phale, M.B. (2008). *Work-related well-being of employees in a South African parastatal*. Unpublished doctoral thesis, Industrial Psychology Department, North-West University, Potchefstroom, RSA.
- Pienaar, J., & Rothmann, S. (2006) Occupational stress in the South African police service. *South African Journal of Industrial Psychology*, 32(3), 72–78.
- Rannona, M.V. (2003). *The relationship between job insecurity, job satisfaction and organizational commitment in a mining organisation*. Unpublished mini-dissertation, Humanities Department, North-West University, Vaal Triangle Campus, RSA.
- Ribeiro, S., Bosch, A., & Becker, J. (2013). *Keeping South African female chartered accountants in public practice: The impact of job resources. Women in the Workplace research report*. Johannesburg: RSA: University of Johannesburg.
- Richardsen, M. & Burke, R.J. (1993). Occupational stress and work satisfaction among Canadian women physicians. *Psychological Reports*, 72, 811–821.
- Robbins, S.P. (2005). *Essentials of organisational behaviour*. (8th edn.). Upper Saddle River, NJ: Prentice Hall.
- Roskies, E., & Louis-Guerin, C. (1990). Job insecurity in managers: Antecedents and consequences. *Journal of Organizational Behavior*, 11, 345–359. <http://dx.doi.org/10.1002/job.4030110503>
- Rothmann, S. (2002, November). *Burnout and engagement: A fortigenic perspective*. Inaugural lecture presented at the North-West University, Potchefstroom, RSA.
- Rothmann, S. (2005, May). Work engagement in South African organisations: Relations with job and person factors. In W.B. Schaufeli (chair), *Engagement and burnout: Conceptual and measurement issues*. Symposium conducted at the meeting of the 28th European Work and Organization Psychology Congress, Istanbul, Turkey.
- Rothmann, S., & Barkhuizen, N. (2008). Burnout of academic staff in South African higher education institutions. *South African Journal of Higher Education*, 22(2), 439–456. <http://dx.doi.org/10.4314/sajhe.v22i2.25794>
- Rothmann, S., Jackson, L.T.B., & Kruger M.M. (2003). Burnout and job stress in a local government: The moderating effects of sense of coherence. *South African Journal of Industrial Psychology*, 29, 52–60.
- Rothmann, S., & Jordan, G.M.E. (2006). Job demands, job resources and work engagement of academic staff in South African higher education institutions. *SA Journal of Industrial Psychology*, 32, 87–96. <http://dx.doi.org/10.4102/sajip.v32i4.247>
- Rothmann, S., & Jorgensen, L.I. (2007). A model of work-related well-being for police members in the North West Province. *Acta Criminologica*, 20(4), 73–84.
- Rothmann, S., Kleyn, E., Louw, E.J., & Makgala, D. (2003). *Occupational stress, job satisfaction and burnout in the South African Police Service in the North West Province*. Potchefstroom, RSA: North-West University.
- Rothmann, S., & Malan, M.M. (2004). Occupational stress of engineers in South Africa. *Southern African Review*, 10(2), 1–16.
- Rothmann, S., & Malan, M. (2007). Occupational stress of hospital pharmacists in South Africa. *International Journal of Pharmacy Practice*, 15, 235–242. <http://dx.doi.org/10.1211/ijpp.15.3.0011>
- Rothmann, S., & Malan, M. (2011). Work-related well-being of South African hospital pharmacists. *SA Journal of Industrial Psychology*, 37(1), 1–11. <http://dx.doi.org/10.4102/sajip.v37i1.895>
- Rothmann, S., Mostert, K., & Strydom, M. (2006). A psychometric evaluation of the Job Demands-Resources Scale in South Africa. *SA Journal of Industrial Psychology*, 32(4), 76–86. <http://dx.doi.org/10.4102/sajip.v32i4.239>
- Rothmann, S.I., Van der Colff, J.J., & Rothmann, J.C. (2006). Occupational stress of nurses in South Africa. *Curationis*, 29(2), 22–33. <http://dx.doi.org/10.4102/curationis.v29i2.1069>
- Sager, J.K. (1990). Reducing sales manager job stress. *The Journal of Consumer Marketing*, 7(4), 5–14. <http://dx.doi.org/10.1108/EUM000000002584>
- Schaufeli, W.B., & Bakker, A.B. (2004). Job demands, job resources and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behaviour*, 25, 293–315. <http://dx.doi.org/10.1002/job.248>
- Shaughnessy, J.J., Zechmeister, E.B., & Zechmeister, J.S. (2006). *Research methods in psychology*. (7th edn.). New York, NY: McGraw-Hill.
- Siegrist, J. (1996). Adverse health effects of high effort-low reward conditions. *Journal of Occupational Health Psychology*, 1, 27–41. <http://dx.doi.org/10.1037/1076-8998.1.1.27>
- Sorcinelli, M.D. (1994). Effective approaches to new faculty development. *Journal of Counselling and Development*, 72, 474–479. <http://dx.doi.org/10.1002/j.1556-6676.1994.tb00976.x>

- SPSS for Windows version 20.0 [Computer software] (2011). Chicago, IL: SPSS Inc.
- Sullivan, G.M., & Feinn, R. (2012). Using effect size—or why the *p* value is not enough. *Journal of Graduate Medical Education*, 4(3), 279–282. <http://dx.doi.org/10.4300/JGME-D-12-00156.1>
- Sverke, M., Hellgren, J., Näswall, K., Chirumbolo, A., De Witte, H., & Goslinga, S. (2001). *European Unions in the wake of flexible production: Technical report on the data set used in a SALTSA project, SALTSA report 2000:1*. Stockholm, Sweden: National Institute of Working Life and SALTSA.
- Sverke, M., Hellgren, J., Näswall, K., Chirumbolo, A., De Witte, H., & Goslinga, S. (2004). *Job insecurity and union membership: European unions in the wake of flexible production*. Bruxelles, Belgium: Peter Lang.
- Tabachnick, B.G., & Fidell, L.S. (2001). *Using multivariate statistics*. (4th edn.). Boston, MA: Allyn and Bacon.
- Vakola, M., & Nikolaou, I. (2005). Attitudes towards organizational change – What is the role of employees' stress and commitment? *Employee Relations*, 27(2), 160–174. <http://dx.doi.org/10.1108/01425450510572685>
- Van Vuuren, T. (1990). *Met ontshg bedreigd. Werknemers in onzekerheid over hun arbeidsplaatz bu veranderingen in de organisatie* [Threatened with dismissal. Job insecurity among workers during organizational change]. Amsterdam, The Netherlands: VU Uitgeverij.
- Van Zyl, Y. (2005). *Job insecurity, burnout, work engagement, general health and job satisfaction in selected organisations in the Vaal Triangle*. Unpublished doctoral thesis, Humanities Department, North-West University, Vaal Triangle Campus, RSA.
- Vokic, N.P., & Bogdanic, A. (2007, February). *Individual differences and occupational stress perceived: A Croatian survey*. Zagreb, Croatia: Working Paper Series 07-05 February.
- Welthagen, C., & Els, C. (2012). Depressed, not depressed or unsure: Prevalence and relation to well-being across sectors in South Africa. *SA Journal of Industrial Psychology*, 38(1), Art. #984, 12 pages. <http://dx.doi.org/10.4102/sajip.v38i1.984>
- Winefield, A., Gillespie, N., Stough, C., Dua, J., Hapuararchchi, J., & Boyd, C. (2003). Occupational stress in Australian university staff: Results from a national survey. *International Journal of Stress Management*, 10, 51–63. <http://dx.doi.org/10.1037/1072-5245.10.1.51>
- Winter, R., Taylor, T., & Sarros, J. (2000). Trouble at mill: Quality of academic work life issues within a comprehensive Australian university. *Studies in Higher Education*, 25, 279–294. <http://dx.doi.org/10.1080/713696158>
- Zuma, J. (2008). *ANC: Zuma*. Address to the congress of Grain SA, delivered by Sight Administrator. Retrieved March 14, 2008, from <http://www.polity.org.za>