

Job demands and job resources from the perspective of hearing-impaired employees in South Africa: Exploration, development and validation

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Dissertation submitted in fulfilment of the requirements for the degree *Master of Commerce* in *Human Resource Management* at the North-West University

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COMMENTS

The following remarks are important to note beforehand:

- The editorial style as well as the references drawn in this dissertation follow the format prescribed by the Publication Manual (6th ed.) of the American Psychology Association (APA). This practice is in accordance with the policy of the Programme in Human Resource Management of the North-West University (Potchefstroom) as requirement to use the APA style in all scientific documents since January 1999 onwards.
- This dissertation was submitted in the form of two research articles. The editorial style is specified in accordance with the *South African Journal of Human Resource Management*, as it is in line with a significant part of the APA style. Construction of tables was followed in line with APA guidelines.
- Qualitative articles tend to comprise more manuscript pages as compared to quantitative articles (Levitt et al (2018)).¹ The reasons for this are twofold: Firstly, the methods section includes detailed procedures. Secondly, the results section employs a narrative that consists of rich descriptions. In light of the above, the qualitative research article presented in chapter 2 exceeds the length of standard quantitative articles.

¹ Levitt, H. M., Bamberg, M., Creswell, J. W., Frost, D. M., Josselson, R., & Suarez-Orozco, C. (2010). Journal article reporting standards for qualitative primary, qualitative meta-analytic, and mixed methods research in psychology: The APA Publications and Communications Board Task Force Report. *American Psychologist*, 73(1), 26-46. <https://doi.org/10.1037/amp0000151>.

DECLARATION

I, Strauss Chelius, hereby declare that **‘Job demands and job resources from the perspective of hearing-impaired employees in South Africa: Exploration, development and validation’** is my own work and that the views and opinions expressed in this study are those of the author and taken from relevant literature as shown in the references.

I further declare that the content of this research will not be handed in for any other qualification at any other tertiary institution.

STRAUSS CHELIUS

MARCH 2019

DECLARATION FROM LANGUAGE EDITOR

WELLINGTON
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13 March 2019

TO WHOM IT MAY CONCERN:

I hereby confirm that the MCom dissertation, *Job demands and jobs resources from the perspective of hearing-impaired employees in South Africa: Exploration, development and validation* by S Chelius (student no: 23026332) was edited and groomed to the best of my ability. The processing included recommendations to improve the language and logical structure, guide the line of argument as well as to enhance the presentation. I am satisfied that, provided my changes to the text and my recommendations are implemented, the language would be of a standard fit for publication.

Rev Claude Vosloo
Language and knowledge practitioner and consultant

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<i>Don't think outside the box, reinvent the box</i>
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To my Heavenly Father: ‘I will remember the deeds of the Lord; yes, I will remember your miracles of long ago’ (Psalm 77:11). I testify Psalm 23.

Background: I was diagnosed with temporal lobe epilepsy at 8 years of age, later to be re-diagnosed as tuberous sclerosis. At the age of 13, the fits occurred frequently – to an extent that I once suffered three fits within two days. Shortly thereafter I was sent to Constantiaberg Medi-Clinic for possible neurosurgery. This led to a lobectomy of my left temporal lobe. The operation was successful. Utter, thanks to Dr M Lippert, Dr J Butler and Dr RL Melville.

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SUMMARY

Title: Job demands and job resources from the perspective of hearing-impaired employees in South Africa: Exploration, development and validation.

Keywords: Job characteristics, job demands, job resources, Job Demands-resources model, scale, development, internal validity, hearing-impairment, hearing-impaired employee, South Africa.

South Africa's government has formally acknowledged disability issues and drafted legislation targeting the workplace. These legal instruments regulate affirmative action initiatives and prohibit unfair discrimination against persons with disability. South African legislation on employment does prescribe reasonable accommodation of persons with disability within the work environment. However, seemingly the country still lacks legitimate insight into the situation of disability groups. It can be deduced that research in this field should be disability-specific. Therefore, the present investigation focused on the sub-group of hearing-impaired employees (HIEs) in South Africa.

Job demands and job resources underlie employees' wellbeing and performance. Therefore, perspective is necessary on job characteristics that HIEs in South Africa experience as job demands or resources. Such a focus should lead to insight that can be used to promote this group's wellbeing and performance. Furthermore, there is an international trend in workplace-level findings of hearing impairment being associated with health-impairment. The case can be argued that HIEs' job demands are not being controlled. This raises a question about awareness of job characteristics that HIEs experience as job demands –energy-consuming. The present study's further aim was to investigate this issue of awareness from the standpoint of HIEs in South Africa. The research was conducted through both a qualitative and quantitative study.

The qualitative investigation was approached from a phenomenological perspective and was based on the paradigm of social constructivism. Sampling targeted the marginal population, while respecting sampling requirements. The methods were purposive, quota and snowball sampling. Data were gathered from pre-lingually deaf ($n = 8$), post-lingually deaf ($n = 4$) and hard-of-hearing ($n = 2$) employees in South Africa. An in-depth perspective was formed about job characteristics HIEs experience as job demands, as well as job resources. During analysis, certain of the derived categories for job demands seemed clearly *norm-deviant*.

The quantitative investigation sought to develop a scale to reflect the mentioned deviant themes of job demands, which emerged from the qualitative inquiry. The scale's development followed two stages. The first phase was to develop a scale that measures job demands unique to HIEs in South Africa, and the second was to determine the preliminary validity of the scale ($N = 85$).

The second phase entailed the preliminary validation, namely investigating the psychometric properties of the newly-developed Job demands Scale for Hearing-impaired Employees. The results provided evidence for construct validity and adequate reliabilities were found for all three overall scales and the corresponding 10 sub-scales. It was concluded that the newly-developed scale for measuring job demands unique to HIEs was confirmed preliminarily as valid and reliable.

In the final analysis, this study helps provide insight into human resource strategies at the workplace for managing HIEs' wellbeing and performance better. This is done by proactively detecting environmental barriers that impede them. At the end, recommendations were made for practice and future research.

OPSOMMING

Titel: Werkseise en werkhulpbronne vanuit die oogpunt van gehoorgestremde werknemers in Suid-Afrika: Verkenning, ontwikkeling en validering

Sleutelwoorde: Werkkenmerke, werkeise, werkhulpbronne, Werkseise-hulpbronne-model, skaalontwikkeling, interne geldigheid, gehoorgestremde werknemer, Suid-Afrika.

Die Suid-Afrikaanse regering het formeel die kwessie van gestremdheid erken en wetgewing opgestel wat die werkplek teiken. Hierdie wetlike instrumente reël inisiatiewe van regstellende aksie en verbied onbillike diskriminering teen persone met gestremdheid. Suid-Afrikaanse arbeidswetgewing skryf wel redelike akkommodering voor vir persone met gestremdhede binne die werkomgewing. Nogtans blyk dit dat die land steeds geldige insig kortkom oor die omstandighede van gestremde groepe. Hieruit kan dus afgelei word dat navorsing in hierdie veld meer spesifiek op gestremdheid moet fokus. Gevolglik het die huidige ondersoek die klem laat val op die subgroep van gehoorgestremde werknemers binne Suid-Afrika.

Werkseise en werkhulpbronne lê die grondslag vir werknemers se welsyn en prestasie. Daarom is 'n perspektief nodig op werkkenmerke wat gehoorgestremde werknemers binne Suid-Afrika as werkeise of -hulpbronne beskou. So 'n klem sal insig bied wat benut kan word om hierdie groep se welsyn en prestasie te bevorder. Voorts is daar 'n internasionale tendens wat literatuur oor gehoorgestremdheid met gesondheidsgestremdheid vereenselwig. Daar kan dus geredeneer word dat die gehoorgestremde werknemers se werkeise nie beheer word nie. Dit laat die vraag ontstaan oor die bewustheid van werkkenmerke wat hierdie groep as werkeise ervaar wat hulle energie verbruik. Die huidige studie se verdere doel was om sodanige bewustheid te ondersoek vanuit die standpunt van die gehoorgestremde werknemers binne Suid-Afrika. Die navorsing het beide 'n kwalitatiewe en kwantitatiewe benadering gevolg.

Die kwalitatiewe ondersoek is vanuit 'n fenomenologiese perspektief benader en is op die paradigma van sosiale konstruktivisme gegrond. Steekproefneming het die randpopulasie geteiken terwyl die vereistes vir steekproewe eerbiedig is. Die metodes was doelbewuste-, kwota- en sneeubal steekproefneming. Data is ingesamel van pre-linguistiese dowes ($n = 8$), post-linguistiese dowes ($n = 4$), en hardhorende ($n = 2$) werknemers binne Suid-Afrika. 'n Diepgaande perspektief is gevorm oor

werkkenmerke wat gehoorgestremde werknemers as werkeise ervaar (saam met die korrelerende werkhulpbronne). Tydens die analise het duidelik geword dat sommige kategorieë onder werkeise van die norm afwyk.

Die kwantitatiewe ondersoek se doel was om 'n skaal te ontwikkel om die genoemde afwykende temas te weerspieël wat uit die kwalitatiewe ondersoek na vore gekom het. Die skaal is oor twee fases ontwikkel. Die eerste fase was om 'n skaal te ontwikkel om die werkeise te kan meet wat uniek is aan gehoorgestremde werknemers binne Suid-Afrika. Die tweede fase was om die voorlopige geldigheid van die skaal vas te stel.

Die tweede fase het die voorlopige validering behels, naamlik om die psigometriese eienskappe van die nuutontwikkelde Werkeise-skaal vir Gehoorgestremde Werknemers te ondersoek. Die resultate het getuienis opgelewer vir konstruk geldigheid en voldoende betroubaarheid vir al drie oorkoepelende skale en die passende subskale. Die slotsom was dat die nuutontwikkelde skaal om werkeise uniek aan gehoorgestremde werknemers te meet, wel as geldig en betroubaar bevestig is.

Finaal beskou, help hierdie studie om insig te bied oor menslikehulpbronstrategieë binne die werkplek om gehoorgestremde werknemers se welsyn en prestasies beter te bestuur. Dit geskied deur proaktief die omgewingsversperrings te kan naspur wat hulle binne hierdie omgewing belemmer. Laastens is aanbevelings gemaak met die oog op die praktyk en toekomstige navorsing.

CHAPTER 1

Introduction

This chapter focuses on the rationale for the investigation in the present study. This includes the problem statement, the research questions, the general and specific research objectives and the according research design, followed by the division of chapters.

1.1 Problem statement

The democratic Constitution of South Africa prioritises people with disabilities in terms of its affirmative action agenda (Christianson, 2012; Dube, 2005). The country's post-1994 Government composition is a landmark to the country's democracy in terms of progressive employment legislation and policy (Dube, 2005).

Yet, in the modern South Africa, it is common for an individual with a disability to not be employed over a long term (Christianson, 2012; Gida & Orllepp, 2007; Jakovljevic & Buckley, 2011; Komana, 2006; McKinney, 2013). Approximately 2 152 598 of South Africa's individuals have disabilities (Statistics South Africa, 2011). Therefore, it seems that such terms apply to over two million individuals in South Africa. This contradicts South African legislative purposes such as implementing affirmative action measures and ensuring equitable workplace-level representation regarding members of designated groups (Employment Equity Act, no. 55 of 1998). It also contradicts the purpose of advancing social justice and democratisation of the workplace (Labour Relations Act, no 66 of 1995).

Scholars (Majola & Dhunpath, 2016; Maja, Mann, Sing, Steyn & Naidoo, 2008) acknowledge that South Africa's democratic Government formally recognises disability employment issues and drafted respective employment legislation. However, the scholars argue that South Africa has been falling short about practically implementing these legislations. Maja et al. (2008) attribute the matter to lack of knowledge about disability. Majola and Dhunpath (2016) comparably state that more workplace-level disability research is needed for practical implementation as such. The country's Department of Labour (2015) supports these notions. In conceptualising discrimination based on disability, South Africa's Department of Labour (2015) mentions lack of disability awareness as a key cause behind lack of reasonable accommodation.

Graham, Moodley and Selipsky (2013) recommend that research about disability should focus on a single group for two reasons: to promote the generalisability of the results and to generate individual in-depth understanding of a particular disability group. Based on these aims, the present study targeted hearing-impaired employees (HIEs) within the South African context. The Massachusetts Department of Elementary and Secondary Education (2015) describes hearing-impairment as any case where an individual's natural auditory reception is limited, impaired, or absent. The World Health Organisation (2015) states that disabling hearing loss, in the case of adults, refers to hearing loss that exceeds 40 decibels (dB).

The present research sought to investigate an apparent problem: lack of awareness about job demands and job resources from the perspective of HIEs.

A number of case studies investigating HIEs reveal poor management when dealing with their job demands. To begin with, Lussier, Say and Corman (2000) point out that HIEs report lower levels of wellbeing. In addition, Coniavitis Gellerstedt and Danermark (2004) found that the health states of HIEs were worse than the normally-hearing reference group in their study. From their side, Nachtegaal et al. (2009) emphasise that HIEs experience a significantly stronger need for recovery after work than their normally-hearing colleagues. In their research, Kramer, Kapteyn and Houtgast (2006) found that hearing-impaired employees report sick leave due to fatigue, strain or burnout at a rate of 26%, while the normally-hearing comparison group reported at a significantly lower rate of 7%. According to Woodcock and Pole (2008), HIEs are more likely, than hearing respondents, to report job dissatisfaction, high levels of work stress and depression.

Furthermore, Nachtegaal, Festen and Kramer (2012) found that poor hearing ability associated with higher risks of health-impairment, whereas the need for recovery is higher among employees with lesser degrees of hearing ability. Helvik, Krokstad and Tambs (2012) report that reduced hearing ability is associated with a higher risk of early retirement. Nachtegaal et al. (2012) point out that HIEs experience limited work capacity, which indicates that hearing-impairment is associated with health-impairment.

The Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2014; 2017; Demerouti, Bakker, Nachreiner & Schaufeli, 2001; Schaufeli & Bakker, 2004; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007) suggests the above-mentioned HIE health-impairment cases to

indicate poor management of the HIEs' job demands. Namely, job aspects that an employee associates with exhaustion (Demerouti et al., 2001) – phrased by later scholars as associated with physiological and/or psychological costs (Bakker & Demerouti, 2014; 2017; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007). *Job demands* 'consume energy and may therefore eventually lead to exhaustion and related health problems' (Schaufeli & Taris, 2014, p. 55).

In light of the discussion above, questions can be raised about the awareness of human resource management (HRM) about aspects in the workplace that apply as job demands for HIEs. The rationale is that certain job demands are applicable in the general sense, for example, workload; but other demands are unique to a context, for example, physical and/or psychological demands (Bakker & Demerouti, 2007; 2014; Bakker, Demerouti & Euwema, 2005).

Furthermore, the apparent inefficient controlling of HIEs' job demands also gives reason to question awareness about job aspects that count as job resources to HIEs. *Job resources* concerns job aspects that promote constructive employee outcomes within the work environment (Bakker & Demerouti, 2007; 2014). In more practical terms: job aspects positively associated with employee motivation, learning and/or task completion (Bakker & Demerouti, 2007; 2014; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007). One hypothesis of the JD-R model is that job resources buffer the strain-imposing impact of job demands (Bakker & Demerouti, 2007; 2014; 2017). The trend of HIE health-impairment implies, accordingly, insufficient buffering of job demands experienced by HIEs (see Coniavitis Gellerstedt & Danermark, 2004; Helvik et al., 2012; Kramer et al., 2006; Lussier et al., 2000; Nachtegaal et al., 2009; 2012; Woodcock & Pole, 2008). Therefore, question can be raised about HRM cognisance of job aspects that count as job resources to hearing-impaired employees.

1.1.1 Hearing-impaired employee

In previous work-level disability research from South Africa (Gida & Ortlepp, 2007; Jakovljevic & Buckley, 2011; Komana, 2006; McKinney, 2013; Mthembu, 1994; Naudé, 2002), no definition was found for 'hearing-impaired employee'. Thus, for the purpose of this study, a concept was compiled by combining descriptions in scientific literature of (a) the term 'hearing-impairment' and (b) South Africa's legal definition of the term 'employee'. These terms are elaborated below.

Shemesh (2010) explains that individual hearing loss is classified according to: (a) the continuum (permanent or fluctuating); (b) degree of the hearing loss (i.e. mild loss; hard-of-hearing or complete loss; deafness); (c) whether it is unilateral (only in the case of one ear) or bilateral (in the case of both ears); and (d) in case of bilateral hearing loss, whether it is symmetrical (equal degrees among the ears) or asymmetrical (unequal degrees among the ears). Shemesh (2010) adds that hearing loss can also be classified according to the stage of the person's life when the loss occurred. In this regard, hearing loss before or during an individual's birth can be classified as *congenital* hearing loss; and loss after birth can be termed *post-natal*. Post-natal hearing loss entails the two sub-categories of *pre-lingual* (i.e. prior to acquiring speech and language); and *post-lingual* (i.e. after acquiring speech and language).

Initially, the present study adopted Section 213 of South Africa's Labour Relations Act (no. 66 of 1995: LRA) as the framework to classify the concept of *employee*. However, it was noticed that section 200A(1) of the LRA provides more specific criteria for classification of employees. Thus, these criteria were used to classify an *employee* for the purpose of this study. Section 200A(1) states that, until an opposing case is proven, an individual who works for or renders service to another party is regarded as an employee, irrespective of the form of the contract. At least one of the following criteria must apply to the case:

- (a) the manner in which the person works is subject to the control or direction of another person;
- (b) the person's hours of work are subject to the control or direction of another person; (c) in the case of a person who works for an organisation, the person forms part of that organisation; (d) the person has worked for that other person for an average of at least 40 hours per month over the last three months; (e) the person is economically dependent on the other person for whom he or she works or renders services; (f) the person is provided with tools of trade or work equipment by the other person; (g) the person only works for or renders services to one person.

Considering the exposition above, the term *hearing-impaired employee* should refer to a hearing-impaired individual who meets one or more of the criteria mentioned in Section 200A(1) of the LRA. Therefore, prior to data collection and for the purpose of this study, the term *hearing-impaired employee* was concluded to apply to any individual in South Africa in terms of three criteria:

1. who is hearing-impaired in the pre-lingual, post-lingual, hard-of-hearing, deaf, unilateral and/or bilateral sense;
2. whose hearing-impairment counts as long-term or recurring; and
3. who meets criteria 1 and 2 of this definition as well as at least one of the following criteria:
 - manner of work is subject to the control or direction of another person;
 - hours of work are subject to the control or direction of another person;
 - forms any part of the organisation they work for;
 - has worked for someone else for an average of at least 40 hours per month over the past three months;
 - is economically dependent on the person for whom he/she works or renders services to;
 - tools of trade or work equipment are provided by another person; and/or
 - works for or supplies services to only one person.

From South Africa's population, hearing-impaired individuals are prevalent mainly from the age of 40 years, and the majority consists of individuals beyond the retirement age of 65 years (Statistics South Africa, 2011). On the one hand, the statistics indicate that most cases of hearing-impairment in South Africa occurs in terms of what Capella (2003) phrases as the *post-vocational* basis. This implies hearing loss after the initial stages of an individual's vocational career – once such a person has become familiar with the language system of the trade/profession and its society. On the other hand, it can be questioned whether the tendency in South Africa to associate hearing impairment mainly with the pensioners and the elderly has led society to overlook the other group. This would include people for whom the onset of their hearing-impairment took place before or during periods closer to the initial stages of their vocational careers.

Druchen (2010) points out that South African society thus far has neglected its younger hearing-impaired individuals. The present study thus concurs that pre-lingually hearing-impaired individuals in South Africa may face neglect. Such a problem further justifies inquiry into hearing-impaired employees within the South African context.

1.1.2 Job demands and job resources

The two aspects of job demands and correlating resources are discussed below.

Job demands: The JD-R model uses the term '*job demands*' to refer to the following features of a job: 'physical, psychological, social [and/]or organisational aspects' (p. 2) at the workplace that impose effort-related liability towards the employee, requiring expenditure of physical and/or psychological (cognitive and/or emotional) resources (Demerouti & Bakker, 2011). The *health-impairment process* is linked to job demands in the sense that such job characteristics primarily promote employees' exhaustion (Bakker & Demerouti, 2014; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007). Such demands may even take an employee past exhaustion towards health-impairment (Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007; Bakker & Demerouti, 2017). Examples of job demands identified by Demerouti and Bakker (2011) are work pressure, work environments that are physically unfavourable, and irregular working hours. Research has also found job demands positively related to burnout (Crawford, LePine & Rich, 2010), with the potential to cause health-impairment (Demerouti & Bakker, 2011).

Job resources: refers to the 'physical, psychological, social and/or organisational aspects' inherent to a job that ultimately help employees achieve work-related goals (Demerouti & Bakker, 2011). Such resources entail the following functions: (a) reducing physiological and psychological expenses associated with job demands; (b) stimulating employees' learning, development and personal growth; (c) promoting motivation and engagement of employees (Demerouti & Bakker, 2011, p. 2).

Whereas job demands are job characteristics perceived as consuming factors (i.e. of physical and/or psychological [cognitive and/or emotional] effort), job characteristics perceived as complementary count as job resources to employees (Bakker & Demerouti, 2018; Schaufeli & Taris, 2014). The *motivational process* is attributed to job resources of which the primary characteristic is keeping employees committed and experiencing job satisfaction (Bakker & Demerouti, 2014; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007).

Demerouti and Bakker (2011) explain that job resources may motivate employees in two ways:

- *Intrinsically*: help foster growth, learning and development of employees;
- *Extrinsically*: instrumental in employees achieving work goals.

Job resources entail aspects such as job control, development opportunities, involvement in decision-making, task variety, feedback and social support from the workplace (Crawford et al., 2010). Employees who tend to experience low levels of job resources may develop a pessimistic outlook on their work and reduced job satisfaction (Bakker & Demerouti, 2007).

1.1.3 The Job Demands-Resources model

The perspective of the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007) has allowed analyses of employee contexts across the globe. A number of studies suggest that the model allows study of workplace setups that can be enabling/disabling. Analyses indicate that job resources influence future work engagement, while job demands predict burnout and depression (Hakanen, Schaufeli & Ahola, 2008). It was also found that the interaction between an employees' job demands and correlating resources can predict the duration of their sick leave and potential burnout/engagement (Schaufeli, Bakker & Van Rhenen, 2009). The model established further that job resources buffer the negative impact of job demands (Bakker et al., 2005; Bakker, Hakanen, Demerouti & Xanthopoulou, 2007). Furthermore, absence of long-term illness is linked to job demands and job resources (Clausen, Nielsen, Carneiro & Borg, 2012).

Further analyses assessed the effectiveness of the JD-R model to explain the influence of job demands and job resources on safety outcomes for individual occupations (Li, Jiang, Yao & Li, 2013). This provided the proposition and testing of a conceptual model about antecedents and outcomes of perceived work ability (McGonagle, Fisher, Barnes-Farrell & Grosch, 2015). This model enabled testing of the interaction between job demands, job resources and workplace wellbeing (Kimber & Gardner, 2016).

Through the JD-R model, numerous employee contexts could be analysed and tested within South Africa too. The literature provides various examples. Researchers could analyse whether

organisations in South Africa differ significantly in managing employees in terms of growth opportunities, advancement, organisational support, job insecurity and overload (Rothmann, Mostert & Strydom, 2006). The model also helped assess aspects such as burnout and engagement of management staff (Rothmann & Joubert, 2007); occupational stress, sense of coherence, burnout, coping and work engagement (Van der Colff & Rothmann, 2009); and factors associated with the engagement of employees in South Africa (Rothmann & Rothmann, 2010).

The JD-R model also made it possible to measure components of employees' occupational stress, burnout and work engagement (Rothmann, 2008). Researchers were also enabled to focus on the relationship between job characteristics, optimism, burnout and ill health in the case of support staff at a South African institution of higher education (Rothmann & Essenko, 2007). Finally, the JD-R model analysed workload as a co-predictor of burnout (Thuynsma & De Beer, 2016).

As supported above by actual studies, the JD-R model states that job demands and job resources are key factors behind employee outcomes. The model also makes it possible to forecast the nature of employee outcome that a workplace setup is likely to cause (Bakker & Demerouti, 2014; 2017). That is, referring to employee wellbeing/health-impairment and performance progress (Bakker & Demerouti, 2007; 2017). One can translate this into implication that the JD-R model allows analysis and identification of workplace aspects that have enabling or disabling effects towards employees. Hence, the proposed research initiative for better HR management towards a group that commonly experiences disability seems justified, at least theoretically.

As discussed previously, the wellbeing and performance of employees are the overarching themes of the mentioned outcomes drawn from analyses by the JD-R model (Bakker & Demerouti, 2014; 2017). These two overall themes describe employee outcomes related to the above-mentioned HIE case studies (Coniavitis Gellerstedt & Danermark, 2004; Helvik et al., 2012; Kramer et al., 2006; Lussier et al., 2000; Nachtegaal et al., 2009; 2012; Woodcock & Pole, 2008). It stands to reason that the JD-R perspective will provide insight into causes behind the negative outcomes of HIEs within the work environment. Therefore, research using the JD-R model from the HIE's perspective, may provide results that could be used in future to more effectively interpret and handle the factors that influence employee outcomes of this group.

The JD-R perspective has served in earlier years as a landmark in research within South Africa. Over the years, continued research has included developing the Job Demands-Resources Scale (Jackson & Rothmann, 2005: JDRS) and further validation of the JDRS scale within the South African context (Asiwe, Hill & Jorgensen, 2015; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann et al., 2006).

To date, the JD-R model has not been used to for paying attention to disability groups at the workplace level. Hence, neither of its principals have been applied to hearing-impaired-employees in South Africa.

1.1.4 HIE case studies outside South Africa

The literature reports on HIE case studies from outside South Africa. The cases relate directly to job demands and job resources, in the theoretical sense. However, they are not grounded on the JD-R model. Those case studies are expounded below.

Job demands: Certain HIE case studies are linked directly to the *job-demands* perspective. Geyer and Schroedel (1998) found the job satisfaction among HIEs related negatively to on-the-job limitations. Lund (2015) concludes that HIEs' energy levels are affected significantly in a negative linear sense, and stress in a positive linear sense, by: (a) noise level; (b) number of people in the room; and (c) communication difficulty. Van Gils, Van den Bogaerde and de Lange (2010) found HIEs to experience slightly, but not significantly, higher levels of stress. The scholars also reported that their hearing-impaired respondents experienced significantly higher degrees of job demands than their hearing colleagues, even though the individuals of the employee groups showed comparable degrees of job control. Kramer et al. (2006) found that the valid sick leave of HIEs correlated significantly in a positive linear sense with communication in noise, distinguishing sounds and effort to hearing as well as with perceived reverberation (i.e. lengthy sound and its resonance, Oxford Dictionaries, 2018).

In an integrative literature review, Punch (2016) found that HIEs associate background noise with relatively high levels of fatigue and stress since it required higher concentration and hypervigilance. According to Punch, Hyde and Power (2007), HIEs more often, than employees with no hearing-impairment (hearing employees), experience meetings and training

activities as problematic. Punch (2016) found other literature concurring that HIEs find meetings, in-service training sessions as well as work-related social functions significantly challenging. Hua et al. (2013) point out that HIEs report lower physical functioning and higher perceived effort under conditions of increased noise levels. Even though both groups (hearing employees and HIEs) found office noise to be comparably distractive, the HIEs' experienced the situation as significantly more energy-consuming. Jahncke and Halin (2012) found that HIEs are stressed more by higher levels of noise than their hearing colleagues are. This is reflected through the following outcomes: (a) impaired performance in tasks that required the recall of word-related information; (b) significantly higher levels of fatigue; and (c) higher levels of stress hormones. However, Jahncke and Halin (2012) also emphasize caution about the sample size.

According to Hua, Anderzén-Carlsson, Widén, Möller and Lyxell (2015), HIEs experience difficulties in the work environment such as commotion and competing speech. Van Gils et al. (2010) associate lower efficiency in the modal language to higher levels of HIE stress. Furthermore, Punch et al. (2007) point out that HIEs experience attending meetings and training activities as 'quite a lot to a great deal' of difficulty (p. 509) more frequently than hearing employees. The scholars add that HIEs find evaluations and social functions more challenging than hearing employees do. Significantly, the findings also suggest that the hearing employees – whose colleagues included HIEs – experience 'quite a lot and a great deal' of difficulty (higher counts) in co-worker interactions. Hua et al. (2015) found that hearing employees also experience less stress at work after accommodations were made for their hearing-impaired work associates.

Not all the job demands mentioned above are documented in Schaufeli and Taris (2014). Therefore, it could be queried whether all the job demands experienced by HIEs are put forward in the major literature on the topic of job demands and job resources. Van Gils et al. (2010) recommend an investigation about whether job demands that HIEs experience, are comparable to those experienced by their hearing counterparts.

Job resources: Several HIE case studies can be linked directly to the *job-resources* perspective. Danermark and Coniavitis Gellerstedt (2004) as well as Kramer et al. (2006) found that HIEs experience significantly lower degrees of job control, in comparison to hearing employees – while both groups experience comparable levels of job demands. Geyer and

Schroedel (1998) point out that job satisfaction among HIEs relates positively to improved communication at the workplace. Detaille, Haafkens and Van Dijk (2003) found that HIEs attach significant weight to the following resources: understanding, acceptance and acknowledgement within the work environment; and management support to help them adapt to and ease into the work environment. Jahncke and Halin (2012) found that HIEs who are allowed to rest – in an environment with noise – was associated positively with work motivation. In other words, within a work environment that HIEs initially associated with impaired performance, the noise increased the fatigue and caused higher levels of stress hormones, which were countered by allowing them to rest. The scholars did state, however, that the size of their sample should be considered carefully when assessing the findings.

Lund (2015) found that stress among HIEs relate significantly to maintaining control in communication situations and that their interaction with fellow employees energises them. Therefore, it is necessary that colleagues and management have a collaborating responsibility to promote positive outcomes for HIEs as employees. Congruently, Punch et al. (2007) found that the degree of social support that new HIEs received from their fellow employees relate significantly to accommodating them in their work contexts. A different study found that 54% of hearing-impaired respondents depended on colleague support for work-related information (Van Gils et al., 2010). Their findings also showed that hearing team members' ability to communicate through sign language enabled 43% of the HIEs to transfer work-related information and HIEs reported person-to-person interaction as significant. These scholars also point out that technological development promotes HIEs' equality by allowing them access to work-related information.

Regarding the activities related to job resources of meetings and training activities, Punch et al. (2007) found that HIEs report 'quite a lot and a great deal' of difficulty, which measured significantly higher than hearing employees. In this regard, Punch (2016) concludes that higher levels of job performance and career satisfaction among HIEs are associated with the request for and implementation of work-related accommodation. According to Hua et al. (2015), HIEs experience facilitative affects from resources such as acoustic and technical adjustments to the work environment as well as understanding and support from colleagues. Punch (2016) suggests that appropriate accommodations within the work environment is of 'critical importance' to the careers of HIEs.

However, in scientific literature to date, no research was conducted on job demands and job resources from the perspective of HIEs within South Africa. On the other hand, inductive reasoning about the listed international case studies of HIEs suggest the job demands-resources concept is a common theoretical notion in HIEs' contexts. Deductive reasoning then suggests that a qualitative inquiry, grounded on the concepts of job demands and job resources, could develop a perspective regarding HIEs in South Africa. The focus would be on job characteristics that this group of employees' experience as job demands and/or job resources.

Although several studies tested the construct validity of the JD-R scale for employees in South Africa, this focus excluded employees with hearing disabilities. The present study therefore aimed to fill that gap by validating this scale that was developed based on findings about the experiences of HIEs in South Africa. As a result, the qualitative findings of this study's first query were used to develop a questionnaire. The questionnaire was tested to determine its construct validity – namely the extent to which it measures the theoretical construct that it is intended to measure (Foxcroft & Roodt, 2018) – and its scale reliability – whether it shows consistency in measurements (Foxcroft & Roodt, 2018). Doing so allowed the researcher to test whether the job demands themes derived from the qualitative study are indeed commonly experienced by members of the population group (Fouché, Delpont & De Vos, 2011).

The investigation was motivated further by the directive of South Africa's Human Sciences Research Council Act (no. 17 of 2008) that each member of South Africa's human sciences community is obliged to contribute to initiative for making a constructive impact on human welfare and prosperity of their fellow South Africans. Furthermore, the literature review revealed a paucity of research on HIEs within a South African work environment. Therefore, further understanding is necessary to plan and implement management strategies that promote affirmative action for this group of employees. In this regard, research that investigate job demands and job resources from the perspective of HIEs in the country could develop insight to inform management and enhance this group's wellbeing and/or performance in the work place.

To recap, the research problem can be summarised as:

It is currently unclear how HIEs in South Africa experience job demands and job resources. Furthermore, there is also no instrument that measures job demands of HIEs in South Africa.

Based on the problem statement above, the following research questions were posed per article:

Article 1:

- How are job demands, job resources and hearing-impaired employees conceptualised in scientific literature?
- What job demands are experienced by hearing-impaired employees in South Africa?
- What job resources are experienced by hearing-impaired employees in South Africa?
- What recommendations can be made for future research and practice?

Article 2:

- How are job demands, hearing-impaired employees, scale development and psychometric properties conceptualised in scientific literature?
- Will the qualitative findings enable development of a scale to measure job demands of hearing-impaired employees in particular?
- Will the internal structure of developed measure will be valid and reliable? That is, in terms of:
 - internal (i.e. construct) validity; and
 - scale reliability (i.e. Cronbach alpha coefficient > 0.70).
- Will significant associations be found between certain biographical information (e.g. category of hearing loss, laterality of hearing loss, gender and Language) and job demands of hearing-impaired employees?
- What recommendations can be made for future research and practice?

1.2 Expected contributions of the study

The present study aimed to contribute in three fields, which are explicated below.

1.2.1 Contribution for the individual

The present study provided new insight into job characteristics that HIEs experience as job demands and job resources. HIEs in South Africa were given the opportunity to identify job characteristics that they experience as job demands and/or job resources. This could help individual employees conceptualise their performance in relation to their work contexts. The development and validation of the HIEs' job-demands measure benefited this group, by providing a method that can be used to facilitate communication with their employers about job demands they are experiencing. Testing the construct validity and scale reliability of the developed job-demands measure, helped promote accurate representation by the researcher.

1.2.2 Contribution to the organisation

Increased insight into job demands and job resources from the perspective of HIEs could help organisations refine their policies to manage HIEs' wellbeing and performance. The development of the HIEs' job-demands measuring instrument provides organisations with a method to capture information from their HIEs about job demands they are experiencing and possibly identify discrimination by the work context. The findings could help organisations make more reasonable accommodations for employees who are HIEs.

1.2.3 Contribution to literature on human resource management

None of the reviewed scientific literature showed concern for the workplace aspects that HIEs in South Africa experience as job demands or job resources. Neither does literature to date mention the development of a scale that measures job demands unique to HIEs. The present research contributes in both aforementioned ways to the field of human resource management.

The literature review also did not produce an applicable definition of hearing-impaired employee based on South African employment legislation. Therefore, the definition developed

in the present study may provide a future reference point for building a common body of literature about HIEs in South Africa. Finally, none of the literature about HIEs and job characteristics acknowledged the JD-R perspective as underlying approach to conceptualise the international case studies of HIE wellbeing and/or performance within the work place.

1.3 Research objectives

The objectives for the present research can be broken down into a general objective and specific objectives. These objectives are discussed in terms of the two articles presented in this dissertation.

1.3.1 General objective

1.3.1.1 Article 1

The general objective of the Article 1 was to explore job demands and job resources of hearing-impaired employees in South Africa.

1.3.1.2 Article 2

The general objective of Article 2 was to develop a new job demands scale and preliminarily test its psychometric properties, specifically for HIEs within the South African context.

1.3.2 Specific objectives

The specific objectives flowing from the general objective of each article were formulated as follows:

1.3.2.1 Article 1

- Establish how job demands, job resources and hearing-impaired employees are conceptualised in scientific literature.
- Determine job demands of hearing-impaired employees in South Africa.
- Determine job resources of hearing-impaired employees in South Africa.

- Identify recommendations that can be made for future research and practice.

1.3.2.2 Article 2

- Conceptualise job demands, hearing-impaired employees, scale development and psychometric properties, according to the relevant scientific literature.
- Develop a scale, specifically for hearing-impaired employees, which measures their job demands.
- Determine whether the internal structure of the newly-developed measure is valid and reliable. That is, in terms of:
 - internal (i.e. construct) validity; and
 - scale reliability (i.e. Cronbach's alpha coefficient > 0.70).
- Establish the associations between certain biographical information aspects (e.g. category of hearing loss, laterality of hearing loss, gender and language) and the job demands of hearing-impaired employees.
- Make recommendations for future research and practice.

1.4 Research design: Article 1

1.4.1 Research approach

The research design adopted for the present study was descriptive and explorative. The study followed a descriptive approach in line with Creswell's (2013) definition. This means researchers consider established assumptions and theoretical frameworks but still seek to gain new perspective by allowing the participants to describe the subjective interpretations they attach to the object of interest. In more specific terms: HIEs in South Africa were guided to provide rich descriptions of job demands and job resources from their standpoint. The investigation was, therefore, grounded on a qualitative research design (Fouché & Schurink, 2011; Creswell, 2013). In practical terms: (a) the investigation was based on naturalistic observation instead of controlled measurement (Fouché & Schurink, 2011); (b) the data were collected from members of the target group (HIEs) from within their natural setting(s) (Creswell, 2013); and (c) inductive reasoning was used to interpret the data (Creswell, 2013). The research was therefore descriptive since it was based on observation and the procedures involving the participants were not manipulated (Johnson & Christensen, 2012).

In conjunction, the research had an explorative nature. This means the respondents were allowed the optimum response freedom within the parameters of the research design, ensuring that undiscovered data could be captured if any exist (Struwig & Stead, 2011).

Furthermore, the research followed a phenomenological approach since it acknowledged the basis of concepts that have been discovered (job demands and job resources) but did not assume that the target group of the study (HIEs) relate to those concepts in the same manner as employees have generally been found to. The study focused, rather, on the population group's experiences – within their context – of the phenomenon of interest (Willis, 2007). Namely, job characteristics that HIEs experience as job demands/job resources. Thus, this study followed the rationale of exploring job demands and job resources from the perspective of hearing-impaired employees within South Africa. More specifically, the study followed what Finlay (2009) terms the *descriptive* phenomenological approach. It derived conclusions from 'concrete empirical examples' (p. 478) for the aim of developing a general structure of experiences unique to the population group. Finally, this approach also presupposed that HIEs may present norm-deviant outlooks of the workplace factors (objective realities), which they experience as job demands and/or job resources. This notion is informed by the paradigm of social constructivism (Creswell, 2014), namely that subjective meanings can vary among parties about the same objective phenomenon.

1.4.2 Research strategy

The case study approach was used as research strategy in the present study. Accordingly, the research context was prescribed in order to explore the particular system about which data was sought (Creswell, 2013). As pointed out above, the system of interest was the HIEs' within the workplace. The case study strategy is appropriate for research focusing on a particular social phenomenon (Babbie, 2013). In this case, it was the HIEs in South Africa and the job characteristics they experience as job demands and/or job resources.

1.4.3 Research method

The research method for the present study comprised a literature review, a particular research setting, entrée and establishing research roles. The method also entailed sampling, as well as collecting, methods, recording, and analysing the data, which include strategies to ensure the quality and integrity of the data. Finally, the method focused on reporting style, and ethical considerations.

1.4.3.1 Literature review

A thorough literature review was conducted about the concepts under investigation by using the keywords: job demands, job resources, hearing-impaired, deaf, hard-of-hearing, and employees. The sources that were consulted include scientific articles and textbooks published between 1994 and 2018. The list of peer reviewed journals included the following: *South African Journal of Industrial Psychology*, *Journal of Vocational Behaviour*, *Anxiety, Stress & Coping*, *Journal of Personnel Psychology*, *International Journal of Audiology* and *Journal of the American Deafness and Rehabilitation*. The following search engines were consulted: Google Scholar, ResearchGate, EBSCOhost, JSTOR, library catalogues, LexisNexis, Sabinet Reference, SA ePublications, Scopus, Science Direct, Web of Science and Google.

1.4.3.2 Research setting

The research setting was the workplace of employees with hearing disabilities within South Africa. This included both workplaces where HIEs count as the majority and those where HIEs are in the minority. The participants were asked to complete the self-administered questionnaires only while at the workplace.

1.4.3.3 Entrée and establishing researcher roles

Consent was obtained from the Scientific Research Committee of the North-West University's School of Industrial Psychology and Human Resource Management. The approved research proposal and application for ethical clearance were submitted to the Research Ethics Committee, who cleared the study for data collection (ref: EMSMHW16/06/10-01/05).

Contact was initiated with a potential facilitating organisation that specialises in training and developing of hearing-impaired individuals in South Africa. The organisation is linked to a significant number of HIEs in South Africa who are distributed across a range of work settings for various employers. The correspondence covered the purpose of the research, potential contributions and how the coordinating organisation could help the researcher obtain respondents.

The correspondence took place through textual communication between the researcher and the Chief Operations Officer and the Human Resource (HR) manager of the organisation. Thereafter, the HR Manager of the organisation distributed the research invitation to supervisors of suitable candidates that could forward it to their relevant employees. The HR manager also distributed the invitation among employees who are part of the facilitating organisation. The selected individuals were given consent to participate in the study. The main difference between the invitations is that the second one mentioned that permission to participate had already been granted by the supervisor.

The research invitations were distributed through e-mail. The invitations explained the following aspects: (a) background to and the purpose and procedures of the study; (b) the contributions that the participants would make; (c) the research ethics that would be adhered to and the procedures they have to follow in this regard; (d) that permission was required from the immediate supervisor; and (e) that by participating, individual employees confirm they have obtained permission from their immediate supervisor. The language of the invitation was simplified considering a general possibility that deaf respondents may be less textually literate (Spencer & Marschark, 2010). Several additional respondents were acquired through the snowball-sampling method. The questionnaires were provided to respondents either individually on a day-to-day basis, or all were distributed at once. The manner adopted towards a respondent was based on the individual's indicated preferences. Daily reminders were sent to the respondents about returning the day's completed questionnaire. However, should respondents decline, their request was respected.

All correspondence was conducted electronically and the discussions on research procedures included access to a translation of the questions into South African sign language (SASL). Content validity was established of the documents and validity of the SASL interpretations.

The researcher circulated the documents between the interpreter and his supervisor for final certification before they were distributed.

The researcher was responsible for coordinating the processes as well as collecting and storing the data. This responsibility included ensuring adherence to ethical standards as well as organising, analysing, and interpreting the data and reporting the findings.

1.4.3.4 Research participants and sampling methods

The responses included in the data analysis were limited to those from participants who met certain criteria. The participants had to be people within South Africa who were employed during the data collection as well as permanently hearing-impaired pre-lingually deafened, post-lingually deafened or hard-of-hearing (Shemesh, 2010). Purposive sampling means limiting the sample to individuals showing the required attributes and qualify as informants who are most likely to provide the required data (Strydom & Delport, 2011). Effective purposive sampling (as certified by the Scientific Research Committee) is appropriate to studies that target unique populations (Teddlie & Yu, 2007) and help promote the internal validity of the collected data (Tongco, 2007).

An effort was also made to obtain the perspective from all three mentioned sub-groups. Compiling an overall sample from sub-groups of the general population, makes the sample more representative of the general population's entirety (Babbie, 2013; Davies & Hughes, 2014). This strategy can also be termed 'quota sampling' (Babbie, 2013; Davies & Hughes, 2014). For the first article's main data collection, the researcher aimed for each quota to consist of at least 10 representatives from each mentioned subgroup typifying hearing loss categories. The World Health Organisation (2016) suggests that such participant counts are appropriate for qualitative studies which investigate comparable sub-groups.

1.4.3.5 Data collection methods

Self-administered questionnaires were used to collect the data. The reason was that face-to-face interviews would involve strenuous logistics and encounter communication barriers. Furthermore, the inclusion of a third-party interpreter would have jeopardised the ethical consideration of confidentiality. However, the qualitative interest of the study was seen to through open-ended questions. An open-ended question asks a respondent to recall personal

experiences of theirs that relate to the subject matter (Greef, 2011). Open-ended questions allow respondents to give feedback in their own words, promoting the acquired data's accurate reflection of the respondent's own perceived experience (Kumar, 2014). Dichotomous questions were used to collect the biographical data.

Consideration was also given to advice by Bolger, Davis and Rafaeli (2003): that to prevent the gathering of irrelevant data from participants, effort must be made that participants understand the definition(s) of the phenomenon clearly. Therefore, corresponding icons were included in the questionnaire. Respondents could click on these icons, which explained the particular question through SASL. This was to accommodate the deaf participants, who may be textually less literate (Spencer & Marschark, 2010). Individual inquiries were made through self-administered questionnaires to seek answers for the second and third research questions of Article 1, which are presented later below.

The data collection occurred over five workdays, for each day its own questionnaire. The respondents were asked to conclude each workday by returning their completed version of the prescribed self-administered questionnaire. The exchange of the collected data content was conducted electronically. Respondents were asked, through the initial invitation, not to discuss their responses with others, until after the data collection phase.

The questions that were posed for data collection during days 1 – 4 are indicated below (first the text, then in italics the backward translation of the SASL rendition):

1. When thinking about all of the things that happened to you today while at work, what are the experiences that took energy from you? Please list all of the cases and explain each in detail. *When you think about all the things that happened to you today while at work, what are the experiences that took energy from you? Please list all the cases and explain each in detail.*
2. When thinking about all of the things that happened to you today while at work, what are the experiences via which you learned? Please list all of the cases and explain each in detail. *When you think about all the things that happened to you today while at work, what are the experiences which you learned from? Please list each case and explain each in detail.*

3. When thinking about all of the things that happened to you today while at work, what are the experiences that made you feel excited or motivated? Please list all of the cases and explain each in detail. *When you think about all the things that happened at work today, what experiences made you feel excited or motivated? Please list each experience in detail and explain clearly what happened.*
4. When thinking about all of the things that happened to you today while at work, what are the experiences that assisted you to complete the tasks that were required? Please list all of the cases and explain each in detail. *When thinking about all of the things that happened to you today while at work, what assisted you in completing the tasks that were required? Please list all the cases and explain each one in detail.*

The questionnaires, formulated for five days' consecutive data collection, reduced the chances of limiting the data collection to job demands/resources which the respondents experienced during prior recorded workdays. The self-administered questionnaire that was sent on the fifth day of data collection summarised the previous days' responses the respondents provided under each question. Thereafter, the questionnaire inquired whether respondents could recall other practical encounters, besides those listed, from the past six months which led them to experience examples of the above-mentioned job characteristics – and to list those encounters. The layout of the inquiries presented for the final data collection are indicated below, word-for-word as it was formulated.

All of the work experiences of the last four workdays that you listed as [the effect of the job characteristic of interest was listed] are listed below.

Day 1:

Day 2:

Day 3:

Day 4:

Please tell us about any other work experiences from the last six months that ... [the effect of the job characteristic of interest was listed]. In the box below, please list all of the cases and explain each in detail.

The format above was used on day 5 to enquire about experiences that: (a) took energy from the employee (job demands); (b) the employee learnt from (job resources, learning); (c) made

the employee feel excited or motivated (job resources, motivation); and (d) those that the employee experienced as complementing task completion (job resources, task completion). SASL translations were also provided.

1.4.3.6 Recording the data

The respondents were asked to complete the self-administered questionnaires while they were within their work premises. These questionnaires could be completed electronically, through a computer, smart phone, or tablet. Since the responses were presented through written content, it could be transcribed automatically into text. The final copies of the data in the Microsoft Office documents were transferred as exact copies of the source texts. The storage location of the data remained confidential to the researcher. Access to the data was secured further by an access password, which were known only to the researcher.

1.4.3.7 Data analysis

The method of qualitative content analysis was utilised to analyse the data. Content analysis is the more suitable form to process qualitative data for studies investigating a topic about which there is limited knowledge (Vaismoradi, Turunen & Bondas, 2013). The aim of this analysis was to develop a structural description that categorises the phenomenon under research (Elo & Kyngäs, 2008). Inductive qualitative content analysis was used. The method entails deriving categories from the qualitative data while making effort to avoid anchoring analysis on previously defined structures or knowledge (Elo & Kyngäs, 2008). Such an analysis is appropriate for cases where previous research on the phenomenon did not investigate a large quantity (Elo & Kyngäs, 2008). To date, limited research has been done on job demands and job resources from the perspective of HIEs in South Africa. Therefore, the mentioned method of data analysis was deemed most suitable for the purpose of the present study. Typically, an inductive qualitative content analysis has the following steps (Elo & Kyngäs, 2008, p. 109-111):

Preparation phase: the primary researcher became immersed in the qualitative data and engaged in the ‘climate’ of the discussion. The responses were scanned repeatedly. The researcher familiarised himself with the respondents’ overall manner of speech. Common themes amongst the data then began to emerge.

Organising phase: the qualitative data were organised through open coding, thereby creating categories and enabling abstraction.

Open coding: the primary researcher and co-coders determined labels that could be assigned to the contents of the transcriptions. These transcriptions were revised until every section of the transcription had been coded. Labels were generated through brainstorming at this stage.

Creating categories: the individual labels that have been formulated were grouped under a narrower range of overarching headings (i.e. categories). The purpose was to identify the overarching categories of the discovered job demands and job resources, while simultaneously seeking to distinguish separate sub-categories that resorted under each of the identified categories.

Abstraction: the dimensions that were identified during the step of ‘creating categories’ were described in terms of a general structure. This was done by assigning content-characteristic titles to those identified overarching categories and proceeding in a recessive (i.e. top-down) manner.

Reporting: the process of data analysis is defined in this dissertation, and the conceptual system or model that emerged from the analysis is described and discussed.

1.4.3.8 Strategies to ensure quality data

The prescribed strategies were utilised to ensure the internal and external validity of the data, as expounded below.

Prolonged engagement: helps a researcher build trust and become familiar with the culture and general tendencies of the target group (Teddie & Tashakkori, 2009). In this case, the primary researcher of the present study has relatives with hearing disabilities, implying *secondary exposure* to the context of hearing-impaired individuals in South Africa. The primary researcher also gained exposure within an organisation that is predominantly made up of HIEs.

Triangulation techniques: the triangulation of sources, methods and/or investigators, lessens the chance that personal bias of either party will influence the interpretation of the data (Teddie

& Tashakkori, 2009). Triangulation was practiced by using different sources and analysts. Shenton (2004) defines such a practice as confirmability to enhance the objectivity of the evaluation. For Shenton (2004) such data collection practices promote the internal validity, or ‘credibility’ of the data.

Dependability: the research procedures were documented clearly and concisely to allow readers to evaluate the dependability of the qualitative investigation’s outputs (Shenton, 2004).

Thick descriptions: the goal of the data recording was to obtain as much detail as possible, thus ensuring the interpretations and conclusions of the study would be evidence-based (Teddie & Tashakkori, 2009). For this aim, the questions were open-ended. The questions did not limit the responses further, besides directing them towards the concepts of job demands and job resources. Open-ended questioning promotes acquisition of in-depth detail (Kumar, 2014).

Transferability: the external validity of the collected data was ensured by a clear description of the outlying parameters of the research setting. This helped estimate the extent to which the findings, as outcomes of the analysis within this context, could apply to a similar setting (Shenton, 2004). The research setting of this investigation was workplaces within South Africa of employees with hearing disabilities. In other words, the focus was on workplaces where HIEs count as the majority or where they are in the minority.

1.4.3.9 Reporting style

The research was reported from a descriptive viewpoint, which Glesne (2006) would label as the interpreter’s perspective. Accordingly, the researcher aimed to process the gathered data from a third-party perspective. This implied a critical stance that would provide an objective reflection on the observations on the research topic.

Reporting are done in the form of a qualitative narrative; a rich and thick description of the identified structure of the phenomenon. This narrative is supported by citations of substantiating data.

1.5 Research design: Article 2

1.5.1 Research approach

A non-experimental quantitative approach was followed for Article 2. The study was quantitative since it used a survey to confirm the qualitative findings of Article 1. The data were interpreted statistically to draw conclusions about the proposed hypotheses (Struwig & Stead, 2011). The study was also non-experimental, meaning that none of the variables of interest were manipulated, nor was any experimental/control group involved (Fouché, Delport & De Vos, 2011). The research used a cross-sectional design, which quantitatively examines the subject of interest at a single point in time and is suited to cases of exploratory quantitative research (Fouché et al., 2011). The cross-sectional approach has certain advantages: (a) appropriate for screening hypotheses; (b) can be used to investigate the commonness of a condition; and (c) requires only relative commitment in time and resources (Carlson & Morrison, 2009).

1.5.2 Research method

The method of research comprised the following aspects: A literature review, research participants, measuring instruments, research procedure and statistical analysis.

1.5.2.1 Literature review

In Article 2, a thorough literature review was done based on the following keywords: job demands, Job Demands-Resources model, scale, development, internal validity, reliability, hearing-impairment, hearing-impaired employees. Relevant scientific literature published between 2008 and 2018 was searched by using databases such as Google Scholar, ResearchGate, EBSCOhost, JSTOR, library catalogues, LexisNexis, Sabinet Reference, SA ePublications, Scopus, Science Direct, Web of Science and Google. Particular attention was paid to the following prominent scientific journals: *Communication Methods and Measures*, *Journal of Vocational Behaviour*, *Journal of Applied Psychology*, *Journal of Managerial Psychology*, *Tutorials in Quantitative Methods for Psychology*.

1.5.2.2 Research participants

The research participants were selected through a combination of purposive sampling and network sampling. Hearing-impaired individuals who are employed in South Africa were targeted as respondents for this study. Since specific attributes were required of the participants, the sampling method was purposive as well (White & McBurney, 2013). The attributes that were required included (a) being employed, (b) indication to be hearing-impaired and (c) well-versed in the English language (in order to complete the questionnaire successfully). The data included in the final analysis were limited to those of respondents who met all of these criteria. Limiting research respondents to those who show the unique attributes of the targeted population helps strengthen the internal validity of the gathered data (Tongco, 2007). This also implies confidence in the research outcomes – which would not be the case if the respondents were not limited accordingly. No further limitations were placed on the diversity of the sample. Furthermore, the sample population are part of a rare group. Hence, respondent attainment depended on an internal reference between group members, all of which counted as key informants to the investigation (Quinlan, Babin, Carr, Griffin & Zikmund, 2015). Thus, the ‘network sampling’ method (Lavrakas, 2008), also known as snowball sampling, applied too. The implication is that in-group members (i.e. those of South Africa’s deaf-and-hard-of-hearing network) who were the initial contacts connected the research to other in-group members. Such referrals are continued until a satisfactory respondent count was reached (Wolf, Jove, Smith & Fu, 2016).

1.5.2.3 Measuring instruments

Measuring instruments such as the newly developed job demands scale and biographical questionnaire were employed in the present study and are explicated below.

The newly developed Job demands Scale for Hearing-Impaired Employees: The instrument was developed based on the findings of the qualitative study about the job demands of HIEs in South Africa. The steps for this development are discussed below:

- **Step 1:** Define the core concepts: job demands and hearing-impaired employees. The definitions were based on relevant theory and the findings of the qualitative study.

- **Step 2:** Generate items from existing measuring instruments as well as items captured from the data collected during the qualitative phase of the research. These items were developed into new items to measure the unique aspects within the South African context.
- **Step 3:** Evaluations were done regarding the utility of the items for the new measuring instrument. Items where words overlap with other items, were removed to reduce the likely error of within-factor correlated measurements (Bagozzi & Yi, 1988; Netemeyer, Boles & McMurrian, 1996).
- **Step 4:** Item refinement and selection of the items of the newly develop Job demands Scale for Hearing-Impaired Employees.

Biographical questionnaire: A biographical questionnaire was utilised to gather information about the individuals comprising the sample population in terms (a) gender; (b) language; (c) higher qualification; (d) category of hearing loss (e) laterality of hearing loss, (f) permanency of hearing loss and (g) whether their workplace is predominantly compiled of hearing employees

1.5.2.4 Research procedure

Ethical clearance for the present study was obtained from the particular University's Scientific and Ethical Committee (Ethical approval number: EMSMHW16/06/10-01/05). The research only commenced after permission was granted. A number of organisations were approached for permission to conduct the research. The organisations were predominantly in the education, banking and hospitality industries. After permission was been obtained from managers, the questionnaire booklet to distribute for data collection was compiled. The booklet was compiled of an informed consent letter (conveying the purpose and significance of the study), the voluntary participation letter, and the newly-developed job demands scale.

The questionnaire booklet was produced in two forms: firstly, the traditional paper-and-pencil format; secondly, an online version (which included text and sign language). The respondents who used the online version e-mailed their completed questionnaires to the researcher. Those who used the traditional paper-and-pencil format submitted their completed questionnaires in sealed envelopes, each respondent was provided their own envelope. Those respondents first forwarded their envelopes to their managers. The only role the management of the

organisations played during this process was granting permission to conduct the study and submitting the sealed questionnaire to the researcher. The envelopes were then collected by the researcher. The completed online-version questionnaires were stored in a secure place that are password protected, to which only the researcher had access. The researcher ensured that all results were kept confidential and no ethical guidelines were breached (Strydom, 2011).

To encourage participants to complete the booklet, a retail voucher was included for a R500 lucky draw. Contact details of the individuals who participated were recorded for the lucky draw through voluntary provision but were immediately discarded afterwards.

After the data collection process, the statistical analysis commenced.

1.5.2.5 Statistical analysis

The IBM SPSS program version 25.0 (IBM SPSS Inc., 2017) was used to do the statistical analysis. Descriptive statistics were analysed to determine the mean, standard deviation, and percentage response explained for each of the items (Struwig & Stead, 2011). Furthermore, exploratory factor analysis (EFA) was used to determine the internal validity of the newly developed job demands scale for hearing-impaired employees (Fabrigar & Wegener, 2012; Muthén, & Muthén, 2017). Requirements such as the Kaiser-Meyer Olkin (KMO) test, Bartlett's test of sphericity, Kaiser's criterion was met and the principle-component analysis was also utilised during this process (Child, 2006; Kaiser, 1970; Kerlinger & Lee, 2000; Williams, Onsman & Brown, 2012). During the EFA communalities and item loadings on the factors were determined. After the EFA was completed, the reliability of each factor were tested by using Cronbach's alpha coefficients (i.e. internal consistency) (i.e. 0.70 and higher; Cicchetti, 1994; Nunnally & Bernstein, 1994).

T-tests were used to determine differences based on job demands between two different sample population groups (Jackson, 2014). Effect-size (*d*-values) evaluations were used to interpret the results of the t-tests (Cohen, 1992; Jackson, 2014). Furthermore, analysis of variance (ANOVA) was used to determine the differences based on job demands between three or more sub-groups (Jackson, 2014). The *d* value was used to analyse the effect sizes of sub-group comparisons, considering the data was obtained from a small-scale population (Ellis & Steyn, 2003).

Product Moment Correlations, specifically Pearson's correlation coefficients were used to determine the relationships between the various job demands factors (Swanepoel, Swanepoel, Van Graan, Allison & Santana, 2011). The cut-off point for the statistical significance of the results was $p \leq 0.05$. Cohen's (1992) effect sizes were used to classify the practical significance of the correlations: $r \leq 0.30$ were regarded as suggesting small; $0.31 \leq r \leq 0.49$ as medium; and $r \geq 0.50$ large.

1.5.2.6 Ethical considerations

The following ethical considerations were adhered to, as adapted from Strydom (2011):

- *Avoiding harm*: The language was considered carefully to prevent reinforcing mental barriers and negative stereotypes attached to hearing-impaired individuals.
- *Voluntary participation*: The participants were informed that their participation is voluntary and that they are entitled to withdraw from the study at any time during the research process – without any repercussions.
- *Informed consent*: Potential participants were informed about the aim of the investigation, the anticipated duration of their participation, the processes to be followed during the investigation, and the credibility of the researchers. The subtitles and a SASL interpreter were integrated into the orientation video. This method reduced the danger of a language barrier preventing potential participants from being completely aware of the ethical considerations that guided the study.
- *Privacy*: The researchers respected the wish of participants who declined to share further information about a topic when probed.
- *Anonymity*: None of the identities of any respondents was revealed.
- *Confidentiality*: Personal information shared by respondents was kept private.
- *Publication of findings*: During each stage of the process, efforts were made to document the research procedure, thereby ensuring the findings are accurately and adequately reflected. This meant all the information was provided to explicate the issue under research. The researcher also ensured no biased language was directed towards any groups based on age, gender or disability. Furthermore, the results were not manipulated to confirm any hypotheses. Action was taken to prevent any plagiarism and limitations of the study are pointed out accurately. Furthermore, the researcher

strived to present the findings of the research in a language as understandable to the general public as possible.

1.6 Overview of chapters

The chapters of this mini-dissertation have the following layout:

Chapter 1: Introduction;

Chapter 2: Research article 1;

Chapter 3: Research article 2;

Chapter 4: Conclusions, limitations and recommendations for further research.

1.7 Chapter summary

In this chapter, the researcher explained the reasoning on which this investigation was based. This entailed the following: the problem statement, research questions as well as the objectives, design, and method regarding the research, followed by the division of chapters.

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CHAPTER 2

RESEARCH ARTICLE 1

EXPLORING JOB DEMANDS AND JOB RESOURCES OF HEARING-IMPAIRED EMPLOYEES IN SOUTH AFRICA

ABSTRACT

Orientation: South Africa's affirmative action programme makes it necessary to develop functional insight into the situation of its hearing-impaired employees.

Research purpose: Exploring job demands and job resources of hearing-impaired employees in South Africa.

Motivation for the study: The lack of research on job demands and job resources in South Africa, specifically for hearing-impaired employees.

Research design, approach and method: The study conducted qualitative research with a descriptive phenomenological approach and based on a social-constructivist paradigm. Methods were utilised of purposive, quota, and snowball sampling. Data were gathered from pre-lingually deaf ($n = 8$), post-lingually deaf ($n = 4$) and hard-of-hearing ($n = 2$) employees in South Africa through deaf-friendly, self-administered questionnaires. Data were processed through an inductive, qualitative content analysis.

Main findings: Numerous themes and sub-themes for job demands and job resources emerged from the data. Themes for 'job demands' were found to be communication barriers, task hindrances, task pressure, task environment variance, lack of cooperation, inconsideration, bounded rationality and time burdens. The themes for 'job resources: learning', focused on learning from subordinates or work associates and academic exposure. 'Job resources: motivation', include themes such as: constructive social affiliation, learning, constructively influencing, holding responsibility and challenges. Themes for 'job resources: task completion', focused on communication adequacy, orientation, assistance and time consideration.

Practical/managerial implications: Findings of this investigation revealed norm-deviance among hearing-impaired employees in South Africa regarding job characteristics they experience as job demands and developed depth of insight about job characteristics that they

experience as job resources. Therefore, findings suggest that managers should be cautious about assuming the existing job demands-resources literature to cover all the job characteristics that could be considered as job demands/job resources to hearing-impaired employees.

Contribution/value-add: This investigation led to the discovery of job demands that apply *specifically* to hearing-impaired employees in South Africa and developed depth-of-insight about their job resources. The improved understanding of these job characteristics contributes to the body of scientific knowledge on both the theory of job demands/resources and on hearing-impaired employees' experience of the workplace setting.

Keywords: job characteristics, job demands, job resources, hearing-impaired, employee, South Africa.

Introduction

One of the most neglected disability groups are those who are hearing-impaired (Wilson, 2013). Scholars suggest that the case applies to inquiry into the field of scientific human resource management (HRM). To date, this field has received a low degree of research (Carr, 2015), limited scientific perspective (Hua, Karlsson, Wildén, Möller & Lyxell, 2013) and insufficient HR management practices focusing on the group (Kramer, 2008). Majola and Dhunpath (2016) suggest that these deficiencies apply to South African research on HIEs. Considering the prevalence of hearing-loss in the modern-day industrial world (Williams, Falkum & Martinsen, 2015), the lack of intervention is concerning. Hindhede (2015) states that those who are hearing-impaired, are the least explicitly noticeable disability group.

Majola and Dhunpath's (2016) found that Human Resources Managers of South African governmental departments have done 'very little' (p. 50) in terms of further reviewing and developing disability employment policies. Hence, this qualitative inquiry is justified.

The qualitative inquiry of the present study explored whether HIEs in South Africa experience job characteristics which are not yet listed in literature. The inquiry recorded substantiating data. In this regard, it can be concluded that qualitative investigation about job demands and job resources from the perspective of HIEs in South Africa could provide functional insight

into HIEs' relation with certain job characteristics. Such insights will help promote constructive interventions to enhance their wellbeing and increase their performance (see Bakker & Demerouti, 2017; 2018).

Research purpose and objectives

The general purpose of this qualitative study was to explore job demands and job resources of hearing-impaired employees in South Africa. The purpose translated into the following specific research objectives:

- Establish how job demands, job resources and hearing-impaired employees are conceptualised in scientific literature.
- Determine job demands of hearing-impaired employees in South Africa.
- Determine job resources of hearing-impaired employees in South Africa.
- Identify recommendations that can be made for future research and practice.

Literature review

The literature review discusses the constructs of job demands, hearing-impairment and the definition of 'hearing-impaired employee' that was developed for the present study. This review also draws attention to previous research that simultaneously relates to job characteristics and hearing-impaired individuals in work contexts, as well as theoretical implications that became apparent based on the JD-R model.

Job demands

The term *job demands* concerns job characteristics that incur effort-related costs on the employee (Bakker & Demerouti, 2018; Sonnetag & Zijlstra, 2006). Boudrias et al. (2011) describe such costs as taxes that employees inherit as charge for their membership to their job environment. Therefore, job demands entail those aspects of a job that require sustained efforts from an employee (Bakker & Demerouti, 2017; Demerouti, Bakker, Nachreiner & Schaufeli, 2001; Schaufeli & Bakker, 2004; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007).

According to Sonnetag and Zijlstra (2006), the more taxing job demand-related affairs are, the higher/more prolonged the mandatory level of effort that will be required from the employee. The *health-impairment process* is attributed to job demands in the sense that (a) the job characteristic is suggested primarily to cause exhaustion among employees (Bakker & Demerouti, 2014; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007) (b) it has the potential to take an employee beyond exhaustion towards health-impairment (Bakker & Demerouti, 2017; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007); and, ultimately, (c) it may elicit self-undermining behaviour (Bakker & Demerouti, 2014).

Job demands are the most significant predictors of outcomes for employees such as exhaustion, psychosomatic health complaints, and repetitive strain injury (Bakker & Demerouti, 2014). Other employee outcomes caused by job demands alone include: physical ill health, psychosomatic health complaints, negative work-home interference, unsafe behaviours, accidents and injuries, depression, and adverse events (Schaufeli & Taris, 2014). While certain job demands have a general application such as workload, others are unique to the context, for example, physical and/or psychological demands (Bakker & Demerouti, 2007; 2014; Bakker, Demerouti & Euwema, 2005). From the literature mentioned above, job demands can be defined as aspects inherent to the job that will cost energy from those occupying the job environment; thus, it will require mitigation to control potential effects of their health impairment. In addition, context-unique cases have been uncovered.

A job demand can be characterised in both objective and subjective sense and thus vary considerably among parties in both cases (Boyd & Tuckey, 2014; Daniels, 2006).

Objective sense: Boyd and Tuckey (2014) identify two sub-categories namely: task requirements (e.g. technical requirements) and stressors imposed by the organisation's processes (e.g. straining work procedures). Schaufeli and Bakker (2004) point out the quantitative manifestation of job demands, with workload as an example.

Subjective sense: Schaufeli and Taris (2014) explain that an employee's negative appraisal of a job characteristic will turn it into a job demand for that individual. This notion implies individual-level variation about job characteristics that are classified as job demands. Schaufeli and Bakker (2004) also point out that job demands occur subjectively, mentioning emotional

demands as an example. Schaufeli and Taris (2014) define job demands in overarching terms as negatively valued job characteristics. They postulate that the perceived value for a job characteristic (i.e. perceived negative or positive value) may vary among parties. Likewise, Crawford, LePine and Rich (2010) and Van den Broeck, De Cuyper, De Witte and Vansteenkiste (2010) argue that a job demand which one employee perceives as a hindrance, may be viewed by another as a constructive challenge.

Job demands can be categorised in terms of the following themes: (a) *physical* (Demerouti et al., 2001; Schaufeli & Bakker 2004; Xantholoulou, Bakker, Demerouti & Schaufeli, 2007); (b) *psychological* (Bakker & Demerouti, 2014; Boudrias et al., 2011; Schaufeli & Bakker, 2004); (c) *social* (Bakker & Demerouti, 2018; Schaufeli & Bakker 2004; Xantholoulou et al., 2007); and (d) *organisational* (Bakker & Demerouti, 2017; Demerouti et al., 2001; Schaufeli & Bakker 2004).

Among the literature about the Job Demands-resources (JD-R) model (Bakker & Demerouti, 2018; Demerouti et al., 2001; Schaufeli & Bakker 2004; Xantholoulou et al., 2007), the researcher noticed a gap regarding a definition of specific job demands themes, namely, physical, social, and organisational. Definition of the psychological job demands theme was encountered, namely concerning job-related aspects that require continual cognitive and/or emotional efforts (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004) and/or skills (Bakker & Demerouti, 2007). Boyd and Tuckey (2014) state that a single job demand will entail at least two or more of the above-mentioned aspects – physical, psychological, social, or organisational. An example of such a case could include responsibility since such a job demand could cause an employee at least social and psychological strain (Schaufeli & Taris, 2014).

As mentioned, four themes of job characteristics experienced frequently as job demands. These are: physical, psychological, social and organisational aspects. These vary from emotional dissonance, interpersonal conflict, sexual harassment, qualitative workload to job insecurity. It may describe a wider range of characteristics, from negative spillover from family to work, computer problems, demanding job-inherent social interaction, problems planning, time pressure, to subordinate misbehaviour. Furthermore, it may include risks and hazards, role ambiguity, role conflict, complexity, reorganisation, centralisation, and job responsibility. Other work-related demands may be: unfavourable shift work schedules, unfavourable work

conditions, downsizing, work pressure, work-home conflict, work overload and performance demands (Schaufeli & Taris, 2014).

The following antecedents of job demands were found in the consulted literature:

- policy – e.g. task assignments (Daniels, 2006);
- workplace associates – e.g. unpleasant workplace interaction from work associates (Boyd & Tuckey, 2014);
- individual employees themselves – e.g. acquiring additional responsibilities (Bakker & Costa, 2014; Boyd & Tuckey, 2014; Daniels, 2006); and
- the environment external to an organisation (Boyd & Tuckey, 2014) – e.g. an environmental catastrophe.

The JD-R model's overarching themes of effects associated with job demands include: the health-impairment process (Bakker & Demerouti, 2014; 2017; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007); intensifying the positive affect of job resources to motivate employees (Bakker & Demerouti, 2017); and promotion of the chance that an overload of job demands may accumulate and eventually lead to excessive demands (Bakker & Demerouti, 2018). Therefore, scholars point out that too high levels of job demands will affect the employee negatively; but that the same applies to excessively low levels as well.

Academic literature focusing on HIEs was encountered. The literature was from outside South Africa. The studies mostly did not refer specifically to the job demands-resources perspective. However, all the listed studies relate to the job demands principal. Some relate *directly* by listing job characteristics and HIE effects that were found to be associated – that is, the types of employee outcomes that the JD-R model would attribute to job demands. Others relate *indirectly*, by reporting HIE outcomes that the JD-R model would classify as employee symptoms of uncontrolled job demands.

Direct relation to HIEs

In HIE research that relates to the job-demands perspective directly, Geyer and Schroedel (1998) found the job satisfaction among HIEs to be negatively related to on-the-job limitations. In this regard, Hua, Anderzén-Carlsson, Widén, Möller and Lyxell (2015) found that HIEs experience as difficulties commotion in the work environment as well as competing speech.

Punch, Hyde and Power (2007) found that HIEs, more often than employees with no hearing-impairment (hearing employees), report meetings and training activities as problematic. Punch (2016) adds that other literature concur that HIEs find meetings, in-service training sessions, and work-related social functions, as a significant challenge. Furthermore, Van Gils, Van den Bogaerde and De Lange (2010) found lower levels of efficiency in the modal language to be associated with higher levels of stress.

Lund (2015) concludes that HIEs' energy levels are affected significantly in the negative linear sense, and stress in the positive linear sense, by the following factors: noise level, number of people in the room, and difficulty to communicate. Kramer, Kapteyn and Houtgast (2006) found that the valid sick leave of HIEs' correlated significantly in the positive linear sense with communication in noise, distinguishing sounds and effort in hearing as well as with perceived reverberation (i.e. background commotions and vibrations – Oxford Dictionary, 2016). Punch (2016) found through an integrative literature review that HIEs associate background noise with relatively high levels of fatigue and stress since they require higher concentration and hypervigilance.

Hua et al. (2013) found HIEs to report lower physical functioning and higher perceived effort under conditions of increased noise levels. Even though both groups of employees (hearing and hearing-impaired) found office noise comparably distractive, the HIEs' experienced the situation as significantly more energy-consuming. In the same vein, Jahncke and Halin (2012) found HIEs to be more stressed by higher levels of noise than their hearing colleagues. These stress levels are reflected through: (a) impaired performance of tasks that require recall of semantic information; (b) significantly higher levels of fatigue; and (c) higher levels of stress hormones. The scholars emphasised that the small sample size does suggest caution about interpreting the results.

Van Gils et al. (2010) found that HIEs experience slightly, but not significantly, higher levels of stress. These scholars also found that hearing-impaired respondents experience significantly higher degrees of job demands than their hearing colleagues, even though the individuals of the employee groups held comparable degrees of job control.

Not all of the job demands cited above were noticed in Schaufeli and Taris (2014). Thus, there is reason to question whether all of the job demands experienced by HIEs are listed by main

exponents of the theme *job demands*. Van Gils et al. (2010) recommend an investigation about whether job demands which HIEs experience are comparable to those of hearing employees.

Indirect relation to HIEs

Other HIE research relates indirectly to the job-demands perspective. These studies do not specify job characteristics. However, these studies report HIE outcomes that the JD-R model would classify as employee symptoms of uncontrolled job demands. Therefore, these studies indirectly relate to the job demands principal.

A handful of international academic scholars convey that HIEs face job-demand overloads. Coniavitis Gellerstedt and Danermark (2004) and Danermark and Coniavitis Gellerstedt (2004) found that HIEs' health state was worse than that of the hearing reference groups in their studies. Woodcock and Pole (2008) point out that HIEs will more likely, than hearing respondents, report job dissatisfaction, high levels of work stress and depression. According to Backenroth-Ohsako, Wennberg and Klinteberg (2003), respondents with hearing loss generally report less satisfaction with their work situations and show significantly higher levels of anxiety. Furthermore, Lussier, Say and Corman (2000) found that HIEs report lower levels of wellbeing. In this regard, Kramer et al. (2006) conclude that hearing-impairment should be considered a risk factor leading to fatigue and mental distress.

Similarly, Nachtegaal et al. (2009) and Nachtegaal, Festen and Kramer (2012) found poor hearing ability associated with higher risks of health-impairment; thus, the need for recovery is higher among employees with lesser hearing ability. Hua et al. (2015) also found the need for recovery prevalent among HIEs.

From a different angle, Hogan, O'Loughlin, Davis and Kendig (2009) point out that people with hearing loss are more unlikely to occupy jobs that require high levels of skill. In this regard, Tye-Murray, Spry and Mauzé's (2009) report that most of their hearing-impaired respondents believed that their job performance was associated negatively with their hearing loss – some to the extent that they believed they may have lost their competitive edge.

Furthermore, Helvik, Krokstad and Tambs (2012), and Kramer (2008), found that poorer hearing ability is associated with a higher risk of early retirement. In the same vein, Dettelle,

Haafkens and Van Dijk (2003) conclude that employees such as the hearing-impaired may appear over a significant period to be in a normal state, but then reach a state of burnout or chronic fatigue due to the stressful work environment.

Such HR management problems among HIEs, internationally, require general attention and intervention to address the job demands which HIEs experience. However, significantly, none of the South African literature that was consulted about HIEs related to the job-demands perspective.

Job resources

Paired with the concept of job demands is the notion of *job resources* (Bakker & Demerouti, 2017; Demerouti et al., 2001; Schaufeli & Bakker, 2004). Unlike job demands, as job characteristics perceived as consuming factors, job characteristics which employees experienced as complementary count as job resources to them (Bakker & Demerouti, 2018; Schaufeli & Taris, 2014). The *motivational process* is attributed to job resources. This job characteristic is reported primarily to strengthen employees' motivation (Bakker & Demerouti, 2014; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007). Thus, motivation leads employees to construct positive meaning within their work environment (Bakker & Demerouti, 2018).

Research found several overarching themes of effects associated with job resources, as presented by versions of the JD-R model over the years. These themes are: buffering the strain-imposing impact of job demands for the employee (Bakker & Demerouti, 2007; Demerouti et al., 2001; Xanthopoulou et al., 2007); promoting personal resources for employees (Bakker & Demerouti, 2018); and helping employees acquire further resources (Bakker, 2015; Schaufeli, Bakker & Van Rhenen, 2009).

Daniels and De Jonge (2010) argue that individual employees' coping with a job demand will depend on their access to the appropriate job resources. These will help them deliver the outcome(s) required for the job demand they have to deal with – possibly through particular job resources. The more demanding a state of affairs due to job demands, the more job resources will be required (Sonnetag & Zijlstra, 2006). Individuals whose resource pools limit the degree to which they can meet demands, are more likely to encounter strains that may

eventually cause burnout (Crawford et al., 2010). Demerouti et al. (2001) explain that insufficient job resources will lead to withdrawal behaviour and eventually to disengagement from work – a notion supported by Schaufeli & Taris (2014). Daniels (2006) suggests that job resources are only effective if actually utilised. Conversely, Boyd and Tuckey (2014) find it possible that in certain circumstances simply knowing that a resource will be available should it be needed (e.g. social support) may give employees sufficient reassurance to handle job demand(s) confidently. Thus to summarise, the term *job resources* concerns job-inherent aspects that help individual employees interact constructively with their job context.

The construct of *job resources* was found to entail several characteristics – the primary being that job resources are viewed as *external* to an employee (Demerouti et al., 2001).

Secondly, the multi-level perspective applies to job resources. These resources can be found at various levels (Bakker & Demerouti, 2018): namely that of the *individual*, for example, role clarity, task identity, autonomy, performance feedback; *team*, for example supervisor and colleague support, team climate, participation in decision-making; *organisation*, such as career opportunities; and in *leadership*, such as intellectual stimulation, inspirational motivation, and individual counselling.

Thirdly, the concept of job resources was found to entail two sub-categories of sources: *organisational* (e.g. job control, task variety, participation in decision-making) and *social* (e.g. support from colleagues) (Demerouti et al., 2001).

Fourthly, the construct also shows two sub-categories for *longevity*. Certain resources (e.g. time) count as ‘volatile resources’ in the sense that they are finite and transient. This means they have a limited supply and/or can only be used once. Therefore, these mentioned resources require regular recovery and renewal for continued associated effects (Ten Brummelhuis & Bakker, 2012). Other resources (e.g. a stable network of work associates) count as ‘structural resources’ by being more consistent over time and can be considered as reliable assets, which can be utilised more than once over and/or to larger extents (Ten Brummelhuis & Bakker, 2012).

Finally, variation at individual level is suggested about job characteristics that are experienced as constructive. Writings of interest include Crawford et al. (2010) and Van den Broeck et al.

(2010). Schaufeli and Taris (2014) summarise the overall notion. The scholars define job resources in overarching terms as positively-valued job characteristics.

Mirroring job demands, the construct of job resources covers the following aspects of an occupation: *physical* (Bakker & Demerouti, 2017; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007); *psychological* (Bakker & Demerouti, 2014; Demerouti et al., 2001; Schaufeli & Bakker, 2004); *social* (Bakker & Demerouti, 2007; Demerouti et al., 2001) and/or (d) *organisational* (Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007). In the consulted literature, no general definition was noticed for either of the job-resources themes (Bakker & Demerouti, 2007; 2014; 2017; 2018; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007).

Job characteristics that employees have frequently been found to experience as job resources range from quality relationship with supervisor, social support from supervisor, social support from colleagues, and participation in decision making as well as goal clarity, to innovative climate, skill utilisation and leadership (Schaufeli & Taris, 2014).

Literature indicates that job resources have several effects. Firstly, the fundamental effect concerns driving employee motivation (Bakker & Demerouti, 2017; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007). Job resources can motivate employees extrinsically (i.e. instrumental in their achieving work goals) as well as intrinsically (i.e. satisfaction of basic human need for autonomy, relatedness, and competence) (Schaufeli & Taris, 2014).

Secondly, the construct applies to job characteristics that help employees relieve the costs they incur through job demands (Bakker & Demerouti, 2014; Demerouti et al., 2001; Schaufeli & Bakker, 2004). These costs can be physically as well psychologically (Bakker & Demerouti, 2007; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007). Bakker and Demerouti (2014) point out that job resources entail more functions than mere counterbalancing by reducing the experienced job demands and associated costs.

Thirdly, job resources include job characteristics that help employees mitigate the nature of the effects of job demands on them (Boyd & Tuckey, 2014). An example is management guiding

employees to react constructively to a demanding situation – i.e. leadership (Schaufeli & Taris, 2014).

Fourthly, the construct entails job characteristics that stimulate employees' personal growth, learning and/or development (Bakker & Demerouti, 2017; Schaufeli & Bakker, 2004). Examples are: interaction with co-workers, being work partners, shadowing, and new exposure (see Schaufeli & Taris, 2014).

Fifthly, the construct describes aspects of a job with the constructive purpose of helping the employee achieve work-related goals (Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007). Examples are: mentoring and technology.

Finally, job resources serve employees' basic psychological needs for competence, relatedness, and autonomy (Bakker & Demerouti, 2018). Thus, in addition to counterbalancing job demands and/or associated costs, it can be reasoned that the effects of job resources include more dynamic job characteristics. Such characteristics may relate to one or more of the factors that Boxall and Purcell (2011) found to drive employees' performance, namely: ability, motivation and opportunity ($P=f(A, M, O)$).

The following antecedents of job resources were noticed in the literature:

- institutional measures (Daniels, 2006) – e.g. legislation on affirmative action;
- formal organisation policy (Daniels, 2006) – e.g. affirmative action policy at the organisation level;
- informal social policy in the organisation (Demerouti et al., 2001) – e.g. organisation-level politics and/or culture; and
- employees' personal resources (Bakker & Demerouti, 2014; 2017; Bakker et al., 2010; Fernet, Trépanier, Austin, Gagné & Forest, 2015; Xanthopoulou et al., 2007) – e.g. harmonious passion (Fernet et al., 2015).

Research focused at HIEs, and relating to the job resources principal, was encountered. The literature was not local to South Africa. Danermark and Coniavitis Gellerstedt (2004) as well as Kramer et al. (2006) point out that HIEs experience significantly lower degrees of job control, in comparison with their normally-hearing colleagues, while both experience

comparable levels of job demands. Geyer and Schroedel (1998) found that job satisfaction among HIEs are related positively to promoting their communication at the workplace. In a study by Dettaille et al. (2003) HIEs reportedly attach significant weight to understanding, acceptance and acknowledgement in the work environment, on the one hand, and management's support to help them adapt and ease into the work environment on the other hand.

Jahncke and Halin (2012) conducted their research in a work environment that led HIEs to impaired performance, increased fatigue and higher levels of stress hormones among HIEs. The scholars found that despite the aforementioned, rest was associated with increased motivation – even in the mist of the noise levels. The scholars did caution that their small sample size may influence the findings. Lund (2015) found that HIEs' stress in the workplace relates significantly to their ability to maintain control in communication situations, and that they are energised by interaction with other people. Thus, Lund emphasises the necessity that colleagues and management share collaborative responsibility to seek positive employee outcomes for HIEs.

In the same tone, Punch et al. (2007) point out that the degree of social support new HIEs receive from their work associates relates significantly to accommodation in their work contexts. A further study found that 54% of hearing-impaired respondents depend on colleagues' support for work-related information (Van Gils et al., 2010). The researchers also found that hearing team members' ability to communicate through sign language enabled 43% of the HIEs in the transfer of work-related information and that HIEs found person-to-person interaction extremely helpful. The scholars also argue that technological development can promote HIEs' equality by their access to information about the work.

Punch (2016) concludes her integrative literature review by inferring that higher levels of job performance and career satisfaction among HIEs can be associated with request for and implementation of work-related accommodation. Hua et al. (2015) found that HIEs experience facilitative affects from three factors: (a) acoustic and technical adjustments to the work environment; (b) colleagues' understanding; and (c) colleagues' support. In this regard, Punch (2016) emphasised that the implementation of appropriate accommodations is of 'critical importance' to the careers of HIEs.

In conclusion, it should be noted that none of the consulted South African literature on HIEs, linked their situation to the perspective of *job-resources*.

Perceived job characteristics

Daniels (2006) discusses variation at individual level in the perceived nature of a job characteristic, seeing that individuals' cognitions differ. Crawford et al. (2010) and Van den Broeck et al. (2010) concur that the perceived nature of a single job demand may vary among employees. In this respect, Schaufeli and Taris (2014) point out that there can be cases of norm-deviant association towards a job characteristic. They imply positive association toward job resources and negative towards job demands.

Schaufeli and Taris' (2014) argue that despite the fact that job control is generally regarded as a job resource, certain employees may experience this job characteristic as a threat, rather than an opportunity to learn and develop. According to Boyd and Tuckey (2014) such individual variations may occur due to employees' personal outlooks on aspects of their work as well as by their standing in the environment. Ventura, Salanova and Llorens (2015) found that employees with higher levels of professional self-efficacy generally perceive job demands more constructively than destructively, and that engagement seems to be more prevalent among such employees, with burnout less common.

Daniels (2006) points out that group-level variation occurs as well, a rationale supported by later literature. Bakker and Sanz-Vergel (2013) challenge the notion of job demands perceived synonymously across occupations. Bakker and Demerouti (2017) state that there are variations among job contexts regarding the perceived nature of job characteristic(s) – whether it is constructive or not.

Regarding the JD-R model, Schaufeli and Taris (2014) point out that this instrument (Demerouti et al., 2001; Schaufeli & Bakker, 2004) does not classify restrictions in job characteristics as job demands or job resources. The same was found to apply to the later versions of the JD-R model (Bakker & Demerouti, 2014; 2017; Xanthopoulou et al., 2007). Since the perceived nature of a job characteristic (job demand or job resource) can vary among parties, the *effect* of a job characteristic that is attributed to a job demand or resource, will *vary* among parties (Daniels, 2006).

The discussion above emphasises the relevance of linking this investigation, about job demands and job resources from the perspective of HIEs in South Africa, to the social constructivist paradigm as well as following a phenomenological approach. The social constructivist paradigm was applied based on the researcher's initial postulation that HIEs in South Africa may hold norm-deviant outlooks on workplace factors, which they attribute as job demands and/or job resources (Creswell, 2009). The phenomenological approach was followed since the researcher initially acknowledged the fundamental concepts that have already been discovered (job demands and job resources) but questioned whether the target group of the study (HIEs in South Africa) relate to those concepts similarly to the way employees generally have been found to do (Willis, 2007).

After establishing and discussing the foundational concepts and associated approaches, the concept of hearing-impairment is discussed subsequently.

Hearing-impairment

Impairment entails restraint of a personal function due to a perceived or an actual personal factor (South Africa, Department of Labour, 2015). *Hearing-impairment* generally refers to individuals whose hearing acuity is not within the standard range (Edwards & Crocker, 2012). Such impairment limits individuals' reception of auditory information to an explicitly noticeable extent (Vaccaro, 2016). This condition ranges from hard-of-hearing to total deafness (Shemesh, 2010). Such a diagnosis points to a physical impairment; not an intellectual deficiency (South Africa, Department of Labour, 2015), however, it has social and psychological repercussions (Hua et al., 2015; Manchaiah & Stephens, 2013). Noticeably, not the physical condition as such but social constructs impact hearing-impaired individuals (Hua et al., 2013).

Hearing loss is one of the most common sensory impairments (Rabinowitz, Sircar, Tarabar, Galusha & Slade, 2005) and is often associated with disability (Thorne et al., 2008). South Africa's Department of Social Development (2016) defines *persons with disabilities* as individuals who are hindered from full participation in society due to attitudinal, informational, communication and/or physical barriers associated with their impairment. According to the World Health Organisation (WHO; 2016), hearing loss (for adults) greater than 40 decibels (dB) in the better ear, can be classified as disabling. The WHO (2016) suggests a framework

for classifying the severity of hearing loss. Hearing loss, applied to the better ear, will count as *slight* if it is amid the range of 26 dB and 40 dB; *moderate* if within the range of 41 dB and 60 dB; *severe* for the range of 61 dB and 80 dB; *profound* if equivalent to or more than 81 dB. Helvik et al. (2012) found that the risk of early retirement increases among employees who present higher degrees of low-frequency hearing loss.

A case of hearing-impairment can also be classified by focusing on the following four factors: (a) the type of hearing loss; (b) the degree of hearing loss; (c) the stage of its onset; (d) laterality (whether or not the hearing loss occurred to both ears), which contains a sub-theme of *symmetry* (to be discussed later).

Types of hearing loss

Edwards and Crocker (2012) divides hearing loss into two main categories: conductive hearing loss and sensori-neural hearing loss.

- *Conductive hearing loss* entails loss due to impaired audio transmission in the outer ear and/or the middle ear (Edwards & Crocker, 2012).
- *Sensori-neural hearing loss* occurs as a result of damage to the inner ear (i.e. cochlea) and/or the nerve that transmits the sound signal from the inner ear to the hearing-oriented regions of the brain (Edwards & Crocker, 2012).

Lorenzi, Gilbert, Carn, Garnier and Moore (2006) found that individuals with sensori-neural hearing loss tend to battle grasping speech, especially when background sounds are present. Hearing loss due to both conductive and sensori-neural issues does occur as well (Centres for Disease Control and Prevention, 2018).

Degrees of hearing loss

Hearing loss can be differentiated in terms of four sub-categories in order of severity (Centres for Disease Control and Prevention, 2018):

- *Mild*: the inclination to hear aspects of speech but struggling to hear soft sounds.
- *Moderate*: generally struggling to grasp speech at the normal auditory level.
- *Severe*: the inability to grasp information of the normal auditory level, but not limited to loud sounds.

- *Profound*: completely limits reception of speech but may include reception to particularly loud sounds.

Shemesh (2010) classifies mild and moderate hearing loss as *hard-of-hearing*; and severe and profound hearing loss as *deafness*. Individuals who are hard-of-hearing tend to communicate through spoken language and lip-reading along with their residual hearing, while those who are deaf tend to communicate predominantly through texting and sign language (Lane, Hoffmeister & Bahan, 1996; Shemesh, 2010). Language barriers (e.g. communication through a less familiar language) worsen the impacts of hearing-impairment (Rabinowitz et al., 2005).

Stage of onset

The stage of life at which an individual's hearing loss occurred also plays a part in classifying his/her case of hearing-impairment (Shemesh, 2010). Hearing loss prior to or during an individual's birth is labelled as *congenital*. Hearing loss that ensued after birth is classified as *post-natal*. Post-natal onset can be unpacked into two sub-categories, namely *pre-lingual* – prior to acquisition of speech and language; and *post-lingual* – hearing loss after acquiring speech and language (Shemesh, 2010). Therefore, the age-related stage of hearing-loss onset will significantly influence the extent to which the condition impacts an individual's speech and language (Lane et al., 1996).

Capella (2003) briefly proposes the concept of *post-vocational hearing loss*. This entails hearing loss subsequent to the initial stages of an individual's vocational career, in other words, once he/she has become familiar with the language form frequented by the trade/profession and its society.

Laterality and symmetry

Shemesh (2010) points out that hearing loss can also be classified in terms of whether it occurred to only one ear – *unilateral hearing loss*; or both ears – *bilateral hearing loss*. Furthermore, a case of bilateral hearing loss can be classified in terms of whether the degree of hearing loss is equal among the ears or not – *symmetrical*, or *asymmetrical bilateral hearing loss*.

Hearing-impaired employee

A definition of *hearing-impaired employee* (HIE) was not found in the literature. However, a classification was developed by integrating the description above of hearing-impairment (Edwards & Crocker, 2012; Shemesh, 2010; Thorne et al., 2008; Vaccaro, 2016) into the definition of *employee* provided by Section 200A(1) of South Africa's Labour Relations Act (no. 66 of 1995: LRA). The assembled definition describes the terms and conditions according to which an individual can be classified as a HIE, in the case of the present study.

Section 200A(1) of the LRA provides employee-classification criteria that are more specific than those mentioned in Section 213 of the Act. Thus, the criteria of Section 200A(1) were used to classify an *employee* for the purpose of this study. Section 200A(1) states that, until an opposing case is proven, an individual who works for or renders service to another party is regarded as an employee, irrespective of the form of the contract. At least one of the following criteria must apply to the case:

- (a) the manner in which the person works is subject to the control or direction of another person;
- (b) the person's hours of work are subject to the control or direction of another person;
- (c) in the case of a person who works for an organisation, the person forms part of that organisation;
- (d) the person has worked for that other person for an average of at least 40 hours per month over the last three months;
- (e) the person is economically dependent on the other person for whom he or she works or renders services;
- (f) the person is provided with tools of trade or work equipment by the other person; or
- (g) the person only works for or renders services to one person.

The Labour Relations Amendment Act (no. 6 of 2014) adds that for the purpose of the LRA, the above-mentioned criteria of Section 200A(1) apply to any employment law and Section 98A of the Insolvency Act (no. 24 of 1936).

In light of the discussion above, the term *hearing-impaired employee* thus refers to a hearing-impaired individual who meets one or more of the criteria mentioned in Section 200A(1) of the

LRA. Therefore, for the purpose of this study, *hearing-impaired employee* was classified as any individual:

1. who is hearing-impaired in the pre-lingual, post-lingual, hard-of-hearing, deaf, unilateral and/or bilateral sense;
2. whose hearing-impairment counts as long-term or recurring; and
3. who meets criteria (1) and (2) of this definition as well as at least one of the following criteria:
 - the manner in which the person works is subject to the control or direction of another person;
 - the person's hours of work are subject to the control or direction of another person;
 - in the case of a person who works for an organisation, the person forms part of that organisation;
 - the person has worked for that other person for an average of at least 40 hours per month over the last three months;
 - the person is economically dependent on the other person who whom he or she works or renders services;
 - the person is provided with tools of trade or work equipment by the other person; or
 - the person only works for or renders services to one person.

Theoretically speaking: In South Africa, criteria associated with employment of hearing-impaired individuals outline the following cases: (a) 'designated groups'; (b) Broad-based Black Economic Empowerment; (c) protection from unfair discrimination; and (d) a pressing social issue in the country that requires research. The following four paragraphs discuss these criteria.

Designated groups

The term *designated groups* refers to Black people, women and persons with disabilities (Employment Equity Act, no. 55 of 1998; EEA). Members of designated groups all form part of South Africa's affirmative action policies and programmes (South Africa, Department of Women, Children and Persons with Disabilities, 2013). Especially two HRM criteria are associated legally with designated groups, namely affirmative action (Sections 15 and 20(3) of the EEA; Employment Equity Amendment Act, no. 47 of 2013; EEAA, p. 4) and employment

equity plans (EEA, Section 20). Section 42(d) of the EEA states that assessing designated employers' compliance includes evaluating the degree to which they have made progress about eliminating barriers that adversely affect the employment of people from designated groups.

In order for a physical impairment to be legally regarded as a 'disability', the impairment must be long-term or recurring. In addition, the impairment must be associated with barriers to employment opportunities and/or career progress (EEA, p. 10). This condition should also have the potential to hinder an individual's full and effective involvement in society on a basis equal to individuals *without* disabilities (South Africa, Department of Labour, 2015).

Literature (Gida & Ortlepp, 2007; Jakovljevic & Buckley, 2011; Komana, 2006; McKinney, 2013; Naudé, 2002) suggests that hearing-impaired individuals in South Africa experience such barriers. Furthermore, the EEAA prescribes additional criteria that an individual in South Africa with a disability must meet in order to be considered legally as a member of South Africa's designated groups. The individual of interest must either hold a South African citizenship by birth or descent, or have become a citizen of the Republic prior to 27 April 1994 or after 26 April 1994.

Broad-based Black economic empowerment

The term *Black people* does not refer directly to South Africa's individuals with disabilities; rather to the Africans, Coloureds and Indians within the population as a whole (p. 4). However, Section 1 of the Broad-based Black Economic Empowerment Act (no. 53 of 2003) classifies individuals in South Africa who have disabilities as part of *Broad-based Black economic empowerment*. This relates to the policy's equity initiatives about HR development and promotion of equitable representation of occupations and workforce levels.

Congruently, section 2(e) of the Skills Development Act (no. 97 of 1998; SDA) encourages employers in South Africa to provide training and education to South Africans of the country's previously disadvantaged groups in order to improve their prospects for employment. In addition, section 2(c)(iv) of the SDA encourages employers to employ South Africans who have difficulty in finding employment (this includes hearing-impaired individuals: Gida & Ortlepp, 2007; Jakovljevic & Buckley, 2011; McKinney, 2013; Mthembu, 1994; Naudé, 2002). The Skills Development Amendment Act (no. 37 of 2008) does not object to either of the two citations of the SDA. The Broad-Based Black Economic Empowerment Amendment Act (no.

46 of 2013) was not noticed to diverge from any of the cited notions regarding the Broad-Based Black Economic Empowerment Act (no. 53 of 2003).

Protection from unfair discrimination

Numerous versions of South Africa's governmental prescriptions are aimed at protecting individuals, including the country's hearing-impaired, from unfair discrimination. To begin with, Section 6 of the EEA stipulates that no employer in South Africa may discriminate, directly or indirectly, against individual employees on the basis of their disability.

South Africa's Department of Social Development (2016, p. 4) defines discrimination as:

Any act or omission, including a policy, law, rule, practice, condition or situation which directly or indirectly (a) imposes burdens, obligations or disadvantages on; and/or (b) withholds benefits, opportunities or advantages from, any person on one or more of the prohibited grounds, which include disability and any other ground that might disadvantage a person, undermines human dignity or adversely affects an individual's rights and freedoms.

South Africa's Department of Labour (2015, p. 10) and Department of Social Development (2016, pp. 4-5) adopt the United Nations' (2007) Article 2 definition of 'discrimination on the basis of disability':

Any distinction, exclusion or restriction on the basis of disability which has the purpose or effect of impairing or nullifying the recognition, enjoyment or exercise, on an equal basis with others, of all human rights and fundamental freedoms... It includes all forms of discrimination, including denial of reasonable accommodation.

Section 6 of the Promotion of Equality and Prevention of Unfair Discrimination Act (no. 4 of 2000; PEPUDA) infers that employers in South Africa are prohibited from discriminating unfairly against employees such as those who are hearing-impaired. In accordance, Section 9 of the PEPUDA, subject to section 6 of the Act, states that no party in South Africa (i.e. including employers) may discriminate unfairly against any individual in the country who has a disability (thus, hearing-impaired job candidates/employees included). Such discrimination may imply practices such as failing to eliminate obstacles that unfairly restrict their equity

and/or equal opportunities and/or failing to take the initiative to accommodate their needs. No section of the Promotion of Equality and Prevention of Unfair Discrimination Amendment Act (no. 95 of 2003) was found to contradict these citations of the PEPUDA.

Furthermore, Section 7(1) of the EEA prohibits unfairly discriminatory medical testing of employees. Section 8 of the EEA protects job candidates/employees from discrimination through biased evaluation. This section states that psychological testing or any related evaluations of *any* employee are prohibited unless the assessment being used adhere to the following criteria: (a) validity and reliability scientifically proven; (b) applied *fairly* to the employee group of interest; and (c) proven to unbiased against the employee group of interest. Section 4 of the EEAA (no. 47 of 2013), as an amendment to section 8 of the EEA, adds that the assessment measure should also have been certified by the Health Professions Council of South Africa or any other establishment that is legally sanctioned to certify tests or assessments for the employment field.

South Africa's Department of Labour (2015; section 8.3.1) adds that the above-mentioned testing must be applicable and fitting to the sort of work for which the applicant is being assessed. Thus, any testing that divert from the mentioned criteria, will be considered unfair discrimination. Furthermore, employers ought to avoid bias during the calculation and interpretation of the results (section 8.3.2). In addition, section 187 (1)(f) of the LRA states that dismissal of any employee on arbitrary grounds of disability alone will automatically count as unfair dismissal. However, section 187(2)(a) of the LRA qualifies that despite section 187(1)(f), a dismissal may be regarded as *fair* if the reason for it is based on (an) inherent requirement(s) of the particular job of interest. The LRA's 'Code of Good Practice: Dismissal' (pp. 150-153) lists considerations to distinguish unfair discrimination on the basis of disability.

Pressing social issue in the country that requires research

Regarding the criterion of a pressing social issue that requires research: Regulatory environments that forbid discrimination and promote vocational training and educational opportunities provide a critical stepping stone towards economic liberation (Selah & Bruyère, 2018). However, regulatory environments alone have not proven sufficient for practical intervention (Selah & Bruyère, 2018). Maja, Mann, Sing, Steyn and Naidoo (2011) point out that the practical implementation of South Africa's laws for employment equity and affirmative action concerning its individuals with disabilities is falling short.

Based on rationale by Tillet and French (2010), it can be deduced that the legal instruments address secondary issues instead of primary, underlying ones. Fagan and Jacobs (2009) imply that South Africa lacks specialist insight into the plight of its hearing-impaired individuals. Graham et al. (2014) attribute the case to the outlook that the South African authorities initially adopted towards individuals with disabilities. Such an outlook leads to a lack of initiative; insufficient development of specialist insight about disability groups and secondary factors that affect them. In the main, South Africa lacks its own context-specific theory about the country's disability groups. Graham, Moodley and Selipsky (2013) recommend that South Africa's research about disability groups should focus on the type of disability in order to make findings generalisable and develop insight about disability groups on individual level. Therefore, literature suggests that the topic of HIEs in South Africa is an issue that requires intervention, but that South Africa's level of empirical insight about this group is currently too limited to help realise the employment equity to which the country aspires.

Generally, literature covering HIEs in South Africa was found to be limited. As a result, the literature review included research about HIEs that was conducted prior to the year 2006; this includes a study from the year 1994 about HIEs within South Africa (Mthembu, 1994). Inherently, researchers enquired about the recurrence of comparable HR issues concerning HIEs in the country – considering the significance of the year 1994 in South Africa's context. Due to the limited research on South Africa's HIEs in particular, general studies about employees with disabilities were also reviewed. The reason was gaining further insight into the HRM climate that is likely to apply to HIEs within South Africa.

Researchers found that HRM issues that apply specifically to HIEs in South Africa at the year 1994 (Mthembu, 1994) do still emerge in comparable terms and conditions in the 'new' South Africa. The issues most relevant to mention in this study are: (a) lack of long-term employment (Gida & Ortlepp, 2007; Jakovljevic & Buckley, 2011; Komana, 2006; McKinney, 2013; Mthembu, 1994), (b) lack of career progress (Gida & Ortlepp, 2007; Komana, 2006; McKinney, 2013; Mthembu, 1994; Statistics South Africa, 2011) and (c) insufficient accommodation (Gida & Ortlepp, 2007; McKinney, 2013; Mthembu, 1994). Literature also mentions employers' poor compliance with affirmative-action policy (Gida & Ortlepp, 2007; Jakovljevic & Buckley, 2011; McKinney, 2013; Naudé, 2002).

The scientific research relating to HIEs in South Africa was found to be limited: a mere total of six scientific writings (Gida & Ortlepp, 2007; Jakovljevic & Buckley, 2011; Komana, 2006; McKinney, 2013; Mthembu, 1994; Naudé, 2002). That was the result of a thorough literature search by using Google Scholar and other relevant search engines.

Therefore, the researcher concluded that scientific literature has a general gap with regard to the topic of HIEs in South Africa. Studies focusing on HIEs' perceived job characteristics from the perspective of job demands/job resources were found to be limited in international literature and non-existent in South African ones.

To substantiate the above-mentioned research focus further, Kramer et al. (2006) found that valid sick leave of HIEs' correlate positively with having to communicate through noise, distinguishing sounds and effort in hearing as well as with perceived reverberation (i.e. lengthy sound and its resonance: Oxford dictionaries, 2018). The scholars summarised the noteworthy findings that HIEs perceive higher levels of background noise than their normally-hearing colleagues. This perception suggests that employees with hearing disabilities are generally more sensitive to background noise, and its excessive levels may lead to exhaustion and ultimately health-impairment among HIEs. Therefore, based on theory by Bakker and Demerouti (2018), it can be considered as a job demand. However, none of the items in the encountered South African JD-R scales (Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann, Mostert & Strydom, 2006) reflect job demands in such a sense.

Based on the gap explained above, the present study qualitatively explored job demands and job resources from the perspective of HIEs in South Africa. The focus for the research is thus, gaining scientific knowledge of the phenomenon and improving the perspective on this matter with a view to future research and practice.

Research design

The design of the investigation comprised a particular approach, strategy and methodology for the research.

Research approach

Qualitative research focuses exclusively on a phenomenon and population group of interest (Thomas & Magilvy, 2011) by identifying and describing how these participants form a psychological construction of the phenomenon (Gelo, Braakmann & Benetka, 2008). Accordingly, the researcher undertook an in-depth study to gain insight about HIEs (Thomas & Magilvy, 2011). Such practice enhances the insight about the population group in relation to the phenomenon of interest, in order to develop a practice that is more sensitive to such a group (Thomas & Magilvy, 2011). Data collection based on the qualitative approach is done in a non-numerical form (Gelo et al., 2008), in the case of this study the medium is text. Qualitative data considered adequate in light of the research goal is not limited to cases of data saturation; new depth and/or unnoticed themes are viewed as possible academic progress in studying the phenomenon (O'Reilly & Parker, 2012).

This study was also based on the social constructivist paradigm and followed a phenomenological approach. The social constructivist paradigm states that perceptions (e.g. about job demands/job resources) of the same objective reality (e.g. a job characteristic) can vary between parties (Creswell, 2009). The phenomenological approach is also applicable since the research acknowledged an established basis of concepts (job demands and job resources) but did not assume the target group of the study (HIEs in South Africa) relate to those concepts normatively (Willis, 2007).

Data collection practices did not interrupt the respondents' behaviour or intervene in their environment, which classify the observation as naturalistic (Jackson, 2008). In line with the qualitative approach, the following steps were taken: (a) the data were collected while the subjects were in their natural settings (Creswell, 2013); (b) the procedures in which the respondents participated were not manipulated (Johnson & Christensen, 2012); (c) the participants were allowed optimum freedom to respond within the parameters of the research

design (Struwig & Stead, 2011); and (d) inductive reasoning (starting from the experiences of the participants at hand) was used to interpret the data (Creswell, 2013).

Research strategy

The research comprised the collection of detailed in-depth data within system- and time-based parameters and reported through case-based themes. In this regard, the research strategy can be classified as a *case study* (Creswell, Hanson, Plano Clark & Morales, 2007). The strategy is appropriate to investigate a particular social phenomenon (Babbie, 2013). In the case of the present study, this phenomenon entails elements of workplaces that HIEs in South Africa experience as job demands/job resources.

Research method

The research method consisted of a literature review, a particular research setting, entrée and establishing researcher roles. Furthermore, the focus was on sampling, collection methods, recording of the data, as well as analysis, and strategies to ensure quality data. This was followed by the explication of reporting style and discussion of ethical considerations.

Literature review

A literature review was conducted by focusing on the following themes: HIEs, job demands, job resources, and job characteristics. The following keywords were used in the literature review: ‘hearing-impaired’ or deaf or ‘hard-of-hearing’ or disability or disabled and employee, and ‘job demands’ or ‘job resources’ or ‘job characteristics.’

Google Scholar, EBSCOhost and ResearchGate were chosen as the modal data bases. The library of North-West University was also consulted. Alternative databases considered were JSTOR, library catalogues, LexisNexis, Sabinet Reference, SA ePublications, Scopus, Science Direct, Web of Science and Google.

The following peer-reviewed journals were used: *South African Journal of Industrial Psychology*, *Journal of Vocational Behaviour*, *Anxiety, Stress & Coping*, *Journal of Personnel*

Psychology, International Journal of Audiology and Journal of the American Deafness and Rehabilitation.

Research setting

The research setting concerned, both, workplaces where staff establishments mostly were made up of HIEs and those whereby the staff were mostly made up of hearing employees. The research settings were not limited to any specific basis. Respondents were asked to complete the data-collection procedures only while on duty, towards the end of the workday. The data were collected over the course of five work days.

Entrée and establishing researcher roles

Consent was obtained from the Scientific Research Committee of the North-West University's School of Industrial Psychology and Human Resource Management. The approved research proposal was submitted to the Research Ethics Committee, who also gave consent (ref: EMSMHW16/06/10-01/05; appendix A).

Contact was initiated with a potential facilitating organisation that specialises in training and development of hearing-impaired individuals in South Africa. This organisation is linked to a significant number of HIEs in South Africa who are distributed across a range of work settings. The researcher informed the other party about the purpose of the research, potential contributions and how the gate-keeping organisation could help the researcher gather respondents. The correspondence occurred through textual communication between the researcher and the Managing Director and the Human Resource (HR) Manager of the facilitating organisation. Thereafter, the HR Manager distributed the provided research invitation (see Appendix B) to supervisors of suitable candidates having them forward it to the relevant employees. The HR Manager also distributed an invitation to employees within their organisation who gave their consent to voluntarily participate (see Appendix C).

There is a clear difference between the invitations. Where the second invitation mentioned that permission to participate had already been obtained from the supervisor, the first-mentioned invitation didn't. The research invitations were distributed through e-mail. The invitation provided explanations about the following relevant aspects of the research: (a) background to

and purpose and procedures of the study; (b) the allowed contributions by the selected participants; (c) the research ethics adhered to and the accompanying procedures that they must follow; (d) that permission from an immediate supervisor was required; and (e) confirmation that by participating in the study the individual had obtained permission from their immediate supervisor.

The language of the text was simplified given the general chance that a deaf respondent may be less literate (Spencer & Marschark, 2010). Several respondents were acquired by using the snowball sampling method (see Appendix D). The questionnaires were provided to respondents individually on a day-to-day basis, or all questionnaires were sent at once. The manner adopted towards individual respondents was based on issues they indicated that they prefer. Reminders about returning the day's completed questionnaire were sent to the respondents daily. If a respondent wanted the researcher to cease doing so, the request was respected.

All correspondence was conducted electronically and the discussions on research procedures also provided access to translations in South African sign language (SASL). Moreover, the language of the content was simplified to be more understandable. Attention was paid to content validity of the documents and validity of the SASL interpretations. The researcher circulated the documents between the interpreter and his supervisor throughout their development.

The researcher was responsible for coordinating the processes, collecting and storing the data, ensuring that ethical standards were adhered to as well as organising, analysing and interpreting the data and reporting the findings.

Research participants and sampling methods

The attained sample consisted of eight pre-lingually deafened employees, four post-lingually deafened employees, and two hard-of-hearing employees ($N = 14$).

The research used purposive and quota sampling. *Purposive* sampling means limiting potential respondents to individuals based on criteria according to which they stand a significant chance of yielding qualitative data of interest (Etikan, Musa & Alkassim, 2016). Such sampling is appropriate to a qualitative inquiry with a specific aim (Maree & Pieterse, 2007). In this

regard, analysis was limited to responses from individuals who indicated two facets, namely (a) hearing-impaired; and (b) at the time employed in South Africa (in terms of section 200A(1) of the Labour Relations Act, no. 66 of 1995). *Quota* sampling assigns aspired respondent's quotas to the identified sub-categories of the respondent population (Monette, Sullivan & DeJong, 2011). The applicability of 'quota sampling' is not limited to a perfectly proportionate number of respondents (Maree & Pieterse, 2014). Of these respondents were acquired through snowball sampling or contacted through references from other survey respondents (Black, 2010).

The researcher aimed for each quota to comprise at least 10 representatives of each of the three sub-groups: pre-lingually deafened employees, post-lingually deafened employees and hard-of-hearing employees. This goal was not achieved. However, the 14 individuals who provided responses did yield a degree of data that allowed the researcher to identify certain themes and sub-themes.

The SASL translations of items for the purposive-sampling questionnaire were validated through individuals who are proficient in SASL as home language (see Appendix E). Table 1 below outlines the characteristics of the participants.

Table 1

Characteristics of participants (N = 14)

Item	Category	Frequency	Percentage
Section 200A(1) [Act 66/95] applies the respondent's work situation	Yes	14	100
	No	0	0
Hearing loss: General category	Deaf	12	85.7
	Hard-of-hearing	2	14.3
	No hearing loss	0	0
Hearing loss: Permanency	Permanent	14	100
	Not permanent	0	0
Hearing loss: Laterality	Bilateral (both ears)	11	78.6
	Unilateral (one ear)	3	21.4
Hearing loss: Symmetry	Degree of hearing loss equal among ears	7	50
	Degree of hearing loss unequal among ears	4	28.6
	Hearing loss did not occur to both ears	3	21.4
Hearing loss: Stage of onset (referring to both general categories)	Pre-lingual hearing loss	9	64.3
	Post-lingual hearing loss	5	35.7

Table 1, continued

Characteristics of participants (N =14)

Gender	Male	8	57.1
	Female	6	42.9
Home language	South African sign language	4	28.6
	English	6	42.9
	Afrikaans	1	7.1
	Sotho	1	7.1
	English & SASL	1	7.1
	Tswana & SASL	1	7.1
Age group (years)	20 – 29	2	14.3
	30 – 39	9	64.3
	40 – 49	2	14.3
	50 – 59	1	7.1
Highest level of formal qualification	Grade 10/Std 8	1	7.1
	Grade 11/Std 9	2	14.3
	Grade 12/Matric	5	35.7
	Certificate	3	21.4
	Diploma	2	14.3
	Advanced Diploma	1	7.1
Area of tertiary qualification	Electrician	1	7.1
	Information Technology	2	14.3
	Hotel reception	1	7.1
	Administration	1	7.1
	Not clearly indicated	1	7.1
	Have no tertiary qualification	8	57.1
Workplace predominantly compiled of hearing people?	Yes	7	50
	No	6	42.9
	Missing value	1	7.1
Industry	Education	5	35.7
	Information Technology	2	14.3
	Law	2	14.3
	Food	1	7.1
	Finance	1	7.1
	Hospitality	1	7.1
	Generator & plan hire	1	7.1
	No response	1	7.1
Job title	Manager: Credit risk	1	7.1
	Manager: Quality	1	7.1
	Manager: Stock	1	7.1
	Facilitator: Information Technology	2	14.3
	Facilitator: End-user computing	1	7.1
	Facilitator: no further specification	2	14.3
	Scanner: Administrator	1	7.1
	Scanner: Clerk	1	7.1
	Electrician: Underground and surface	1	7.1
	Spray painter	1	7.1
	‘Logistic’	1	7.1
	Handyman	1	7.1

Table 1, continued

Characteristics of participants (N =14)

Period in current job	1 – 15 months	4	28.6
	16 – 30 months	2	14.3
	31 – 45 months	0	0
	46 – 60 months	5	35.7
	61 – 75 months	1	7.1
	76 – 90 months	1	7.1
	324 months	1	7.1

Table 1 above shows that all the participants whose feedback was included in the data analysis indicated that one or more of the LRA's section 200A(1) criteria (Act no. 66 of 1995) did apply to their employment situation; they also confirmed that their hearing loss was permanent. The sample consisted predominantly (86%) of deaf employees. Most (79%) of the respondents' hearing-impairment applied to both ears, while 50% reported that the degree of hearing loss was equal among both ears. Furthermore, most (64%) of the respondents reported that their hearing loss occurred before they began learning verbal communication.

The male gender (57%) was the modal among the sample, similarly English as home language (43%). Regarding age groups, the majority of the respondents (64%) fell within the interval of 30 to 39 years. Most of the respondents (57%) indicated that they have no tertiary qualifications. The highest reported level of formal qualification was that of Advanced Diploma (one respondent: 7% of the sample); the lowest reported level of formal qualification was that of Std 8/Grade 10 (one respondent: 7% of the sample); Matric/Grade 12 was the modal level of formal qualification (36%), with Information Technology the modal area of tertiary qualification (14%).

The most common industries in which the respondents worked were those of Education (36%), Information Technology (14%) and Law (14%). Half of the respondents (seven) indicated that their workplaces consisted predominantly of hearing staff, whereas 43% worked among mostly hearing-impaired staff. One respondent (7%) did not provide feedback about the inquiry. Education was indicated as the most common industry (36%), followed by Information Technology and Law – both applying to 14% of the sample respectively. The modal level of job title (36%) was that of facilitator and 21% reported occupying management-level jobs. Time spans between 46 and 60 months were the most common occupational periods that job positions were kept (36%).

Data collection methods

The self-administered questionnaire was utilised. The questionnaire was compiled of dichotomous questions about biographical characteristics and open-ended questions for the qualitative data. In open-ended questioning, a respondent is 'asked to 'think back' and reflect on personal experiences' before responding to the query of interest (Greef, 2011, p. 370), possible response categories are not offered (Kumar, 2014). Open-ended questioning promotes acquisition of in-depth detail. Furthermore, the respondent's answer is in their own words, thus more accurately reflecting *their* perceived experienced (Kumar, 2014).

The respondents' choice of questionnaire form was either *web survey* or through a Microsoft Word document. These formats were provided in accordance with respondents' indicated preference. In addition to the English text of the questionnaire, reference was provided to video clips in an SASL translation of each question.

In the *web survey* version of the questionnaire, each question was accompanied by an icon that could be activated for the SASL interpretation of the question. In the case of a web survey, the questionnaire is accessed through a website (i.e. online). Respondents reply to the open-ended questions by typing directly into a provided boxed area (Bryman, 2016). In the case of this study, each boxed area was below its query and specified. For the *Microsoft Word* documents, each question was complemented by a link to the SASL interpretation of the inquiry.

Bolger, Davis and Rafaeli (2003) advise that in order to avoid irrelevant data from the respondents, effort must be made to help them receive the inquiry accurately. According to Spencer and Marschark (2010), there is a significant chance that randomly-selected deaf respondents may be textually illiterate. The SASL interpretations were validated through backward translations by means of an independent expert proficient in SASL as home-language and with NQF 7-efficiency in English. In backward translation, the original items are translated into the home language of a target population (by one translator) and then translated back to the original language (by another translator). Correspondence is evaluated by judging the consistency between the original texts and the backward-translated (Foxcroft & Roodt, 2018).

The data were collected over five workdays. Each day a new questionnaire was used. The respondents were asked to conclude each workday by returning their completed prescribed self-

administered questionnaires. The exchange of the collected data was done electronically. Respondents were asked, as part of the invitation, to avoid discussing their responses with each other until after the data collection phase.

The open-ended questions for data-collection days 1 to 4 are presented below (first the text, then in italics the backward translation of the SASL rendition):

1. When thinking about all of the things that happened to you today while at work, what are the experiences that took energy from you? Please list all of the cases and explain each in detail. *When you think about all the things that happened to you today while at work, what are the experiences that took energy from you? Please list all the cases and explain each in detail.*
2. When thinking about all of the things that happened to you today while at work, what are the experiences via which you learned? Please list all of the cases and explain each in detail. *When you think about all the things that happened to you today while at work, what are the experiences which you learned from? Please list each case and explain each in detail.*
3. When thinking about all of the things that happened to you today while at work, what are the experiences that made you feel excited or motivated? Please list all of the cases and explain each in detail. *When you think about all the things that happened at work today, what experiences made you feel excited or motivated? Please list each experience in detail and explain clearly what happened.*
4. When thinking about all of the things that happened to you today while at work, what are the experiences that assisted you to complete the tasks that were required? Please list all of the cases and explain each in detail. *When thinking about all of the things that happened to you today while at work, what assisted you in completing the tasks that were required? Please list all the cases and explain each one in detail.*

The questionnaire formulated for the fifth days' data collection aimed to lessen the chance of limiting the data to job demands/job resources which the respondents experienced during previously-recorded workdays. The self-administered questionnaire that was sent on the last day of data collection, summarised the previous days' responses the respondent provided under each question. Thereafter, the questionnaire enquired whether respondents could recall other practical experiences, besides the listed ones, from the last six months that led them to

experience the listed symptom of job characteristics, and to list these encounters. The layout of the questionnaire for the final data collection session is provided below, word-for-word as it was formulated:

All of the work experiences of the last four work days that you listed as (the effect of the job characteristic of interest was listed) are listed below:

Day 1:

Day 2:

Day 3:

Day 4:

Please tell us about any other work experiences from the last six months that... [the effect of the job characteristic of interest was listed]. In the box below, please list all of the cases and explain each in detail.

The format above was used on day 5 to inquire about experiences that (a) took energy from the employee (job demands); (b) the employee learned from (job resources, learning); (c) made the employee feel excited or motivated (job resources, motivation); as well as about those that (d) the employee experienced as complementing task completion (job resources, task completion). SASL translations were also seen to. (An index of the questions and the links to the online videos of the SASL interpretations is available in Appendix E.)

The data collection was initiated as a pilot study. This entails a small-scale testing of the data-collection method to assess its feasibility for gathering data on a larger scale according to the goal of the research (Leon, Davis & Kraemer, 2011). The aim of the pilot study was assessing the effectiveness of the posed questions as well as its backward SASL interpretations. After the pilot study indicated that the data from the beginning were generally valid to the investigation, the researcher proceeded to the overall data collection.

Data recording

Respondents were asked to complete the self-administered questionnaires while within their work environments. Either of the two versions of the questionnaire could be completed through a computer, smart phone or tablet. The final copies of the data in the Microsoft Office documents were transferred as exact copies of the source texts. The storage location of the data remained confidential to the researcher and was not publicly accessible. The gathered information reached data saturation, no new themes or sub-themes were noticed to emerge during the course of the data collection.

Strategies to ensure quality and integrity of the data

The strategies utilised to ensure the internal and external validity of the data are explicated below.

Prolonged engagement: Prior to data collection, the researcher established trust and fostered a climate of open communication with the target group (Teddie & Tashakkori, 2009). The researcher is related to deaf individuals and therefore already had secondary exposure to hearing-impaired individuals within South Africa. The researcher also gained exposure within an organisation predominantly staffed with HIEs, which helped give him the HIEs perspective on the phenomenon during the data analysis.

Triangulation techniques: were followed to help avoid bias (Teddie & Tashakkori, 2009). This means data were analysed by means of multiple sources – including the literature review and analysts (as advised by the authors). Such a practice helps ensure the objectivity of the evaluation (Shenton, 2004).

The afore-mentioned practices promote internal validity or credibility of a study (Shenton, 2004).

Dependability: The research procedures were further documented clearly and concisely to allow readers to conduct their own quality-assessment of the research procedures (Shenton, 2004). Such record will allow other parties to evaluate the dependability of the qualitative investigation's data (Shenton, 2004).

Thick descriptions: The data-recording aimed to obtain as extensive detail as possible. Such rich data ensured the interpretations and conclusions of the study were evidence-based (Teddie & Tashakkori, 2009).

Transferability: effort was made to strengthen the external validity of the data by clearly describing the outlying parameters of the contexts from which the information was obtained. Such an approach helps investigators estimate the extent to which the findings (as outcomes of the specific context) can apply to the workplace setting of their interest (Shenton, 2004).

Data analysis

The data analysis was aimed at capturing categories from the information without having to consider previously defined structures or knowledge – since prior research about the phenomenon of interest is severely limited (Elo & Kyngäs, 2008). Accordingly, the method that was chosen for the present study, is inductive qualitative content analysis (Elo & Kyngäs, 2008). Content analysis is the more suitable form of qualitative data processing in order to research a topic about which, to date, little is known (Vaismoradi, Turunen & Bondas, 2013).

For such an, inductive, qualitative content analysis, the outline was used of the approach by Elo and Kyngäs (2008). The successive research phases are described below.

Preparation: The primary researcher became immersed in the qualitative data during the preparation phase and engaged in the ‘climate’ of the discussion. Participants’ responses reflecting their experiences of job demands and resources were read several times.

Organising: The qualitative data were organised by using open coding, thereby creating categories and abstraction of the topic.

Open coding: the researcher and supervisor determined labels that could be assigned to the contents of the transcriptions. These transcriptions were revised until every section was coded. The labels were formulated through brainstorming during this stage.

Creating categories: The individual labels which were formulated were grouped and a narrower range of overarching group-specific headings established (i.e. categories). The

purpose of creating categories was to identify overarching themes of the recorded job demands and resources, while simultaneously seeking to recognise sub-categories.

Abstraction: The dimensions that were identified during the previous step were described in terms of the general structure. This was done by assigning titles that characterise the content to the themes and sub-themes, extracted from the categories (job demands and job resources). The research sought to do so inductively, without reverting to previously defined knowledge or labels.

Reporting: The process of data analysis was defined, and the conceptual model that emerged from the analysis described and discussed thoroughly.

Reporting style

The findings were reported from a descriptive viewpoint, which Glesne (2006) labels as the interpreter perspective. Accordingly, the researcher aimed to process the gathered data through a third-party perspective, which was reinforced by using the *triangulation* of analysts. This critical processing of the data was done to provide objective reflection about observations that were made. Reporting took place in the form of a qualitative narrative, which entailed a rich and thick description of the identified structure from the phenomenon. In the report, the narrative is substantiated by direct citations as excerpts from the data.

Ethical considerations

The main ethical considerations were adhered to, as advised by Strydom (2011). The potential participants were informed about the aim of the investigation, the estimated duration of their participation, the processes to be implemented, and the credibility of the researcher (*informed consent*). They were also informed that participation is voluntary and that they are entitled to withdraw their participation from the study at any stage, without repercussions (*voluntary participation*). Furthermore, no identities of respondents would be revealed (*anonymity*) and confidentiality maintained throughout the research process. Well-thought out and simplified language was used to avoid reinforcing mental barriers and/or negative stereotypes, which may be linked to hearing-impaired individuals (*avoidance of harm*). If a participant did not wish to

share further information about a topic when probed to do so, the researchers respected the wish (*right to privacy*).

Regarding *publication of findings*: The researcher made an effort in each phase of the research procedure. The aim was to (a) present all relevant information understandable without compromising academic standards; (b) avoid biased language towards any group on the basis of age, gender, or disability; (c) prevent possible plagiarism; (d) ensure against data manipulation; (e) provide accurate and adequate reflection of the findings; and (f) acknowledge and specify limitations of the investigation.

The respondents were informed prior to their participation through the research invitations about these ethics foundational to the data collection procedures. SASL interpretation was included in order to ‘ensure’ their informed consent.

Results

Findings were drawn from the qualitative data obtained from HIEs by using the self-administered questionnaire. Analysis of the data suggested themes and sub-themes from the basic theoretical categories. These were captured from responses to the questions in the self-administered questionnaire and in light of the specific research objectives of this study. The questionnaire focused on job demands, and job resources in terms of learning, motivation and task completion.

The categories, themes and sub-themes are presented and discussed in the following sections and are substantiated by relevant direct quotations from respondents. Each theme/sub-theme is supported by a citation of the two aspects of data which the researcher consider the most relevant. In each case, the participant who provided the response, is indicated after the citation – e.g. ‘P1’, labelling the respondent as Participant no. 1, et cetera.

The findings are presented in the same order as the questions were posed in the questionnaires, starting from Table 2, Category 1, until Table 5, Category 4.

Category 1: Job demands

The question posed to the respondents based on the research objective of determining job demands of HIEs in South Africa, is presented below (first the source text, thereafter the backward translation of the SASL rendition, in italics):

When thinking about all of the things that happened to you today while at work, what are the experiences that took energy from you? Please list all of the cases and explain each in detail. *When you think about all the things that happened to you today while at work, what are the experiences that took energy from you? Please list all the cases and explain each in detail.*

The themes and sub-themes captured from the responses are illustrated in Figures 1.1 and 1.2 below, and reported in Table 2 thereafter.

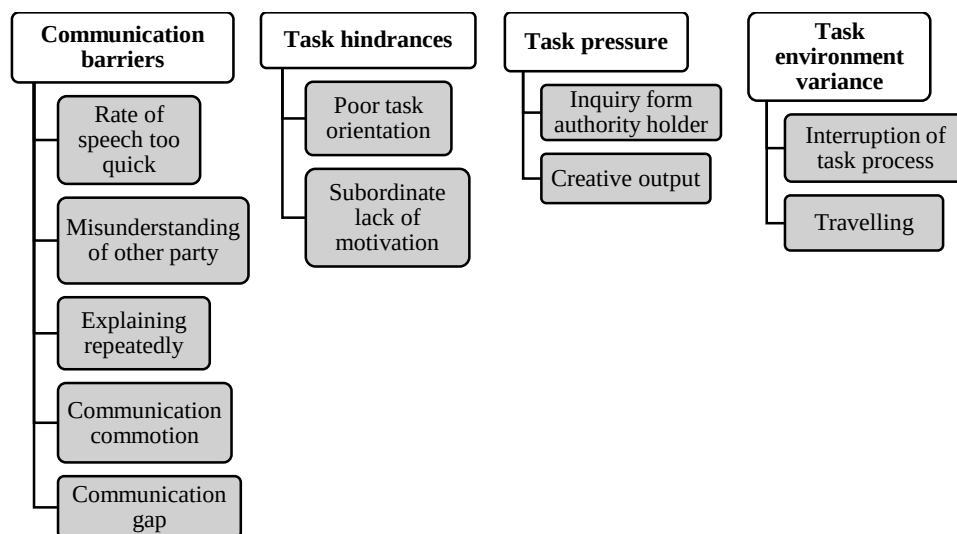


Figure 1.1: Job demands found to be experienced by HIEs in South Africa

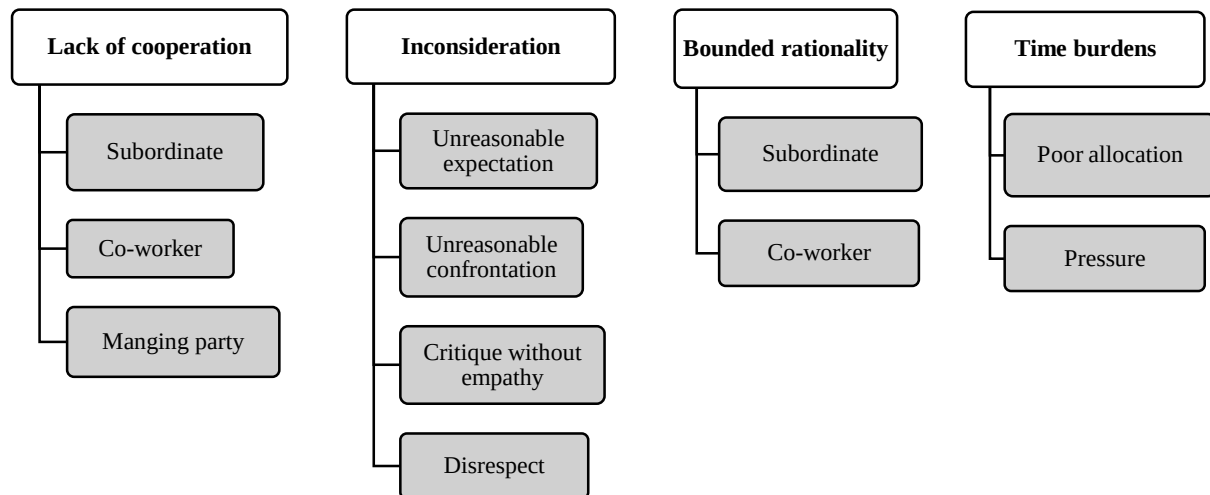


Figure 1.2: Job demands found to be experienced by HIEs in South Africa, continued

Table 2

Job demands which HIEs in South Africa experience

Theme	Sub-theme	Response
Communication barriers	Rate of speech too quick	'People assume when they approach you that you can hear them and start babbling immediately.' (P5) 'I'm struggling to communicate faster even when a person talk too fast and I can't keep up with every words though.' (P6)
	Misunderstanding of other party	'... learners who are struggled to understand ...' (P1) '... it is hard for me because there are lots of misunderstandings... They have sign language but not enough...' (P4)
	Explaining repeatedly	'... having to constantly explain ...' (P5) 'I had to explain to them twice...' (P9)
	Communication commotion	'In an open-plan environment with people talking all around it is hard to decipher who is actually addressing you and this can make one quite tired.' (P5) 'There are a lot of communication going around and I had to ask them to write down on paper for what they order while I do not understand what they are saying.' (P6)
	Communication gap	'Difficult communication that took me lot of effort to find ways of communication with people.' (P6) 'In the beginning was so hard for me because I am profound deaf and they don't have interpreter.' (P8)
Task hindrances	Poor task orientation	'I did do drawing as what he want but not explain me enough.' (P4) 'I needed a partner to work with and see what they do and how it done in the job, which will help me understand better.' (P6)
	Subordinate lack of motivation	'Students absent made me disappoint. That lost energy.' (P3) 'Learner's lack of motivation ...' (P9)
Task pressure	Inquiry from authority holder	'Some time I get stress with email from moderator.' (P3) '... [boss] asked me why I took so long to complete my drawings.' (P4)
	Creative output	'Do the drawing of conveyor in new ways as reduce for less cost.' (P4) '... having a meeting to come up with the idea ...' (P14)

Table 2, continued

Job demands which HIEs in South Africa experience

Task environment variance	Interruption of task process	‘...I am fortunate that my team know that I can only hear on the right-hand side, and they normally conduct traffic on that side. In an open-plan environment, with people talking all around, it is hard to decipher who is actually addressing you and this can make one quite tired...’ (P5) ‘When I started my drawing, then my boss asked me to do delivery now. So I saved my drawing. When I returned from delivery. Then I catch up my drawing then... [second in charge] asked me to watch her dogs or staffs while... [boss] and...went an meeting; then I saved my drawing then I returned to my drawings ... Lots of interruption ...’ (P4)
	Travelling	‘Underground its nice jobs but not too hard work, but take lots of energy to up and down.’ (P8) ‘... traveling to Braamfontein from Centurion, really tired from driving in the traffic.’ (P14)
Lack of cooperation	Subordinate	‘Dealing with unskilled staff and having to constantly explain procedures which their immediate bosses should cover.’ (P5) ‘Learner’s lack of motivation of their gaining knowledge as they did not want to research more work of the tasks that I gave them.’ (P9)
	Co-worker	‘I learned that a large portion of the staff are only interested in what they are working on and have no time to pass knowledge on, or are only trying to enhance their careers at the expense of others. There would appear to be lack of respect for others, which is very disheartening.’ (P5) ‘This morning have a meeting with my supervisor. Only artisan attend for the meeting.’ (P8)
	Managing party	‘... (boss) asked me why I took so long to complete my drawings. And I told him that he didn’t give me chance to finish my drawing. Lots of interruption.’ (P4) ‘In the beginning, the company was not deaf friendly at all ... the former manager was not willing to co-operate with me ... it was hell to deal with them.’ (P7)
Inconsideration	Unreasonable expectation	‘... [boss] asked me why I took so long to complete my drawings. And I told him that he didn’t give me chance to finish my drawing.’ (P4) ‘Also when a person said something when I do not understand, they get frustration.’ (P6)
	Unreasonable confrontation	‘My dad [boss] asked me why I took so long to complete my drawings. And I told him that he didn’t give me chance to finish ...’ (P4) ‘The company was not deaf friendly at all and I got several verbal warnings and seven warning letters.’ (P7)
	Critique without empathy	‘I feel mostly frustrated. My colleague respond to me, “Relax ...”’ (P2) ‘I showed him my idea. ... [boss]’ reaction is: “Expensive, not right.” No appreciation ...’ (P4)
	Disrespect	‘When I have no work and I have asked my boss to give me some drawings and he said okay will give me later. I did wait and wait till end of day. Had some time like this again and again.’ (P4) ‘There would appear to be lack of respect for others, which is very disheartening.’ (P5)
Bounded rationality	Subordinate	‘These learners who are struggled to understand during the training.’ (P1) ‘Dealing with unskilled staff and having to constantly explain procedures which their immediate bosses should cover.’ (P5)
	Co-worker	‘I am constantly amazed by people’s lack of common sense and I find this debilitating and it drains me ... people are clearly not taught [taught] to think for themselves or manage their tasks.’ (P5) ‘After five years they understand me better; it was hell to deal with them.’ (P7)

Table 2, continued

Job demands which HIEs in South Africa experience

Time burdens	Poor allocation	‘Procrastination – complete task at the last day.’ (P2) ‘My boss had gave me job to do drawing from this morning. I did do drawing as what he want, but not explain me enough. He find it all wrong from noon time and I did do again. But he not think twice that I just start in noon time and won’t be finish at end of day today. He still pushing me as he need it today. But he not explain me enough.’ (P4)
	Pressure	‘... difficult to ... and meet all deadlines because of the training schedule is very tight.’ (P1) ‘It all about time to hasten everything.’ (P6)

*P = participant

From Table 2 above, it is clear that HIEs in the present study experienced the following job demands: *communication barriers*, *task hindrances*, *task pressure*, *task environment variance*, *lack of cooperation*, *inconsideration*, *bounded rationality*, and *time burdens*. The following paragraphs provide a description of each theme and its accompanying sub-themes.

Communication barriers: Respondents indicated that non-hearing-impaired people’s rate of speech can be experienced as too fast for their degree of audio receptivity. Therefore, a HIE may find it difficult to follow what is being/has been said and/or to respond at a matching rate. It was also found that HIEs experience that having to explain repeatedly takes energy out of them. This applies to the context of HIEs explaining to hearing people as well to other hearing-impaired individuals. Misunderstanding of the other party was another sub-theme that was identified as a communication demand. The sub-theme of communication commotion was extracted from cases where HIEs found themselves surrounded by several instances of communication, which makes it difficult to follow the discussion directed to them. The last sub-theme, communication gap, points out the difficulty and effort that HIEs experience when there are gaps in communication with work associates.

Task hindrances: Respondents described cases of poor task orientation to be experienced as energy-consuming. Lack of motivation among subordinates is another sub-theme.

Task pressure: HIEs to experienced enquiry from a higher authority as energy-consuming. HIEs also reported being urged to develop a new perspective (*creative output*) to also be experienced as such.

Task environment variance: Interruption of task process was found to occur in terms of social traffic and inherent interruption of task processes. The one form of interruption concerned the audio sense, people talking all around and that interrupting the HIE's audio reception of task-related information. The other form of interruption concerned social parties entering the HIE's environment while the HIE was busy with a task, and those social parties delegating additional tasks to the HIE – implying the newly-delegated tasks to be more urgent than the task that the HIE was initially busy with. Feedback from HIEs also indicates that they experience travelling as part of their occupation, as a job demand.

Lack of cooperation: From the HIEs' responses it is clear that they view lack of cooperation as a job demand in interaction across management levels. This comprises the levels of subordinate, co-worker, and management.

- *Subordinate:* In one case, a HIE had to take on additional work since their subordinate did not deliver the required service; in another case, a sub-ordinate did not complete a task.
- *Co-worker:* Employees neglect to render mutual support when possible; in another case, a co-worker failed to take on personal responsibility as part of the team.
- *Management:* Managing parties fail to cater for unique needs of the HIE.

Inconsideration: One can label of the situations that HIEs experienced as job demands as *unreasonable expectations*. Noted examples are: being scorned at for failing to complete a task without being given a fair chance; inconsideration for their condition of being hard-of-hearing/deaf. *Unreasonable confrontation* is another socially-related matter that HIEs reported as sapping their energy. Both mentioned cases entailed a HIE who was reprimanded by a party whose perspective showed that he/she was not yet well-informed about such disabilities. In the one case, the HIE was deemed as the culprit, where the confronting party (apparently) did not recognise his/her own contribution to the undesired outcome. The other case was when a HIE was warned without a fair procedure being followed.

When discussing *inconsideration*, respondents suggested that critique of HIEs lacked empathy. Such critique was often based on inconsideration for the emotional state of a HIE at the time and without a constructive tone. Regarding the final sub-theme, one respondent referred

directly to *disrespect* among work associates, but did not imply the attitude was directed towards them, as HIEs, in particular. However, another response did focus on behaviour towards HIEs in particular. This respondent's feedback generally indicated a tone of disrespect from their superior towards them.

Bounded rationality: This applies to HIEs' subordinates and co-workers and are considered as job demands in the present study. Bounded rationality of subordinates' points to delayed comprehension; that of co-workers to lack of personal autonomy and an insufficient perspective on the situation of HIEs.

Time burdens: Time were allocated poorly in terms of the following aspects: the person leading the HIE in a task directing the process in a manner that wasted the HIE's time, and outcomes of procrastination. Pressure was experienced in terms of borderline time insufficiency (e.g. deadline becoming impractical due to initial time wastage) and continually being pressed for time.

Category 2: Job resources, learning

The following question, based on the research objective, was posed to determine learning-related job resources of HIEs in South Africa (first the text, then the backward translation of the SASL rendition):

When thinking about all of the things that happened to you today while at work, what are the experiences via which you learned? Please list all of the cases and explain each in detail

When you think about all the things that happened to you today while at work, what are the experiences which you learned from? Please list each case and explain each in detail.

The themes and sub-themes that were found are illustrated in Figure 2 below and reported in Table 3 thereafter

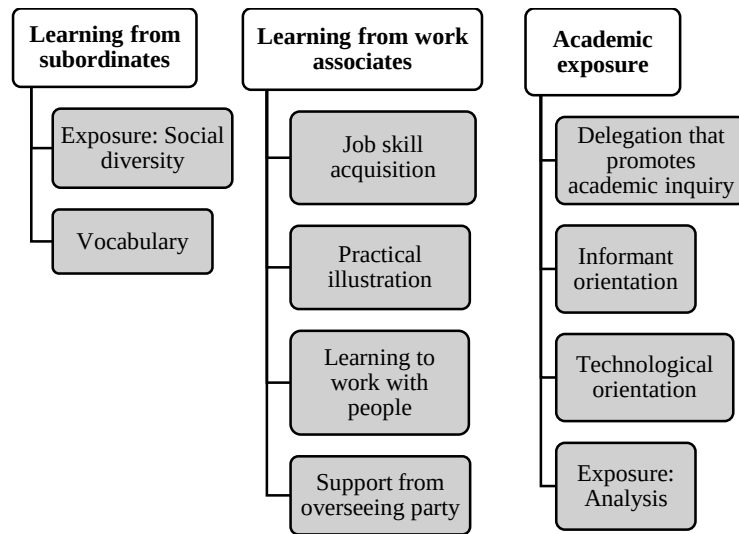


Figure 2: *Job resources which HIEs in South Africa were found to experience in terms of learning*

Table 3

Job resources in terms of learning experienced by HIEs in South Africa

Theme	Sub-theme	Response
Learning from subordinates	Exposure: Social diversity	‘I had this new experience at work is that I work with different learners from different backgrounds ...’ (P1) ‘I learn many things everyday, because I work with learners and learners are different.’ (P3)
	Vocabulary	‘... especially when I learn new different sign language from each learners ...’ (P1) ‘I learnt new words when the learner gives his own presentation of the task I gave.’ (P9)
Learning from work associates	Job skill acquisition	‘...Dealing with deadline pressure. Learned new things that I developed my skills.’ (P2) ‘I share with my artisan. They are good team work. I learn some from them like fitter and boil maker ... I love to learn something new.. Let me improve my level of quality.’ (P8)
	Practical illustration	‘...help my boss to remove security bar for PC from table.’ (P4) ‘Hand-on learning is a form of experience learning.’ (P10)
	Learning to work with people	‘Teach me about the value and challenges of working with others.’ (P2) ‘I learnt from other that I must be patient with people or boss or learners...’ (P3)
	Support from overseeing party	‘Facilitators show me how to reduce stress from workload.’ (P2) ‘... if any problem and I don't know about it and I always ask my foreman or artisan to help or advice.’ (P8)

Table 3, continued

Job resources in terms of learning experienced by HIEs in South Africa

Academic exposure	Delegation that promotes academic inquiry	'New challenges I faced ... Updating all weekly plans was convenient for me to allocate and complete the tasks. To prompt, assess, encourage and guide the learners to achieve the learning outcomes. To provide feedback on the learners' progress towards achieving the learning outcomes. I had designed the assessment tasks.' (P2) 'I have a job that requires researching of assets and their applications as well as the industry to which they pertain, so I am constantly learning every day.' (P5)
	Informant orientation	'... better understanding of how company work like to give deaf employee a completed company policy handbook and allow to read careful each pages, ask them questions if not understand.' (P7) '... if any problem and I don't know about it and I always ask my foreman or artisan for advice' (P8)
	Technology orientation	'For the last six months I've experienced a lot through computer, especially movie editing and also did animation too.' (P6) 'Visio [visual illustration computer application software].' (P11)
	Exposure: Analysis	'A moderator's clear explanation strike me. I learn a lesson to make much pressure to complete the tasks.' (P2) 'I have a job that requires researching of assets and their applications as well as the industry to which they pertain, so I am constantly learning every day.' (P5)

*P = participant

From Table 3 above it is clear that HIEs in this study experienced that the following job resources enhanced their learning: *learning from subordinates*, *learning from work associates* and *academic exposure*.

Learning from subordinates: HIEs reported that exposure to social diversity was enlightening. One respondent drew attention to demographic diversity in particular. Respondents also mentioned that interaction with subordinates helped broaden their vocabulary.

Learning from work associates: HIEs in the present study pointed out that interaction with work associates allow them the opportunity to learn new job-related skills. According to one respondent, such interaction enable HIEs to improve the quality of their output. It was mentioned that practical illustrations serve HIEs well in the learning function. One respondent strongly highlighted practical engagement as an important learning aspect. Interaction with work associates was also suggested to serve HIEs' learning well, by allowing them opportunities to learn to work with people. HIEs also stated that support from the overseeing party enable them to overcome barriers to completing their task.

Academic exposure: In this study, HIEs also reported that their learning is promoted through job delegation that encouraged them to undertake academic data collection and analysis. Thus, orientation to sources for enquiries particular to their occupation also enhanced the learning of HIEs. Respondents also reported that technological orientation helped HIEs getting academic exposure. One respondent indicated that computer usage over the past six months enabled him/her to gain extensive knowledge about skills relevant to the field of work. Job processes that exposed HIEs to analyses were reported to enhance learning as well. That is, observing experts in the process of analysing as well as being led to engage in own analyses.

Category 3: Job resources, motivation

The following question was posed (according to the research objective) to determine motivation-related job resources of HIEs in South Africa (first the text; then the SASL rendition in italics):

When thinking about all of the things that happened to you today while at work, what are the experiences that made you feel excited or motivated? Please list all of the cases and explain each in detail. *When you think about all the things that happened at work today, what experiences made you feel excited or motivated? Please list each experience in detail and explain clearly what happened.*

The themes and sub-themes captured from the responses are illustrated in Figure 3 below and reported in Table 4 thereafter.

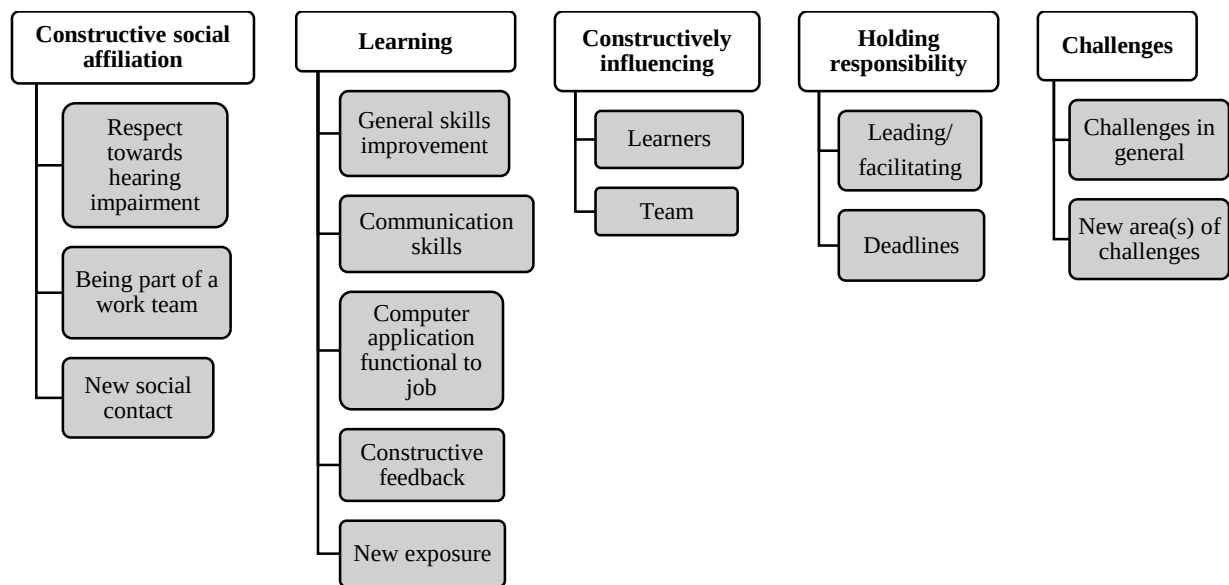


Figure 3: Job resources that HIEs in South Africa experienced as motivational

Table 4

Job resources that HIEs in South Africa experience as motivational

Theme	Sub-theme	Response
Constructive social affiliation	Respect towards hearing impairment	'I am fortunate that my team know that I can only hear on the right- hand side, and they normally conduct the traffic that side' (P5) 'I have lots of motivated because they do respect with me. They believe that deaf it's nothing wrong.' (P8)
	Being part of a work team	'I enjoyed here with my work team.' (P10) 'Work with team.' (P12)
	New social contact	'I facilitated new learners.' (P2) '... meeting new people ...' (P6)
Learning	General skill improvement	'I'm getting better, which makes me even more excited.' (P6) 'Let improve my level of quality.' (P8)
	Communication skills	'I feel motivate to learn something new about communicate.' (P3) 'I have excited professionalism, communication and PowerPoint.' (P11)
	Computer application functional to job	'Drawing with Draft Sight.' (P4) 'I excited for PowerPoint and email.' (P11)
	Constructive feedback	'Moderator provided more positive feedback to me.' (P2) 'I learnt a lot when I got several troubles ... I know what company expects me to do.' (P7)
	New exposure	'I love to learn something new.' (P8) '... learning different things at work ...' (P5)
Constructively influencing	Learners	'I coached the learners to improve their learning abilities and an air of confidence.' (P2) 'Give them [learners] activity such as drawing on A3 paper and empowering them to give them presentation.' (P9)
	Team	'I feel motivated by leading a team and helping colleagues grow.' (P2) 'Motivate help team work, we could achieve together, celebrate our success.' (P3)

Table 4, continued

Job resources that HIEs in South Africa experience as motivational

Holding responsibility	Leading/facilitating	‘When I learned more about the learners and their background during the training and they inspired me to work with them and also motivates me to teach and encourage them to achieve what they want. And also it motivates me to help them to reach their goal.’ (P1) ‘By facilitating 47 learners, I enjoy great challenges.’ (P2)
	Deadlines	‘Meeting deadlines keeps me motivated to continue to exceed expectations.’ (P2) ‘Motivate deadlines, work well on schedule. Meeting a deadlines help me to feel like I have accomplished a goal.’ (P3)
Challenges	Challenges in general	‘By facilitating 47 learners, I enjoy great challenges.’ (P2) ‘I have a lot motivated at mines. They have many challenged [challenges].’ (P8)
	New area(s) of challenges	‘...I enjoyed work everyday, because there are always new challenges.’ (P6) ‘... new challenge way forward’. (P13)

*P = participant

Table 4 above indicates that HIEs in this study experienced the following job resources as motivational: *constructive social affiliation, learning, constructively influencing, responsibility and challenges*. These themes and relevant sub-themes are discussed below.

Constructive social affiliation: HIEs pointed out as motivational factor: respect for hearing-impairment, shown through considerate behaviour and not viewing this disability in a negative light. An additional factor mentioned was membership of a work team and new social contact.

Learning: General skill improvement was also reported to enhance motivation. Such skill provides HIEs the potential to improve the standard of their output. Respondents also indicated the developing of communication skills as motivational. The reported cases highlighted improving communication insight, while the other one mentioned professional conduct. Learning to operate a computer application functional to one’s job was reported to promote HIEs’ motivation as well. Learning new things, in the general sense, was also found to boost HIEs’ motivation. One respondent indicated that he loves to learn something new.

Constructive influencing: Responses suggest that HIEs experience constructive influence by another social party as motivational through interaction on individual- as well as team-level.

- *Individual level*: influence means improving learners’ personal growth potential, technical skills and group-level correspondence.

- *Team level:* influence generally concerns helping employees use their collective potential. One respondent also mentioned facilitation of individual team members.

Holding responsibility: The responses indicate that HIEs were motivated stronger when they were given responsibility. In this regard, two sub-themes were identified:

- the suggestion to HIE that they are responsible (e.g. their assignment to lead/facilitate);
- opportunity given to HIEs individually to demonstrate that they are responsible (e.g. keeping deadlines).

Challenges: Two sub-themes emerged from the responses, namely: challenges in general and new area(s) of challenge.

- *Challenges in general:* one respondent indicated that she was motivated by facilitating 47 learners and in the process enjoyed extensive challenges.
- *New area(s) of challenge:* a respondent indicated that she enjoyed every work day as there were continually new challenges. The other respondent associated new area(s) of challenge with progress.

Category 4: Job resources, task completion

The following question was posed to determine job resources linked to task completion for HIEs in South Africa (first the text, then the SASL rendition in italics):

When thinking about all of the things that happened to you today while at work, what are the experiences that assisted you to complete the tasks that were required? Please list all of the cases and explain each in detail. *When thinking about all of the things that happened to you today while at work, what assisted you in completing the tasks that were required? Please list all the cases and explain each one in detail.*

The themes and sub-themes captured from the responses are illustrated in Figure 4 below and reported in Table 5 thereafter.

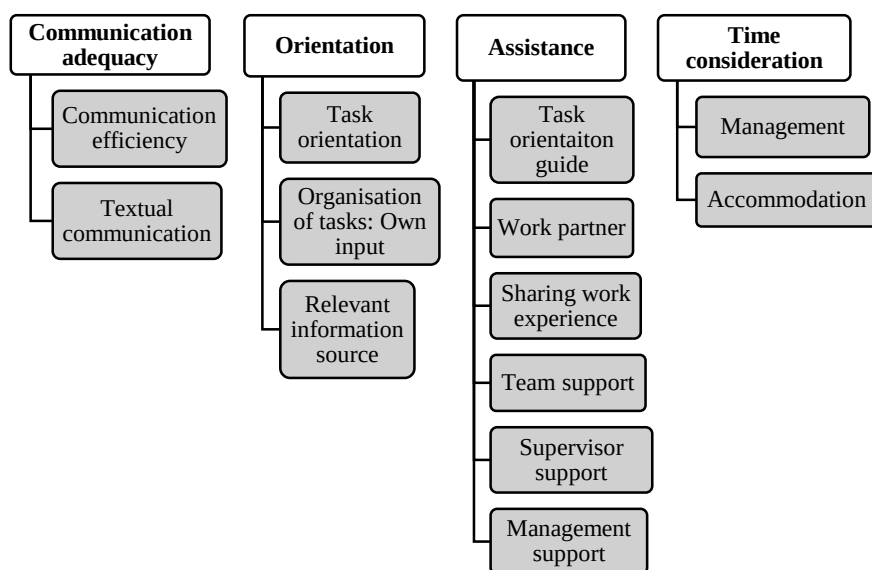


Figure 4: *Job characteristics which HIEs in South Africa were found to experience as assisting task completion*

Table 5

Job resources which HIEs experience as assisting task completion

Theme	Sub-theme	Response
Communication adequacy	Communication efficiency	‘Was not good enough to help when I need. So now most better, because communicate improved.’ (P3) ‘Communicate it’s no problem.’ (P8)
	Textual communication	‘Easier communication can be written on paper or via phone from another person.’ (P6) ‘... need to give me written job cards all the time and I can easy to follow instructions ... also better understanding of how company work like to give deaf employee a completed company policy handbook and allow to read careful each pages.’ (P7)
Orientation	Task orientation	‘I always place my client on my right- hand side so that I can get the information clearly.’ (P5) ‘It can give me some idea of what I am supposed to be doing.’ (P10)
	Organisation of tasks: Own input	‘Updating all weekly plans was convenient for me to allocate and complete the tasks.’ (P2) ‘I am an extremely organised person and do my job according to priorities and this allows me tackle my work day in a scheduled manner.’ (P5)
	Relevant information source	‘I have access to the necessary equipment to fulfil my tasks as well as the necessary research engines.’ (P5) ‘Lucky I know what going on. I got all the information from the foreman and paper.’ (P8)
Assistance	Task orientation guide	‘... if any problem and I don't know about it and I always ask my foreman or artisan to help or advise.’ (P8) ‘... need to have some guidance/guideline ...’ (P14)
	Work partner	‘I do like to have assisted with me to do the complete, but my boss did not have enough time with me.’ (P4) ‘One of my co-worker helped and worked with me all the time’. (P6)

Table 5, continued

Job resources which HIEs experience as assisting task completion

	Sharing work experience	‘Staff shared work experiences with me in order to make sure I could complete the tasks easily.’ (P2) ‘We share our experiences, which helps us complete tasks.’ (P5)
	Team support	‘If I do not understand the tasks then I would ask my team work or ... to explain again to understand.’ (P3) ‘I am surrounded by a team who motivate and assists where needed.’ (P5)
	Supervisor support	‘My supervisor assisted me to learn training about the scanner and checking files.’ (P10) ‘Yes, [name of supervisor].’ (P11)
	Management support	‘Training manager help alert me to be aware of the task I forget to complete.’ (P2) ‘Moderator and IT Management help me to improve my communication @ work.’ (P3)
Time consideration	Management	‘... manage time to make sure the tasks are completed ...’ (P2) ‘Time management is required to complete all the tasks.’ (P14)
	Accommodation	‘Allocate time for learners to complete the tasks.’ (P2) ‘Find time to learn to understand.’ (P3)

*P = participant

From table 5 above it is clear that HIEs in this study experienced that the following job resources help them complete their task: *communication adequacy, orientation, assistance and time consideration*.

Communication adequacy: This theme provided two sub-themes:

- *Communication efficiency*: Responses of HIEs suggest that their chances of completing tasks improved when communication was efficient.
- *Textual communication*: were found to promote communication efficiency, to which HIEs also referred as assisting with task completion. According to one respondent, textual communication was easier to engage in, while another respondent expressed a need for text references.

Orientation: plays a significant role for HIE respondents in completing their tasks. The data provided the following sub-themes:

- *Task orientation*: In the one case, HIEs received adequate information about the matter they had to address; in another case, the employee was given an idea about what was expected of him.

- *Orientation to organising own tasks:* in the process HIEs' could provide their own input in organising their tasks. This entailed weekly plans supplementary to the tasks' allocation and completion, as well as prioritisation of such tasks.
- *Orientation to relevant information sources:* Respondents pointed out that it also helped HIEs to complete their tasks, when they are informed about sources that may help them function better. One respondent mentioned a source of technological information, while another pointed to a higher authority in the workplace as their source of information.

Assistance: HIEs suggested various forms, which were captured in several sub-themes. In light of the discussion above, respondents found that a *task-orientation guide* would help HIEs complete their task efficiently. Further support from *work partners* or colleagues *sharing their work experience*, were found to provide support in completing tasks. In addition, *team support* from work associates – at various levels – were pointed out as promoting HIEs' task completion. This include support at both *team and supervisory level* (mentioned particularly) and from *management*. Thus, the responses indicated that support generally aids HIEs' in completing their tasks and that the support is not limited to a particular hierarchical level as source.

Time consideration: This theme delivered two distinctive sub-themes:

- *Time management:* HIEs reported that effective time allocation helped them complete their task more effectively.
- *Time accommodation:* It was also suggested time gap(s), created to facilitate HIEs' personal adaptation to output requirements will help them complete their tasks. This need is expressed by the following responses: '... find time to learn to understand ...' (P3); '... allocate time for learners to complete tasks'. (P14). Both references focus on creating time gaps to accommodate HIEs in the fulfilling of their tasks.

Discussion

Outline of the results

The overall objective of the present investigation was to explore job demands and job resources from the perspective of HIEs in South Africa. The motivation concerned questioning awareness about job characteristics that HIEs experience as job demands and/or job resources. The problem statement was formulated as follows: There being a lack of clarity about workplace aspects that HIEs in South Africa experience as job demands and/or job resources.

The literature review was found to substantiate the suggested need for clarification. Literature clearly shows variation across employee groups about how different job characteristics are experienced.

This study's data collection led to apparent discovery of job demands themes not listed in literature, as well as depth of insight about workplace aspects that promote HIEs' learning, motivation and task completion. Hence, this investigation can be regarded as an approach to developing clarity about workplace aspects that HIEs experience as job demands and job resources.

The above statement is explicated by elaborating on the objectives that were formulated for the present study.

Objective 1

The *first objective* was to determine how job demands, job resources and hearing-impaired employees in South Africa are conceptualised in literature.

Job demands: were found to be covered in the consulted literature (Bakker & Demerouti, 2007; 2014; 2017; Bakker et al., 2005; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Sonnetag & Zijlstra, 2006; Xanthouloulou et al., 2007). Such demands were conceptualised as job-inherent aspects that will cost energy from occupants within the work environment and may need mitigation to control potential effects of their health impairment.

Job resources were also found to be discussed in the literature (Bakker, 2015; Bakker & Demerouti, 2007; 2014; 2017; Boyd & Tuckey, 2014; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Schaufeli & Taris, 2014; Schaufeli et al., 2009; Xanthopoulou et al., 2007). These resources were conceptualised as job-inherent aspects that promote employees' constructive interaction with their work context. Furthermore, individual characteristics of employees will influence the way each handle job demands and/or job resources (Bakker & Demerouti, 2014; 2017; Daniels, 2006).

Hearing-impaired employee: A definition of this concept was not found in the literature. However, a classification was developed by integrating the encountered description of hearing-impairment (Edwards & Crocker, 2012; Shemesh, 2010; Thorne et al., 2008; Vaccaro, 2016) into the definition of 'employee' provided by Section 200A(1) of South Africa's Labour Relations Act (no. 66 of 1995).

In light of the above, *hearing-impaired employee* was conceptualised as any individual:

1. who is hearing-impaired in the pre-lingual, post-lingual, hard-of-hearing, deaf, unilateral and/or bilateral sense;
2. whose hearing-impairment counts as long-term or recurring; and
3. who meets criteria (1) and (2) of this definition as well as at least one of the following:
 - the manner in which the person works is subject to the control or direction of another person;
 - the person's hours of work are subject to the control or direction of another person;
 - in the case of a person who works for an organisation, the person forms part of that organisation;
 - the person has worked for that other person for an average of at least 40 hours per month over the last three months;
 - the person is economically dependent on the other person who whom he or she works or renders services;
 - the person is provided with tools of trade or work equipment by the other person; or
 - the person only works for or renders services to one person.

Objective 2

The *second objective* of the present research was to identify workplace aspects that HIEs in South Africa experience as job demands. As conveyed in chapter 1: The main question concerned suspected lack of awareness about workplace aspects that HIEs experience as job demands. That translates into suspicion about norm-deviant themes of job demands, in the case of HIEs. The gathered data delivered eight themes – all of which included sub-themes.

Several of the job demands themes stood out from the mainstream job demands themes of physical, psychological, social and organisational (Bakker & Demerouti, 2017; Demerouti et al., 2001; Schaufeli & Bakker 2004; Xantholoulou et al., 2007). Namely, the job demands themes of communication barriers and time burdens, as well as the task demands sub-themes of interruption of task processes and travelling. The themes receive specific attention in the discussion below.

1. Communication barriers: Respondents from this investigation indicated that non-hearing-impaired people's *rate of speech* can be experienced as too fast for their degree of audio receptivity. In this regard, Kramer et al. (2006) point out that HIEs find that they must distinguish sounds, and experience the effort to hear/listen as demanding. *Misunderstanding of the other party* is another sub-theme identified in this study as a communication demand. Comparably, Van Gils et al. (2010) found that HIEs' lower efficiency in the modal language can be associated with higher levels of stress. Furthermore, Lund (2015) concludes that HIEs' energy levels are demoted, and stress levels promoted, when they experience difficulties with communication. This is in accordance with the present study's findings that for HIEs, having to *explain repeatedly*, takes energy out of them. This entails both a context where HIEs must explain to hearing individuals or where they have to explain work-related matters to other hearing-impaired individuals.

The sub-theme of *communication commotion* was inferred from cases where HIEs from this study were surrounded by several instances of communication, which made it difficult to follow the part of discussion that applied to them. Several scholars (Hua et al., 2015; Kramer et al., 2006; Lund, 2015; Punch, 2016) found that communication within commotion can be associated with health-impairment of HIEs. For example: Hua et al. (2015) found that concentrating to listen amid audio commotion can cause physical tensions in the neck, shoulders and back. The mentioned scholars also concluded that a most common feeling among

their HIE respondents concerns exclusion during group conversations. Furthermore: The sub-theme of *communication gap* drawn from the data point to the difficulty and effort that HIEs experience due to aspects that hinder their interaction with work associates.

It can be questioned whether the above-mentioned communication issues could indeed explain the findings (Punch et al., 2007; Punch, 2016) where HIEs reported training activities as problematic. According to Nikolarazi and Hadjidakou (2006), despite providing training for the hearing-impaired, there are still communication issues that impede their development. A response from the present study underlines the significance of an interpreter to address the issue of the communication gap: ‘I am profound deaf and they don’t have interpreter’ (P8). Druchen (2010) states that the use of SASL to communicate with the hearing-impaired person is a key factor for South Africa’s integration of individuals such as HIEs into social processes of the country.

Overall, the above discussion conveys a fundamental notion of communication-related processes being experienced by HIEs as energy-consuming. Based on the job demands concept (Demerouti et al., 2001; Bakker & Demerouti, 2007), the above could be translated into a principal of *communication demands*. Job demands-resources literature (Bakker & Demerouti, 2007; 2014; 2017; Schaufeli, 2017; Schaufeli & Taris, 2014) does not contain such a job demands theme. Therefore, a new addition to the job demands-resources framework may have been identified – with consideration towards HIEs.

2. Task-related demands: There seems to be a theoretical link between the task demands sub-themes of *interruption of the task process* and *travelling*. One response listed under *interruption of task process* conveys environmental commotion: ‘In an open-plan environment, with people talking all around...’ (P5). The two responses listed under *travelling* also convey environmental commotion: ‘Underground its nice jobs but not too hard work, but take lots of energy to up and down’ (P8); ‘... traveling to Braamfontein from Centurion, really tired from driving in the traffic’ (P14). The response by P5 conveys more of an audio environmental commotion. However, one can reason that in an open-plan environment an employee is also exposed to physical commotion – people moving around. The responses under *travelling* also convey physical commotion, which HIEs reported to be energy-consuming to them. Therefore, it seems that environmental commotion might be an underlying dynamic of job processes that HIEs experience as energy-consuming. Such a theme of job demands was not encountered in

literature. Hence, this finding may be a new discovery about a theme of job characteristic that is experienced by HIEs in the job demands sense. Kramer et al. (2006) found perceived reverberation to correlate with stress-related sick leave of HIEs. Punch (2016) concluded that in work settings that entail background noise, the commotion may require higher concentration from HIEs and lead them to hypervigilance, ultimately stress and fatigue. Therefore, literature suggests *environmental stimuli demands* in terms of non-tangible aspects. However, findings of this study suggest that principal to apply in terms of tangible aspects too. Therefore, two further additions to the job demands-resources framework may have been identified (with consideration towards HIEs). Firstly, the ‘job demands’ spectrum (Bakker & Demerouti, 2007; 2014; 2017; Schaufeli, 2017; Schaufeli & Taris, 2014) may include the job characteristics theme of *environmental stimuli demands* as well. That is, job aspects that primarily concern variation in surroundings. Secondly, variation of surroundings being experienced as energy-consuming by HIEs seems to apply not only to intangible aspects but also to tangible aspects.

3. Lack of cooperation: HIEs from the present study linked lack of cooperation to depletion of their energy. HIEs reported that lack of cooperation as a job demand applies to interaction across organisational levels: from subordinate, and co-worker to management level. More energy is spent by HIEs to communicate with persons in the workplace. This might explain why HIEs’ energy is depleted when colleagues and management do not offer their cooperation.

4. Inconsideration: Hua et al. (2015) suggest that an employee’s *perceived* difficulties due to hearing-impairment could impact the individual’s daily life. Thus, these employees may feel a sense of exclusion, resulting in withdrawal behaviour and fatigue. This may explain why HIEs from the present study viewed aspects like unreasonable expectations and unreasonable confrontation as inconsideration.

5. Bounded rationality: The construct refers to a party’s reasoning constraints (Fabian, Galea & Bologna, 2010). The scholars point out that bounded rationality can be imposed due to limited and/or unreliable information, irrespective of a party’s level of intelligence. Bounded rationality of, both HIEs’ *subordinates* and *co-workers* were identified as job demands by HIE respondents from the present study.

HIEs attributed aspects external to themselves as the causes behind unpleasant outcomes, instead of recognising the outcomes as self-imposed to an extent – self-serving bias operates

on the same basis (Kreitner & Kinicki, 2010). Therefore, interestingly, the HIEs themselves may have applied a bounded rationale.

6. Time burdens: The time-related themes of job demands that emerged from the data, focused on allocation and pressure. *Poor allocation* of time was indicated as a respondent's own procrastination: 'Procrastination – complete task at the last day' (P2); and an authority figure, leading another respondent in a task and directing the process in a manner that wasted the HIE's time: 'My boss had gave me job to do drawing from this morning. I did do drawing as what he want but not explain me enough. He finds it all wrong from noon time and I did do again. But he not think twice that I just start in noon time and won't be finish at end of day today. He still pushing me as he need it today. But he not explain me enough' (P4). According to Schaufeli and Taris (2014), disengagement, such as the responses above, indicates insufficient resources to meet job demands. Withdrawal may also function as a self-protection strategy to prevent further energy depletion of the employee/manager.

Interestingly, results of Coniavitis Gellerstedt and Danermark (2004) also, just as this study, highlight poor time allocation. The scholars state *time pressure* will resultantly prevail towards HIEs. The time pressure was found in in the present study entails time limits as such, and borderline time insufficiency (e. g. deadline becoming impractical due to initial time wastage). The preceding causes that scholars suggest imply communication issues to be the underlying problem. That is, the grounds of (a) lacking information and (b) poor instruction.

Thus, the literature discussed above indicate that time demands which HIEs experience are significantly caused by instructions from an authority figure overlooking work procedures, which can be translated into communication impediments.

In conclusion: Job demands experienced due to hearing-impairment may impact both HIEs and hearing employees in the workplace. Furthermore, it was found that research on this topic is still insufficient. Poor management of job demands increases the chance of disengagement, health-impairment and performance depletion of both mentioned parties (Bakker & Demerouti, 2017).

Objective 3

The *third objective* was to determine job resources of HIEs in South Africa. Job resources were found to be conceptualised in the literature in terms of three sub-categories of job characteristics: (a) workplace aspects from which employees *learn* (Bakker & Demerouti, 2017); (b) those that help *motivate* employees (Schaufeli & Bakker, 2004); and (c) those that help employees deliver *functional output* (Xanthopoulou et al., 2007). Accordingly, separate inquiries were made regarding each of the sub-themes.

To explore job characteristics *from which HIEs in South Africa learn*, questions were posed to the respondents about work experiences through which they learned. From the gathered data several themes and sub-themes were extracted. Two are discussed in more detail below.

1. Learning from subordinates: HIEs reported *exposure to social diversity* as enlightening. In this regard, findings from the present study indicate that the perspective of HIEs in South Africa is impacted by social exposure, which include interaction that does not align with historical social dynamics of South Africa. That is, historical dynamics of social segregation (Deegan, 2014) and high power distance (Human, 1996). Respondents of this investigation explained that interaction with subordinates helped broaden their *vocabulary*. This is in line with the suggestion by Chaudhuri and Chosh (2012) that reverse mentoring can function as a social-exchange tool that guides generations to exchange intellectual capital. Hearing-impairment in South Africa is significantly associated with social isolation (Peer, 2015) which may explain why exposure to diverse peoples (in this case subordinates) were regarded as a job resource from whom they have learned. One respondent emphasised demographic diversity in particular.

South Africa's education of its hearing-impaired citizens is still sub-standard (Druchen, 2010; Magongwa, 2010) and this social group is still significantly socially isolated (Peer, 2015). This also raises the question to what extent South Africa's hearing-impaired have been led to move past the country's traditional social orientations. Furthermore: Are those outdated outlooks preventing HIEs in South Africa from social interaction, ultimately impeding their acquisition of further knowledge, skills and attitudes (KSA)? The following two paragraphs investigate the social dimensions within the work place as dynamics to broaden KSA of HIEs in South Africa.

2. Learning from work associates: For HIEs of the present study, interaction with work associates gave them the opportunity to *acquire new job skills*. A participant reported such

interaction helped her improve the quality of her output. Moore (2001) found that on-the-job training of HIEs relate significantly to obtaining levels of competence that are competitive to the labour market. *Practical illustrations* were suggested to serve HIEs well in the learning function. One respondent emphasised practical engagement in this regard.

HIEs of the present study pointed out that interaction with work associates help enlighten them about the *ways to work with people*. Such support from HIEs' work associates is suggested to empower the latter's learning, past the immediate effect. Cawthon et al. (2015) pointed out that social skills positively predict hearing-impaired individuals' learning for up to 10 years thereafter.

HIEs indicated *support from an overseeing party* as a significant factor in their learning at the workplace. Likewise, findings by Sarti (2014) suggest a positive relationship between supervisor support and employees' learning. Bakker and Demerouti (2018) state that interventions as job resources include the training of supervisors to provide resources for their employees and teams. Boxall and Purcell (2011) state that an employee's immediate supervisor plays a critical role in the perceptions that individual employees develop about their workplace.

A *collaborative social system* at a workplace can help build both procedural and declarative knowledge (Kimmerle, Cress & Held, 2010). Findings of the present study indicated that such collaborative system enhanced HIEs' learning at their places of work.

3. Academic exposure: Apparently HIEs' *delegation* led them to engage in reasoning and activities that urged them towards academic inquiry. *Informant orientation* is suggested to be complementary. Fong and Snape's (2015) suggest that such empowering leadership help develop recipients' psychological autonomy.

To explore job characteristics that *motivate HIEs in South Africa*, the present research investigated work experiences that made these employees feel excited or motivated. The data produced several themes and sub-themes. Two themes are discussed in more detail.

1. Constructive social affiliation: HIEs reported that the following conduct strengthen their motivation: *Respect for hearing-impaired individuals*, demonstrated by considerate behaviour and not viewing hearing-impairment in a negative light. The following response reflects respect

experienced on a more personal level: ‘They believe that Deaf its nothing wrong’ (P8). In this regard, the individual’s colleagues help promote his self-acceptance. This finding shows that the outlook of colleagues and management towards an HIE, significantly shapes the identity of that individual (Lund, 2015). Nikolarazi and Hadjikakou (2006) conclude that social behaviour towards hearing-impaired individuals is critical in forming their own identities. Dube (2005) states that accommodation of disability at workplaces in South Africa helps the employees concerned to accept themselves. Acceptive social affirmation of such individuals will enhance their self-authenticity, and ultimately their wellbeing (Didonato & Krueger, 2010). Therefore, respect shown for hearing-impairment is reported to yield wellbeing effects beyond mere motivation, as indicated in the present investigation, and should therefore be taken note of.

Similar to the above-mentioned finding and also relating to social acceptance, HIEs reported that *being part of a work team* can motivate them. Dettelle et al. (2003) found that HIEs attach significant weight to understanding, acceptance and acknowledgement in the work environment. In addition, it was found that HIEs link *new social contact* positively to their motivation. In this regard, Lund (2015) found that social interaction has energised the HIEs who took part in her study. Thus, constructive social affiliation can be significant for research about motivation of HIEs.

2. Learning: *General skills improvement* was found to empower HIEs, which helps improve the standard of their output. Therefore, such skills were reported to strengthen their motivation. P6 mentioned that ‘getting better’ (i.e. speaking in general terms) made her even more excited. P8 highlighted being enabled to improve their ‘level of quality’. This corresponds with Ryan and Deci’s (2000) statement that personal competence enhances personal motivation.

Developing communication skills was a further motivation-related sub-theme that emerged from the data. The reported cases include the improvement of communication insight as well as professional conduct. The findings above reflect the notion of job resources in the sense of learning being associated positively with employees’ motivation (Bakker & Demerouti, 2018).

Learning to operate computer applications, functional to the job, was reported to strengthen HIEs’ motivation as well. A possible explanation for this is that sophisticated technologies are creating more equal opportunities for HIEs (Van Gils et al., 2010). It follows thus, that

mastering such technologies and being on equal footing with co-workers can facilitate motivation for learning.

Learning through *constructive feedback* is another sub-theme that was suggested to be associated positively with HIE motivation. This resembles findings of coaching positively, and directly, relating to manifestation of positive emotions among employees (Xanthopoulou, Bakker, Demerouti & Schaufeli, 2012).

Learning new things, in the general sense, is also reported to boost HIE motivation. One respondent indicated that he loved learning something new. Personal growth is found to be innately motivational to employees (Jha, 2010).

3. Constructive influencing: Responses indicated that HIEs were motivated when they could influence another party constructively through interaction on both individual and team level. At *individual level* the focus was on improving learners' personal growth potential, technical skills and group-level correspondence. At *team level*, the focus was generally on using collective potential. These findings may suggest that constructive social interaction have social significance for the HIEs, leading to their self-acceptance (Detaille et al., 2003).

4. Responsibility: Qualitative feedback from the present study indicates that HIEs' motivation increased when they accepted certain responsibilities. It seems that *taking on responsibilities* and meeting *deadlines* facilitated an increase in confidence which may explain why HIEs felt motivated by such work experiences.

5. Challenges: Two sub-themes emerged from the responses, namely: *challenges in general* and *new area(s) of challenge*. HIEs in the present study, reported that they experience job aspects, which they perceive as constructively demanding, to be associated positively with their work motivation. A possible explanation for this could be that HIEs experienced a sense of accomplishment when meeting work challenges which in turn increased their intrinsic motivation (Gómez-Miñambres, 2012).

To explore job resources in terms of job characteristics that *HIEs in South Africa find to help them to deliver functional output*, the research investigated work experiences that helped

respondents complete their tasks. The gathered data were found to contain themes and sub-themes. Four themes will be discussed in more detail below.

1. Adequate communication: Two sub-themes were identified from analysing the data about communication adequacy. These were: *communication efficiency* and *textual communication*. Responses of HIEs in this study indicated the belief that they had a better chance of completing tasks when communication was efficient. Hua et al. (2015) found that all of their HIE respondents highlighted communication strategies as substantial to their coping with demands at their workplaces.

Furthermore, textual communication was found to make communication more efficient, thus making it easier for HIEs to complete their tasks. The one respondent (P6) mentioned that he found textual communication easier to engage in, while the other respondent (P7) expressed a need for textual references. A possible explanation for this is that textual communication bridge the potential communication divide between HIEs and HE in the workplace.

In light of the discussion above, it is evident that efficient communication involving HIEs should be a clear consideration for them to complete their tasks. Furthermore, technological developments are reported to narrow communication gaps (see www.speak-see.com). This means the onus lies with employers of HIEs to become aware of those developments when facilitating HIEs.

2. Orientation: HIEs from the present study pointed out that their orientation to task-related processes plays a significant role in helping them complete their tasks. The gathered data referred to *task orientation*, *HIE input towards the organisation of their tasks*, and *orientation to relevant information sources*. Regarding task orientation, in one case, the HIE confirmed that he receives adequate information about the matter that had to be dealt with; in the other case, the employee was being given an idea of what he was supposed to be doing. Coniavitis Gellerstedt and Danermark (2004) emphasise that even for routine work, which does not require hearing capacity, adequate orientation of an HIE to grasp the task from the beginning is critical. Unfortunately, Punch et al. (2007) found that HIEs reported meetings as problematic more often than hearing employees. Thus, Punch (2016) conclude that literature generally indicates HIEs to experience meetings as significantly challenging.

The sub-theme of *own contribution to organising tasks* refers to weekly planning as supplementary to the tasks' allocation and completion, as well as to prioritising such assignments. Supportively, scholars suggest that HIEs should be allowed degrees of control over their work setups for the sake of their wellbeing (Van Gils et al., 2010; Lund, 2015). This means employees' wellbeing is precedent to their performance (Bakker & Demerouti, 2018). In this regard, Kramer et al. (2006) found that HIEs who demonstrate more control in their tasks were more likely to be employed on a full-time basis, possibly due to higher productivity.

Furthermore, respondents from the present study also reported that having access to potential sources that help them fulfil their tasks (task-functional information), helped them complete assignments more effectively. Van Gils et al. (2010) found that more than 50% of their HIE respondents depend on support from colleagues for work-related information. The scholars also argue that technological development promotes HIEs' general equality since it provides them access to information about their work. Therefore, it is evident that adequate orientation of HIEs is critical if they are to complete their assignments.

3. Assistance: HIEs suggested *task-orientation guides* to help them complete their tasks. Respondents also mentioned that a *work partner* could serve the same purpose, as well as colleagues who *share their work experience*. Such job resources can be linked to the finding by Van Gils et al. (2010) that more than 50% of their HIE respondents depend on colleague support for work-related information. Dettelle et al. (2003) found that HIEs attach significant value to mutual understanding among co-workers in order to make matters easier for them within the work environment.

4. Time consideration: HIEs reported that effective *time management* helped them complete their tasks. Coniavitis Gellerstedt and Danermark (2004) found time pressure to be a modal experience of job demands for hearing-impaired individuals in workplaces. Such pressure is due to common occurrences where they experience insufficient time and a lack of accommodation by colleagues. Being job demands, one can then reason (Bakker & Demerouti, 2017) that they will deter HIE performance if not controlled. Comparably, findings of this study suggest time management and time accommodation as factors underlying time affairs of HIEs, to ultimately influence their task completion.

Next, the practical implications resulting from the current study will be discussed.

Practical implications

Presumably, the main question to be answered henceforth concerns what the *practical significance* of the case is. Rationale therefor are specified in the following paragraphs. The discussion highlights, both, academic implications and implications to managers at the ‘ground level’ of interaction with HIEs in South Africa. The academic implications are discussed first.

Academic implications

JD-R framework: A supposed means to develop perspective/specialist insight for pursuing affirmative action aimed at HIEs in South Africa

It was found that the JD-R framework served as a course for developing specialist insight about HIEs.

As mentioned in the *hearing-impaired employee* section of this investigation’s literature review: Criteria associated with HIEs in South Africa include ‘designated groups’, Broad-based Black Economic Empowerment, protection from unfair discrimination, and a pressing social issue in the country that requires research. The records show that South African authorities strive to promote the affirmative action of employees such as the hearing-impaired but are barricaded by lack of functional insight therefor.

According to Graham et al. (2013), Smith (2012) and Majola and Dhunpath (2016): Bottom-up research based on HIEs as a focus group can lead to innovation in developing insight for affirmative action towards HIEs in South Africa. Bakker and Demerouti (2014) state that the JD-R model’s flexibility for deductive application is one of its fortes. Likewise, Schaufeli and Taris (2014) state that the model is tailorable to an extremely wide set of job settings, bordering on any (p. 59), and allows identification of specific employee needs in a given job context. If the case be as such, it would mean that a bottom-up research about HIEs, based on the JD-R model, will yield depth of functional insight about them.

Results of this study, the first of its kind in South Africa, suggest that the JD-R model is a reliable framework for deductively addressing the functional insight deficit that is obstructing

practical implementation of affirmative action towards HIEs. Therefore, this study's grounding rationale may count as ground-breaking to HIE research in South Africa or even national breakthrough to South Africa's research and development for affirmative action towards employees with disabilities.

This qualitative exploration (across industries and occupations) about job demands and job resources of HIEs in South Africa generated unprecedented depth of insight about job characteristics that they experience as job demands/job resources. Even though the derived job characteristics fall under themes listed in mainstream JD-R literature (social, cognitive, emotional & organisational: Bakker & Demerouti, 2007; 2014; 2017; 2018; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007), this study obtained specific detail about social/cognitive/emotional/organisational aspects that HIEs experienced as job demands/resources. More particularly, detail to an extent that should allow bottom-up policy development.

One point to bring to the forefront, is that this study obtained in-depth perspective about HIE job demands to the extent of identifying two apparent themes of job demands that are not listed by internationally leading JD-R scholars (Bakker & Demerouti, 2014; 2017; 2018; Schaufeli, 2017; Schaufeli & Taris, 2017). That is, the themes of communication demands and environmental stimuli demands. The data also proposed areas of personal resources to consider in relation to job demands-resources matters of HIEs (further detail is provided at the recommendations for future research).

Hence, the JD-R model as the grounding rationale of this investigation enabled development of specialist-level functional insight about HIEs – in terms of concepts, and an overall framework, that have been found to allow identification of factors that positively/negatively predict employee wellbeing, performance and retention (Bakker & Demerouti, 2014). The *affirmative action measures* section of the EEA (section 15) suggests initiative in terms of identifying factors that unfairly discriminate against people from designated groups and/or count as employment barriers to them ((2)(a)), making reasonable accommodation for them in manners that respect promotion of their equity ((2)(c)), and retaining such individuals for the sake of the further development ((2)(d)(ii)). Thus, it seems that deductive research based on the JD-R model (Bakker & Demerouti, 2014; 2017) allows generation of insight that can be used for

venturing towards developing HIE specialist insight for practical implementation of South Africa's affirmative action policies towards them.

It is hoped that this study will inform policy development and further research initiative.

A further step towards testing the JD-R model's as a framework would be to develop questionnaires valid to the population group. That is, questionnaires that can measure the mentioned factors of the JD-R model. The second article of the present research endeavoured to develop a questionnaire focusing on job demands of HIEs in South Africa, based on the norm-deviant job demands findings of this qualitative investigation.

Since the approach of this investigation was found to hold significance for gaining insight about HIEs, question arises whether such a research approach can be applied to other disability groups.

Management implications

Overseers of HIEs in South Africa

Furthermore, there are practical implications concerning supervisors/managers who oversee HIEs in South Africa. The findings of the present study indicate that managers should not assume that current job demands-job resources literature mention all of the job characteristics that could count as job demands/job resources to HIEs and/or their hearing work associates.

If a HIE or a work associate shows symptoms of *job-demands overload* (i.e. health-impairment and/or performance deficiency: Bakker & Demerouti, 2017), qualitative inquiry should be made about the underlying cause(s). According to Schaufeli and Taris (2014), it should be considered that possible job resources may be under-supplied in such cases. Therefore, supervisors/managers should enquire by HIEs and their work associates not only what the problem is, but also what they believe can be done to rectify it. Workplace climates that encourage and accept the airing of issues should help make both management and staff aware of these issues (Provera et al., 2010).

Potgieter, Coetzee and Ximba (2017) concluded that the ignorance among South Africa's managers and work associates about disability is affecting the latter's careers adversely.

Likewise, findings of this study suggest that managers should not assume the current establishment of JD-R literature to mention all of the job characteristics to consider to possibly count as job demands/job resources to HIEs and/or their hearing work associates. If a HIE or a work associate of a HIE conveys (a) symptom(s) of job demands overload (i.e. health-impairment and/or performance deficiency: Bakker & Demerouti, 2017), qualitative inquiry should be made about the cause(s) behind the affect(s). Schaufeli and Taris (2014) advise one to also consider possible job resources undersupply about such cases. Hence, supervisors/managers should inquire with HIEs and their work associates not only about what the problem is; also, about what they believe can be done to address it. Workplace climates that encourage and appreciate the airing of issues should promote development of awareness about the issues (Provera et al., 2010).

Considerations about communication

Regarding communication, particular focus should be on background noises as job demand for HIEs. Commotional environments are not conducive to exchanging important work-related information. HIEs are sensitive to commotion, which hamper them by diverting their attention and require that they intercept other sound waves than those that they must retrieve. Coniavitis Gellerstedt and Danermark (2004) emphasise it is critical that HIEs receive adequate orientation about a task – from the beginning. The responses from the present study practically substantiate the need for communication mediums appropriate to HIEs. Communication through text was the particular means highlighted for task completion. The SpeakSee real-time transcription product could assist HIEs in this regard (see www.speak-see.com). Modern developing technologies are providing opportunities for the professional advancement of the hearing-impaired (Maiorana-Basas & Pagliaro, 2014).

Objective 4

The *fourth objective* was to identify recommendations that can be made for future research. The matter is discussed in the second paragraph of the section below.

Limitations and recommendations

Limitations of the study

Despite the contributions to the particular field of study, certain limitations have to be factored in.

Firstly, it would have been more ideal if pre-lingually deaf and post-lingually deaf employees could have been equally represented in this study. However, the aim and scope of the study did not necessitate these sub-categories specifically.

Secondly, hard-of-hearing employees were under-represented in this research. However, the study aimed to explore the job demands and job resources of *hearing-impaired* employees in general, and not according to degrees of hearing loss.

Thirdly, the researcher's proficiency in SASL is not at the level required for personal interviews. Consequently, another method was needed to collect data. The option of using a third party as interpreter in a semi-structured interview setting was rejected by the researcher since it would prove difficult to ensure confidentiality and privacy. The researcher circumvented the problem by opting for a self-administered questionnaire, which included URL links to online SASL translations of the question.

Fourthly, the chosen data-collection method meant that responses were provided by text. However, not all respondents were equally fluent in written communication.

Finally, the use of snowball sampling also resulted in a stronger representation of the Education sector, thus potentially influencing some of the themes of the responses.

Recommendations for future research

HEI awareness: Further qualitative inquiry about JD-R of HIEs is proposed. Furthermore, technological developments are reported to be narrowing communication gaps. Accordingly, scholars researching HR practices that serve HIEs have the onus to promote awareness of those developments (e.g. text-based applications).

Both HIEs and hearing employees: Regarding the present investigation overall, it is evident that job demands/resources within work contexts that include HIEs, impact both HIEs and hearing employees. However, to date, limited research was done on job demands/resources that

specifically concerns HIEs as employees. As explained in the discussion, academics propose mutual consideration for the issue of job demands and job resources for HIEs and their co-workers. Therefore, it should also be queried whether the role-players are aware of the wide range of job demands and/or resources applicable to hearing employees whose work associates include HIEs.

Overseers: The involvement of the supervisor, or overseeing party, emerged numerous times during the discussion. This implies that the practice of supervisors/management in facilitating HIEs, relates significantly to their JD-R affairs. Therefore, further investigation is suggested about job demands and resources experienced in relation to an HIE's supervisors in particular. Boxall and Purcell (2011) state that the immediate supervisor plays a critical role in the individual employee's experience of their workplace.

Learning: The researcher encountered limited literature covering HIE-specific investigations that relate to the JD-R sphere in terms of motivating HIEs through learning activities. Therefore, more *HIE-specific research* is required about learning activities and motivation of HIEs.

Self-motivation: HIEs feedback about job characteristics that help strengthen their motivation, reflect the theme of 'innate psychological needs' of the *self-determination theory* (SDT: Ryan & Deci, 2000). Therefore, SDT may hold potential as a conceptual framework to investigate job characteristics that motivate HIEs.

Personal resources: The sub-themes captured during this investigation include locus of control, self-efficacy, self-conceptualisation, emotional intelligence and level of cognitive reasoning. These constructs can be expanded through focus group discussion about their relevance to the wellbeing and performance of HIEs in South Africa.

The JD-R connection: In theory it can be questioned whether the approach of the JD-R model could help identify contexts that are positively or negatively associated with HIEs wellbeing and/or performance. In addition, in the case of HIEs, *personal-resource* themes should be captured that associate constructively with JD-R contexts. To start off with: In inductive terms, focus-group research could be done about the HR outcomes towards which HIEs should be led. From such focus groups, JD-R contexts can be observed and assessed, which are

positively/negatively associated with HIEs' wellbeing and performance. Observed practices could be translated into policies that regulate organisational culture. Development, over time, would hopefully reach a point whereby exploration can be done quantitatively.

Established theories: The constructs that were inferred from the HIEs' responses could be linked to established psychological theories. This makes it possible to apply these established concepts to the context of HIEs in South Africa. However, Spencer and Marschark (2010) caution against merely assuming that such established concepts could be applied to HIEs. Findings by Terre Blanche, Durrheim and Painter (2016) indicate that the grounded-theory approach can be used for an evaluation of HIEs' context in accordance with the mentioned theoretical constructs. Focus-group discussion about areas of agreement and disagreement towards conceptualisations could also be useful about contextualising constructs to HIEs.

Adapted questionnaires: At least in certain instances, questionnaires would be required that can be applied validly to HIEs in South Africa. Therefore, a focus group discussion can be held involving HIEs. The focus could be on developing sign language questionnaires based on established constructs.

In conclusion: The second article from this research sought to develop a questionnaire to test apparent norm-deviant themes of job demands that HIEs described during the present investigation. These themes reflect demands that HIEs face in terms of *communication*, *environmental stimuli* and *time management*.

Conclusion

A case-study research strategy was applied. The data were collected through the method of a self-administered questionnaire. Findings from this qualitative investigation provided insight into workplace characteristics that HIEs consider as job demands/job resources.

In answer to the research objectives, the present study on HIEs in South Africa led to insight into aspects of their work environment (job demands/resources) that influence their wellbeing and performance. One can conclude through theoretical reasoning that such an inquiry based on the JD-R model (Bakker & Demerouti, 2017) may help develop a *holistic understanding* of environmental aspects necessary for HR practitioners managing the wellbeing and performance of HIEs. Such functional insight could even be of national interest to South Africans by informing policies regulating disability (Statistics South Africa, 2011). Hua et al. (2013) emphasise the need for researchers to unravel the equation about factors underlying work outcomes of HIEs.

South Africa's Department of Social Development (2016) reports that possible investment towards development for the country's people with disabilities is currently limited. According to the Department, it invests only in developing learning opportunities for children with disabilities. The initiative seeks to ensure that they are 'empowered to meet the needs of the 21st century' (p. 7). In answer, the present research developed *front-line HIE insight* and may have identified an underlying concept that can be used to guide reasoning, research, and development to improve the management of HIEs' wellbeing and performance. Hence, it may help to rectify the sub-standard HRD that HIEs as adults had to receive previously.

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CHAPTER 3

RESEARCH ARTICLE 2

THE JOB DEMANDS SCALE FOR HEARING-IMPAIRED EMPLOYEES IN SOUTH AFRICA: DEVELOPMENT AND PRELIMINARY ANALYSIS OF THE PSYCHOMETRIC PROPERTIES

ABSTRACT

Orientation: A newly-developed scale that preliminarily passes as valid and reliable is necessary for progress towards measuring the job demands which hearing-impaired employees face in South African workplaces.

Research purpose: This research was conducted to develop items for a scale based on themes derived from the qualitative study. The aim was to measure job demands of hearing-impaired employees within South Africa. The further aim was to conduct a preliminary validation in order to evaluate the functionality of these items.

Motivation for the study: Currently South African organisations find it a challenge to identify and measure the job demands of hearing-impaired employees. To date, there is limited literature on valid and reliable scales for hearing-impaired employees in the country. Hence, the same applies to a scale for measuring job demands experienced by hearing-impaired employees. It is crucial to develop such a scale, seeing that it will provide researchers and South African organisations with a valid and reliable tool to measure the job demands confronting hearing-impaired employees.

Research design, approach and method: A sample of South African hearing-impaired employees participated in this quantitative study ($N = 85$). A cross-sectional research design was used to collect data. The data were processed through the IBM SPSS program version 25.0 to test the factor structure, as well as preliminary internal validity and reliability of the newly-developed questionnaire.

Main findings: A four-step procedure described in literature on psychometric testing and scale development was used to develop the 57-item job demands questionnaire for hearing-impaired employees. After a preliminary evaluation, the scale was found to be valid and reliable. All items showed good commonalities as well as good loadings. Furthermore, differences were found in the way and degree that various hearing-impaired demographic groups experienced job demands as energy-consuming.

Practical/managerial implications: The results provide a sample of newly-developed valid and reliable items that can be used by researchers and South African organisations as a tool to measure job demands which hearing-impaired employees experience.

Contribution: The study contributes by rectifying literature's lack of a job demands scale for hearing-impaired employees. This research contributes further by providing a valid and reliable tool that is promising to researchers and South African organisations, which helps them measure the job demands that hearing-impaired employees encounter.

Keywords: job demands, Job Demands-Resources model, scale, development, internal validity, reliability, hearing-impairment, hearing-impaired employees.

Introduction

Hearing impairment is viewed as an ‘invisible condition’ and in certain instances becomes a ‘silent epidemic’, making the hearing-impaired the least noticeable disability group (Backenroth & Ahlner, 1997; Hindhede, 2015; Marx, Ward, Goshorn & Sumrall, 2015). Hearing impairment refers to any type of hearing loss that a person may experience (Shemesh, 2010). These forms may be conductive, sensorineural, mixed or central hearing loss. Hearing impairment may also be classified in terms of degree and range, slight, mild, moderate, severe or profound, across different speech frequencies. Furthermore, the hearing loss may be fluctuating, temporary or permanent (Department of Labour, 2015), as well as bilateral or unilateral (Shemesh, 2010).

Usually the hearing loss is to such an extent that it affects communication (Department of Social Development, 2016). Possible causes for such impairment among adults are advanced age, exposure to excessive noise (Isaacson & Vora, 2003), or ototoxic medication (Harris et al., 2011; Saunders et al., 2007). These causes also include ailments such as cardiovascular disease and/or diabetes and/or HIVAids that lead to hair cell damage (Fransen et al., 2008; Khoza & Ross, 2002).

In South Africa, the reported prevalence rate of hearing impairment was estimated at 3.6%, making it the third highest reported disability after vision (11%) and cognitive disability (4.2%) (Statistics South Africa, 2011). Furthermore, hearing-impaired employees, as a group, constitute only a small percentage of disabled people within the South African labour market. South Africa’s persons with disabilities are barricaded from entering the labour market and those disabled more severely are impeded the most (Statistics South Africa, 2011). The most prevalent barriers include discriminatory attitudes, ineffective labour legislations, unsupportive work environments, and inadequate information about disability (Statistics South Africa, 2011).

As mentioned previously, hearing-impairment can also be regarded as a hidden disability (Backenroth & Ahlner, 1997). Many hearing-impaired individuals in South Africa do not openly mention their condition – to avoid stigmatisation and/or discrimination (Gida & Ortlepp, 2007). Literature indicates that the fear of stigmatisation or discrimination are key

concerns among hearing-impaired individuals (Hétu & Getty, 1993; Hétu, Riverin, Getty, Lalonde & St-Cyr, 1990). South Africa has numerous anti-discriminatory legislative provisions, especially regulating the workplace. These regulatory instruments include the following: Broad-Based Black Economic Empowerment Act no. 53 of 2003; Employment Equity Act no. 55 of 1998; Labour Relations Act 66 of 1995; and Skills Development Act no. 97 of 1998.

However, often legislative provisions do not prevent a form of disability (such as hearing-impairment) from being stigmatised by the majority within society (see Gida & Ortlepp, 2007; Jakovljevic & Buckley, 2011; McKinney, 2013; Naudé, 2002). Thus, it is understandable that an individual with a disability (such as hearing loss) may wish to conceal it. This may explain hearing-impaired individuals pretending to understand communication, or avoiding social interaction altogether, including in their work environment. This is done to disguise their hearing-impairment and prevent risk of their colleagues labelling them as inept.

When employees have to conceal hearing loss, or avoid social interaction at work, this could lead to various negative experiences such as frustration, embarrassment, social and emotional isolation, stress, fatigue, depression, and anxiety. These and other psychological consequences may endanger the health of hearing-impaired employees (HIEs) (Gida & Ortlepp, 2007; Hua, Karlsson, Wildén, Möller & Lyxell, 2013; Hua, Anderzén-Carlsson, Widén, Möller & Lyxell, 2015; Jahncke & Halin, 2012; Jakovljevic & Buckley, 2011; Kramer, Kapteyn & Houtgast, 2006; Lund, 2015; McKinney, 2013; Punch, 2016; Van Gils, Van den Bogaerde & De Lange, 2010).

In light of the findings mentioned above, it is evident that hearing impairment encompasses the communication process and influences individuals' quality of life (Gondim et al., 2012; Joore, Potjewijd, Timmerman & Anteunis, 2002). Due to the above-mentioned negative consequences, increased awareness is necessary about possible factors (e.g. job demands) that affect HIEs negatively in the workplace environment at different levels of the labour market. The reason is that these factors also impact employees' wellbeing (Rothmann, Mostert, & Strydom, 2006).

Within South Africa, numerous scholars have addressed employees' awareness of job demands. This is done by focusing on various demands that employees face, and applying the

Job Demands-resources (JD-R) model to the South African working context (Jackson & Rothmann, 2005; Ribeiro, Bosch & Becker, 2016; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann et al., 2006). However, to date, no study has been found that addresses the possible factors (i.e. job demands) that employees with hearing-impairment encounter.

Furthermore, several measuring instruments focusing on employees' job demands have been applied, adapted and developed for the South African context (Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann et al., 2006). Though, no measuring instrument has been developed that could assess the job demands of hearing-impaired employees (HIEs). For such a measuring instrument, it is imperative to use rigorous scale development procedures as set out in the literature (DeVellis, 2017; Foxcroft & Roodt, 2018). Such rigorous development will ensure that the construct measured (e.g. job demands) is adequately represented. According to the South African Employment Equity Act (no. 55 of 1998: section 8) and Department of Labour (2015), development of a *valid* job-demands measuring instrument for HIEs is necessary to promote unbiased evaluation. Therefore, it seems essential that development of such a (new) measuring instrument be based on strict scale development procedures.

The Employment Equity Act (1998, p. 8) states that, 'Psychological testing and other similar assessments of an employee are prohibited unless the test or assessment being used has been scientifically shown to be valid and reliable; can be applied fairly to all employees; and is not biased against any employee or group.' Based on this legislation, it is necessary to validate the job demands scale which focuses specifically on HIEs in South Africa. Such a newly-developed and valid job-demands measuring instrument will raise awareness and provide insight into the job demands that hearing-impaired employees experience.

Furthermore, not only will the above-mentioned instrument raise awareness; it will also function as a tool for organisations and managers to draw information from their HIEs about the job demands they are experiencing. Moreover, such a tool could strengthen organisations' reasonable accommodation of their HIEs within the workplace. On a national level, this tool will help modify the disability policy in South Africa by focusing specifically on hearing impairment. Such an initiative is necessary to promote the interests of HIEs effectively (Smith, 2012).

Therefore, the aim of the present study was to develop this mentioned tool, which could measure job demands of hearing-impaired employees within South Africa; and a further aim to do a preliminary validation of this developed measurement.

Research purpose and objectives

The general objective of the present study was to develop a new job demands scale and preliminarily test its psychometric properties, specifically for HIEs within the South African context. The following specific objectives flowed from the general aim:

- Conceptualise job demands, hearing-impaired employees, scale development and psychometric properties, according to the relevant scientific literature.
- Develop a scale, specifically for hearing-impaired employees, which measures their job demands.
- Determine whether the internal structure of the newly-developed measure is valid and reliable in terms of:
 - internal (i.e. construct) validity; and
 - scale reliability (i.e. Cronbach's alpha coefficient > 0.70).
- Establish the associations between certain biographical information aspects (e.g. category of hearing loss, laterality of hearing loss, gender, and language) and the job demands of hearing-impaired employees.
- Make recommendations for future research and practice.

Literature review

The research used a literature review to gather information on the concepts, discussed below.

Hearing-impairment and hearing-impaired employees in South Africa

South Africa's Department of Social Development (2016) defines disability as an individual with an impairment being barricaded from full participation in all aspects of life in the country. Preceding key issues include neglecting individuals' unique needs, amounting to failure by

South African authorities to uphold the rights of such individuals in terms of practice. The following intermediary barriers are highlighted by the Department:

- *Social*: points to a lack of awareness about disability and communication difficulties involving these individuals.
- *Psychological*: entails the impaired individuals' 'fear for personal safety' (South Africa, Department of Social Development, 2016, p. 4), which implies psychological safety issues (Newman, Donohue & Eva, 2017).
- *Structural*: relates to infrastructure, operations and information, and may entail institutionalised discrimination (see Lemley, 2014).

The Department of Social Development (2016) advises that the definition of 'disability' should be contextualised to the group of interest, and should focus on objectives such as affirmative action, protection against discrimination, and measures to promote their reasonable accommodation.

The Employment Equity Act (EEA no. 55 of 1998) defines disability based on individuals' impairment as a condition which may hinder employment or impede career prospects. The Revised Draft Code of Good Practice on the Employment of Persons with Disabilities (Department of Labour, 2015) suggests that the EEA's definition of disability should be interpreted as focusing on hindrances within the work environment that individual employees experience on grounds of their impairment, not as drawing to the impairment.

Hearing-impairment adheres to South Africa's 'disability' criteria per employment-levels. According to these criteria, the impairment must (a) apply on a long-term basis (Employment Equity Act, no. 55 of 1998: EEA, p. 10); (b) include inherent risk of deterrence from full and effective involvement in society (Department of Labour, 2015); and (c) be associated with barriers to employment opportunities and/or career progress (EEA, p. 10).

Scholars suggest that hearing-impaired individuals in South Africa meet the above-mentioned disability criteria (Gida & Ortlepp, 2007; Jakovljevic & Buckley, 2011; Komana, 2006; Majola & Dhunpath, 2016; McKinney, 2013; Naudé, 2002; Smith, 2012). Smith (2012) discusses the criterion of impairment associated with potential deterrence of an individual's full and effective involvement in society. This scholar points out that hearing-impaired individuals in South

Africa face integration barriers (discriminatory assumptions, attitudes and practices) as well as communication barriers.

Regarding the criterion that associates impairment with barriers to employment opportunities and/or career progress, scholars made several findings. Komana (2006) points out that unfair discriminatory recruitment practices are frequently conducted towards hearing-impaired individuals within South Africa. McKinney (2013) claims to have witnessed numerous hearing-impaired employees question why they were denied promotions over less experienced (hearing) staff. Gida and Ortlepp (2007) found that 84% of the participant organisations reported that they would not likely make effort to prevent a hearing-impaired employee from losing out on training due to difficulties in understanding or processing the information.

Naudé (2002) established that employers in South Africa presumed hearing-impaired individuals would stand the best chance of employment for, in descending order: domestic positions, packing, computer application, clerical work, administration, and technical work; but least likely as candidates for managerial positions. More recently, a statement by South Africa's Department of Labour (2015) indicates that managers still have such discriminatory assumptions about hearing-impaired employees. The Department mentions undermining assumptions, without grounds, about the potential of employees with disabilities. The Department also reports that people with disabilities often remain in low-status jobs and tend to get below-average remuneration.

Disability is not necessarily inherent to impairment; the terms are not synonymous – according to South Africa's Department of Social Development (2016). The South African Government's conceptualisation reflects the social model of disability (Department of Social Development, 2016). This model does not postulate a direct causal link between impairment and disability (Swain, French, Barnes & Thomas, 2014). The social model indicates that individuals' disability is not imposed by their impairment; rather by society's failure to uphold the unique needs inherent to their condition (Department of Social Development, 2016). The model does not deny the objective 'reality' of the impairment, but neither attributes such impairment as primary cause to individuals' disability. The main issue is rather the barriers imposed by broader society (Department of Social Development, 2016; Oliver & Barnes, 2010).

In turn, *hearing-impairment* generally refers to cases where individuals' hearing ability is below the standard range (Edwards & Crocker, 2012), to such an extent that is clearly noticeable (Vaccaro, 2016). Hearing-impairment among South Africans is only significantly prevalent from the age group of 35-39, from where the proportion increases rapidly onwards. In the preceding age groups, only approximately 2% of South Africa's people are hearing-impaired. The count of South Africans whose hearing loss is severe, generally constitute around only 1% of the country's population (Statistics South Africa, 2011).

Not all individuals with below-standard hearing acuity approve of being referred to as 'hearing-impaired' (Leigh, 2009; Skelton & Valentine, 2003). Although some individuals who are impaired may see the term as reflecting their objective reality, others reject the audiological definition under preference of an ideological connotation (e.g. Deaf, as a social group of its own: Leigh, 2009). Furthermore, parties differ about the criteria to describe lower hearing acuity – to an extent that developing a generally-accepted reference term seems near impossible (Leigh, 2009). South Africa's Department of Labour (2005; 2015) classifies hearing-impairment as a physical impairment incurred due to 'partial or total loss of a bodily function' (p. 8; p. 11).

Two causes of hearing loss can be distinguished (World Health Organisation, 2015):

- *Congenital*: incurred during birth or acquired soon thereafter, and may include maternal rubella, syphilis and other particular infections during pregnancy. It may also be incurred through low birth weight, asphyxia or jaundice. Ill-suited use of medicines during pregnancy is another possible cause.
- *Acquired*: hearing loss at any stage after the congenital; includes infectious diseases (e.g. meningitis, measles and mumps), chronic ear infections, collection of fluid in the ear, misuse of certain medicines, head/ear injury, excessive noise exposure (from work or recreation), ageing and wax/foreign bodies blocking the ear canal.

A case of hearing-impairment can be classified in terms certain sub-categories: (a) mild, (b) moderate, (c) severe, and (d) profound hearing loss (Centres for Disease Control and Prevention, 2018). These sub-categories can be explained as follows:

- *Mild*: inclined to struggle with hearing soft sounds but generally grasp speech at common auditory level.
- *Moderate*: struggling to grasp speech at common auditory level.
- *Severe*: unable to grasp auditory information presented at normal auditory level, but still grasping loud sounds.
- *Profound*: unable to understand any speech – and if they grasp any sound, it will be noise which is particularly loud.

Shemesh (2010) suggests that the first two above-mentioned cases of slighter hearing loss (i.e. mild and moderate) can be classified as *hard-of-hearing* and the second two cases of more intense hearing loss (i.e. severe and profound hearing loss) as *deafness*.

Communication is a major challenge that people with hearing-impairment face (Shemesh, 2010). Ways of communication that can be used for hearing-impaired individuals include lip-reading, note-taking, captioning and sub-texting as well as South African sign language (SASL) (Department of Social Development, 2016). Individuals who are hard-of-hearing tend to communicate through spoken language and lip-reading along with their residual hearing. On the other hand, individuals who are deaf tend to communicate predominantly through sign language and text (Lane, Hoffmeister, & Bahan, 1996). However, those whose deafness occurs later in life may never utilise SASL as their primary language (Department of Social Development, 2016).

South Africa's Constitution guarantees persons with disabilities the right to equal protection of and benefit from the law (Department of Social Development, 2016). Section 24 of South Africa's Constitution states that everyone has the right to an environment that does not hinder their wellbeing. Section 9(1) stipulates that every person is equal before the law, which then also applies to individuals with hearing impairment. The subsequent sub-section (s9(2)) highlights protection and advancement for categories who are disadvantaged by unfair discrimination. The aim would be to allow full and equal employment of all human rights and freedoms. Furthermore, the following sub-section (s9(4)) specifies legislation as frameworks to prevent or prohibit unfair discrimination. On this basis, the Constitution is translated into national policies and legislation (Department of Social Development, 2016).

Since the new democratic dispensation, South Africa's authorities have formulated numerous forms of legislation that prohibit unfair discrimination towards citizens such as the hearing-impaired group. The Social Assistance Act, no. 13 of 2004, stipulates an ethos according to which South Africans may not take advantage of disabled persons' vulnerability, but instead pursue their liberation. The legal frameworks include legislation such as the Employment Equity Act no. 55 of 1998 (EEA); Labour Relations Act no. 66 of 1995 (LRA); and Promotion of Equality and Prevention of Unfair Discrimination Act no. 4 of 2000 (PEPUDA).

Discrimination based on disability is prohibited not only in general (PEPUDA, section 6), but also at employment level (EEA, section 6). The EEA refers to both direct and indirect discrimination (section 6). The LRA forbids discrimination in terms of dismissal on grounds of disability alone (section 187 (1)(f)). The Act's 'Code of Good Practice: Dismissal' lists considerations for distinctions about unfair discrimination based on disability (pp. 150-153).

Section 8 of the EEA shields job candidates/employees against discrimination through biased evaluation. Psychological testing, or any related evaluations of *any* employee, are prohibited unless the assessment adheres to the following provisions: (a) proven scientifically in terms of its validity and reliability; (b) applied fairly to the mentioned employee group; and (c) verified to avoid bias against these employees.

Section 4 of the Employment Equity Amendment Act (no. 47 of 2013), amendment to section 8 of the EEA, adds that the assessment measure must also have been certified by the Health Professions Council of South Africa or any other establishment that is legally sanctioned to certify tests or assessments for the field of employment. The Department of Labour (2015; section 8.3.1) stipulates also that such testing must be applicable and fitting to the sort of work for which the applicant is being assessed.

Environmental obstacles are another discriminatory issue to which South Africa's legislation pay attention. Section 9 of the PEPUDA, subject to section 6 of the Act, states that no party in South Africa (including employers) may discriminate unfairly against any individual in the country who has a disability (including hearing-impaired job candidates/employees). Discrimination in this regard would mean failing to eliminate obstacles that unfairly restrict this group's equity and/or equal opportunities.

Scholars argue that legislations like the above, as such, did not suffice. Maja, Mann, Sing, Steyn and Naidoo (2011) point out that issues remain about South Africa's practical implementation of legislation that regulate disability employment. Majola and Dhunpath (2016) state that South Africa's employment of people with disabilities has been hindered by slow development of disability employment policies specific to the workplace level. Roulstone and Prideaux (2012) advise that policies for managing disability must acknowledge the diversity within this field rather than consider disability in general as a sub-category of diversity. Hence, disability-specific research at the workplace level is needed for the sake of developing policies that will allow enactment of the respective legislations. Such policies should be developed bottom-up, based on research at workplace-level (Graham, Moodley & Selipsky, 2013; Majola & Dhunpath, 2016; Smith, 2012).

Lack of knowledge about disability is highlighted as a major factor behind South Africa's failed practical intervention towards disability employment (Maja et al., 2011). McKinney (2013) concludes evidence to show that South Africa severely lack awareness about disability, in general; inherently, lack understanding about the unique considerations for people with disabilities. However, recently there is national-level focus on re-formulating policy to deal with disability employment.

The Department of Social Development (2016) urges accelerated input to consider disability, based on the recognition that the 'one-size-fits-all' outlook for a policy on disability development is not viable. It is risky to manage disability based on a general outlook. The main problem of such an approach is that it overlooks differences between disability groups regarding conditions that are disabling to each. This fails to promote disability-specific insight and consideration (Colella & King, 2018). Comparably, Smith (2012) advises that South African authorities should investigate contextual factors that may influence hearing-impaired individuals' functioning. Overarching rationale about such factors, disability models, are discussed below.

Disability models

Disability models generally conceptualise disability, at varying degrees, between two perspectives: the medical model (biological condition) and the the social model (social organisation) (Stanford Encyclopedia of Philosophy, 2011). These two are the major historical

models of disability (World Health Organisation: WHO, 2013). At the one extreme, biological impairment is believed to be the primary cause of limitation; at the other extreme, organisation of the context in which the individual with an impairment/impairments resides is argued to be the primary cause of limitation (Stanford Encyclopedia of Philosophy, 2011). Conceptualisation of disability has evolved over time as further insight has been generated about the phenomenon (Graham et al., 2014).

The medical professions community were the first to acknowledge of disability as an affair that could be intervened towards. As the result, the initial orientation that society developed towards impairment and disability was shaped by the medical perspective, from which the *medical model* of disability (medical model) emerged (Bhaskar & Danermark, 2006). According to the medical model, disability is the result of an individual's limited degree of physical, cognitive, behavioural and/or sensory functions, being below the 'normal' level of functions (i.e. impairment) – to an extent that limits their range and level(s) of (cap)abilities (Handley, 2003). Hence, the locus of disability is attributed to the individual's biological incapacity to keep up to the pace of the established society in terms of the demands of its established functions and operations (Bhaskar & Danermark, 2006; Gilson & DePoy, 2002). Impairment is conceptualised as empirical reality of a person's physical, cognitive and/or sensory functions not being at the same standard as the general population, to an extent that their functioning capability generally restricts them from engaging in general society (Handley, 2003). Disability is seen as imposed by one's lack of capability and a personal misfortune, an issue that is dealt with privately; no onus is placed towards broader society about collaboratively solving problems that people with impairments face (Handley, 2003). Interventions are aimed at the impaired individuals alone and seek to counterbalance disabled individuals' personal 'deficits', centring on using clinical treatments to biologically normalise or fix disabled individual's impairment(s) to the greatest extent possible. That is, so that the disabling effect may be weakened to the greatest extent possible, wishfully nullified, for the individual to become a 'normal' person who is able to meet the demands of mainstream society (Gilson & DePoy, 2002; Handley, 2003). Main criticism towards the medical model is that it neglects and marginalises people with impairments, and *that* is the main disabling issue (Handley, 2003). Despite that fact that the medical model is based on scientific and empirical notions, it is criticised as reflecting an orthodox perspective (Gilson & DePoy, 2002). It is said to amount to tunnel-vision and closed-mindedness about disability, ultimately leading society to limit its perspective about disability (Handley, 2003).

The medical perspective that was initially held towards the people began to be challenged during the 1960s by the disability movement (Bhaskar & Danermark, 2006). Disabled people, themselves, drew attention to the biological reductionism and how the halo effect of perceived sovereignty about medical knowledge resulted in the medical model's conceptualisation about disability not being critiqued. This resulted in failure to consider intermediary factors between impairment and disability; narrow-mindedness (Handley, 2003). The *social model* of disability argues that impairment and disability are not directly linked (Anastasiou & Kauffman, 2011). Rather, impairments are seen in the light of diversity (Gilson & DePoy, 2002). The cause of disability is argued to not be found in the body but in the environment (Bhaskar & Danermark, 2006). Disability is said to be a social construct created by barriers that are imposed by social and economic organisations, which fail to pay humane consideration and accommodation towards differently abled people. That, in turn, hinders their development along with mainstream society – leading to their marginalisation (Anastasiou & Kauffman, 2011). Hence, the social model implies that institutional accommodation is the needed intervention for dealing with disability issues. 'The very premise of the social model is grounded in resistance aimed at social processes that oppress disabled people' (Gabel & Peters, 2004, p. 592). However, just as the social model criticises the medical model of doing: The social model only focuses on one level of reality – the environmental (Bhaskar & Danermark, 2006).

The International Classification of Functioning, Disability and Health (*ICF*) integrates the notions of these two main models of disability – the medical model and the social model – into a 'bio-psycho-social synthesis' (World Health Organization, 2013, p. 5). The ICF aims for its conceptualisations to be progressively considerate in the holistic sense while also scientifically objective and neutral. The model evolves its conceptualisation of disability around an individual's health, judging that in context. The model suggests that a person's health be monitored in terms of multiple regression reasoning and analysis about individual-level and environment-level factors that are positively/negatively affecting it. 'Functioning' and 'disability' are said to be the umbrella terms that denote the natures of the two main types of personal outcomes that can emerge. The document (WHO, 2013) formally defines 'impairment' as differing degree of body function and/or structure, at an extent to which difficulty is inherently experienced. However, its overall discussion of the ICF model seems to conceptualise impairment – in the sense of a limitation at the individual level leading to disability – in terms of health impairment due to neglect towards individual and/or contextual factors. Disability intervention would be about promoting and preserving an individual's health

to afford them functionality. Such management would be conducted by means of identification and management of environment-level and individual-level factors that positively/negatively relate to the individual's wellbeing.

Based on WHO (2013), one can presume that the ICF has not been generally applied for measuring disability at the workplace level. The document does not mention the model's application at the workplace level. The levels that the WHO (2013) highlights application at include health sector, insurance, social security, labour, education, economics, policy or legislation development and the environment. However, the JD-R model conveys the same principals as the ICF (as will be discussed below), and the concepts of the JD-R model test valid in workplaces across the world (Schaufeli & Taris, 2014).

The Job Demands-Resources model and job demands

The Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2017), focusing at the employee level, also advises that wellbeing is a prerequisite to performance capacity and that health-impairment will deplete performance capacity. Interestingly, just as the ICF model does (WHO, 2013), the JD-R model states that employee wellbeing is influenced by, both, factors at the environmental level as well as the individual level. The JD-R model does so in terms of the job context. Moreover, on the same type of basis that the ICF implies individual wellbeing be monitored, the JD-R model suggests that employee wellbeing be monitored in terms of multiple regression reasoning about environmental-level and individual-level factors that positively/negatively affect it. Furthermore, employee engagement and employee burnout are said to be the two main types of outcomes that can prevail based on holistic proactive management towards an employee's wellbeing – which is comparable to the ICF's notions of functionality and disability. Therefore, the JD-R model conveys the same principals as the ICF model, at the workplace level. The JD-R model seems to be a tool for applying the same comparable conceptualisation and analysis principles. Therefore, the JD-R model is suggested to hold potentil for disability management at the workplace level.

The ecological perspective about disability in relation to hearing-impairment (Noble & Héту, 1994) conveys the same holistic analysis as the ICF and the JD-R model: 'An ecological approach is advocated giving attention to the system of interactions, both disabling and enabling, among various components: persons, environments and interfaces' (abstract).

Therefore, the case suggests that the JD-R model holds potential for disability analysis, intervention and management at the workplace level towards HIEs. However, study about the JD-R model being applied particularly to a disability group has not been encountered.

The JD-R model has been applied across a wide range of occupational and cultural contexts (Bakker & Demerouti, 2014; 2017). Hence, the model and its notions have tested valid among workplace contexts across the world (Schaufeli & Taris, 2014). This includes the South African environment (e.g. De Beer, Pienaar & Rothmann, 2016; Els, Mostert & De Beer, 2015; Janse van Rensburg, Rothmann & Diedericks, 2018; Stander, De Beer & Stander, 2015; Thuynsma & De Beer, 2016).

The term *job demands* refer to job characteristics that require effort from employees (Bakker & Demerouti, 2017; 2018; Sonnentag & Zijlstra, 2006). These may be phrased as energy-related taxes that employees inherit as charges for their membership to the particular work environment (Boudrias et al., 2011). The more a job demand is experienced as a stressor, the more energy it will take from the individual employee (Sonnentag & Zijlstra, 2006). Furthermore, the process of *health-impairment* is typically attributed to job demands in the following ways: (a) the job characteristic causing employee exhaustion (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner & Schaufeli, 2001; Schaufeli & Bakker, 2004); (b) leading past exhaustion towards health-impairment (Bakker & Demerouti, 2007; 2014; Schaufeli & Bakker, 2004; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007); and, ultimately, (c) resulting in self-undermining behaviour (Bakker & Demerouti, 2014; 2017).

According to Schaufeli and Taris (2014), uncontrolled job demands can be associated with employee outcomes such as physical ill-health, psychosomatic health complaints, negative work-home interference, unsafe behaviours, accidents and injuries, depression, and adverse events. Certain job demands apply generally, for example, workload; whereas others are unique to the context, for example, physical and/or psychological demands (Bakker & Demerouti, 2007; 2014; Bakker, Demerouti & Euwema, 2005). From the literature investigated above, job demands can be defined as job-inherent aspects that will cost energy from occupants of the job environment and require mitigation to control the potential effects of health impairment, while these demands may also be specific to a particular context.

Paired with the concept of job demands is *job resources* (Bakker & Demerouti, 2007; 2014; 2017; Demerouti et al., 2001; Schaufeli & Bakker, 2004). As was pointed out, job demands entail job characteristics perceived as consuming factors. In contrast, job characteristics that employees perceive as complementary and supportive may apply as job resources (Bakker & Demerouti, 2018; Schaufeli & Taris, 2014). The *motivational process* is attributed to job resources, as job characteristics that primarily strengthens employees' motivation (Bakker & Demerouti, 2014; 2017; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007). Due to such enhanced motivation, employees are led to construct positive meaning within their work environments (Bakker & Demerouti, 2018).

The present study, however, focused only on *job demands* that hearing-impaired employees encounter. The reason for such an exclusive focus is that scholars (Colella & King, 2018; Smith, 2012) urge research on environmental aspects, which may be disabling to individuals such as hearing-impaired employees. The JD-R model (Demerouti et al., 2001; Bakker & Demerouti, 2007; 2017; Schaufeli & Bakker, 2004) indicates that uncontrolled job demands are likely to impair employees' wellbeing and performance. In this sense, job demands of hearing-impaired employees can be considered as potential disabling factors.

A job demand can be characterised in, both, the objective sense and subjective sense – and may vary considerably among parties (Boyd & Tuckey, 2014; Daniels, 2006). Regarding *objective* job demands, Boyd and Tuckey (2014) identify two sub-categories: task requirements (e.g. technical needs), and stressors imposed by the organisation's processes (e.g. straining work procedures). Furthermore, Schaufeli and Bakker (2004) point to the quantitative manifestation of job demands such as workload. Regarding the *subjective* dimension, Schaufeli and Taris (2014) argue that employees' unpleasant association with a job characteristic will render this as a job demand to that individual. This also implies that job characteristics, which employees could experience as job demands, may differ among individuals.

In addition, documented workplace situations which HIEs have been found to experience as energy-consuming, differ distinctly from job demands themes identified in mainstream literature on the JD-R model. The common themes of demands focus on the following four basic dimensions: (a) *physical* (Bakker & Demerouti, 2007; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007); (b) *psychological* (cognitive and/or emotional effort: Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004); (c) *social* (Bakker & Demerouti, 2017; 2018; Xanthopoulou

et al., 2007); and (d) *organisational* (Bakker & Demerouti, 2014; Demerouti et al., 2001; Schaufeli & Bakker 2004; Xantholoulou et al., 2007). The themes derived from qualitative data of the present study are: *communication demands*, *environmental-stimuli demands* and *time demands*. These themes differ from the above-mentioned mainstream overarching job demands. Moreover, the mentioned themes, captured from HIE qualitative responses, concur with international findings on HIEs. These cases are elaborated below.

Communication difficulties

Previous international findings suggest that HIEs find their energy consumed by workplace experiences such as difficulties with communication (Lund, 2015; Van Gils et al., 2010); competing speech (Hua et al., 2015); and communication amidst noise (Kramer et al., 2006). Lund (2015) concludes that difficulties with communication associate negatively with HIEs' energy levels, and positively with their stress. Van Gils et al. (2010) found lower levels of HIE efficiency in the modal language to be associated with higher levels of stress. Hua et al. (2015) point out that HIEs experience commotion in the work environment and competing speech as difficulties. In the same vein, Kramer et al. (2006) found that the valid sick leave of HIEs' correlated significantly in a positive linear sense with communication in noise and effort in hearing.

The findings above are comparable to the notion of the *communication demands* theme that was derived from data of the present qualitative inquiry. In this regard, communication demands are described as job aspects primarily relating to communication (exchange of information among two or more social parties), which hearing-impaired employees experience as taking energy from them. Examples are: too rapid rate of speech, misunderstanding of other party, explaining repeatedly, communication commotion, and communication gap.

Environmental stimuli

The environmental stimuli job demands theme was also derived from the present qualitative inquiry and also relates to prior findings on HIEs. *Environmental-stimuli demands* are described as job aspects that primarily concern variation in surroundings, which, according to hearing-impaired employees, take energy from them. Such variation entails both intangible (e.g. sound waves) and tangible aspects (e.g. travelling). This theme is in line with international findings on HIEs. Comparable findings that theory (Bakker & Demerouti, 2017) would

translate into job demands include workplace situations where employees must distinguish sounds (Kramer et al., 2006), increased noise levels (Hua et al., 2013; Jahncke & Halin, 2012; Lund, 2015), and effort in hearing (Kramer et al., 2006). Other equivalent findings include number of people in the room (Lund, 2015) as well as ‘reverberation’ (Hua et al., 2015; Kramer et al., 2006; Punch, 2016), which refers to lengthy sound and its resonance (Oxford Dictionaries, 2018).

Time demands

The job demands theme of *time demands* was also derived from the qualitative data. These demands can be defined as those job aspects linked primarily to time management (by either the employees themselves or work associates). Hearing-impaired employees experienced that insufficient time management takes energy from them (e.g. pressure, poor job allocation). During the literature review, the theme of time demands was not noticed among indexing articles about the JD-R model (Bakker & Demerouti, 2007; 2014; 2017; 2018; Demerouti et al., 2001; Schaufeli & Bakker 2004; Schaufeli & Taris, 2014; Xantholoulou et al., 2007).

However, the construct is mentioned among investigations related to the job-demands theme. De Hauw and Greenhaus (2015) used the term, time demands, to denote duration of work hours. Nijp, Beckers, Kompier, Van den Bossche and Geurts (2015) focus on time regulation, whereas Grissom, Loeb and Mitani (2015), mention time-based conflict. For Dijkhuizen, Gorgievski, Van Veldhoven and Schalk (2016), such demands imply time pressure and time management. According to Kim and Hollensbe (2017), this means having limited time but much to do. Gadeyne, Verbruggen, Delanoëije and De Cooman (2018) point out time-related constraints imposed on work days. The term ‘time demands’ was also noticed in other articles, but no description of the construct was provided (Creed, French & Hood, 2015; Deery, Walsh & Zatzick, 2014; Lee, Kim, Faulkner, Gerstenblatt & Travis, 2018).

As mentioned above, the exploratory quantitative study dealt only with job demands of hearing-impaired employees. In particular, the focus was on the above-discussed demands themes derived from the qualitative findings. Namely, communication, environmental-stimuli and time management. This focus aims to provide insight into a problem about which there is limited existing scientific literature (Struwig & Stead, 2011).

The psychometric properties of existing South African job demands scales

Various scales measuring job demands have already been developed and validated in South Africa through rigorous procedures. These scales are widely documented across South African studies (see Asiwe, Hill & Jorgensen, 2015; Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann et al., 2006). However, the use of such job demand scales may be problematic since they do not consider possible norm-deviance among HIEs about job characteristics that are experienced as job demands. Therefore, it is crucial to develop a job demands scale specifically addressed at them (Majola & Dhunpath, 2016; Smith, 2012). To adequately develop such a scale, it is necessary to pay attention to its psychometric properties from the beginning (Foxcroft & Roodt, 2018). Namely, it is imperative for a newly-developed scale to show satisfactory validity and reliability (Ginty, 2013). The Employment Equity Act of South Africa (1998) stipulates as follows:

Psychological testing and other similar assessments of an employee are prohibited unless the test or assessment being used – (a) has been scientifically shown to be valid and reliable; (b) can be applied fairly to all employees; and (c) is not biased against any employee or group (p. 16).

Therefore, a preliminary evaluation was necessary of the newly-developed job demands scale for hearing-impaired employees. The aim was to determine acceptable reliability and validity for it to be classified as a suitable measuring instrument (Paterson & Uys, 2005). According to DeVellis (2017), it is imperative to use measuring instruments that show evidence of reliability and validity, since such instruments have various implications for relationships with other variables. Therefore, it was deemed necessary to investigate the preliminary psychometric properties (e.g. reliability and validity) of the newly-developed job demands scale for hearing-impaired employees.

Reliability

Foxcroft and Roodt (2018) describe reliability as the degree to which a measure is consistent. Every measurement contains a degree of error (Goodwin & Goodwin, 2014). As a result, a researcher should assess whether their error degree is statistically significant to jeopardise the dependability of the attained data (Goodwin & Goodwin, 2014). Such assessment can be made by evaluating the reliability of the particular scale (Goodwin & Goodwin, 2014). As mentioned

previously, the reliability of a scale concerns the extent to which the accuracy of its measurements are consistent over time or are likely to be (Creswell, 2014; Foxcroft & Roodt, 2018; Jackson, 2014; Terre Blanche, Durrheim & Painter, 2012). Should a scale be unreliable, that will compromise the confidence in the data that it yields (Goodwin & Goodwin, 2014). Therefore, the reliability of a scale can be considered the cornerstone of its validity (Creswell, 2014).

Assessing the reliability of a scale will indicate whether its error in measurement is low enough to conclude that the yielded score is close enough to the true score (Goodwin & Goodwin, 2014). Cronbach's alpha is the most widely-used reliability coefficient to determine the internal consistency of a measure. When a scale's Cronbach's alpha coefficients score above 0.70, the scale can be regarded as reliable (Nunnally & Bernstein, 1994). Studies by various South African researchers found acceptable internal reliabilities ranging between 0.70 and 0.90 for their job demands scales (Asiwe et al., 2015; Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann et al., 2006).

Validity

One of the major psychometric properties to consider for studies in developing job demands/resources is the construct validity of instruments (Asiwe et al., 2015; Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann et al., 2006). Construct validity refers to the degree to which an instrument measures the theoretical construct or trait that it is supposed to measure (Foxcroft & Roodt, 2018). Procedures of factor analysis may be used to determine validity. There are two types (Pallant, 2013): exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). EFA concerns statistically exploring relationships amid variables and is suggested for early stages of research (Pallant, 2013). EFA links a scale's items statistically to identify the commonalities between them (Yong & Pearce, 2013). In this way, the underlying latent factors that the items reflect are identified (Fabrigar & Wegener, 2012). Therefore, through this method it can be analysed whether the items group in manners that show them to reflect the constructs that they are suggested to (Stommel & Wills, 2004). On the other hand, CFA is about confirming or rejecting (i.e. testing) theoretical analogy about structure that underlies variables of interest (Pallant, 2013). It is applicable to later stages of research about a topic (Pallant, 2013).

The present study used preliminary EFA instead of CFA, as the study aimed to explore the internal validity of the factors and indicate which items load onto each factor. A further reasoning was that most of the South African studies on job demands employ the EFA method (see Asiwe et al., 2015; Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann et al., 2006). Examples of these studies are explicated below.

Studies on job demands/resources

Jackson and Rothmann (2005) developed a Job Demands-resources scale (JDRS) to measure job demands and job resources of educators in South Africa's North West Province ($N = 266$). The scale was compiled initially of 48 items, of which 43 passed the validity test (exploratory factor analysis: EFA). The items were derived from literature and interviews with educators in the mentioned province. Ratings were done through a four-point scale ranging from 1 (*never*) to 4 (*always*). The following factors emerged through the EFA: pace and amount of work, information, communications, participation, contact possibilities, uncertainty about the future, remuneration and career possibilities. Cronbach's alpha coefficients ranged from 0.71 to 0.90 ($0.71 \leq \alpha \leq 0.90$).

The JDRS used by Rothmann and Jordaan (2006) comprise mostly items that directly resemble those of Jackson and Rothmann (2005). The items from their JDRS were developed to reflect more directly the job demands and job resources experienced by academic staff of higher education institutions in South Africa ($N = 471$). As in Jackson and Rothmann (2005), Rothmann and Jordaan (2006) obtained ratings according to a four-point scale ranging from 1 (*never*) to 4 (*always*). As many as 46 of the 48 items passed the validity test (EFA). The factors that emerged from the EFA were role overload (pace and amount of work, mental load and emotional load); job characteristics (variety, opportunities to learn and independence); social support (relationship with colleagues and contact possibilities); organisational support (relationship with immediate supervisor, ambiguities about work, information, communication, participation); uncertainty about the future; remuneration, and career possibilities. Cronbach's alpha coefficients ranged from 0.76 and 0.92 ($0.76 \leq \alpha \leq 0.92$).

The JDRS used by Rothmann et al. (2006) was also adapted from Jackson and Rothmann (2005). Therefore, the scale was compiled generally of items that directly resemble those of Jackson and Rothmann (2005). The scale of Rothman et al. (2006) was administered to

employees in South Africa's industries of insurance, engineering, correctional services, along with personnel at a university of technology, and academics at higher education institutions ($N = 2717$). The items were adapted based on a literature review along with interviews with participant groups of the study. Several additional JDRS items were developed by Rothmann et al. (2006), who made measurement through a four-point scale ranging from 1 (*never*) and 4 (*always*). As many as 45 of the 48 items were not rejected by the EFA. The factors that emerged are: pace and amount of work, mental load, emotional load, variety in work, relationships with colleagues, relationship with immediate supervisor, ambiguities about work, information, communications, participation, contact possibilities, uncertainty about the future, as well as remuneration, and career possibilities. Cronbach's alpha coefficients ranged from 0.76 to 0.92 ($0.76 \leq \alpha \leq 0.92$).

Rothmann and Joubert (2007) used a JDRS to measure job demands and resources of employees on management level in South Africa's platinum mining industry ($N = 310$). Additional items were developed based on focus group interviews with managers. The scale predominantly resembled that of Jackson and Rothmann (2005). Rothmann and Joubert's (2007) JDRS added a job characteristics theme that was not listed in any of the previously developed scales: the theme of technology. Further added items relate to already-listed dimensions of job characteristics (cognitive, emotional, social and financial) but specified different forms of those dimensions. All these mentioned items were among the 53 of the initial 67 that were retained after conducting the EFA. Rothmann and Joubert's (2007) ratings took place through a four-point scale ranging from 1 (*never*) to 4 (*always*). Cronbach's alpha coefficients ranged from 0.78 to 0.94 ($0.78 \leq \alpha \leq 0.94$).

Asiwe et al. (2015) adapted the JDRS of Jackson and Rothmann (2005) to measure job demands and resources of employees in the South African agricultural sector ($N = 443$). The 48 items of the original JDRS were adapted to reflect job demands and resources of the agricultural instead of educational sector. Accordingly, the words 'children' were replaced by 'clients'. Likewise, the words 'educational department' was replaced by 'organisation/institute/division'; 'school' by 'organisation/institute'. In addition, seven items were rephrased to reflect the particular work environment better. Twelve items were added in order to gain further insight about job demands and resources of this country's agricultural environment. The JDRS of Asiwe et al. (2015) added a job characteristics theme that was not listed in any of the prior scales: physical – however, referring to a single item. The initial questionnaire was compiled

of 60 items. A seven-point scale was used to rate the items, ranging from 1 (*never*) to 7 (*always*). As many as 48 of the initial 60 items were retained through the EFA. The scale tested reliable since Cronbach's alpha coefficients ranged between 0.77 and 0.92 ($0.77 \leq \alpha \leq 0.92$).

Research design

The research approach and the research method are discussed as the main elements of the research design.

Research approach

This study followed a quantitative research approach. Such an approach can be described as conclusive research of samples selected for the study and investigated through a structured procedure of data processing (Struwig & Stead, 2011). A cross-sectional research design was chosen, implying that the data was collected at one particular point in time (Saunders, Lewis & Thornhill, 2009). The reason for such a design was that the purpose of the present study was not to investigate the relationships between variables (Bryman et al., 2014). The study can be described as exploratory, since its purpose was to gain insight into unknown territory (Delpont & Fouché, 2011). Such a cross-sectional design also has the advantages that it is both convenient and less costly (Fouché, Delpont & De Vos, 2011).

Research method

The research method encompassed of a scale development and preliminary testing of the newly developed scales validity and reliability.

Scale development

The primary purpose of the study was to develop a scale that could accurately measure job demands of hearing-impaired employees. These demands concerned communication, environmental stimuli, and time.

In order to develop a new scale, a four-step procedure was followed, entailing the initial conceptualisation of the construct, generation, development and evaluation of items, choosing a scaling format, and refining items. These four-steps adhere closely to procedures described in literature on the development of psychometric scales (Carpenter, 2018; DeVellis, 2017; Foxcroft & Roodt, 2018; Tay & Jebb, 2017). The procedure is described in more detail below.

Initial conceptualisation of the construct

Prior to the development of a scale, the construct to be measured must be conceptualised clearly (Tay & Jebb, 2017). The structure and meaning of a scale's construct(s) should be grounded on empirical theory and research (Tay & Jebb, 2017). The quality of a measure rests on the researchers' judgement, in particular by identifying sub-constructs and wording of items to be included in the scale (Carpenter, 2018). Drawing on the theoretical perspective of the Job Demands-resources model (JD-R model) (Bakker & Demerouti, 2007; 2014; 2017), job demands of hearing-impaired employees were defined as: *Job aspects that hearing-impaired employees frequently encounter, which consume their energy and therefore are associated with depletion of their work energy.*

The latent constructs developed to reflect specific job aspects that hearing-impaired employees experience as energy consuming, were derived from findings of the qualitative study (as indicated in chapter 2 of this study). Although the conceptualisation of the construct is drawn from the JD-R model, the scale of the present investigation is different since it brings to light themes of job demands that were not listed previously. These constructs differ significantly from those which key researchers on JD-R generally mention (Bakker & Demerouti, 2007; 2014; 2017; Demerouti et al., 2001; Schaufeli & Bakker 2004; Xanthopoulou et al., 2007). The latter view job demands in terms of dimensions: physical, psychological (cognitive and/or emotional demands), social, and organisational. The following constructs of job demands were not found in the literature, and are perceived by HIEs as taking energy from them:

- *Communication*: job aspects primarily linked to communication. Such demands are: work associates' rapid speech or inability to understand; the need to explain repeatedly;

communication gap, poor task-orientation; and a commotional communication environment.

- *Environmental-stimuli*: job aspects as part of changing surroundings that HIEs encounter – both intangible (e.g. sound waves) or tangible (e.g. travelling). These aspects challenge HIEs, for example, physical commotion, or interrupted tasks.
- *Time*: job aspects mostly linked to time management by either employees themselves or work associates, namely aspects such as time pressure, or time allocation.

Generation, development and evaluation of items

An introductory sentence for the items (i.e. the prefix) was developed at the onset when the item was generated (e.g. *‘It takes energy from me at my work when ...’*). The prefix was developed to reflect the apparent energy-consuming nature of the workplace experiences, in terms of the three above-mentioned job demands (communication, environmental stimuli, and time) derived from the data of the qualitative inquiry. Based on the definitions of the construct and sub-constructs, as well as previous qualitative findings, the researcher developed preliminary suffixes (i.e. items) for the questionnaire (e.g. *‘There is disturbance in the background while me and a co-worker are trying to communicate with each other’*).

A slight fraction of the developed scale’s items was based on items of the matured JDRS, already established in South Africa. Only two items of existing South African instruments that measure job demands (Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann et al., 2006) were noticed to directly relate to the data to be reflected in the developed questionnaire. Six of the developed scale’s items were derived from JDRS items. The two JDRS items of interest are listed in appendix F. A further 65 new items were developed. All 71 items were adapted and developed based on criteria set out by researchers (DeVellis, 2017; Foxcroft & Roodt, 2018; Tay & Jebb, 2017). These criteria describe the following aspects: (a) the purpose of the measure; (b) congruence to substantive theory; (c) the characteristic boundaries of the phenomena; and (d) balance between specificity and generality of phrasing. The 71 items were then re-read to ascertain their direct relation to the core purpose of the investigation (McCusker & Gunaydin, 2015). That led to the discarding of five items, with 66 items retained for further refinement.

Choosing a scaling format

It was decided to use a format scale based on the frequency of responses. The decision for using such a scale with no midpoint, was based on suggestions from previous researchers in the job-demands field (Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann et al., 2006). The response options were worded to signify roughly equal intervals in the frequency of occurrences (DeVellis, 2017), and included a four-point rating scale: (1) *never*, (2) *sometimes*, (3) *often*, (4) *always*. The homogeneity of a response scale (i.e. four-point scale between the questionnaires) promotes comparability of the findings (De Jonge, Veenhoven & Aarends, 2014). Two further response options were included: (5) *I have not experienced this situation* and (6) *Does not make sense*. This was done to prevent errors in measurement. Firstly, option (5) allowed identification of cases where respondents' workplace circumstances did not apply to either terms of the four-point rating scale. Secondly, option (6) helped identify items that the respondents did not understand – in order to be excluded from the final data analysis. Items that were loaded or incomprehensible raised concerns about possible measurement error (Tay & Jebb, 2017), therefore these last two options were included.

Refining the items

After the items were developed, further refinement was necessary. Errors in measurement can occur due to complex wording or language, vague questions or response categories, double-barrelled questions, and leading or biased questions (Tay & Jebb, 2017). Researchers emphasise that respondents should be knowledgeable (i.e. subject-matter researchers/experts) about the relevant content areas (Clark & Watson, 1995; DeVellis, 2017; Pett, Lackey, & Sullivan, 2003). This notion would especially be useful when refining items for a scale.

A panel of three experts reviewed the shortlisted items. They were researchers in the field of job demands/resources as well as an expert in the field of deafness and South African sign language (SASL). The experts were provided with a definition of the job demands scale for hearing-impaired employees as well as the conceptualisation of each of the sub-constructs for the scale: communication demands, environmental-stimuli demands and time demands. The experts were requested to classify items by identifying phrasing that were confusing/unclear/ambiguous, or which hearing-impaired individuals may misinterpret. The panel were also asked to respond to identified cases by highlighting problematic items and proposing alternative phrasing to these item/s.

After the involving the experts, the 66 remaining items were scrutinised and adapted where necessary. Through the mentioned refining process, nine items were discarded based on the panels' recommendations regarding phrasing that was ambiguous or overly complex. The final item pool of 57 items was generated and included the pen-and-paper as well as online questionnaire (see Appendix G). Additionally, provision was made for those hearing-impaired employees who are less textually literate (Spencer & Marschark, 2010). This was done by developing SASL video clips of the final reviewed items. These video clips were recorded by an SASL interpreter (Gerich & Lehner, 2006) and included in the online version of the questionnaire. An initial study was conducted to assess the preliminary validity and reliability of the new questionnaire.

Research participants

The newly-developed 57-item, job-demands measuring instrument was administered to hearing-impaired employees within the South African context. A combination of purposive and network sampling was used. That is, methods of non-probability sampling. Purposive sampling refers to the technique where the researcher makes a judgement call based on certain criteria, about who to include in the sample (White & McBurney, 2013). Thus, the selected individuals would be key informants on the topic under investigation (Quinlan, Babin, Carr, Griffin & Zikmund, 2015). The following inclusion criteria were applied, according to which respondents had to: (a) be employed; (b) indicate that they had a hearing-impairment; and (c) be well-versed in the English language to complete the questionnaire successfully. By limiting the research respondents who have the unique attributes of the targeted population, also helped ensure the internal validity of the attained data (Tongco, 2007).

Furthermore, network sampling (also known as snowball sampling) is widely used when rare populations are used in survey research (Lavrakas, 2008) – in this case, hearing-impaired employees. According to this sampling technique, initial contacts within the network (i.e. the deaf-and-hard-of-hearing network of South Africa) refer the researcher to other in-group members (i.e. HIEs) of that network. These referrals continue until a sufficient number of respondents are reached (Wolf, Joye, Smith & Fu, 2016). The demographic characteristics of the sample for the present study are displayed in Table 1 below.

Table 1

Characteristics of participants (N =85)

Item	Category	Frequency	Percentage
Gender	Male	46	54.1
	Female	39	45.9
Language	Afrikaans	22	25.9
	English	26	30.6
	African	6	7.1
	SASL	28	32.9
Highest qualification	Grade 6/Standard 4	1	1.2
	Grade 8/Standard 6	3	3.5
	Grade 9/Standard 7	1	1.2
	Grade 10/Standard 8	1	1.2
	Grade 11/Standard 9	3	3.5
	Grade 12/Matric	19	22.4
	Certificate	15	17.6
	Diploma	8	9.4
	Advanced Diploma	6	7.1
	Bachelor's Degree	11	12.9
	Honours Degree	4	4.7
	Master's Degree	4	4.7
	Doctorate	2	2.4
	Other	3	3.5
	Double entry	1	1.2
	Missing value	3	3.5
Category of hearing loss	Deaf	49	57.6
	Hard-hearing	36	42.4
Laterality of hearing loss	Bilateral (both ears)	75	88.2
	Unilateral (one ear)	9	10.6
	Missing value	1	1.2
Permanency of hearing loss	Permanent	85	100
Workplace predominantly consists of hearing employees	Yes	64	75.3
	No	21	24.7

It is evident from Table 1 above, that the sample consisted of 54.1% males and 45.9% females. SASL was indicated as the most common home language among the respondents (32.9%), followed by English (30.6%), Afrikaans (25.9%) and African language groups (7.1%). Furthermore, most of the respondents (22.4%) had obtained a Grade 12/Matric qualification, followed by 17.6% who had obtained a certificate and 12.9% a Bachelor's degree. Regarding the category of hearing loss, the majority of the respondents (57.6%) indicated that they are deaf, while 42.4% indicated that they are hard-of-hearing. On laterality of hearing loss, the majority of the respondents (88.2%) indicated loss in both ears (bilateral), while 10.6% indicated hearing loss in one ear (unilateral). Finally, the majority of the respondents (75.3%) indicated that their workplaces consist of predominantly hearing employees.

Measuring instruments

Two basic measuring instruments were utilised:

Biographical questionnaire: administered to collect the personal data of hearing-impaired employees. This data focused on their gender, language, higher qualification, category of hearing loss, laterality of hearing loss, permanency of hearing loss and whether their workplace consist of predominantly hearing employees.

Job Demands Scale for Hearing-Impaired Employees: The newly-developed 57-item questionnaire was used to measure job demands related to communication, environmental stimuli, and time.

Research procedure and ethical considerations

Ethical clearance for the present study was obtained from the particular University's Scientific and Ethical Committee (Ethical approval number: EMSMHW16/06/10-01/05). After permission was granted the research commenced. Various organisations (i.e. education, banking and hospitality) were approached for permission to conduct the research. Once permission had been obtained from management to distribute the questionnaire to hearing-impaired employees within their organisation, the questionnaire booklet was compiled. This booklet consists of an informed consent letter, which conveys the purpose and significance of the study, the voluntary participation letter, as well as the newly-developed job demands scale. The questionnaire booklet was produced in traditional paper-and-pencil format as well as an online version (which included text and sign language).

The respondents who used the online version e-mailed their completed questionnaires to the researcher, while others using the traditional paper-and-pencil format submitted their completed questionnaires in a sealed envelope to their organisation's management, from which the researcher collected it. To encourage participants to complete the booklet, a retail voucher was included for a R500 lucky draw. Contact details of the individuals who participated were recorded for the lucky draw through voluntary provision but were immediately discarded afterwards. The only role the management of the organisations played during this process was granting permission to conduct the study and submitting the sealed questionnaire to the

researcher. The completed online-version questionnaires were stored in a secure place that are password protected, to which only the researcher had access. The researcher ensured that all results were kept confidential and no ethical guidelines were breached (Strydom, 2011). After the data collection process, the statistical analysis commenced.

Statistical analysis

Statistical analysis was done by using the IBM SPSS program version 25.0 (IBM SPSS Inc., 2017). A preliminary analysis focused on the factor structure of the newly-developed questionnaire and its psychometric properties such as internal validity and reliability. Descriptive statistics were analysed to determine the mean, standard deviation, and percentage response explained for each of the items (Struwig & Stead, 2011). The distribution of the items was determined, and it was ascertained whether items were answered in a consistent or random way. Thereafter EFA was used to determine the internal validity of the 57-item job demands scale for hearing-impaired employees separately. This scale comprises ten subscales, namely: work associates' rapid rate of speech; work associates struggling to understand; having to explain repeatedly; communication gap; poor task-orientation; commotional communication environment; physical commotion; task interruption; time pressure; and time allocation. EFA helps identify the latent factors that items in the questionnaire congruently or ultimately represent and to describe the correlations among a set of observed variables correctly (Fabrigar & Wegener, 2012; Muthén & Muthén, 2017).

Before EFA can be conducted, several conditions should be met. Firstly, the Kaiser-Meyer Olkin (KMO) test must produce values greater than 0.50 for data to be appropriate for factor analysis (Williams, Onsman & Brown, 2012). Secondly, Bartlett's test of sphericity must produce significant results to indicate that the scale items correlate adequately. Finally, Kaiser's criterion factors have to produce Eigenvalues larger than 1.00 (Kaiser, 1970). The above-mentioned conditions were all met in the present study. The principle-component analysis (PCA) was employed as extraction method, followed by no rotation for each subscale of the 57-item job demands scale, since only a single factor was extracted for each of the subscales.

After the PCA, the researcher determined communalities and item loadings on the factor. When a communality for a specific item scores low (in this case $< .2$), it will be difficult for this item

to load significantly on the specific factor. Thus, such items should be removed from further analysis. The results of the component matrix were used to determine the item loadings on the factor and to ascertain how strong the loading was. Loadings smaller than 0.30 indicates that an item does not measure the studied factor effectively (Child, 2006; Kerlinger & Lee, 2000). Therefore, it was decided to omit such items. Furthermore, Eigenvalues were identified of 1 and greater to the total variance that was explained. After the EFA was completed, Cronbach's alpha coefficients (i.e. internal consistency) was calculated, to determine whether the subscales could be considered as reliable (i.e. 0.70 and higher; Cicchetti, 1994; Nunnally & Bernstein, 1994).

The t-test was used to determine differences based on job demands between two different sample population groups (Jackson, 2014). The t-test allows a researcher to determine whether the sub-groups are as similar to the independent variable, that they can be considered as part of the same population group, or whether there is a distinct difference (Jackson, 2014). Effect-size evaluations were used to interpret the results of the t-tests. Effect size indicates to what degree the independent variable influences variance of the dependent variable. In other words, the larger the effect, the more consistent the independent variable's influence would be (Jackson, 2014). Effect sizes between 0.20 and 0.49 count as small effects (i.e. effect sizes < 0.20 are not considered); effect sizes between 0.50 and 0.79 count as medium effects; effect sizes of 0.80 or higher count as large effects (Cohen, 1992).

Furthermore, analysis of variance (ANOVA) was used to compare the mean outcome scores based on job demands between three or more sub-groups, since t-tests in such terms would imply possible type-1 errors occurring (Jackson, 2014). Effect sizes of ANOVA outcomes were interpreted through the eta-square (η^2) – as recommended by Jackson (2014). The eta-squared value helps estimate the extent to which the variance of the dependent variable is caused by the independent variable. By multiplying the value by 100, its percentage can be calculated (Jackson, 2014). The *d* value was used to analyse the effect sizes of sub-group comparisons, considering the data was obtained from a small-scale population (Ellis & Steyn, 2003).

Finally, Pearson's correlation coefficients were calculated to define the relationships between the job demands variables. Pearson's coefficient allows researchers to detect possible covariance in the linear relationships between the two variables concerned (Swanepoel, Swanepoel, Van Graan, Allison & Santana, 2011). The cut-off point for the statistical

significance of the results was $p \leq 0.05$. Cohen's (1992) effect sizes were used to classify the practical significance of the correlations: $r \leq 0.30$ were regarded as suggesting small; $0.31 \leq r \leq 0.49$ as medium; and $r \geq 0.50$ large.

Results

Descriptive statistics of items for the Job demands Scale for Hearing-Impaired Employees

The first step of the analysis for the present study was to examine the descriptive statistics of all 57 items from the Job demands Scale for Hearing-Impaired Employees. Table 2 below describes the quality of the data of the scale by examining the items.

Table 2

Descriptive statistics on the Job demands Scale for Hearing-Impaired Employees

Code	Items of JD Scale	Never	Sometimes	Often	Always	Have not experience	Does not make sense	Mean	SD
B1	It takes energy from me at my work when a work associate does not talk slow enough for me to follow what they are saying	9.4	40.0	25.9	20.0	3.5	1.2	2.59	0.93
B2	It takes energy from me at my work when a person struggles to communicate with me	15.3	44.7	15.3	21.2	2.4	0	2.44	1.01
B3	It takes energy from me at my work when it is difficult to meet a time limit at work	22.4	43.5	17.6	4.7	9.4	2.4	2.05	0.82
B4	It takes energy from me at my work when I am not given a proper explanation about what I am supposed to do on a job	14.1	47.1	17.6	14.1	7.1	0	2.34	0.92
B5	It takes energy from me at my work when a work associate struggles to understand what I am trying to explain to them	15.3	47.1	23.5	8.2	5.9	0	2.26	0.84
B6	It takes energy from me at my work when people talking in the background distracts me while I am busy with a job	22.4	32.9	15.3	23.5	2.4	3.5	2.43	1.11
B7	It takes energy from me at my work when there is a noise in the background and that makes it difficult to spot when each person is talking	17.6	31.8	15.3	24.7	8.2	2.4	2.53	1.10
B8	It takes energy from me at my work when there is not an interpreter to help me to communicate with people	35.3	22.4	12.9	14.1	14.1	1.2	2.07	1.12

Table 2, continued

Descriptive statistics on the Job demands Scale for Hearing-Impaired Employees

B9	It takes energy from me at my work when my work puts me in an environment with physical commotion around me	20.0	31.8	15.3	15.3	14.1	3.5	2.31	1.04
B10	It takes energy from me at my work when I leave a job to the last minute to complete	23.5	38.8	17.6	7.1	11.8	0	2.09	0.89
B11	It takes energy from me at my work when it is not quiet and that makes it difficult to spot when each person is talking	11.8	42.4	17.6	21.2	4.7	2.4	2.53	1.10
B12	It takes energy from me at my work when things around me distract me while I am busy with a job	18.8	42.4	18.8	15.3	4.7	0	2.32	0.97
B13	It takes energy from me at my work when my work puts me in an environment with social commotion around me	14.1	34.1	25.9	15.3	10.6	0	2.47	0.96
B14	It takes energy from me at my work when I am not clearly told what I must do on a job	12.9	43.5	16.5	18.8	8.2	0	2.45	0.98
B15	It takes energy from me at my work when a work associate does not understand what I am trying to explain to them	16.5	38.8	23.5	12.9	7.1	1.2	2.36	0.94
B16	It takes energy from me at my work when my supervisor does not lead me to use my time well	27.1	30.6	15.3	7.1	18.8	1.2	2.03	0.95
B17	It takes energy from me at my work when I see that I did not use my time well enough to complete a job at work	21.2	48.3	12.9	10.6	7.1	0	2.14	0.91

Table 2, continued

Descriptive statistics on the Job demands Scale for Hearing-Impaired Employees

B18	It takes energy from me at my work when there is not proper communication tools to help me interact with work associates	12.9	32.9	22.4	18.8	12.9	0	2.54	1.00
B19	It takes energy from me at my work when I have to explain again and again to a work associate	15.3	41.2	22.4	11.8	9.4	0	2.34	0.91
B20	It takes energy from me at my work when a work associate talks too fast for me to understand their words	5.9	32.9	25.9	24.7	8.2	2.4	2.78	0.93
B21	It takes energy from me at my work when there is background disturbance and that makes it difficult to catch what is being said to me	11.8	36.5	21.2	20.0	5.9	4.7	2.55	0.99
B22	It takes energy from me at my work when I am not properly shown what I am supposed to do on a job	15.3	42.4	20.0	10.6	11.8	0	2.29	0.90
B23	It takes energy from me at my work when my supervisor leads me in a way that wastes time	14.1	29.4	25.9	10.6	17.6	2.4	2.41	0.93
B24	It takes energy from me at my work when there is a noise in the background and that makes it difficult to catch what a person is saying	18.8	25.9	17.6	21.2	14.1	2.4	2.49	1.11
B25	It takes energy from me at my work when a work associate talks too fast for me to keep up with their words when they speak	5.9	32.9	34.1	17.6	9.4	0	2.70	0.86
B26	It takes energy from me at my work when it is not quiet and that makes it difficult to follow when each person is speaking	14.1	34.1	18.8	22.4	8.2	0	2.55	1.04

Table 2, continued

Descriptive statistics on the Job demands Scale for Hearing-Impaired Employees

B27	It takes energy from me at my work when I am pressured to finish a job on time	15.3	40.0	15.3	23.5	4.7	0	2.50	1.04
B28	It takes energy from me at my work when I struggle to communicate with a person	11.8	52.9	16.5	10.6	7.1	0	2.28	0.84
B29	It takes energy from me at my work when people talking in the background makes it harder for me to focus on a job	24.7	32.9	17.6	12.9	9.4	1.2	2.21	1.02
B30	It takes energy from me at my work when my work puts me in an environment with lots of people moving	24.7	25.9	20.0	17.6	10.6	0	2.35	1.10
B31	It takes energy from me at my work when there is disturbance in the background while me and a co-worker are trying to exchange information	11.8	37.6	20.0	18.8	9.4	1.2	2.52	0.98
B32	It takes energy from me at my work when a work associate does not understand correctly what I am trying to say to them	15.3	48.2	21.2	7.1	7.1	0	2.19	0.80
B33	It takes energy from me at my work when my work puts me in an environment with lots of things moving	21.2	30.6	21.2	11.8	12.9	1.2	2.28	1.00
B34	It takes energy from me at my work when work associates struggle to communicate with me	15.3	42.4	25.9	9.4	4.7	1.2	2.32	0.87
B35	It takes energy from me at my work when I have to work quicker to meet a time limit	17.6	41.2	22.4	10.6	7.1	0	2.28	0.91

Table 2, continued

Descriptive statistics on the Job demands Scale for Hearing-Impaired Employees

B36	It takes energy from me at my work when there is not an interpreter to help me to communicate with work associates	24.7	30.6	14.1	9.4	18.8	1.2	2.10	0.99
B37	It takes energy from me at my work when I have to explain to a work associate over and over and over again	12.9	45.9	17.6	9.4	11.8	1.2	2.27	0.85
B38	It takes energy from me at my work when I only start to work on a job at the last minute	21.2	47.1	12.9	8.2	7.1	2.4	2.09	0.87
B39	It takes energy from me at my work when there is disturbance in the background while me and a co-worker are trying to communicate with each other	15.3	38.8	18.8	18.8	3.5	2.4	2.45	1.00
B40	It takes energy from me at my work when I do not receive enough information about a job to do	12.9	38.8	21.2	16.5	8.2	0	2.46	0.96
B41	It takes energy from me at my work when I struggle to communicate with people	15.3	41.2	17.6	14.1	8.2	1.2	2.35	0.95
B42	It takes energy from me at my work when I am not properly told what I am supposed to do on a job	11.8	44.7	15.3	15.3	10.6	0	2.39	0.95
B43	It takes energy from me at my work when it is not quiet and that makes it difficult to catch what a person is saying	12.9	37.6	17.6	20.0	7.1	2.4	2.51	1.01
B44	It takes energy from me at my work when I have to work faster to meet a time limit	20.0	43.5	20.0	11.8	2.4	0	2.25	0.93

Table 2, continued

Descriptive statistics on the Job demands Scale for Hearing-Impaired Employees

B45	It takes energy from me at my work when a work associate does not understand what I am trying to say to them	11.8	52.9	16.5	8.2	7.1	0	2.24	0.80
B46	It takes energy from me at my work when things of the work environment interrupt me while I am busy with a job	15.3	48.2	23.5	7.1	3.5	0	2.24	0.82
B47	It takes energy from me at my work when I struggle to communicate with work associates	12.9	47.1	17.6	10.6	8.2	1.2	2.29	0.87
B48	It takes energy from me at my work when a work associate talks too fast for me to follow what they are saying	14.1	37.6	22.4	17.6	3.5	0	2.46	0.98
B49	It takes energy from me at my work when I have to continuously explain to a work associate	10.6	55.3	12.9	10.6	8.2	0	2.26	0.82
B50	It takes energy from me at my work when something in the work environment makes it more difficult for me to do a job	12.9	47.1	20.0	7.1	9.4	1.2	2.24	0.80
B51	It takes energy from me at my work when my work puts me in an environment with things moving	21.2	36.5	14.1	10.6	11.8	3.5	2.17	0.96
B52	It takes energy from me at my work when I struggle to catch what people are trying to say to me	10.6	34.1	28.2	20.0	3.5	1.2	2.62	0.95
B53	It takes energy from me at my work when a work associate does not understand my message correctly	11.8	52.9	20.0	4.7	5.9	2.4	2.17	0.71
B54	It takes energy from me at my work when my work puts me in an environment with people moving	24.7	29.4	16.5	12.9	12.9	1.2	2.21	1.04

Table 2, continued

Descriptive statistics on the Job demands Scale for Hearing-Impaired Employees

B55	It takes energy from me at my work when I am pressured to meet a time limit at work	15.3	54.1	14.1	10.6	3.5	0	2.21	0.85
B56	It takes energy from me at my work when there is disturbance in the background while me and a co-worker are trying to talk to each other	14.1	31.8	24.7	17.6	7.1	1.2	2.52	0.99
B57	It takes energy from me at my work when a work associate struggles to understand what I am trying to say to them	12.9	49.4	21.2	7.1	7.1	0	2.25	0.80

It is evident from Table 2 above, that the items were generally understandable and the described work situations applicable. Furthermore, when examining the average mean of the items (*based on only the four scale ratings – 1 never, 2 sometimes, 3 often and 4 always*), all the described work situations were generally reported to be energy-consuming on the *often* basis. Based on these descriptives, all items of the job demands scale for hearing-impaired employees were included in the exploratory factor analysis (EFA) to determine the preliminary internal validity of the scale.

Exploratory factor analysis and reliability of the newly-developed scale

To determine the preliminary validity, EFA was done separately on each of the 10 subscales of the 57-item job demands scale. Communalities and loadings were determined through the EFA. The focus of the EFA was to extract the individual factors' items and remove less important ones of which communalities were too insignificant for each construct (Burns & Machin, 2009). Loadings smaller than 0.30 and communalities smaller than 0.20 indicate that an item does not measure the factor under study sufficiently (Child, 2006; Veth, Van der Heijden, Korzilius, De Lange & Emans, 2018). PCA was employed as extraction method, followed by no rotation. Furthermore, to determine the reliability of each subscale of the job demands scale, the internal consistency (Cronbach's alpha coefficients) was calculated. The communalities, factor loadings and reliabilities are presented in Table 3 below.

Table 3

Exploratory factor analysis and reliabilities of the Job demands Scale for Hearing-Impaired Employees

Code	KMO	%Variance explained	Factor loadings	Communalities	α	Mean	SD
F1	0.79	72.31	0.74-0.92	0.55-0.85	0.88	2.58	0.80
F2	0.84	64.76	0.76-0.84	0.58-0.70	0.90	2.23	0.65
F3	0.67	69.70	0.77-0.88	0.59-0.77	0.78	2.28	0.75
F4	0.80	49.84	0.60-0.83	0.36-0.70	0.85	2.35	0.72
F5	0.86	71.37	0.75-0.89	0.56-0.78	0.89	2.34	0.81
F6	0.92	75.16	0.78-0.91	0.60-0.82	0.96	2.49	0.88
F7	0.75	83.41	0.90-0.92	0.82-0.85	0.90	2.19	0.93
F8	0.87	56.65	0.65-0.85	0.43-0.73	0.88	2.30	0.73
F9	0.84	69.91	0.76-0.89	0.58-0.79	0.90	2.26	0.78
F10	0.81	54.9	0.64-0.80	0.42-0.64	0.79	2.17	0.69

F1: Work associates' rapid rate of speech; F2: Work associates battling to understand; F3: Having to explain repeatedly; F4: Communication gap; F5: Poor task-orientation; F6: Commotional communication environment; F7: Physical commotion; F8: Task interruption; F9: Time pressure; F10: Time allocation.

Table 3 above indicates that all the items showed acceptable communalities (h^2) of 0.20 and higher, as well as acceptable loadings of 0.30 and higher. Therefore, no items were omitted for all the subscales of the mentioned job demands scale for hearing-impaired employees. To determine further whether these subscales are useable, the internal consistency of the items was calculated (i.e. through Cronbach's alpha coefficients). The results showed that all the subscales of the job demands scale had good reliability, with coefficients ranging from $\alpha = 0.78$

to 0.96. Further analysis was done by determining the scale reliability for each of the overall demands (communication demands, environmental-stimuli demands and time demands). As mentioned, communication demands consist of the following subscales: work associates' rapid rate of speech; work associates battling to understand; having to explain repeatedly; communication gap; and poor task-orientation. These subscales showed a reliability of $\alpha = 0.87$. Environmental stimuli demands (i.e. commotional communication environment; physical commotion; task interruption) scored a Cronbach's alpha coefficient of 0.85; and Time demands (i.e. time pressure; time allocation) had an internal consistency of $\alpha = 0.76$. As was mentioned, a Cronbach's alpha coefficient of 0.70 and higher is considered as reliable (Nunnally and Bernstein, 1994). Thus, it was concluded that all scales adhered to the guidelines and could be used for further preliminary analysis.

Association between biographical characteristics and job demands of hearing-impaired employees

To determine whether hearing-impaired employees experience job demands, the same t-tests and ANOVAs were conducted. The d value was used to analyse the effect sizes of sub-group comparisons, considering that the data were obtained from a small-scale population (Ellis & Steyn, 2003). These differences were based on the category of hearing loss, laterality of hearing loss, gender, and language groups, and are presented in Tables 4 to 7 below.

Table 4

Differences between hearing-impaired employees' job demands, based on category of hearing loss

Job Demands	Category	<i>n</i>	Mean	<i>SD</i>	<i>P</i>	<i>d</i>
Commotional communication environment	Deaf	48	2.33	0.90	0.05	0.42
	Heard-of-hearing	36	2.71	0.83		

Considering the differences in job demands that hearing-impaired employees face, based on the category of hearing loss, the results in Table 4 above, reveal that the demand of commotional communication environment showed statistically and practically significant differences between deaf and heard-hearing employees. In particular, it is evident from Table

4 above that heard-of-hearing employees experience more energy consumption due to commotion communication demands ($M = 2.71$; $SD = 0.83$; $p = 0.05$; $d = 0.42$), compared to deaf employees ($M = 2.33$; $SD = 0.90$; $p = 0.05$; $d = 0.42$).

Table 5

Differences between hearing-impaired employees' job demands, based on laterality of hearing loss

Job demands	Laterality	<i>n</i>	Mean	<i>SD</i>	<i>P</i>	<i>d</i>
Communication gap	Both	75	2.41	0.74	0.01	0.64
	One	9	1.94	0.41		
Poor task-orientation	Both	74	2.39	0.84	0.02	0.44
	One	8	2.02	0.32		
Commotional communication environment	Both	74	2.55	0.88	0.21	0.46
	One	9	2.14	0.85		
Task interruption	Both	75	2.33	0.72	0.32	0.39
	One	8	2.01	0.83		
Time allocation	Both	74	2.22	0.70	0.08	0.50
	One	8	1.87	0.47		
Communication overall	Both	75	2.44	0.62	0.06	0.50
	One	9	2.13	0.41		
Task overall	Both	75	2.31	0.72	0.19	0.46
	One	9	1.98	0.62		

Table 5 above indicates the differences between job demands confronting hearing-impaired employees, based on the laterality of hearing loss. The results indicated that communication gap, poor task-orientation, commotional communication environment, task interruption, time allocation, overall communication and task demands showed statistically and practically significant differences between employees with hearing loss in both ears, compared to those with hearing loss in only one ear. Significantly, the results show that heard-of-hearing employees with hearing loss in both ears (bilaterally), experience more of all the indicated demands, compared to employees with hearing loss in only one ear (unilaterally). Furthermore, it was found that these demands consume the most energy from employees with bilateral hearing loss. The findings for the subscales are expounded below.

Communication gap: employees with bilateral hearing loss were found to experience more energy consumed ($M = 2.41$; $SD = 0.74$; $p = 0.01$; $d = 0.64$), compared to those with unilateral hearing loss ($M = 1.94$; $SD = 0.41$; $p = 0.01$; $d = 0.64$).

Poor task-orientation: employees with bilateral hearing loss experienced more loss of energy ($M = 2.39$; $SD = 0.84$; $p = 0.02$; $d = 0.44$), compared to those with unilateral hearing loss ($M = 2.02$; $SD = 0.32$; $p = 0.02$; $d = 0.44$).

Commotional communication environment: Employees with bilateral hearing loss experienced more energy-consumption ($M = 2.55$; $SD = 0.88$; $p = 0.21$; $d = 0.46$), compared to those with a unilateral hearing loss ($M = 2.14$; $SD = 0.85$; $p = 0.21$; $d = 0.46$).

Task interruption: employees with bilateral hearing loss experienced more energy-consumption ($M = 2.33$; $SD = 0.72$; $p = 0.32$; $d = 0.39$), compared to those with unilateral hearing loss ($M = 2.01$; $SD = 0.83$; $p = 0.32$; $d = 0.39$).

Time allocation: These issues were also reported to be experienced as energy-consuming more frequently by bilateral HIEs ($M = 2.22$; $SD = 0.70$; $p = 0.08$; $d = 0.50$) than unilateral HIEs ($M = 1.87$; $SD = 0.47$; $p = 0.08$; $d = 0.50$).

Overall communication demands: The focus was on communication-related issues such as work associates' rapid rate of speech; work associates battling to understand; having to explain repeatedly; communication gap; and commotional communication environment. Overall, it was found that bilateral HIEs experience these issues as energy-consuming ($M = 2.44$; $SD = 0.62$; $p = 0.06$; $d = 0.50$) more frequently than unilaterally HIEs do ($M = 2.13$; $SD = 0.41$; $p = 0.06$; $d = 0.50$).

Overall tasks demands: Finally, bilateral HIEs experienced more energy-consumption ($M = 2.31$; $SD = 0.72$; $p = 0.19$; $d = 0.46$), compared to those who indicated they are unilaterally hearing-impaired ($M = 1.98$; $SD = 0.62$; $p = 0.19$; $d = 0.46$).

Table 6

Differences between hearing-impaired employees' job demands, based on gender

Job demands	Gender	<i>n</i>	Mean	<i>SD</i>	<i>P</i>	<i>d</i>
Commotional communication environment	Male	46	2.31	0.85	0.04	0.45
	Female	38	2.71	0.88		
Communication overall	Male	46	2.29	0.61	0.08	0.39
	Female	39	2.52	0.60		

As is evident from Table 6 above, there are statistical ($p \leq 0.10$) and practical ($d < 0.50$) differences between males and females, especially regarding the two job demands of communicational commotion environment and communication demands overall. In particular, female HIEs experience more consumption of energy due to communication commotion demands ($M = 2.71$; $SD = 0.88$; $p = 0.04$; $d = 0.45$), compared to male HIEs ($M = 2.31$; $SD = 0.85$; $p = 0.04$; $d = 0.45$). Furthermore, female HIEs were found to experience more energy-consumption due to overall communication issues ($M = 2.52$; $SD = 0.60$; $p = 0.08$; $d = 0.39$), compared to their male counterparts ($M = 2.29$; $SD = 0.61$; $p = 0.08$; $d = 0.39$).

Table 7

Differences between hearing-impaired employees' job demands, based on language groups

Job Demands	Language	<i>n</i>	Mean	<i>SD</i>	<i>P</i>	<i>d</i> Afrikaans with	<i>d</i> English with	<i>d</i> African with
Work associates' rapid rate of speech	Afrikaans	22	3.00	0.72	0.01			
	English	26	2.43	0.83		0.69		
	African	6	1.96	0.33		1.46	0.57	
	SASL	28	2.54	0.76		0.61	0.13	0.77
Work associates battling to understand	Afrikaans	21	2.45	0.91	0.20			
	English	26	2.14	0.49		0.34		
	African	6	1.89	0.34		0.61	0.51	
	SASL	27	2.24	0.53		0.23	0.19	0.66
Having to explain repeatedly	Afrikaans	20	2.42	0.86	0.49			
	English	25	2.10	0.63		0.37		
	African	5	2.20	0.90		0.24	0.11	
	SASL	27	2.35	0.72		0.07	0.35	0.17

Table 7, continued

Differences between hearing-impaired employees' job demands, based on language groups

Communication gap	Afrikaans	22	2.64	0.86	0.13			
	English	26	2.16	0.70		0.56		
	African	6	2.23	0.79		0.48	0.09	
	SASL	28	2.33	0.55		0.37	0.24	0.12
Poor task-orientation	Afrikaans	21	2.51	0.95	0.30			
	English	26	2.33	0.77		0.19		
	African	5	1.74	0.38		0.81	0.77	
	SASL	28	2.31	0.78		0.21	0.03	0.73
Commotional communication environment	Afrikaans	22	2.89	1.05	0.03			
	English	26	2.54	0.87		0.34		
	African	6	1.98	0.45		0.87	0.65	
	SASL	27	2.22	0.72		0.64	0.37	0.33
Physical commotion	Afrikaans	22	2.42	1.13	0.43			
	English	24	2.13	0.97		0.26		
	African	5	2.30	0.92		0.11	0.17	
	SASL	25	1.98	0.67		0.39	0.16	0.35
Task interruption	Afrikaans	22	2.57	0.93	0.16			
	English	26	2.28	0.64		0.32		
	African	5	2.15	0.60		0.45	0.19	
	SASL	28	2.12	0.59		0.49	0.25	0.06
Time pressure	Afrikaans	22	2.15	0.94	0.82			
	English	26	2.30	0.71		0.16		
	African	6	2.10	0.73		0.05	0.27	
	SASL	28	2.32	0.71		0.18	0.02	0.30
Time allocation	Afrikaans	21	2.27	0.81	0.65			
	English	26	2.20	0.62		0.08		
	African	5	1.96	0.65		0.38	0.37	
	SASL	28	2.07	0.60		0.25	0.22	0.16
Communication overall	Afrikaans	22	2.70	0.73	0.03			
	English	26	2.27	0.55		0.58		
	African	6	2.05	0.37		0.89	0.41	
	SASL	28	2.34	0.52		0.49	0.12	0.56

Table 7, continued

Differences between hearing-impaired employees' job demands, based on language groups

Task overall	Afrikaans	22	2.51	0.90	0.27		
	English	26	2.24	0.71		0.31	
	African	5	2.06	0.45		0.50	0.24
	SASL	28	2.13	0.56		0.42	0.14
							0.13
Time overall	Afrikaans	22	2.24	0.83	0.89		
	English	26	2.25	0.62		0.01	
	African	6	2.03	0.62		0.25	0.35
	SASL	28	2.19	0.53		0.06	0.10
							0.26

Table 7 above indicates that significant differences in certain job demands were found between language groups. The d values for the job demands are explicated below.

Work associates' rapid rate of speech: Afrikaans-speaking HIEs reported this demand as energy consuming ($M = 3.00$; $SD = 0.72$; $p = 0.01$) on a more frequent basis than those HIEs did from an African language ($M = 1.96$; $SD = 0.33$; $p = 0.01$; $d = 1.46$), who are English-speaking ($M = 2.43$; $SD = 0.83$; $p = 0.01$; $d = 0.69$) as well as using SASL as first-language ($M = 2.54$; $SD = 0.76$; $p = 0.01$; $d = 0.61$). Furthermore, English-speaking HIEs evidently experience this job demand as energy-consuming ($M = 2.43$; $SD = 0.83$; $p = 0.01$) more frequently than those who use an African language ($M = 2.43$; $SD = 0.83$; $p = 0.01$; $d = 0.57$). In turn, the African-speaking HIEs experienced the demand as energy-consuming ($M = 1.96$; $SD = 0.33$; $p = 0.01$) less frequently than the SASL language group ($M = 2.54$; $SD = 0.76$; $p = 0.01$; $d = 0.77$).

Work associates battling to understand: Afrikaans-speaking HIEs reported the situation as energy-consuming ($M = 2.45$; $SD = 0.91$; $p = 0.20$) more frequently than their African-language counterparts ($M = 1.89$; $SD = 0.34$; $p = 0.20$; $d = 0.61$). Furthermore, English-speaking HIEs experienced this demand as energy-consuming ($M = 2.14$; $SD = 0.49$; $p = 0.20$) more frequently than those HIEs speaking African languages ($M = 1.89$; $SD = 0.34$; $p = 0.20$; $d = 0.51$). From their side, HIEs from the African language group were found to experience this demand as energy-consuming ($M = 1.89$; $SD = 0.34$; $p = 0.20$) less frequently than the SASL language group ($M = 2.24$; $SD = 0.53$; $p = 0.20$; $d = 0.66$).

Having to explain repeatedly: Afrikaans-speaking HIEs were found to experience this demand as energy-consuming ($M = 2.42$; $SD = 0.86$; $p = 0.49$) on more of a frequent basis than their English-speaking counterparts ($M = 2.10$; $SD = 0.63$; $p = 0.49$; $d = 0.37$).

Communication gap: Responses of Afrikaans-speaking HIEs generally suggest that they experience this gap as energy-consuming ($M = 2.64$; $SD = 0.86$; $p = 0.13$) more frequently than English-speaking HIEs ($M = 2.16$; $SD = 0.70$; $p = 0.13$; $d = 0.56$), African-language HIEs ($M = 2.23$; $SD = 0.79$; $p = 0.13$; $d = 0.48$), or SASL-language HIEs ($M = 2.33$; $SD = 0.55$; $p = 0.13$; $d = 0.37$).

Poor task-orientation: Afrikaans-speaking HIEs were found to experience this demand as energy-consuming ($M = 2.51$; $SD = 0.95$; $p = 0.30$) more frequently than African-speaking HIEs ($M = 1.74$; $SD = 0.38$; $p = 0.30$; $d = 0.81$). English-speaking HIEs experienced the mentioned demand as energy-consuming ($M = 2.33$; $SD = 0.77$; $p = 0.30$) more frequently than HIEs of the African language group ($M = 1.74$; $SD = 0.38$; $p = 0.30$; $d = 0.77$), whereas the latter group of HIEs experienced that this demand consumed energy ($M = 1.75$; $SD = 0.38$; $p = 0.30$) less frequently than HIEs of the SASL language group ($M = 2.31$; $SD = 0.78$; $p = 0.30$; $d = 0.73$).

Commotional communication environment: this demand showed significant variance between language groups ($p = 0.03$). Afrikaans-speaking HIEs evidently experienced the demand as energy-consuming ($M = 2.89$; $SD = 1.05$; $p = 0.03$) more frequently than the African language group ($M = 1.98$; $SD = 0.45$; $p = 0.03$; $d = 0.87$) as well as employees from the SASL language group ($M = 2.22$; $SD = 0.72$; $p = 0.03$; $d = 0.64$). Furthermore, English-speaking HIEs ($M = 2.54$; $SD = 0.87$; $p = 0.03$) experienced this job demand more frequently than those speaking African languages ($M = 1.98$; $SD = 0.45$; $p = 0.03$; $d = 0.65$).

Physical commotion: HIEs of the Afrikaans language group found this demand to be energy consuming ($M = 2.42$; $SD = 1.13$; $p = 0.43$) more frequently than HIEs of the SASL language group ($M = 1.98$; $SD = 0.67$; $p = 0.43$; $d = 0.39$). HIEs of the African language group indicated that they experience such a situation as energy-consuming ($M = 2.30$; $SD = 0.92$; $p = 0.43$) more frequently than employees of the SASL language group ($M = 1.98$; $SD = 0.67$; $p = 0.43$; $d = 0.35$).

Task interruption: Afrikaans-speaking HIEs were found to experience this demand energy-consuming ($M = 2.57$; $SD = 0.93$; $p = 0.16$) more frequently than HIEs of the African language group ($M = 2.15$; $SD = 0.60$; $p = 0.16$; $d = 0.45$) as well as those of the SASL language group ($M = 2.12$; $SD = 0.59$; $p = 0.16$; $d = 0.49$).

Time allocation: HIEs of the Afrikaans language group generally experienced this demand as energy-consuming ($M = 2.27$; $SD = 0.81$; $p = 0.65$) more frequently than HIEs of the African language group ($M = 1.96$; $SD = 0.65$; $p = 0.65$; $d = 0.38$). In turn, English-speaking HIEs experience the demand as energy-consuming ($M = 2.20$; $SD = 0.62$; $p = 0.65$) more frequently than HIEs of the African language group ($M = 1.96$; $SD = 0.65$; $p = 0.65$; $d = 0.37$).

Communication overall: Afrikaans-speaking HIEs indicated that they experience communication-related demands, generally-speaking, to be energy-consuming ($M = 2.70$; $SD = 0.73$; $p = 0.03$) more frequently than HIEs (in descending order) of African ($M = 2.05$; $SD = 0.37$; $p = 0.03$; $d = 0.89$); English ($M = 2.27$; $SD = 0.55$; $p = 0.03$; $d = 0.58$); and SASL language groups ($M = 2.34$; $SD = 0.52$; $p = 0.03$; $d = 0.49$). HIEs of the English language group ($M = 2.27$; $SD = 0.55$; $p = 0.03$) were found to experience the mentioned job demands overall more frequently than HIEs from the African language group ($M = 2.05$; $SD = 0.37$; $p = 0.03$; $d = 0.41$). Finally, such experiences were found to be energy-consuming to SASL language group HIEs ($M = 2.34$; $SD = 0.52$; $p = 0.03$) more frequently than their African language counterparts ($M = 2.05$; $SD = 0.37$; $p = 0.03$; $d = 0.56$).

Task overall demand: Afrikaans-speaking HIEs ($M = 2.51$; $SD = 0.90$; $p = 0.27$) are suggested to experience task-related job demands generally as energy-consuming most frequently over HIEs of the African language group ($M = 2.06$; $SD = 0.45$; $p = 0.27$; $d = 0.50$) as well as those of the SASL language group ($M = 2.13$; $SD = 0.56$; $p = 0.27$; $d = 0.42$).

Time overall demand: English-speaking HIEs ($M = 2.25$; $SD = 0.62$; $p = 0.89$) were found to experience time-related demands generally as energy-consuming more frequently than HIEs of the African language group ($M = 2.03$; $SD = 0.62$; $p = 0.89$; $d = 0.35$). HIEs of the SASL language group ($M = 2.19$; $SD = 0.53$; $p = 0.89$; $d = 0.26$) indicated that they generally experience time-related job demands as energy-consuming more frequently than HIEs of the African language group ($M = 2.03$; $SD = 0.62$; $p = 0.89$).

Correlation between demands

In the final phase of the scale's results, correlations were drawn between the subscales of job demands that hearing-impaired employees found to consume their energy. The matrix of these correlations is presented in Table 8 below.

Table 8

Matrix of correlations between job demands of hearing-impaired employees

	1	2	3	4	5	6	7	8	9	10	11	12
1. Work associates' rapid rate of speech	-											
2. Work associates battling to understand	0.64 ⁺⁺	-										
3. Having to explain repeatedly	0.55 ⁺⁺	0.73 ⁺⁺	-									
4. Commotional communication environment	0.47 ⁺	0.31 ⁺	0.30 ⁺	-								
5. Communication gap	0.70 ⁺⁺	0.78 ⁺⁺	0.70 ⁺⁺	0.41 ⁺	-							
6. Poor task-orientation	0.55 ⁺⁺	0.69 ⁺⁺	0.58 ⁺⁺	0.33 ⁺	0.68 ⁺⁺	-						
7. Task interruption	0.47 ⁺	0.52 ⁺⁺	0.54 ⁺⁺	0.65 ⁺⁺	0.62 ⁺⁺	0.60 ⁺⁺	-					
8. Physical commotion	0.43 ⁺	0.44 ⁺	0.40 ⁺	0.65 ⁺⁺	0.57 ⁺⁺	0.53 ⁺⁺	0.83 ⁺⁺	-				
9. Time pressure	0.32 ⁺	0.54 ⁺⁺	0.52 ⁺⁺	0.31 ⁺	0.49 ⁺	0.54 ⁺⁺	0.49 ⁺	0.48 ⁺	-			
10. Time allocation	0.41 ⁺	0.47 ⁺	0.51 ⁺⁺	0.48 ⁺	0.56 ⁺⁺	0.60 ⁺⁺	0.56 ⁺⁺	0.47 ⁺	0.59 ⁺⁺	-		
11. Communication overall	0.83 ⁺⁺	0.80 ⁺⁺	0.80 ⁺⁺	0.65 ⁺⁺	0.89 ⁺⁺	0.68 ⁺⁺	0.71 ⁺⁺	0.64 ⁺⁺	0.49 ⁺	0.60 ⁺⁺	-	
12. Task overall	0.52 ⁺⁺	0.60 ⁺⁺	0.56 ⁺⁺	0.60 ⁺⁺	0.71 ⁺⁺	0.80 ⁺⁺	0.91 ⁺⁺	0.90 ⁺⁺	0.55 ⁺⁺	0.61 ⁺⁺	0.75 ⁺⁺	-
13. Time overall	0.41 ⁺	0.58 ⁺⁺	0.56 ⁺⁺	0.42 ⁺	0.59 ⁺⁺	0.64 ⁺⁺	0.58 ⁺⁺	0.52 ⁺⁺	0.92 ⁺⁺	0.84 ⁺⁺	0.60 ⁺⁺	0.64 ⁺⁺

*Correlations are significant at the level of 0.01 (2-tailed)

⁺ Practically significant correlation, medium effect: $r > 0.30$

⁺⁺ Practically significant correlation, large effect: $r > 0.50$

From the results in Table 8 above, focusing specifically on the overall demands of the scale, it clearly shows that the overall Communication demand indicates a positive, statistically significant and practically significant relationship (with a large effect) with the overall Task and Time demands. It is further evident from Table 8 that overall Task demand has a positive statistical and practical significant relationship (with a large effect) with overall Time demand.

Discussion

The general objective of the present study was to develop a scale for measuring job demands unique to hearing-impaired employees in South Africa. The aim was further to do a preliminary validity and reliability test of the developed scale. Additionally, the study investigated possible differences in the energy consumptions of job demands among various hearing-impaired demographic groups. In the following sections, the outline of the results is discussed, practical implications drawn, limitations identified, and recommendations made.

Outline of the results

Job demands and the JD-R model has received extensive attention in South African literature of the field (e.g. Botha & Mostert, 2014; De Beer et al., 2016; De Braine & Roodt, 2011; Els et al., 2015; Janse van Rensburg et al., 2018; Stander et al., 2015; Thuynsma & De Beer, 2016; Van der Colff & Rothmann, 2009). However, to date, limited research has been done on HIEs' experience of job demands, although, various scales that measure job demands have already been developed and validated through rigorous procedures, and these scales are widely accessible across studies within the South African context (Asiwe et al., 2015; Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann et al., 2006). Nevertheless, using those scales may be problematic since they do not address the specific job demands of the HIEs within the South African context. Rectifying this gap, the present study makes a clear contribution to human resources management literature.

As a first step to address the mentioned gap in the literature, existing scales were adapted to measure the specific job demands of hearing-impaired employees within South Africa. During scale development, the researcher adhered closely to procedures described in literature on the development of psychometric scales (Carpenter, 2018; DeVellis, 2017; Foxcroft & Roodt, 2018; Tay & Jebb, 2017). Particular attention was paid to the following aspects: (a) initial conceptualisation of the construct; (b) generation, development and evaluation of items; (c) choosing a scaling format; and 4) refining the items. The initial conceptualisation of the construct (as job demands for HIEs) and sub-constructs for the demands (i.e. communication, environmental-stimuli, and time) were based on the findings of the qualitative study (see chapter 2) as well as theory from the applicable literature.

During the second step of scale development, six items were generated from previous literature (Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann et al., 2006) and adapted to fit to the initial conceptualisation of the various job demands. Furthermore, 65 items were created newly based on the definitions of the three different above-mentioned demands. According to specific criteria developed by researchers (DeVellis, 2017; Foxcroft & Roodt, 2018; Tay & Jebb, 2017), five of the 71 items were discarded, leaving 66 items to be refined further in the following steps.

The third step was to choose a format that would complement the scale's integration. Accordingly, decision was made to use a format scale based on frequency of responses, which consists of four points: (1) *never*, (2) *sometimes*, (3) *often*, (4) *always*. The reason for using such a frequency-based scale, where no midpoint was provided, was based on suggestions from previous researchers in the field of job demands (Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann et al., 2006).

The final step of scale development was to refine items based on understandability and SASL compatibility. During assessment by a panel of experts, the remaining 66 items were evaluated. Nine of those items were concluded to not meet at least one of the criteria and were discarded. This resulted in a newly-developed job demands scale for hearing-impaired employees, consisting of a total of 57-items. On this scale, the items develop per theme and sub-theme amounted to the following:

- *Communication demands*: 36 items – 4 items measured ‘work associates’ rapid rate of speech’; 6 items measured ‘work associates battling to understand’; 3 items measured ‘having to explain repeatedly’; 9 items for ‘communication gap’; 5 items for ‘poor task orientation’ and 9 measured ‘commotional communication environment’.
- *Environmental-stimuli demands*: 11 items – 4 items measured ‘physical commotion’ and 7 measured ‘task interruption’.
- *Time demands*: 10-items – 5 items measured ‘time pressure’; and 5 ‘time allocation’.

A further step in addressing the gap in the literature on job demands of hearing-impaired employees, was to ensure the newly-developed job demands scale is valid and reliable. According to South Africa's Employment Equity Act (no. 55 of 1998), measures must be

scientifically valid and reliable. In this regard, DeVellis (2017) stresses the importance to use measuring instruments that show evidence of validity and reliability, seeing that such instruments have various implications for relationships with other variables. Therefore, preliminary validation and reliability was tested for the newly-developed scale.

Item performance was investigated for the newly developed scale. All 57 items of the scale were measured in terms of four-point frequency rating were the participants responded to each statement: 1) *never*; 2) *sometimes*; 3) *often*; and 4) *always*. When examining the mean scores, based on the four-point response scale, it was found that the average was more or less 2.35. This score indicated that the participants responded in a way leaning towards an ‘often’ response. A possible reason may be that the items were generally understandable and the described work situations were applicable. Thus, it can be concluded that all the described work situations (e.g. job demands) were generally reported to be energy-consuming on the *often* basis.

Based on these descriptive statistics, all 57-items of the newly-developed job demands scale were included in the exploratory factor analysis (EFA) to determine the preliminary internal validity of the scale. EFA was conducted separately on each of the 10 subscales. This was done by examining the explained variance, communalities and factor loadings of items on the 10 subscales. For each subscale, a principle component analysis (PCA) was used as extraction method, followed by no rotation. The results showed clearly that all the items on the 10 subscales indicated that high variance was explained. According to Streiner (1994), factors in a study should explain at least 50% of the common variance. Furthermore, the items on the 10 subscales showed good communalities (h^2) of 0.20 and higher as well as good loadings of 0.30 and higher (Child, 2006; Veth et al., 2018). Therefore, no subscales were omitted from the job demands scale for hearing-impaired employees.

The items developed to reflect apparent job demands unique to HIEs in South Africa loaded as follows:

- *Communication*: ‘work associates’ rapid rate of speech’; ‘work associates battling to understand’; ‘having to explain repeatedly’; ‘communication gap’; and ‘poor task-orientation’.
- *Environmental stimuli*: ‘commotional communication environment’; ‘physical commotion’; and ‘task interruption’.
- *Time*: ‘time pressure’; and ‘time allocation’.

Furthermore, it should be noted that one subscale of the demand ‘environmental stimuli’, namely ‘physical commotion’, is a unique finding. Prior international studies investigated the notion of environmental-stimuli demands (Hua et al., 2013; 2015; Jahncke & Halin, 2012; Kramer et al., 2006; Lund, 2015; Punch, 2016), however, only in terms of intangible, not tangible, aspects. Therefore, the notion of ‘physical commotion’ contributes to the literature by considering variation of tangible aspects as job demand for hearing-impaired employees.

The internal structure of the newly-developed job demands scale for hearing-impaired employees was tested further. South Africa’s Employment Equity Act (no. 55 of 1998, section 8) states that a scale must not only be scientifically proven as valid, but also as reliable. An analysis was done to establish the reliability for each of the 10 subscales as well as the three overall demands (i.e. communication, environmental stimuli and time). The results showed that all 10 subscales had good reliability coefficients, ranging from $\alpha = 0.78 - 0.96$. Further analysis determined the overall scale reliability for each of the mentioned overall demands. The following reliability scores were determined for each demand with its mentioned subscales:

- *Communication demand*: $\alpha = 0.87$;
- *Environmental stimuli demand*: $\alpha = 0.85$;
- *Time demand*: $\alpha = 0.76$.

As was mentioned, a Cronbach’s alpha coefficient of 0.70 and higher is considered as reliable (Cicchetti, 1994; Nunnally & Bernstein, 1994). Therefore, it is evident that all the scales adhered to the guidelines. Based on the findings above, it can be concluded that a scale was

developed, that specifically measures job demands unique to HIEs. Furthermore, the newly-developed job demands scale for hearing-impaired employees was found to be valid and reliable based on the preliminary findings.

The first two of the above-mentioned types of job demands are unique contributions to the field of study, seeing that previous South African studies have not reported on such demands (Asiwe et al., 2015; Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann et al., 2006). Hence, the job demands themes count as additions to South Africa's national job demands-resources database. Such themes were not noticed, either, in writings by world-leading JD-R model scholars (Bakker & Demerouti, 2014; 2017; 2018; Schaufeli & Taris, 2014; Schaufeli, 2017). Therefore, the job demands themes seem to also be additions to the international JD-R model database.

Furthermore, the above-mentioned job demands themes may also count as international breakthrough for HIE researchers. Acknowledgment is made that HIE findings comparable to those two themes are noticed in international studies – for example, Hua et al. (2013), Hua et al. (2015), Kramer et al. (2006), Jahncke and Halin (2012), Lund (2015), Punch (2016), Van Gils et al. (2010), and the rest mentioned in the literature review. Also to highlight: Geyer and Schroedel (1998), Detaille et al. (2003) and Lund (2015) did draw attention to job characteristics. However, neither of the scholars were noticed to phrase them as job demands. Hence, one can question if the academic community is still searching for general concepts that underlie the HIE outcomes noticed. Interestingly, this study seems to have identified foundational concepts conveyed cross international HIE contexts: 'job demands'. If the case be as such, that could enable future deductive query by other HIE researchers, yielding specialist insight that is context-specific and can also be linked with established models (Demands-Control model: Karasek, 1979; Job Demands-Resources model: Bakker & Demerouti, 2014; 2018) – as the case of this study is. HIE researchers being enabled to do so should facilitate development of functional specialist insight about HIEs. Therefore, this study may not only count as national breakthrough to South Africa, but also international breakthrough to HIE researchers across the world. Furthermore, the developed Job demands Scale for Hearing-Impaired Employees might be complementary to HIE researchers in other countries.

Following the scale's assessment, the study used the collected data to examine differences in energy consumption of job demands among various hearing-impaired demographic groups. T-tests and ANOVAs were used to determine these differences. The d value was determined to analyse the effect sizes of sub-group comparisons, considering that the data were obtained from a small-scale population (Ellis & Steyn, 2003). The selected demographic groups were based on language, category of hearing loss, laterality of hearing loss, and gender. The results from the study support supposed association between certain biographical aspects and job demands of HIEs. These demographic aspects are discussed in further detail subsequently.

Category of hearing loss

Regarding category of hearing loss, significant differences were found in HIEs' experience of the demand 'commotional communication environment'. Hard-of-hearing employees experienced this demand to be energy-consuming more frequently, compared to deaf employees. A possible reason may be that hard-of-hearing individuals depend on residual hearing where deaf employees do not. As a result, hard-of-hearing employees may encounter commotional-communication demands as more frequently and resultantly perceive them as more energy consuming. To a similar degree, Punch, Hyde and Power (2007) found that hard-of-hearing employees find meetings, training activities and social gathering problematic – since they would have to depend on residual hearing. Furthermore, scholars such as Hua et al. (2013) and Lund (2015) also highlight commotion-related aspects as having negative impact on energy levels of hard-of-hearing employees. These aspects include communication flow, noise level, load non-verbal noises, and group communications.

Laterality of hearing

Results based on laterality of hearing loss indicated that employees of bilateral (both ears) hearing loss, generally experience that certain job demands consume their energy more frequently than HIEs with unilateral (one ear) hearing loss. These job demands were found to be communication gap, commotional communication environment, poor task orientation, task interruption, time allocation, communication overall and task overall.

As explained above, unilateral HIEs found that certain job demands consume their energy less frequently than bilateral HIEs. Thus, it can be argued that unilateral HIEs can use their audio-receptive ear to compensate for hearing loss from the other ear by directing verbal communication to that ear. In this way, unilateral HIEs can prevent issues such as poor task

orientation and time compromises. Therefore, it can be assumed that unilateral HIEs have more control by behaving actively according to their work environments and the job demands they face. Accordingly, one can reason that unilateral HIEs are less likely, than bilateral HIEs, to experience workplace-induced stress – since they have more control; bilateral HIEs are more likely to experience workplace-induced stress, since they have less control (Karasek, 1979). Various studies found that hearing-impaired employees, compared to hearing employees, experience that they are less in control of their work environment (Backenroth & Ahlner 1997; Danermark & Coniavitis Gellerstedt, 2004; Dettalle, Haafkens & Van Dijk, 2003; Kramer et al., 2006). However, this study suggests that employees with bilateral hearing loss (i.e. in both ears) feel less in control of their work environment. When job demands emerge, it takes more energy from them. Hence, these findings suggest laterality to also relate to degree of control experienced; not only nominal measurement of hearing ability.

Gender

Gender-based differences were also found to relate to the degree of impact HIEs experienced from particular job demands. Females evidently experience a commotional- communication environment and communication (overall) as energy-consuming more often than males do. Kramer et al. (2006) found that males and females did not differ in the extent to which they experience ‘communication in noise’ or ‘distinguishing sounds’ as job demands. One can question whether personal resources may be a construct that could explain the above-mentioned difference between the South African population group of this study, and the Dutch population group of Kramer et al. (2006). Personal resources are suggested to buffer the straining impact of job demands (Bakker & Demerouti, 2014; 2017). Therefore, female HIEs of the present study experiencing a job characteristic to be energy consuming more frequently than their male counterparts implies females have lower degrees of personal resources than males.

Bakker and Demerouti (2017) define personal resources as ‘the beliefs that people hold regarding how much control they have over their [work] environment’ (p. 3). Comparably, Tye-Murray, Spry and Mauze (2009) conclude that overcoming workplace challenges related to hearing loss was based mostly on individuals overcoming difficulties and developing determination and stamina that help them remain active in the workforce. As was mentioned previously, personal resources buffer the straining impact of job demands (Bakker & Demerouti, 2017) and personal control is a prime notion of personal resources. Therefore,

employees with lower control may experience more energy-consumption within the workplace. However, the findings of Kramer et al. (2006) challenge this notion. Even though male and female HIEs differed significantly in degrees of control, this did not imply differences in energy-consumption due to demands such as: communication in noise; communication in quiet, distinguishing sounds, localisation of sounds, perceived noise, perceived reverberation, or effort in hearing. Hence, other areas of personal resources (Schaufeli & Taris, 2014) may be considered.

Language groups

Findings of the present investigation suggest variation among language groups in how frequently hearing-impaired employees experience job demands as energy-consuming. In this regard, the findings emphasise that attention should be paid to diverse language groups, in order to develop a perspective about HIEs' job demands. This corresponds with the assertion of Van Gils et al. (2010) that researchers should consider language when studying workplace stressors that HIEs experience. Findings for the diverse language groups under investigation are expounded below.

Afrikaans-speaking: Findings from the present study show that HIEs from the Afrikaans language group experience job demands generally as energy-consuming more frequently than those from the other language groups (i.e. English, African and SASL). Especially the following job demands apply in this regard: 'work associates' rapid rate of speech', 'work associates battling to understand', 'having to explain repeatedly', 'communication gap', 'poor task orientation', 'commotional communication environment', 'physical commotion', 'task interruption', 'time allocation', 'communication overall', and 'task overall'.

The first five above-listed job demands as well as 'communication overall' relate directly to communication. As a result, Afrikaans-speaking HIEs seem to experience communication processes as demanding most frequently. Such a situation may result in communication-related aspects – at least those measured in the present study – generally consuming energy from Afrikaans HIEs. Personal resources include personal aspects that buffer the strain of job demands (Bakker & Demerouti, 2017). Therefore, communication demands, which are not buffered for Afrikaans HIEs, means that this language group contain fewer personal resources than the other language groups of HIEs. Personal resources also concern employees' personal aspects, which are associated positively with their learning (Bakker & Demerouti, 2017). In

light of the above, it could be queried whether Afrikaans-speaking HIEs mostly lack the personal resources that would help develop their communication skills.

Furthermore, outcomes of uncontrolled job demands include psychological strain (Schaufeli & Taris, 2014) and inability to concentrate (Schaufeli & Enzmann, 1998). This may explain why Afrikaans HIEs simultaneously scored the highest on the demands of ‘physical commotion’, ‘task interruption’ and ‘task (overall)’. Afrikaans HIEs also scored the highest on ‘time allocation’ demands due to exhaustion. Thus, possibly, psychological strain and the inability to concentrate may impede their management skills. If that is the case, it could be argued, by referring to the hypothesis of *health-impairment* (Bakker & Demerouti, 2007; 2017), that Afrikaans-speaking HIEs are the language group at the highest risk of health and/or performance impairment due to certain job demands.

Furthermore, Kramer et al. (2006) conclude that hearing loss should be considered a risk factor for fatigue, mental distress, and eventually sick leave. Findings of the present study contribute to the discussion by giving reason to question whether certain language groups are at higher risk of health-impairment than others. Hua et al. (2015) did encourage research to identify HIE groups at high risk of health-impairment.

English-speaking: The findings also showed that English-speaking HIEs only differed from the African language group by scoring significantly higher for the following job demands: ‘work associates’ rapid rate of speech’; ‘work associates battling to understand’; ‘poor task orientation’; ‘commotional communication environment’, ‘time allocation’, ‘communication overall’ and ‘time overall.’ The demand of ‘communication gap’ was not indicated, as was the case for Afrikaans HIEs. Therefore, it can be assumed that ‘communication gap’ is not a prime cause underlying other communication-related demands, such as ‘work associates’ rapid rate of speech’, ‘work associates battling to understand’, ‘poor task orientation’, ‘time allocation’ or ‘time overall’. On the other hand, the demand of ‘work associate’s rapid rate of speech’ may imply the need to improve listening/attentiveness skills while ‘work associates battling to understand’ may imply that a significant number of English-speaking HIEs must improve their communication skills. These matters may give explanation to apparent time management issues.

Lorenzi, Gilbert, Carn, Garnier and Moore (2006) state that people with hearing loss tend to have difficulty understanding speech, particularly amid background sounds. This may explain English-speaking HIEs experiencing ‘commotional communication environment’ as energy-consuming. The scholars add that hearing-impaired individuals find it harder to process speech when they have to listen amid fluctuating background sounds. Kramer et al. (2006) found that ‘effort in hearing’ correlated in the positive linear sense ($r = 0.50$) with ‘communication in noise’. However, explanation is not give about why English-speaking HIEs more frequently experienced the job demand as energy-consuming. One can presume more frequent engagement in such an environment as a possible explanation. Lorenzi et al. (2006) suggest that communication should be complemented by a hearing-impaired person taking advantage of temporal decrease in background noise.

SASL group: The same rationale as above can be applied to HIEs from the SASL language group. Findings showed that this group scored significantly higher on the following job demands: ‘work associates’ rapid rate of speech’ ‘work associates battling to understand’, ‘poor task orientation,’ ‘communication overall’ and ‘time overall’. However, the SASL HIEs scored significantly lower on the demand of ‘physical commotion’. Kramer et al. (2006), on the contrary, noticed their findings to suggest that individuals with hearing loss are more sensitive to background commotion and noted that individuals with hearing loss scored higher on ‘self-perceived environmental noise,’ in comparison to hearing employees.

The findings mentioned above (Kramer et al., 2006) may suggest that employees with lower hearing ability are more sensitive to background noise. However, in the present study, HIEs of the SASL group scored lowest on ‘physical commotion’ than the HIEs of the (presumably spoken) language groups of Afrikaans, English and African. This may point to an inconsistency in the literature. Findings of the present study indicate that HIEs in South Africa with the lowest hearing ability are less sensitive to background commotion. Kramer et al. (2006) measured hearing loss in nominal terms. They did not differentiate between the HIE participants’ degrees of hearing loss. However, these findings suggest such consideration be made.

African group: Findings showed that HIEs of the African language group differ from their SASL counterparts regarding the following job demands: ‘work associates’ rapid rate of speech’, ‘work associates battling to understand’, ‘poor task orientation’, ‘physical commotion’, ‘communication overall’ and ‘time overall’. Significantly, HIEs from the African

language group were found to experience these job demands as less energy-consuming than the HIEs of the SASL, who scored second highest (under Afrikaans HIEs) on ‘work associates’ rapid rate of speech’ and ‘work associates battling to understand’ as energy consuming. This finding corresponds with a conclusion by Van Gils et al. (2010): In work environments with multiple languages, deaf employees are generally at risk of being deprived of information since they do not have entire access to the prevailing styles and networks of communication. Punch et al. (2007) found that HIEs who communicate primarily through sign language experience more difficulties in meetings and training activities than the spoken-language group. This may explain the demand of ‘poor task orientation’ in the case of the SASL group.

Language groups in general

Furthermore, HIEs generally scored significantly higher for the demands ‘communication overall’ and ‘work associates battling to understand’. This score applies across language groups (not only SASL), which suggests that HIEs generally experience communication difficulties within the work place. This finding differs from discussions about communication issues concerning mainly deaf individuals (e.g. Garberoglio, Dickson, Cawthon & Bond, 2015; Gugenheimer, Plaumann, Schaub & Rukzio, 2017; Luft, 2000). However, these findings suggest consideration towards not only deaf employees but hard-of-hearing employees too.

Furthermore, the findings indicate that language groups of HIEs have different strengths by being ‘more immune’ to certain job demands – based on the assumption that personal resources buffer the straining effects of these demands (Bakker & Demerouti, 2017; 2018). HIEs of the English language group generally scored the lowest for ‘having to explain repeatedly’ and ‘communication gap’ as energy-consuming demands, while those of the SASL group scored lowest on ‘physical commotion’ and ‘task interruption’. In addition, HIEs of the African language group generally scored the lowest on sensitivity for the following job demands: ‘work associates’ rapid rate of speech’, ‘work associates battling to understand’, ‘poor task-orientation’, ‘commotional communication environment’, ‘time allocation’, ‘communication overall’, ‘task overall’ and ‘time overall’. Following Bakker and Demerouti (2017), there seems to be variance between HIE language groups regarding personal resources that help them cope with different forms of job demands. Further demand-buffering personal resources may be discovered and can be considered for further cross-cultural training and development of HIEs. To conclude thus, language is clearly a significant factor to consider about job demands facing HIEs.

In conclusion, this study expands on the limited research about job demands specifically for hearing-impaired employees within the South African context. The development and preliminary validation of a job demands scale specifically for hearing-impaired employees, gives researchers the opportunity to empirically explore the situation of HIEs in relation to the mentioned three primary demands represented in the mentioned scale from the present study: communication, environmental stimuli, and time.

Practical implications

The results of the present study have helped expand the existing body of knowledge on job demands specifically experienced by HIEs within the South African context. This was done by providing evidence on the validity and reliability of the newly-developed and contextualised job demands scale for HIEs. By utilising the validated scale, South African organisations can identify and measure hearing-impaired employees' energy consumption based on the job demands they encounter.

Determining the job demands that consume energy from HIEs within organisations could increase awareness and provide new insight into the work situation of this employee group. Besides raising awareness, this list of demands will serve as a tool for organisations and managers to elicit information from their HIEs about which job aspects they experience as demanding. Such insight could strengthen organisations' reasonable accommodation of their HIEs. Thus, researchers and managers can utilise this validated scale to measure and assess job demands of hearing-impaired employees within South African organisations. On a national level, this tool can help inform and amend the existing disability policy within South Africa to focus more specifically on hearing-impaired individuals. Such an initiative is necessary to promote HIEs' interests more effectively (Smith, 2012).

Limitations and recommendations

This study contributes to the field of study on job demands, in terms of those experienced by South African HIEs. However, certain limitations emerged in the study, which are expounded below.

Firstly, the questionnaire was developed based on the findings of the qualitative study (see chapter 2), including only those demands not found in prior research (i.e. communication, environmental stimuli, and time). *Therefore, it would be recommended that future research also develop items based on social, cognitive and emotional demands (as indicated in the qualitative findings).*

Secondly, this study focused only on developing items for job characteristics that HIEs experience as demands. *Thus, it is recommended that a scale should be developed to measure job resources of HIEs as well. By developing items based on further job demands as well as resources, will provide a broader picture of the JD-R model's application to hearing-impaired employees.*

Thirdly, the present study focused only on a preliminary validation of the newly-developed job demands scale for hearing-impaired employees. Since the scale has only been administered once, there is chance that high validity scores may be based on chance differences and/or sampling errors (Foxcroft & Roodt, 2018). *Therefore, inherent review of the developed scale's internal validity is recommended as well as refining of the items used to compile the questionnaire (Foxcroft & Roodt, 2018). This implies a proper validation study of this scale.*

Fourthly, the sample size of this study ($n = 85$) falls short of the minimum number recommended for conducting an EFA by Suhr (2006). This scholar suggests a minimum of 100 suitable respondents ($n \geq 100$) as well as a respondent ratio of five for each questionnaire item. Accordingly, a sample size of 285 ($n = 285$) would be the ideal for such a study. *Therefore, it is recommended that a larger sample size should be used to conduct a full validation of the newly-developed job demands scale. Furthermore, a larger number of participants (based on various criteria for hearing-impairment) will also indicate more thoroughly how HIEs experience their job demands within South African companies.*

Fifthly, a limitation emerging from the study was the large number of items initially included to measure the various job demands. Certain hearing-impaired participants found the length of the scale problematic and also felt that certain items were repetitive. It can thus be assumed that such a lengthy scale could have influenced the way HIEs responded to the items. *Therefore, it is recommended that the items of the newly developed scale be scrutinised and irrelevant items removed.*

Finally, the study focused only on conducting a preliminary analysis of the psychometric properties of this scale. This neglected a proper analysis of the internal psychometric properties. *As recommendation, not only should a full analysis be undertaken of the psychometric properties; the external properties of the job demands scale related to HIEs should be tested as well – in other words, including the relationships with antecedents and outcomes.*

Conclusion

In conclusion, it can be confirmed that the present study contributes to literature on job demands, by developing a new scale patterned specifically for hearing-impaired employees within the South African context. This research contributes further by providing a preliminary validation of the subscales captured from the job demands scale. Evidence was reported on the internal validity of each of the 10 subscales. Acceptable levels of reliability were found for each subscale as well as for the three overall scales (i.e. communication, environmental stimuli, and time demands).

Furthermore, differences were reported among various demographic groups regarding the energy consumption of job demands which HIEs experience. Thus, to conclude, this valid and reliable job demands scale can be used for future research. Such research would help empower both HR management with the applicable psychometric tools, and hearing-impaired employees with coping mechanisms to deal with job-related challenges within the South African working environment, which consists predominantly of hearing employees.

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CHAPTER 4

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

The purpose of this final chapter is to draw conclusions based on the main aim and specific objectives on which this study was based. Thereafter, limitations of the investigation are pointed out and recommendations made for further research.

4.1 Conclusions

The general objectives of the study were twofold. The first aspect was to explore job demands and job resources of hearing-impaired employees (HIEs) in South Africa (Article 1). The second aspect was to develop a job demands scale specifically for HIEs in South Africa and perform a preliminary test on its psychometric properties (Article 2).

Article 1: Exploring job demands and job resources of hearing-impaired employees in South Africa

The first mentioned aspect of the present study's general objective was translated into practice by four specific objectives. The conclusions drawn from the results of the specific objectives for Article 1 are expounded below.

Specific objective 1: Establish how job demands, job resources and hearing-impaired employees are conceptualised in scientific literature

A comprehensive literature review was conducted on the constructs of job demands, job resources, and hearing-impaired employees. The aim was to obtain well-informed conceptualisations of each construct.

Job demands: This construct is conceptualised in the literature as job-inherent aspects that cost energy from occupants of the job environment, which should thus be moderated to help control potential effects of health-impairment (Bakker & Demerouti, 2017; Bakker, Demerouti & Schaufeli, 2005; Schaufeli & Bakker, 2004; Sonnetag & Zijlstra, 2006; Xanthopoulou, Bakker, Demerouti &

Schaufeli, 2007). Examples of job demands are: high work pressure and emotionally-demanding social interactions within the workplace (Bakker & Demerouti, 2017).

Job resources: This was conceptualised in literature as job-inherent aspects that promote employees' constructive interaction with their job context (Bakker, 2015; Bakker & Demerouti, 2017; Boyd & Tuckey, 2014; Schaufeli & Bakker, 2004; Schaufeli & Taris, 2014; Schaufeli, Bakker & Van Rhenen, 2009; Xanthopoulou et al., 2007). Examples of such resources are performance feedback and opportunity for growth (Bakker & Demerouti, 2017).

Furthermore, variations were found in the perceived nature of job characteristics. Schaufeli and Taris (2014) point out that the Job Demands-resources (JD-R) model does not suggest limitation about job characteristics that can be classified as job demands or job resources. The same tendency was found in later versions of the JD-R model encountered in the literature (Bakker & Demerouti, 2018; Xanthopoulou et al., 2007). Congruent to the findings of the present study, the literature points out variations between employee groups regarding certain job characteristics they consider as job demands or job resources (Daniels, 2006; Bakker & Sanz-Vergel, 2013).

Hearing-impaired employee (HIE): A general definition was not encountered in the literature. Therefore, the present study developed a definition specific to South Africa's legal conceptualisation of an employee. This was done by integrating two facets: the encountered academic conceptualisations of hearing-impairment (Edwards & Crocker, 2012; Shemesh, 2010; Thorne et al., 2008; Vaccaro, 2016) and the definition of 'employee' provided by Section 200A(1) of South Africa's Labour Relations Act (no. 66 of 1995).

In light of the explanations above, the term *HIE* was conceptualised as any individual (a) who is hearing-impaired in the pre-lingual, post-lingual, hard-of-hearing, deaf, unilateral and/or bilateral sense; (b) whose hearing-impairment is long-term or recurring; and (c) who meets criteria (a) and (b) of this definition as well as at least one of the following criteria of section 200A(1) of the Labour Relations Act:

- (a) the manner in which the person works is subject to the control or direction of another person;
- (b) the person's hours of work are subject to the control or direction of another person;
- (c) in the case of a person who works for an organisation, the person forms part of that organisation;

- (d) the person has worked for that other person for an average of at least 40 hours per month over the last three months;
- (e) the person is economically dependent on the other person for whom he or she works or renders services;
- (f) the person is provided with tools of trade or work equipment by the other person; or
- (g) the person only works for or renders services to one person.

The human resource management (HRM) criteria that were concluded to connect with the situation of HIEs in South Africa are: ‘designated groups’, Broad-based Black Economic Empowerment, protection from unfair discrimination, and a pressing issue in the country that requires research.

Specific objective 2: Determine job demands of hearing-impaired employees in South Africa

It was concluded that job demands of HIEs in South Africa encompass seven themes – all of which contain sub-themes. These themes were: (a) *communication barriers* (rapid rate of speech; misunderstanding of other party; explaining repeatedly; communication commotion; communication gap); (b) *task hinderances* (poor task orientation; subordinate’s lack of motivation); (c) *task pressure* (inquiry from authority holder; creative output); (d) *task environment variance* (interruption of task processes; travelling); (e) *lack of cooperation* (subordinate; co-worker; managing party); (f) *inconsideration* (unreasonable expectations; unreasonable confrontation; critique without empathy; disrespect); (g) *bounded rationality* (from subordinate; co-worker); and (h) *time burdens* (poor allocation; pressure).

Specific objective 3: Determine job resources of hearing-impaired employees in South Africa

Job resources of HIEs in South Africa were based on three sub-categories of workplace aspects: firstly, that employees *learn from* (Bakker & Demerouti, 2017; Xanthopoulou et al., 2007); secondly that *promote employees’ motivation* (Bakker & Demerouti, 2014; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001); thirdly, that help employees *deliver functional output* (Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007). Accordingly, separate queries were made on each sub-category.

Firstly, job resources that HIEs in South Africa *learn from* consisted of the following themes and sub-themes: (a) *learning from subordinates* (exposure: social diversity; vocabulary); (b) *learning from work associates* (job skill acquisition; practical illustration; learning to work with people; support of

overseeing party); and (c) *academic exposure* (delegation that promotes academic inquiry; informant orientation; technology orientation; exposure: analysis).

Secondly, the job resources associated positively with *motivation* of HIEs in South Africa presented the following themes and sub-themes: (a) *constructive social affiliation* (respect for hearing-impaired; being part of a work team; new social contact); (b) *learning* (general skill improvement; communication skills; computer application functional to job; constructive feedback; new exposure); (c) *constructively influencing* (learners; team); (d) *holding responsibility* (leading/facilitating; deadlines); and (e) *challenges* (in general; new area/s).

Finally, job resources that helped HIEs in South Africa *complete tasks* were: (a) *communication adequacy* (efficiency; textual); (b) *orientation* (task orientation; organisation of tasks: own input; relevant information source); (c) *assistance* (task-orientation guide; work partner; sharing of work experience; team support; supervisor support; management support); and (d) *time consideration* (management; accommodation).

(The last specific objective, ‘recommendations for future research and practice’, is discussed at the end of this chapter)

Article 2: The Job Demands Scale for Hearing-Impaired Employees in South Africa: Development and preliminary analysis of the psychometric properties

The general objective of this study was to develop a new job demands scale and preliminarily test its psychometric properties, specifically for HIEs within the South African context. The conclusions bases on the specific objectives for **Article 2** are presented and discussed below.

Specific objective 1: Conceptualise job demands, hearing-impaired employees, scale development and psychometric properties, according to the relevant scientific literature.

An extensive literature study answered the first objective. This entailed in-depth research and understanding of job demands, hearing-impaired employees in South Africa, scale development, and psychometric properties.

Job demands: This concept is based on the Job Demands-resources model (JD-R model; Bakker & Demerouti, 2007; Demerouti et al., 2001; Schaufeli & Bakker, 2004), which was developed originally

to investigate the effect of characteristics on burnout and work engagement. Job demands can be defined as physical, psychological and organisational dimensions of the job that require mental and physical effort, and are therefore associated with physiological and/or psychological costs (Demerouti et al., 2001). Therefore, job demands can be considered those job aspects that employees mainly perceive as consuming energy from them (Bakker & Demerouti, 2017; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007).

Furthermore, job demands evoke a relatively independent psychological process, namely health impairment. In this regard, high demands require sustained effort, and may exhaust employees' resources or deplete energy and cause health problems (United States of America, Department of Health, Education and Welfare, 1975). Particularly applied to HIEs, the continuing job demands they experience gradually wear down their energy resources and may lead to health impairment (Detaile, Haafkens & Van Dijk, 2003). These outcomes include the burnout syndrome, health deterioration, psychological strain, psychosomatic health complaints, physical ill-health, absenteeism and turnover intention (Schaufeli & Taris, 2014).

In literature, the research found four generally-applicable dimensions of job demands, namely physical, psychological, social, and organisational (Bakker & Demerouti, 2017; Xanthopoulou et al., 2007; Schaufeli & Bakker, 2004). Nevertheless, certain job demands are found to be context-specific (Bakker & Demerouti, 2007; 2014; Bakker, Demerouti & Euwema, 2005). Within their work context, it was found the job demands that HIEs in South Africa experienced as energy-consuming differ, distinctly, from the above-mentioned four general demands documented in mainstream literature on the JD-R. The different demands are those derived from the present qualitative study and can be linked to the following sub-constructs: *communication*, *environmental stimuli* and *time*. Furthermore, these derived themes for South African HIEs correspond with international findings on this group (Hua, Karlsson, Wildén, Möller & Lyxell 2013; Hua, Anderzén-Carlsson, Widén, Möller & Lyxell, 2015; Jahncke & Halin, 2012; Kramer, Kapteyn & Houtgast, 2006; Lund, 2015; Punch, 2016; Van Gils, Van den Bogaerde & De Lange, 2010). However, this prior research did not link the job characteristics to the 'job demands' theme of the JD-R model (Bakker & Demerouti, 2017; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007).

Hearing-impairment: This term generally refers to cases where an individual's hearing ability is below the standard range (Edwards & Crocker, 2012), to an extent that is clearly noticeable (Vaccaro, 2016). South Africa's Department of Labour (2005; 2015) classifies hearing-impairment as a sensory impairment incurred due to partial or total loss of a bodily function. Hearing-impairment meets the country's criteria for 'disability' at employment-level. The criteria require that the impairment should (a) apply on a long-term basis (Employment Equity Act, no. 55 of 1998: EEA, p. 10); (b) be associated with potential hindrance of an individual's full and effective involvement in society on a basis equal to individuals without disabilities (Department of Labour, 2015); and (c) be associated with barriers to employment opportunities and/or career progress (EEA, p. 10).

Furthermore, it was found that hearing impairment among South Africans is only significantly prevalent from the age group of 35-39, from which the proportion increases exponentially. In the preceding age groups, only approximately 2% of South Africa's people are found to be hearing-impaired. The number of South Africans with severe hearing loss generally constitute around only 1% of the country's population (Statistics South Africa, 2011). Therefore, South Africa's hearing-impaired can be considered a minority group who are disabled at the country's employment level.

The first article's finalised definition of *hearing-impaired employee* was adopted for the second article. Accordingly, 'hearing-impaired employee' was conceptualised in terms of the integrated definition of hearing impairment (Edwards & Crocker, 2012; Shemesh, 2010; Thorne et al., 2008; Vaccaro, 2016) and employee (Labour Relations Act, no. 66 of 1995: section 200(A)(1)), as mentioned previously in this chapter.

Scale development: This entails an instrument to measure latent variable(s) of interest in order to yield adequate representation of their existence and/or variance in the given context (DeVellis, 2017; Foxcroft & Roodt, 2018). Throughout the scale development, close attention should be paid to procedures described in literature on psychometric tests and scale development (DeVellis, 2017; Carpenter, 2018; Foxcroft & Roodt, 2018; Tay & Jebb, 2017). According to DeVellis (2017), four steps can be followed to develop a scale, namely: (a) initial conceptualisation of the construct; (b) generating, developing and evaluating items; (c) choosing a scaling format; and (d) refining the items.

According to section 8 of South Africa's EEA, scales used in the country must be scientifically proven as valid and reliable; not be biased against any employee or group; and must be applied fairly to all

employees. Therefore, it is imperative to investigate the *psychometric properties* of a scale, namely, its validity and reliability (Ginty, 2013).

Validity in psychometric terms implies the relevance and applicability of a scale's contents to the particular population group (Foxcroft & Roodt, 2018). From the various forms of validity, earlier versions of job demand scales developed in South Africa, emphasised mainly *construct* validity (Asiwe, Hill & Jorgensen, 2015; Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann, Mostert, & Strydom, 2006). Construct validity can be defined as 'the extent to which it measures the theoretical construct or trait it is supposed to measure' (Foxcroft & Roodt, 2018, p. 72).

To determine the construct validity of a scale, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) can be used. EFA explores the interrelationships between variables and is the more suitable method for early stages of research (Pallant, 2013). On the other hand, CFA tests or confirms specific hypotheses or theories about the underlying structure for the particular variables, and is used at later stages of research about a construct (Pallant, 2013). Most South African studies on job demands, to date, have employed EFA as the method to determine a scale's validity (Asiwe et al., 2015; Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann et al., 2006).

Reliability can be defined as 'the extent to which test scores are accurate, consistent or stable' (Struwig & Stead, 2011). Therefore, the focus is whether the scale's measurement error is low enough to conclude that the yielded score is close enough to the true score (Goodwin & Goodwin, 2014). A scale registering a Cronbach's alpha coefficient of 0.70 and higher, is considered as reliable (Nunnally & Bernstein, 1994).

Specific objective 2: Develop a scale, specifically for hearing-impaired employees, which measures their job demands.

Numerous scales measuring job demands have already been developed and validated in South Africa through rigorous procedures (Asiwe et al., 2015; Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann & Joubert, 2007; Rothmann et al., 2006). However, it may be problematic to use these scales since they do not consider job characteristics experienced by South Africa's *HIEs*. A general outlook on disability and a corresponding generic policy to manage such impairment, restrict

organisations from catering for the needs of these HIEs (Bateman, 2012; Majola & Dhunpath, 2016; Roulstone & Prideaux, 2012). The scale for hearing-impaired employees was developed to measure job demands specific to this employment group in South Africa. When developing the scale, the research adhered closely to the procedures described in the literature on this field (DeVellis, 2017; Carpenter, 2018; Foxcroft & Roodt, 2018; Tay & Jebb, 2017). The researcher followed the four stages mentioned previously as presented by De Vellis (2017).

As the first step of scale development, the initial conceptualisation of the construct was formulated. Job demands of hearing-impaired employees, as well as the accompanying sub-constructs, were based on two sources: findings of the qualitative study (see chapter 2) as well as relevant theory from the literature (JD-R model – Bakker & Demerouti, 2007; 2017; Demerouti et al., 2001; Schaufeli & Bakker, 2004).

The primary construct (job demands of HIEs) was defined as: ‘Job aspects that hearing-impaired employees frequently encounter, which consume energy from them and are therefore associate with depletion of their work energy.’

The sub-constructs reflected the following job demands, which were translated into 10 subscales:

- *Communication*: Job aspects relating primarily to communication that HIEs experience as taking energy from them. These were found to be: work associates’ rapid rate of speech; work associates battling to understand; having to explain repeatedly; communication gap; poor task-orientation; and commotional communication environment.
- *Environmental stimuli*: Job aspects primarily concerning changed surroundings – both intangible (e.g. sound waves) or tangible aspects (e.g. travelling), which HIEs perceive as energy consuming; physical commotion and task interruption.
- *Time*: Job aspects linked primarily to time management (by either the employees themselves or a work associate), which HIEs found to consume their energy: time pressure and allocation.

Although the conceptualisations were drawn from the JD-R model, the newly-developed scale of the present investigation is unique. This construct distinguishes itself by bringing to light themes of job demands that differ from the four above-mentioned general ones previously-listed by key scholars of the JD-R model (Bakker & Demerouti, 2007; 2014; 2017; Demerouti et al., 2001; Schaufeli & Bakker 2004; Xanthopoulou et al., 2007).

During the second step of scale development, six items were generated from previous literature (Jackson & Rothmann, 2005; Rothmann & Jordaan, 2006; Rothmann et al., 2006). These items were adapted to fit the initial conceptualisation of the various job demands. Furthermore, 65 new items were developed based on the definitions of the three derived sub-constructs as demands (i.e. *communication*, *environmental stimuli* and *time*). Five of the 71 items were discarded based on certain criteria from researchers (DeVellis, 2017; Foxcroft & Roodt, 2018; Tay & Jebb, 2018). This left 66 items for further refinement.

The third step was to choose a scaling format to complement the scale's integration into literature on job demands of South Africa. It was decided to use a format scale based on frequency of responses: (1) *never*, (2) *sometimes*, (3) *often*, (4) *always* – providing no midpoint.

The fourth, and final, step was to refine the items. The criteria were: understandability and South African sign language (SASL) compatibility. Assisted by a panel of experts, the remaining 66 items were evaluated, and nine items were discarded.

This procedure produced a newly-developed job demands scale for HIEs, consisting of a total of 57-items. Of these, 36 items were developed for *communication demands*: 4 items for 'work associates' rapid rate of speech'; 6 for 'work associates battling to understand'; 3 for 'having to explain repeatedly'; 9 for 'communication gap'; 5 for 'poor task orientation'; and 9 items concerning 'commotional communication environment'. Regarding *environmental-stimuli demands*, 11-items were developed. These include: 4 items for 'physical commotion' and 7 for 'task interruption'. *Time demands* had 10-items developed: 5 items for 'time pressure' and 5 for 'time allocation'.

Specific objective 3: Determine whether the internal structure of the newly-developed measure is valid and reliable – in terms of internal validity (i.e. construct validity) and scale reliability (Cronbach alpha coefficient > 0.70).

This objective was achieved by exploring the preliminary internal validity (i.e. construct validity) as well as the scale reliability of the newly-developed job demands scale for HIEs. Using exploratory factor analysis (EFA), the construct validity was determined. More specifically, EFA was conducted separately on each of the 10 subscales of the 57-item job demands scale. This was done by examining the variance explained, communalities and factor loadings of items on the 10 subscales. For each of

these subscales a principle component analysis (PCA) was used as extraction method, followed by no rotation.

From the results of the above-mentioned analyses it was evident that all the items on the 10 subscales showed that high variance is explained. According to Streiner (1994), factors in a study should explain at least 50% of the common variance. Furthermore, the items on the 10 subscales showed good communalities (h^2) of 0.20 and higher, as well as good loadings of 0.30 and higher (Child, 2006; Veth, Van der Heijden, Korzilius, De Lange & Emans, 2018). Therefore, no subscales were omitted from the primary scale for hearing-impaired employees. The 10 subscale factors, captured from the mentioned sub-constructs, were labelled as follows: (a) Work associates' rapid rate of speech; (b) Work associates battling to understand; (c) Having to explain repeatedly; (d) Communication gap; (e) Poor task-orientation; (f) Commotional communication environment; (g) Physical commotion; (h) Task interruption; (i) Time pressure; and (j) Time allocation.

To determine the scale's reliability, each of the 10 subscales were analysed as well as the overall three mentioned sub-constructs. The results showed that all 10 subscales of the newly-developed job demands scale for HIEs had good reliability coefficients, ranging from 0.78 to 0.96. *Communication demands* had a reliability of $\alpha = 0.87$; *environmental stimuli* had a Cronbach's alpha coefficient of 0.85; and *time demands* showed an internal consistency of $\alpha = 0.76$. A Cronbach's alpha coefficient of 0.70 and higher is considered as reliable (Cicchetti, 1994; Nunnally & Bernstein, 1994). Therefore, it can be concluded that all the subscales indicated acceptable Cronbach's alpha coefficients, which confirms the reliability of the scale.

Specific objective 4: Establish the associations between certain biographical information aspects (e.g. category of hearing loss, laterality of hearing loss, gender and language) and the job demands of hearing-impaired employees.

Category of hearing loss was found to relate significantly to differences in HIEs' experiencing the demand of *commotional communication environment* as energy-consuming. It was found that hard-of-hearing employees experience this demand as energy-consuming more frequently than deaf employees did. The possible explanation was that hard-of-hearing employees engage in residual hearing (i.e. are more receptive to the demand), whereas the case is less frequently applicable to deaf employees (if at all).

Laterality of hearing loss was found to relate significantly to differences in HIEs' experience of a number of job demands, namely: *communication gap*, *commotional communication environment*, *poor task orientation*, *task interruption*, *time allocation*, *communication overall* and *task overall*. HIEs whose hearing loss is bilateral (i.e. both ears) generally experienced those matters to be energy-consuming more frequently than HIEs did whose hearing loss is unilateral (i.e. one ear). It was argued that unilateral HIEs can use their audio-receptive ear to compensate for hearing loss to the other ear, by directing verbal communication to that ear. This prevents poor task orientation and resultant time compromises.

Gender-based differences were also found in how frequently the genders experience particular job demands as energy-consuming. Males were found to experience *commotional communication environment* and *communication (overall)* as energy-consuming less often than females do.

Differences in job demands were also found among various language groups of HIEs. Those from the Afrikaans language group reported that they generally experience job demands as energy-consuming more frequently than the other language groups did (i.e. English, African and SASL). The Afrikaans group scored the highest in the following subscales: '*work associates' rapid rate of speech*', '*work associates battling to understand*', '*having to explain repeatedly*', '*communication gap*', '*poor task orientation*' and '*communication overall*.' As a result, Afrikaans HIEs seem to experience communication-related demands as demanding most frequently.

English-speaking HIEs only differed from the African language group, scoring significantly higher on the following job demands: '*work associates' rapid rate of speech*'; '*work associates battling to understand*'; '*poor task orientation*'; '*commotional communication environment*', '*time allocation*', '*communication overall*' and '*time overall*.' The demand of '*communication gap*' was not indicated, as in the case of Afrikaans HIEs. This implies that, '*communication gap*' seemingly is not a prime cause for job demands such as these mentioned above. Lorenzi, Gilbert, Carn, Garnier and Moore (2006) found that people with hearing loss tend to have difficulty in understanding speech, particularly when there are background sounds.

English-speaking HIEs were found to score significantly higher on the demand of '*commotional communication environment*'. Such communication difficulties should explain English-speaking HIEs simultaneously scoring significantly in '*poor task orientation*.' The significant score for '*work*

associates battling to understand' can be interpreted as suggesting that a significant number of English-speaking HIEs need to improve their communication skills.

The same rationale as above applied to HIEs of the SASL language group. Their responses scored significantly on '*work associates' rapid rate of speech*,' '*work associates battling to understand*,' '*poor task orientation*,' '*communication overall*' and '*time overall*.' However, in one area the HIEs using SASL, differed clearly from the others, namely in the demand of '*physical commotion*'. The SASL group scored significantly lower on this demand, implying them to be less sensitive of background commotion. This is contrary to findings by Kramer et al. (2006): individuals with hearing loss being more sensitive to background commotion., Their respondents scored higher on '*self-perceived environmental noise*' compared to hearing employees. This clearly points to an inconsistency in the literature. Kramer et al. (2006) measured hearing loss in nominal terms. They did not differentiate between the HIE participants' degrees of hearing loss. Thus, it should be considered how degrees in hearing loss influences HIEs' sensitivity to background noise.

HIEs from the African language group differed from those of the SASL language group in the following job demands: '*work associates' rapid rate of speech*,' '*work associates battling to understand*,' '*poor task orientation*,' '*physical commotion*,' '*communication overall*' and '*time overall*.' Again, the African group were found to experience these job demands as energy-consuming to the lesser degree.

In conclusion it is evident that HIEs from all language groups (not only from SASL) scored significantly in the demands of '*communication overall*' and '*work associates battling to understand*', which suggests that HIEs generally experience communication difficulties.

(The fifth and final specific objective, recommendations for future research and practice, are discussed at the end of this chapter).

4.2 Limitations

Regardless of the significant results, various limitations emerged while conducting the present study. These are expounded below.

Qualitative study

Several limitations became apparent from the qualitative component of the study.

Firstly, equal representation of pre-lingually and post-lingually deaf employees would have been ideal. Yet, such representation was not necessitated by the aim and scope of the study.

Secondly, hard-of-hearing employees were under-represented in this study. Nevertheless, the query was aimed at hearing-impaired employees in general; not towards a particular category of hearing loss.

Thirdly, the researcher's fluency in SASL would not suffice for acceptable personal interviews. Subsequently, another technique was required for data collection. The thought of utilising a third-party translator in a semi-structured interview was also rejected, seeing that safeguarding confidentiality and privacy could be challenging. The self-administered questionnaire – including MS Word format and that of a web survey – was the decided data collection method. Deaf respondents were catered for through SASL translations of the questions, which were accessible through URL links.

Fourthly, the self-administered questionnaire method led to the responses being provided by means of text. Yet, written communication fluency differed between respondents.

Finally, the sample was predominantly compiled of HIEs in the education sector – due to the snowball sampling. This may have influenced the range of the themes among the responses.

Quantitative study

Limitations were identified about the quantitative component of the study as well.

Firstly, the developed questionnaire only considered this study's findings of job-demand themes that differed from mainstream literature (see chapter 2: *communication*-, *environmental stimuli*- and *time demands*). As a result, the quantitative study did not incorporate the qualitative study's findings on social, cognitive and emotional job demands (themes already in literature).

Secondly, this study focused only on a preliminary validation of the newly-developed job demands scale for HIEs. Considering that the scale has only been administered once, there is a chance that high validity scores are based on coincidental alterations and/or sampling errors (Foxcroft & Roodt, 2018).

Thirdly, the sample size of this study ($n = 85$) does not match the minimum sample size recommended for conducting an EFA (Suhr, 2006). In this regard, Suhr (2006) suggests a minimum of 100 suitable respondents ($n \geq 100$) for conducting EFA.

Fourthly, some of the hearing-impaired participants found the length of the scale problematic and felt that certain items were repetitive. Thus, it can be assumed that such an overextended scale may have influenced participants' responses to the items.

Fifthly, the study focused only on a preliminary analysis of the psychometric properties from the newly-developed scale. Hence, it did not test the external psychometric properties (i.e. the relationships with antecedents and outcomes) of the newly-developed scale for HIEs should.

Finally, the study only focused on some biographical characteristics to see how HIEs differ in terms of the energy-consumption of the job demands they experience.

4.3 Recommendations

The final specific objective of both research articles was to make recommendations for future research, which are presented subsequently.

4.3.1 Recommendations for practice

Notwithstanding the limitations of the present study, the findings have important implications for organisations, as explicated below.

The findings generally suggest that supervisors and managers in South African workplaces should not assume to have adequate insight into workplace causes underlying work outcomes of HIEs. Hence, supervisors and managers should not assume the current scientific literature in South Africa to list all the workplace aspects that HIEs could experience as job demands or resources.

From a different angle, Punch, Hyde and Power (2007) indicate that HIEs' hearing work associates (HE) may also experience job demands unique to the specific context. Therefore, if an HIE or HE conveys symptom(s) of uncontrolled job demands (i.e. health-impairment and/or performance decline: Bakker & Demerouti, 2017), the overseers should query the HIE or HE about the work-related cause(s). The present study provides a method to identify possible causes.

A starting point for a query about HIEs' job demands, is to apply the present study's newly-developed Job demands Scale for Hearing-Impaired Employees to determine whether they score significantly on any themes. If so, adjustments could be made to workplace processes and/or setups. Dialogue with the HIE and relevant experts is also proposed as a consideration, when making adjustments for accommodation. Accommodation considerations derived from this study apply to two contexts. Firstly, workplace setups could be improved by reducing background commotion or relocating the HIE's within in the office. Secondly, workplace processes can be enhanced (e.g. communication methods) to accommodate HIEs. Such accommodation would avoid demands of time management hampering the HIEs.

Another way to address HIEs' job demands is by employing job resources. Such resources can be used to buffer the straining effects of job demands (Bakker & Demerouti, 2017). The qualitative findings of Article 1 considered job aspects that could be used in such a manner.

Workplace climates should generally encourage and appreciate dialogue and the airing of opinions, to promote awareness among both HIEs and their hearing work associates. That will help develop awareness of HIEs and of workplace issues. In addition, environments with background commotion are not the ideal setting in which to exchange important information through discussions, when an HIE is part of the matter. Findings show that HIEs experience a *commotional communication environment* as energy-consuming. Furthermore, the supervisors/managers should make an effort to avoid a situation where *work associates' rapid rate of speech* consumes energy; at the same time management should prompt HIEs to inform them should this take place. Overseers should also pay attention to the HIEs during interaction to avoid them from *having to explain repeatedly*. These

actions will ensure HIEs do not experience the demand of the *communication gap*. Such mentioned proactive mitigation to deal with communication demands should lessen the possible disengagement of HIEs from communication processes (Schaufeli & Taris, 2014). This intervention will also help prevent *poor task orientation* and/or *time allocation* demands – and its repercussions (e.g. *time pressure*).

Overall, findings of the present study stress the necessity to consider HIEs in communication and their physical location at the workplace. These two aspects are key considerations to help preserve their energy levels and performance potential within the work context. Finally, organisations can utilise the newly-developed job demands scale for HIEs to gain more insight into and awareness of the possible job demands that HIEs experience. Being aware of these demands will help the organisation develop work environments that are conducive to the needs of HIEs.

4.3.2 Recommendations for future research

Based on the findings and proposed as possible correctives for the limitations, specific recommendation can be made for future study, focusing on the two forms of research.

Qualitative study

Firstly, further qualitative inquiries can be made about job demands that hard-of-hearing employees face. Future research could also include deaf employees, while seeking to prioritise equal representation between the onset stage of deafness, or across all three categories of hearing loss.

Secondly, as a further option, data can be collected through personal interviews by using an SASL interpreter. This could elicit richer descriptions from respondents who are less fluent in English and/or textual communication.

Thirdly, future research could collect data to provide a cross-sectoral view of the workplaces in which HIEs are functioning. According to eDEAF (2018), occupations that HIEs in South Africa head in the direction of include the following: administration and office support; building and construction; food and beverages; hotel industry and hospitality; logistics and transportation; manufacturing and assembly; security [CCTV operators]; warehouse; wholesale and retail.

Finally, the definition for *hearing-impaired employee* includes a legislative foundation (LRA, 2000A(1)). Therefore, it can be assumed that the developed definition hold weight for legal orientation regarding HIEs. Majola and Dhunpath (2016) point out that South Africa require frames of reference to deduce and develop its employment equity policies for disability beyond mere generic descriptions. Therefore, further discussion is recommended about the potential of the present study's developed definition of HIEs to provide such a framework.

Quantitative study

Firstly, as the developed scale only included *communication*-, *environmental stimuli*- and *time demands*, it is recommended that the social, cognitive and emotional job demands derived from the first study (see article 1) should also be included in the questionnaire. By including these demands will give a thorough view of the demand HEI experience. Furthermore, it is also recommended that the resources experienced by HEI (as seen in article one) should also be included in the questionnaire, therefore items specifically for resources should be developed.

Secondly, this study focused only on a preliminary validation of the newly-developed job demands scale for HIEs. Therefore, it is recommended that a thorough investigation be done on the psychometric properties of the newly developed scale (Foxcroft & Roodt, 2018).

Thirdly, the sample size of this study ($n = 85$) does not match the minimum sample size recommended for conducting an EFA (Suhr, 2006). Therefore, it is recommended that this validation should work with a sample size larger than 85 respondents. The proposed number would be at least 100 suitable respondents, while striving for a sample size of 285 ($100 \leq n \leq 285$), in order to conduct the EFA better (Suhr, 2006). Moreover, a larger sample size, based on multiple criteria for hearing-impairment, will also indicate more clearly how hearing-impaired employees experience their job demands within South African companies.

Fourthly, it is recommended that the items of the scale should be reduced as some of the hearing-impaired participants found the length of the scale problematic. Therefore a re-evaluation of the items should be considered, resulting in eliminating unnecessary items.

Fifthly, future research should analyse the external psychometric properties (i.e. the relationships with antecedents and outcomes) to be tested for of the newly-developed job demands scale for HIEs.

Finally, it is recommended that future research consider other biographical characteristics of HIEs that could relate to the degree to which they experience job demands as energy depleting. Such identification could assist risk identification and management.

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Appendix A: Ethical clearance certificate



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Tel: 018 299-1111/2222
Web: <http://www.nwu.ac.za>

WorkWell Research Unit
Tel: 018 299-1369
Fax: 087 231-5396
Email: 10127100@nwu.ac.za

1 September 2016

Mr S Chelius
PO Box 2231
DELMAS
2210

Dear Mr Chelius

ETHICAL CLEARANCE

This letter serves to confirm that the research project of Strauss Chelius, with the title **“Job demands and job resources from the perspective of hearing-impaired employees in South Africa: Exploration, development and validation”** has undergone ethical review. The proposal was presented at a Faculty Research Meeting and accepted. The Faculty Research Meeting assigned the project number **EMSMHW16/06/10-01/05**. This acceptance deems the proposed research as being of minimal risk, granted that all requirements of anonymity, confidentiality and informed consent are met. This letter should form part or your dissertation manuscript submitted for examination purposes.

Yours sincerely

Pieter
Buys

Prof PW Buys
Director: WorkWell Research Unit

Digitally signed by Pieter Buys
DN: cn=Pieter Buys, ou=North-West
University, ou=WorkWell Research Unit,
email=pieter.buys@nwu.ac.za,
c=ZA
Date: 2016.09.01 08:01:32 +0200

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Appendix B: Research invitation, distributed externally via gatekeeping organisation



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Tel: 018 299-1111/2222
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School of Human Resource Sciences
Tel: 018 299 1386
Email: 10679898@nwu.ac.za

SASL: <https://www.youtube.com/watch?v=8UEMgZMqXpw>

Dear potential participant

INVITATION TO JOIN IN A RESEARCH PROJECT

I invite you to join me in my research about Deaf and hard-of-hearing employees in South Africa.

Previous research advises that South Africa needs to develop better understanding about its Deaf and hard-of-hearing individuals. This research aims to develop better understanding about such individuals' experiences of their work environments. Therefore, information from people such as you will be very valuable and I humbly ask you to consider joining in *this* worthwhile and necessary study.

My research is about 'job demands' and 'job resources.' Parts of a work environment that take energy from an employee are called job demands. Parts of a work environment that lead an employee to (i) learn, (ii) feel motivated and/or (iii) assist their completion of tasks are called job resources. Feedback from you about job demands and job resources that you experience will be highly valued and help to develop better understanding about how workplaces are experienced by Deaf and hard-of-hearing employees in South Africa.

Four cases of research give reason to question if employers know about all of the job demands and/or job resources that are experienced by Deaf and hard-of-hearing employees. Therefore, I wish to do research with employees in South Africa like you about job demands and job resources that you experience.

Job demands and job resources influence employee performance, wellbeing and work experience. Therefore, research about job demands and job resources from the view of Deaf and hard-of-hearing employees in South Africa could lead to understanding in the future that can be used by employers in South Africa to more effectively interpret and manage the performance, wellbeing and work experience of Deaf and hard-of-hearing employees in South Africa.

The research compiles part of my master's degree about the field of Human Resource Management. The North-West University's Research Committee and Research Ethics Committee approve of this research idea, reference number: EMSMHW16/06/10-01/05

Rules of research on which this investigation will be based include:

- *Joining the research is your choice:* you can decide if you want to join this research but you must have your supervisor's permission. You are entitled to withdraw your participation at any stage of the research if you or your supervisor wish that you do so;
- *Privacy:* no further areas of inquiry will be made besides basic information about you (e.g. home language, age, qualification), information about your work and the job demands/job resources that you experience. Any decision regarding limits to your participation/feedback will be respected;
- *Anonymity and confidentiality:* your participation in this study and any attained personal information will not be revealed by any of the North-West University's representatives;
- *Academic integrity:* note will continuously be taken to practice fairness and to discourage discrimination or fixed thinking.

In order to participate, you will be needed to reply to my questions over five (5) work days in a row by completing the provided questionnaire at the end of each work day.

If you would like to ask me any questions please contact me via strausscheliuss3@gmail.com

Thank you for your time!



Strauss Chelius
Researcher



BE Jonker
Research supervisor



Dr M De Klerk
Research co-supervisor

Appendix C: Research invitation, distributed within the gatekeeping organisation



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- *Academic integrity:* note will continuously be taken to practice fairness and to discourage discrimination or fixed thinking.

In order to participate, you will be needed to reply to my questions over five (5) work days in a row by completing the provided questionnaire at the end of each work day. You will get each day's questionnaire as a Microsoft Word document that will be sent to you through email.

If you want a question to be explained in SASL, please click on the YouTube link next to each question for a video that will explain the question. For you to join in the research you will need internet access to YouTube.

Please complete each day's questionnaire while you are still at work and send it back straight away to the email address that you received it from. *Make sure you send completed questionnaire from the same e-mail address every day. This is important to avoid confusion.*

I will let you know about when I will send the questions to you, one week before the time.

You are invited because I spoke to your supervisor and they said that it will be fine if you join the research.

It is important you answer all the questions in the survey on the last page of this letter within two days from now and send the completed form to strausscheliuss3@gmail.com if you wish to join this research.

If you would like to ask me any questions please contact me via strausscheliuss3@gmail.com

Thank you for your time!



Strauss Chelius
Researcher



BE Jonker
Research supervisor



Dr M De Klerk
Research co-supervisor

Appendix D: Research invitation, snowball sampling



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Dear potential participant

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Previous research advises that South Africa needs to develop better understanding about its deaf and hard-of-hearing individuals. This research aims to develop better understanding about such individuals' experiences of their work environments. Therefore, information from people such as you will be very valuable and I humbly ask you to consider joining in *this* worthwhile and necessary study.

My research is about 'job demands' and 'job resources.' Parts of a work environment that take energy from an employee are called job demands. Parts of a work environment that lead an employee to (i) learn, (ii) feel motivated and/or (iii) assist their completion of tasks are called job resources. Feedback from you about job demands and job resources that you experience will be highly valued and help to develop better understanding about how workplaces are experienced by deaf and hard-of-hearing employees in South Africa.

Four cases of research give reason to question if employers know about all of the job demands and/or job resources that are experienced by deaf and hard-of-hearing employees. Therefore, I wish to do research with employees in South Africa like you about job demands and job resources that you experience.

Job demands and job resources influence employee performance, wellbeing and work experience. Therefore, research about job demands and job resources from the view of deaf and hard-of-hearing employees in South Africa could lead to understanding in the future that can be used by employers in South Africa to more effectively interpret and manage the performance, wellbeing and work experience of deaf and hard-of-hearing employees in South Africa.

The research compiles part of my master's degree about the field of Human Resource Management. The North-West University's Research Committee and Research Ethics Committee approve of this research idea, reference number: EMSMHW16/06/10-01/05

Rules of research on which this investigation will be based include:

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- *Academic integrity:* note will continuously be taken to practice fairness and to discourage discrimination or fixed thinking.

In order to participate, you will be needed to reply to my questions over five (5) work days in a row by completing the provided questionnaire at the end of each work day. You will get each day's questionnaire as a Microsoft Word document that will be sent to you through e-mail.

SASL interpretations of the questions will be made available via YouTube links. Therefore, for you to join in the research you will need internet access to YouTube.

Please first get your immediate supervisor's permission to join the research before beginning your participation. Therefore, by joining in this research you will mean that your supervisor gave their permission for you to participate.

If you want to join this research, it is important you answer all the questions in the survey on the last page of this letter and send the completed form to strausschelius3@gmail.com *as soon as possible*.

If you would like to ask me any questions please contact me via strausschelius3@gmail.com

Please also e-mail this letter to all of your deaf and hard-of-hearing friends. Then we can collect more data.

Thank you for your time!

Yours sincerely



Strauss Chelius
Researcher



BE Jonker
Research supervisor



Dr M De Klerk
Research co-supervisor

Appendix E: Data collection items & SASL translations thereof

Question	YouTube URL	YouTube title
Please indicate below your category of hearing loss	https://www.youtube.com/watch?v=32KY-6ms3so	Article 1, sampling criteria: Question 1
Does your hearing loss apply to one ear or both ears?	https://www.youtube.com/watch?v=eyzkYzanpLI	Article 1, sampling criteria: Question 2
If hearing loss occurred to both of your ears, is the degree of hearing loss equal among both of the ears?	https://www.youtube.com/watch?v=5cXDBYYGHL4	Article 1, sampling criteria: Question 3
Is your hearing loss permanent?	https://www.youtube.com/watch?v=FgjU9uLRfXA	Article 1, sampling criteria: Question 4
Did your hearing loss occur before you learned spoken communication?	https://www.youtube.com/watch?v=z_G3QNyZ2uU	Article 1, sampling criteria: Question 5
Do one or more of the following apply to the job that you have now? - Your work tasks and procedures are controlled by another person; - Your work hours are controlled by another person; - You form part of a team within the organisation that you work for; - You have worked for someone else for an average of at least forty hours per month over the last three months; - You depend on the person for whom you work or provide your services for your income; - Your work equipment is provided by the person who you work for; - You work for or supply your services to only one person. Please click “yes” if one or more of the above apply to the job that you have now”?	https://www.youtube.com/watch?v=SYBznzl_S3g	Article 1, sampling criteria: Question 6
Please indicate your gender	https://www.youtube.com/watch?v=4nfn49A58bY	Article 1, Biographical inquiries: Question 1
In the box below, please type your home language (for example South African Sign Language/English/isiZulu etc.)	https://www.youtube.com/watch?v=wL5aeS6fmEU	Article 1, Biographical inquiries: Question 2
In the box below, please type the year in which you were born (for example 1975, 1983, 1998 etc.)	https://www.youtube.com/watch?v=M_Ouj3hd7yI	Article 1, Biographical inquiries: Question 3
Please indicate your highest level of educational qualification	https://www.youtube.com/watch?v=iZM088iFwwk	Article 1, Biographical inquiries: Question 4
In the box below, please name the area of your qualification (for example welding, carpentry, information technology, administration, industrial psychology, sociology)	https://www.youtube.com/watch?v=LbViyns0hzI	Article 1, Biographical inquiries: Question 5
What is your job title at the moment? Please type it in the box below (for example Electrician, Safety Officer, Personal Assistant, Plumber, Carpenter, Human Resource Manager)	https://www.youtube.com/watch?v=UY-MZNSVJMY	Article 1, Biographical inquiries: Question 6
In the box below, please indicate how long you have worked in the position of your current job (for example 4 months, 12 months, 18 months etc.)	https://www.youtube.com/watch?v=UTQ03NiVjml	Article 1, Biographical inquiries: Question 7

In the box below, please name the industry that you work in (for example agriculture, financial services, information technology, education, health, security, mining, local government, provincial government, national government, non-governmental organisation, manufacturing, retail, construction, transportation, import and export, etc.)	https://www.youtube.com/watch?v=aswihGQ2YR8	Article 1, Biographical inquiries: Question 8
Is your workplace predominantly compiled of hearing people?	https://www.youtube.com/watch?v=AlkEZhwFYCw	Article 1, Biographical inquiries: Question 9
When thinking about all of the things that happened to you today while at work, what are the experiences that took energy from you? Please list all of the cases and explain each in detail	https://www.youtube.com/watch?v=fVXVEvMQjic	Data collection days 1, 2, 3 & 4: Qualitative question number 1
When thinking about all of the things that happened to you today while at work, what are the experiences via which you learned? Please list all of the cases and explain each in detail	https://www.youtube.com/watch?v=mf4B5Aq7wSo	Data collection days 1, 2, 3 & 4: Qualitative question number 2
When thinking about all of the things that happened to you today while at work, what are the experiences that made you feel motivated? Please list all of the cases and explain each in detail	https://www.youtube.com/watch?v=W8YNWXEjutU	Data collection days 1, 2, 3 & 4: Qualitative question number 3
When thinking about all of the things that happened to you today while at work, what are the experiences that assisted you to complete the tasks that were required? Please list all of the cases and explain each in detail	https://www.youtube.com/watch?v=f6xcV8PeaII	Data collection days 1, 2, 3 & 4: Qualitative question number 4
All of the work experiences of the last four work days that you say took energy from you are listed below	https://www.youtube.com/watch?v=ZbXsei9-S1E	Feedback that you gave over last 4 days for question 1
Please tell us about any other work experiences from the last <i>six months</i> that took energy from you. In the box below, please list all of the cases and explain each in detail	https://www.youtube.com/watch?v=9Q0b_4uKV7Q	Data collection day 5, question 1
All of the work experiences of the last four work days that you say you learned from are listed below	https://www.youtube.com/watch?v=vlQYS0I5C7A	Feedback that you gave over last 4 days for question 2
Please tell us about any other work experiences from the last <i>six months</i> that you learned from. In the box below, please list all of the cases and explain each in detail	https://www.youtube.com/watch?v=TN0iKtAljo	Data collection day 5, question 2
All of the work experiences of the last four work days that you listed as having made you feel motivated are listed below	https://www.youtube.com/watch?v=fc2zmfIvDsE	Feedback that you gave over last 4 days for question 3
Please tell us about any other work experiences from the last <i>six months</i> that made you feel excited or motivated. In the box below, please list all of the cases and explain each in detail	https://www.youtube.com/watch?v=L0kcXgHhtSE	Data collection day 5, question 3
All of the work experiences of the last four work days that you listed as having assisted you to complete your tasks are listed below	https://www.youtube.com/watch?v=f6Mv5CYo-Rg	Feedback that you gave over last 4 days for question 4
Please tell us about any other work experiences from the last <i>six months</i> that assisted you to complete tasks. In the box below, please list all of the cases and explain each in detail	https://www.youtube.com/watch?v=Z7j0dgGhc3s	Data collection day 5, question 4

Appendix F: Items of the South African Job Demands-Resources Scales that were adapted for the Job Demands Scale for Hearing-Impaired Employees

	Item	JDRS version
1.	I receive an overload of information in my work	Jackson and Rothmann (2005)
2.	Do you work under time pressure?	Jackson and Rothmann (2005); Rothmann and Jordaan (2006); Rothmann, Mostert and Strydom (2006)

Appendix G: All items of the Job Demands Scale for Hearing-Impaired Employees

	Item content developed, initial	SASL-compatibility revision
Communication demands		
1.	It takes energy from me at my work when a work associate talks too fast for me to follow what they are saying	SASL compatible
2.	It takes energy from me at my work when a work associate does not talk slow enough for me to follow what they are saying	SASL compatible
3.	It takes energy from me at my work when a work associate talks too fast for me to keep up with their words when they speak	SASL compatible
4.	It takes energy from me at my work when a work associate talks too fast for me to grasp their words	It takes energy from me at my work when a work associate talks too fast for me to understand their words
5.	It takes energy from me at my work when a work associate struggles to understand what I am trying to say to them	SASL compatible
6.	It takes energy from me at my work when a work associate struggles to understand what I am trying to explain to them	SASL compatible
7.	It takes energy from me at my work when a work associate does not understand what I am trying to say to them	SASL compatible
8.	It takes energy from me at my work when a work associate does not understand what I am trying to explain to them	SASL compatible
9.	It takes energy from me at my work when a work associate does not correctly understand what I am trying to say to them	It takes energy from me at my work when a work associate does not understand correctly what I am trying to say to them
10.	It takes energy from me at my work when a person does not receive my message correctly	It takes energy from me at my work when a work associate does not understand my message correctly
11.	It takes energy from me at my work when I have to continuously explain to a work associate	SASL compatible
12.	It takes energy from me at my work when I have to explain again and again to a work associate	SASL compatible
13.	It takes energy from me at my work when I have to explain to a work associate more than once	It takes energy from me at my work when I have to explain to a work associate over and over and over again
14.	It takes energy from me at my work when there is commotion in the background while me and a work associate are trying to communicate with each other	It takes energy from me at my work when there is disturbance in the background while me and a co-worker are trying to communicate with each other
15.	It takes energy from me at my work when there is commotion in the background while me and a work associate are trying to talk to each other	It takes energy from me at my work when there is disturbance in the background while me and a co-worker are trying to talk to each other
16.	It takes energy from me at my work when there is commotion in the background while me and a work associate are trying to exchange information	It takes energy from me at my work when there is disturbance in the background while me and a co-worker are trying to exchange information
17.	It takes energy from me at my work when there is a noise in the background and that makes it difficult to spot when each person is talking	SASL compatible

18.	It takes energy from me at my work when there is a noise in the background and that makes it difficult to grasp what a person is saying	It takes energy from me at my work when there is a noise in the background and that makes it difficult to catch what a person is saying
19.	It takes energy from me at my work when it is not quiet and that makes it difficult to follow when each person is speaking	SASL compatible
20.	It takes energy from me at my work when it is not quiet and that makes it difficult to spot when each person is talking	SASL compatible
21.	It takes energy from me at my work when it is not quiet and that makes it difficult to grasp what a person is saying	It takes energy from me at my work when it is not quiet and that makes it difficult to catch what a person is saying
22.	It takes energy from me at my work when there is background commotion and that makes it difficult to grasp what is being said to me	It takes energy from me at my work when there is background disturbance and that makes it difficult to catch what is being said to me
23.	It takes energy from me at my work when I battle to communicate with work associates	It takes energy from me at my work when I struggle to communicate with work associates
24.	It takes energy from me at my work when I battle to grasp what people are trying to say to me	It takes energy from me at my work when I struggle to catch what people are trying to say to me
25.	It takes energy from me at my work when I battle to communicate with a person	It takes energy from me at my work when I struggle to communicate with a person
26.	It takes energy from me at my work when I battle to communicate with people	It takes energy from me at my work when I struggle to communicate with people
27.	It takes energy from me at my work when a person battles to communicate with me	It takes energy from me at my work when a person struggles to communicate with me
28.	It takes energy from me at my work when work associates battle to communicate with me	It takes energy from me at my work when work associates struggle to communicate with me
29.	It takes energy from me at my work when there is not proper communication tools to help me interact with work associates	SASL compatible
30.	It takes energy from me at my work when there is not an interpreter to help me to communicate with work associates	SASL compatible
31.	It takes energy from me at my work when there is not an interpreter to help me to communicate with people	SASL compatible
32.	It takes energy from me at my work when I do not receive enough information about a task at hand	It takes energy from me at my work when I do not receive enough information about a job to do
33.	It takes energy from me at my work when I am not clearly told what I must do on a job	SASL compatible
34.	It takes energy from me at my work when I am not properly told what I am supposed to do on a job	SASL compatible
35.	It takes energy from me at my work when I am not properly shown what I am supposed to do on a job	SASL compatible
36.	It takes energy from me at my work when I am not given proper explanation about what I am supposed to do on a task	It takes energy from me at my work when I am not given a proper explanation about what I am supposed to do on a job
Environmental stimuli demands		
37.	It takes energy from me at my work when things of the work environment interrupt me while I am busy with a task	It takes energy from me at my work when things of the work environment interrupt me while I am busy with a job
38.	It takes energy from me at my work when things around me at my workplace distract me while I am busy with a task	It takes energy from me at my work when things around me distract me while I am busy with a job

39.	It takes energy from me at my work when people talking in the background distracts me while I am busy with a task	It takes energy from me at my work when people talking in the background distracts me while I am busy with a job
40.	It takes energy from me at my work when people talking in the background makes it tougher for me to concentrate on a task	It takes energy from me at my work when people talking in the background makes it harder for me to focus on a job
41.	It takes energy from me at my work when something in the work environment makes it more difficult for me to do a job	SASL compatible
42.	It takes energy from me at my work when my work puts me in an environment with social commotion around me	SASL compatible
43.	It takes energy from me at my work when my work puts me in an environment with lots of people moving	SASL compatible
44.	It takes energy from me at my work when my work puts me in an environment with people moving	SASL compatible
45.	It takes energy from me at my work when my work puts me in an environment with things moving	SASL compatible
46.	It takes energy from me at my work when my work puts me in an environment with physical commotion around me	SASL compatible
47.	It takes energy from me at my work when my work puts me in an environment with lots of things moving	SASL compatible
Time demands		
48.	It takes energy from me at my work when I am pressured to finish a task in time	It takes energy from me at my work when I am pressured to finish a job on time
49.	It takes energy from me at my work when I am pressured to meet a deadline	It takes energy from me at my work when I am pressured to meet a time limit at work
50.	It takes energy from me at my work when it is difficult to meet a deadline at work	It takes energy from me at my work when it is difficult to meet a time limit at work
51.	It takes energy from me at my work when I have to work faster to meet a deadline	It takes energy from me at my work when I have to work faster to meet a time limit
52.	It takes energy from me at my work when I have to work quicker to meet a time limit	SASL compatible
53.	I see that I did not use my time well enough to complete a task at work	It takes energy from me at my work when I see that I did not use my time well enough to complete a job at work
54.	It takes energy from me at my work when a party leading me in a task at work manages time in a way that wastes my time	It takes energy from me at my work when my supervisor does not lead me to use my time well
55.	It takes energy from me at my work when the party leading me in a task directs the process in a way that wastes my time	It takes energy from me at my work when my supervisor leads me in a way that wastes time
56.	It takes energy from me at my work when I leave a task to the last minute to complete	It takes energy from me at my work when I leave a job to the last minute to complete
57.	It takes energy from me at work when I only start to work on a task at the last minute	It takes energy from me at my work when I only start to work on a job at the last minute