WORK-NONWORK INTERFERENCE IN THE SOUTH AFRICAN CONTEXT

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REMARKS

The reader is reminded of the following:

- The references as well as the editorial style as prescribed by the *Publication Manual (5th edition)* of the American Psychological Association (APA) were followed in this thesis. This practice is in line with the policy of the Programme in Industrial Psychology of the North-West University, Potchefstroom Campus, to use APA style in all scientific documents as from January 1999.
- The thesis is submitted in the form of three research articles.
- The format style of the research articles (Chapter 2, Chapter 3 and Chapter 4) is in accordance with the guidelines for authors of the South African Journal of Industrial Psychology.
- Research article 1 (Chapter 2) was accepted for publication in the South African Journal of Industrial Psychology.
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*Competing models for nonwork-work interference*

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SUMMARY

**Topic:** Work-nonwork interference in the South African context

**Key terms:** work-nonwork role interference, experiences, scale development, item evaluation, psychometric properties, external variables, South African context.

One key focus in the 21st century is adjusting work and personal life in order for individuals to find a rhythm to help them combine work with other responsibilities and aspirations in their personal lives. Over the past few decades it has become evident that work and personal life are interrelated domains and that employed individuals experience interaction between these domains. Although the amount and extent of work-family research studies in South Africa have progressed considerably over the past decade, it is not clear how the experiences of the interference between work and nonwork roles compare to the experiences of employees in other countries. There is also no South African instrument that measures the interference between work and different nonwork roles in both directions (work-to-nonwork and nonwork-to-work). This could pose potential problems for organisations and future work-family studies in South Africa.

The objectives of this research were 1) to gain insight into the interaction between work and personal life in the South African context and how South African employees experience this interaction; 2) to develop a new work-nonwork interference instrument that is suitable for the South African context and that addresses measurement and theoretical issues relating to previous work-family instruments; and 3) to test the psychometric properties of the newly developed work-nonwork interference instrument.

The empirical study consisted of three phases. During the first phase, exploratory interviews (i.e. 92 interviews) were conducted in order to gather information regarding the interaction that individuals experience between their work and their personal lives. Thereafter, a new instrument that measures work-nonwork interference was developed and tested with a pilot study \( (n = 245) \) in order to overcome some of the measurement limitations relating to previous work-family instruments. During the final phase, the psychometric properties of the
newly developed work-nonwork interference instrument were tested (i.e. construct validity, discriminant validity, convergent validity and external validity; n = 366).

Results from the exploratory phase indicated that South African employees experience various forms of interaction between their work and other dimensions in their personal life (e.g. domestic, leisure, exercise, studies, community, extended family and religion/spirituality). In addition, South African employees experience various stressors in their work environment that contribute to this interaction (i.e. general stressors such as pressure, overload, workload, stressful working arrangements, and strenuous relationships at work, and more occupation-specific stressors such as stressful nature of the job and not being valued in an unsupportive work environment). Additional supportive aspects present in their work environment included supportive work arrangements, supportive relationships at work and occupation satisfaction. Results also indicated consequences specifically related to all the forms of interaction (e.g. time-based consequences, build-up and spillover of emotions, and energy depletion) and consequences that are more related to a specific form of interaction (e.g. mental preoccupation, strain on relationships, managing responsibilities, limiting of work opportunities, energy generation, learned skills). From the exploratory study, very similar findings were obtained and some unique contributions were made to existing work-family literature. The antecedents mentioned are in line with international literature (physical workload, time pressures, physical stressors, shift work and recipient contact) and the consequences are very similar to categorised consequences reported in international research (i.e. physical, psychological, behavioural, attitudinal, organisational consequences or work, nonwork and health-related consequences).

During the second phase a new work-nonwork interference (W-NWI) instrument was developed which differentiates among interference between work and various specific roles in an individuals' personal life (i.e. work-parent interference, parent-work interference, work-spouse interference, spouse-work interference, work-religion/spirituality interference, religion/spirituality-work interference, work-domestic interference, domestic-work interference). During the evaluation study various problematic items were eliminated using the Rasch measurement model. The final phase included the validation study where the psychometric properties of the new instrument were investigated. The results provided evidence for construct, discriminant and convergent validity, reliability and significant relations with external variables.
This study provides evidence for the psychometric properties of the new instrument, which researchers and managers can use to investigate the specific interference between work and different nonwork roles in employees' private lives.

Recommendations for future research were made.
OPSOMMING

Onderwerp: Werk-niewerk-inmenging in die Suid-Afrikaanse konteks

Sleutelwoorde: Werk-niewerkrol-inmenging, ervaringe, skaalontwikkeling, item-evaluering, psigometriese eienskappe, eksterne veranderlikes, Suid-Afrikaanse konteks

'n Sleutelfokus van die 21ste eeu is die aanpassing van werk- en persoonlike lewe sodat individue 'n 'ritme' kan vind wat hulle in staat stel om werk met ander verantwoordelikhede en aspirasies in hul persoonlike lewens te combineer. Dit het oor die afgelope paar dekades duidelik geword dat werk- en persoonlike lewe onderling verbonde domeine is en dat werknemers interaksie tussen hierdie domeine ervaar. Hoewel die omvang van werk-gesin-navorsing in Suid-Afrika deur die loop van die afgelope dekade beduidend toegeneem het, is dit steeds nie duidelik hoe ervarings van die inmenging tussen werk- en niewerkrolle met die ervarings van werknemers in ander lande vergelyk nie. Daar bestaan ook geen Suid-Afrikaanse instrument wat die inmenging tussen werk en verskillende niewerkrolle in beide rigtings meet nie. Dit kan probleme inhou vir organisasies en toekomstige werk-gesin-studies in Suid-Afrika.

Die doelstellings van hierdie navorsing was 1) om insig te verkry in die interaksie tussen werk- en persoonlike lewe in die Suid-Afrikaanse konteks en hoe Suid-Afrikaanse werknemers hierdie interaksie ervaar; 2) om 'n nuwe werk-niewerk-inmenging-instrument te ontwikkel wat geskik is vir die Suid-Afrikaanse konteks en wat metings- en teoretiese kwessies met betrekking tot vorige werk-gesin-instrumente ondervang; en 3) om die psigometriese eienskappe van die nuut ontwikkelde werk-niewerk-inmenging-instrument te toets.

Die empiriese studie het uit drie fases bestaan. Gedurende die eerste fase is verkennende onderhoude (92 onderhoude) gevoer met die doel om inligting in te win oor die interaksie wat individue tussen hul werk en hul persoonlike lewens ervaar. Daarna is 'n nuwe instrument wat werk-niewerk-inmenging meet, ontwikkel en getoets met 'n loodsstudie (n = 245) ten einde sommige van die beperkings met betrekking tot vroeëre werk-gesin-instrumente te oorkom. Gedurende die finale fase is die psigometriese eienskappe van die nuut ontwikkelde werk-
Resultate van die verkennende fase het aangedui dat Suid-Afrikaanse werknemers verskeie vorme van interaksie tussen hul werk en ander dimensies van hul persoonlike lewens ervaar (bv. huishouding, ontspanning, oefening, studies, gemeenskap, uitgebreide familie en godsdien/spiritualiteit). Suid-Afrikaanse werknemers ervaar ook verskeie stressors in hul werksomgewing wat hydra tot hierdie interaksie (i.e. algemene stressors soos druk, oorlading, stressvolle werksrelatings, en inspannende verhoudinge by die werk, en meer beroepsbesondere stressors soos werk wat stressvol van aard is, en 'n gebrek aan waardering in 'n nie-ondersteunende werksomgewing). Verdere ondersteunende aspekte teenwoordig in hul werksomgewing was ondersteunende werksrelatings, ondersteunende werksoorbring, en beroepsbevrediging. Die resultate het ook gedui op gevolge wat spesifiek verband hou met al die vorme van interaksie (bv. tydgebasseerde gevolge, opbou en oorloop van emosies, en energie-uitputting) en gevolge wat meer verband hou met 'n spesifieke vorm van interaksie (bv. geestelike preokkupasie, stremming op verhoudinge, bestuur van verantwoordelikhede, beperking van werksgeleenthede, energiegenerering, aangeleerde vaardighede). Die verkennende studie het soortgelyke bevindinge opgelewer en 'n aantal unieke hydraas gemaak tot bestaande werk-gesin-literatuur. Die genoemde antesedente is in coreenstemming met internasionale literatuur (fisiese werklaas, tydspan, fisiese stressors, skofwerk en ontvangerkontak) en die gevolge is soortgelyk aan gekategoriseerde gevolge waaroor in internasionale navorsing verslag gedoen is (i.e. fisiese, sielkundige, gedrags-, houdings-, organisatoriese gevolge of werk, niewerk en gesondheidsverwante gevolge).

Gedurende die tweede fase is 'n nuwe werk-niewerk-inmenging-instrument (W-NWI) ontwikkel wat onderskei tussen inmenging tussen werk en verskeie spesifieke rolle in 'n individu se persoonlike lewe (i.e. werk-ouer-inmenging, ouer-werk-inmenging, werk-gade-inmenging, gade-werk-inmenging, werk-godsdien/spiritualiteit-inmenging, godsdien/spiritualiteit-werk-inmenging, werk-huishouding-inmenging, huishouding-werk-inmenging). In die evaluasie studie is verskeie problematiese items geëlimineer deur gebruikmaking van die Rasch-metingsmodel. Die finale fase het die valideringstudie ingesluit waar ondersoek ingestel is na die psigometrise eienkappe van die nuwe instrument. Die resultate het bewyse opgelewer vir konstruk-, diskriminant- en konvergensiegeldigheid, betroubaarheid en beduidende verhoudinge met eksterne veranderlikes.
Hierdie studie lever bewyse vir die psigometriese eienskappe van die nuwe instrument, wat navorsers en bestuurder kan gebruik om ondersoek in te stel na die spesifieke inmenging tussen werk en verskillende niewerkrolle in werknemers se privaat lewens.

Aanbevelings is gemaak vir verdere navorsing.
CHAPTER 1

INTRODUCTION

This thesis focuses on work-nonwork interference in the South African context. More specifically, the focus is on the experiences of the interaction between work and personal life and the development and psychometric properties of a comprehensive work-nonwork interference instrument.

In this chapter, the background to the study and the problem statement are discussed. The research objectives and the contribution or value-add of the study are set out. Lastly, ethical considerations as well as the research design are explained and an overview and division of chapters are given.

1.1 PROBLEM STATEMENT

For employed individuals, balancing one’s work responsibilities and needs with one’s responsibilities and interests outside work is at best challenging. According to Maxwell and McDougall (2004), one key focus in the 21st century is adjusting work and personal life in order for individuals to find a rhythm to help them combine work with other responsibilities and aspirations in their personal lives. Over the past few decades it has become evident that work and personal life are interrelated domains and that employed individuals experience interaction between these domains (Allen, Herst, Bruck & Sutton, 2000; Butler, Grzywacz, Brenda, Bass & Linney, 2005; Olson-Buchanan & Boswell, 2006).

This interaction has, however, become more difficult as major changes took place within the composition of the workforce, the nature of work itself and family structures, resulting in the experience of interference between work and personal life (Bailyn & Harrington, 2004; Bond, Galinsky & Swanberg, 1997; Grandey, Cordeiro & Crouter, 2005; Lewis & Cooper, 2005; Polach, 2003; Schreuder & Theron, 2001). As a result, international researchers have devoted considerable attention to examine the interrelationships between these domains. A steady stream
of research has been produced over the past 25 years, including various areas of interests, such as the changing nature of work, work schedules and changing work patterns, gender roles within the work and family domains, work-family relationships in dual-earner couples, multiple social roles of employees, organisational strategies relating to work-family assistance, work-family linkages and relationships among life domains (Allen et al., 2000; Bulger, Matthews & Hoffman, 2007; Eby, Casper, Lockwood, Bordeaux & Brinley, 2005; Geurts & Demerouti, 2003; Greenhaus & Beutell, 1985; Lewis, Rapoport & Gambles, 2003; Olson-Buchanan & Boswell, 2006).

Although the interaction/interference between work and family is a widely studied subject matter in international research studies (overview studies of work-family conflict (WFC) include those of Byron, 2005; Eby et al., 2005; Mesmer-Magnus & Viswesvaran, 2005), this phenomenon is also a reality within the South African context. In South Africa, various societal influences, changes and organisational structures are influencing the interaction between employees’ work and personal lives (Vosloo, 2002). Since South Africa is undergoing a process of legislation (i.e. Employment Equity Act, 55 of 1998; Broad-Based Black Economic Empowerment Act, 53 of 2003), previously disadvantaged individuals or groups are given the opportunity to enter the work environment. As a result, the South African workforce is becoming more representative of the South African population. This entails that more women are entering the workplace, which leads to many men being retrenched or transferred and women taking their place in the organisation, ultimately leading to role changes. In addition, due to the high unemployment rate in South Africa, employees feel the need to work harder and longer hours in response to uncertain feelings about their future security. An increasing number of men are forced to take jobs that are far from home, leaving their families for long periods of time – a situation which ultimately influences the interaction between work and personal life (Burmeister, 2009; Kwago, Thesnaar, Thirion & Yates, 2006).

With this in mind, it is clear that a variety of recent South African work-family studies are predominant in accordance with international work-family research trends (Geurts & Demerouti, 2003). Some of the main areas studied internationally include the measurement of WFC, and antecedents and consequences relating to the interaction/interference between work and family (Allen et al., 2000; Bellavia & Frone, 2005; Frone, 2003; Geurts & Demerouti, 2003).
Previously researched antecedents focused on in international work-family literature include socio-demographic and personal characteristics, family or nonwork characteristics, and work or job-related characteristics (Ballout, 2008; Bellavia & Frone, 2005; Byron, 2005; Carnicer, Sanchez, Perez & Jimenez, 2004; Frone, Russell & Cooper, 1992; Geurts & Demerouti, 2003). Work-family-related consequences studied internationally can be classified as work-related consequences (e.g. job satisfaction, turnover intention), nonwork-related consequences (e.g. life satisfaction, marital satisfaction), stress or general health-related consequences (e.g. burnout, somatic or physical symptoms), and physical, psychological, behavioural, attitudinal or organisational consequences (Allen et al., 2000; Bellavia & Frone, 2005; Frone et al., 1992; Frone, 2003; Geurts & Demerouti, 2003).

Research topics mainly studied in South African studies include demographic differences (Coetzer, 2006; De Klerk & Mostert, 2010; Mostert & Oldfield, 2008; Pieterse & Mostert, 2005), possible antecedents and well-being outcomes of WFC (Koekemoer & Mostert, 2006; Mostert, 2009; Mostert, Cronjé & Pienaar, 2006; Mostert & Rathbone, 2007; Patel, Govender, Paruk & Ramgoon, 2006), the prevalence of work-family interaction (Rost & Mostert, 2007), psychometric properties of WFC instruments (Marais, Mostert, Geurts & Taris, 2009; Pieterse & Mostert, 2005; Rost & Mostert, 2007), the occupancy of multiple social roles and role salience (Donald & Lintington, 2008; Naidoo & Jano, 2002), along with limited qualitative studies, focusing on life roles of career-orientated women (Franks, Schurink & Fourie, 2006) and dual roles in self-employed women (McLellan & Uys, 2009). Although the amount and extent of work-family research studies in South Africa has progressed considerably over the past decade, South African researchers are still confronted with important issues relating to work-family interference as well as the overall measurement of work-family interference, which could pose potential problems for organisations and for future work-family studies in South Africa.

Several limitations or gaps exist in the South African work-family literature. The first aspect of concern for South African researchers relates to how South African employees really experience the interaction between their work and personal life and whether these experiences differ from those experiences of employees in other countries. According to Cariku (2002), understanding the interaction between work and personal life and the effects thereof across cultures and
societies has become increasingly important. This is true especially since employees from different societies and cultures may experience roles in their work environments and personal lives very differently, which implies that the conceptualisation and interaction between these domains may be very different compared to international models. Although various South African studies provide important information regarding the interaction between work and home, the usefulness of these studies to explain or conceptualise work-family interference as South African employees experience it may be limited. This is mainly due to the quantitative nature of the studies and the international measuring instruments that they use. When researchers use international work-family instruments, participants are restricted to predetermined categories regarding work-family interference, its causes and consequences. This becomes an issue of concern since South African employees may experience the interaction between work and private life, as well as the causes and consequences associated with this interaction, differently than that is being measured in these quantitative studies and that used in international models and measuring instruments. Quantitative studies also do not allow participants to describe in their own words what is meaningful or important (Kvale, 1996). It is therefore necessary to investigate how South African employees experience the interaction between their work and personal life, and to determine how these experiences are similar to (or different from) international models and theories.

The second aspect of concern is the measurement of work-family conflict/interference. Several measurement issues were raised against WFC instruments, including the dimensionality and inconsistent measurement of interference from both directions (work-to-home and home-to-work interference), the almost exclusive measurement of work interfering with family life (ignoring the potential interference with other nonwork roles), the wording of items, the use of appropriate response anchors and scales and the lack of comprehensive scale development procedures (Bellavia & Frone, 2005; Frone, 2003; Geurts & Demerouti, 2003; Tetrick & Buffardi, 2006).

With regard to the dimensionality of WFC, earlier studies conceptualised the conflict between work and family as one dimension. However, this conceptualisation ignores the fact that family can also cause interference with work and fails to capture the dimensionality inherent to WFC (e.g. Bedeian, Burke & Moffett, 1988; Burke, 1988; Cooke & Rousseau, 1984; Koppelman,
Greenhaus & Connoly, 1983; Thomas & Gangster, 1995). However, Greenhaus and Beutell (1985) suggested the notion that WFC is bidirectional in nature and therefore consists of two separate dimensions (i.e. work→family conflict and family→work conflict). Although this conceptual distinction between work-family and family-work interference/conflict has been validated in recent studies (Carlson & Frone, 2003; Carlson & Kacmar, 2000; Carlson, Kacmar & Williams, 2000; Curbow, McDonell, Spratt, Griffen & Agnew, 2003; Geurts, Taris, Kompier, Dikkers, Van Hooff & Kinnunen, 2005; Grzywacz & Marks, 2000; Mesmer-Magnus & Viswesvaran, 2005), various instruments exist – and are still being used – that are one-directional in nature (Carlson et al., 2000; Desrochers, Hilton & Larwood, 2005; Frone et al., 1992; Grzywacz & Bass, 2003; Stephens & Sommer, 1996).

In addition, the majority of existing instruments almost exclusively measure the interference of work with the family domain. Although various recommendations were made by previous researchers to acknowledge and measure interference between work and other or additional nonwork dimensions or roles outside the work domain (Bellavia & Frone, 2005; Frone, 2003; Geurts & Demerouti, 2003; Kirchmeyer, 1992; Tetrick & Buffardi, 2006), very few instruments exist that measure interference between work and other nonwork roles. With the limited instruments available that do measure the interference of work and nonwork roles, directionality is once again an issue of concern since these instruments only measure one direction of interference (Aryee, 1992; Frone & Rice, 1987; Kirchmeyer, 1992; Small & Riley, 1990;). Only two instruments could be found that measure both directions of interference between work and certain nonwork dimensions or roles (Mallard & Lance, 1998; Premeaux, Adkins & Mossholder, 2007).

Another important concern raised by researchers is the development and use of items that confound with external variables, causes or consequences (Bellavia & Frone, 2005; Frone, 2003; Tetrick & Buffardi, 2006). This is problematic since an item that assesses a construct in terms of its cause or consequence is meaningless for data collection as the cause and the consequence are already given in the item. For instance, when a researcher attempts to measure the interference from work to family, but includes a cause (e.g. work pressure) and a consequence (e.g. irritability) in the work-family conflict item (e.g. “You are irritable at home because your work
is demanding”), the relation with external variables (e.g. work pressure and irritability) will be inflated. Another problem is the development and use of specific types of conflict (e.g. time-, strain- and behaviour-based conflict), where items are developed based on the consequences of the conflict and not the conflict per se. For instance, in the item “Your work takes up time that you would have liked to spend with your spouse/friends/family”, because of work you do not have time to spend with your family.

The use of response anchors in work-family studies is also inconsistent, as some studies measure the frequency of occurrence of work-family interference (e.g. a response anchor ranging from never to always) (Geurts et al., 2005; Grzywacz & Bass, 2003; Grzywacz & Marks, 2000), while other studies provide only the experience of work-family interference (Kirchmeyer, 1992; Netemeyer, Boles & McMurrin, 1996; Small & Riley, 1990; Stephens & Sommer, 1996), making it impossible to estimate the prevalence of conflict. With a response anchor such as agree/disagree no additional information on the frequency of interference are provided, which becomes problematic – a strongly agree response might merely represent the individual’s level of certainty that work-family conflict occurred. An additional measurement issue pertains to scale development of work-family studies, as limited scale development studies exist which rigorously explain the procedures followed in order to develop the instrument. Although clear guidelines for scale development are given in psychometric literature, few work-family scale development studies adhere to or follow these guidelines (Carlson et al., 2000; Geurts et al., 2005; Netemeyer et al., 1996; Mallard & Lance, 1998).

The final aspect of concern which work-family researchers are confronted with is the lack of thorough reporting of psychometric properties of work-family instruments (i.e. internal and external validity of the instruments) and the use of work-family instruments that are not valid and reliable for the South African context. According to scale development researchers (DeVellis, 2003; Robinson, Shaver & Wrightsman, 1991), comparing results of instruments where the psychometric properties (i.e. the validity and reliability) are unknown can be very problematic. In the literature a variety of indicators of psychometric properties of instruments are found (i.e. internal validity, construct validity, discriminant validity, convergent validity,
reliability and external validity, relationships with external variables); however, the reporting and use thereof in work-family studies are very inconsistent and limited.

Regarding the internal validity of work-family instruments – i.e. construct validity, the use of exploratory factor analyses (EFA) – it is only found in a few work-family studies (Aryee, 1992; Grzywacz & Marks, 2000; Kopelman et al., 1983; Premeaux et al., 2007), while the majority of work-family studies use confirmatory factor analyses (CFA) to prove construct validity (Curbow et al., 2003; Carlson & Frone, 2003; Geurts et al., 2005). Other indicators of validity which are also lacking in the majority of work-family studies are evidence for discriminant and convergent validity. Discriminant validity is specifically used to indicate clear distinctiveness between constructs in order to provide further proof of empirically distinct dimensions in instruments (Carlson & Frone, 2003) while convergent validity indicates the relationship with other measures which are closely related. In the literature only a small number of work-family studies tested or provided evidence for discriminant validity (Carlson & Frone, 2003; Carlson et al., 2000; Grzywacz & Marks, 2000; Small & Riley, 1990), while only one of the main work-family studies (i.e. Small & Riley, 1990) tested convergent validity using correlations with similar instruments. In addition, for the investigation and reporting of external validity of instruments, it is also important to indicate relationships between work-family instruments and various external variables (e.g. Carlson & Frone, 2003; Carlson et al., 2000; Geurts et al., 2005).

Finally, the use of work-family instruments that are valid and reliable for use in the South African context is also of great concern for South African researchers. Even though various instruments are used in South Africa, the ‘Survey Work-home Interaction – Nijmegen’ (SWING) is the only instrument which has been validated for use in the South African context. Although the SWING is a widely used, well-researched and psychometrically sound international instrument that has been used in various South African studies (Coetzer, 2006; De Klerk & Mostert, 2010; Koekemoer & Mostert, 2006; Mostert, Cronjé & Pienaar, 2006), and validated in different South African samples (Marais et al., 2009; Mostert & Oldfield, 2009; Pieterse & Mostert, 2005; Rost & Mostert, 2007), this instrument is not without limitations. These limitations are closely related to the measurement limitations identified by previous researchers. The two major issues concerning the SWING are 1) the use of items that are confounded with
external variables, causes and consequences as well as time-based and strain-based interference items; and 2) the SWING only measures interference between two dimensions (i.e. work and home) and fails to measure interference between work and other dimensions in the nonwork domains).

It is thus clear that it is very important to investigate the interaction between work and personal life as experienced by South African employees and that the need may exist to develop a new instrument that could be used in the South African context.

Based on the above problem statement, the following research questions arise:

- How do employees experience the interaction between their work and personal life in the South African context?
- Can a comprehensive work-nonwork interference instrument be developed that measures the interaction between work and several nonwork roles (e.g. parent, spouse, religion/spirituality, domestic)?
- How do the newly developed items and scales perform?
- Can the internal validity (i.e. construct validity and dimensionality, discriminant and convergent validity, reliability) of the new instrument be evaluated?
- Can the external validity (i.e. relationship with theoretically relevant external variables) of the new instrument be evaluated?
- Which recommendations can be made to organisations and future research?

This research will make the following contributions to the subject of Industrial Psychology and the practice thereof in organisations:

- Important information will exist regarding the unique experiences, antecedents and consequences of the interaction between work and personal life for four specific occupational groups in South Africa (police services, secondary educators, academic personnel, mine workers) – i.e. the experiences of individuals’ work environment and the nonwork roles in their personal lives and how these compare with international theories and models.
• It will result in a more comprehensive work-nonwork interference instrument with newly developed items which accurately capture the different dimensions of interference, and which address measurement and theoretical limitations of previous work-family instruments.

• It will result in a psychometrically sound measuring instrument which has been proven to be reliable and valid for the South African context, with proven evidence of internal and external validity.

• It will result in a useful measuring tool that could be used by organisations to measure work-nonwork interference of employees in order to identify specific work-nonwork interference problems or issues and to recommend specific interventions.

• It will result in a measuring tool which individuals could use to identify specific areas of work-nonwork interference and to make adjustments in their personal lives accordingly.

1.2 RESEARCH OBJECTIVES

The research objectives are divided into a general objective and specific objectives.

1.2.1 General objectives

The general objectives of the research are 1) to gain insight into the interaction between work and personal life in the South African context and how South African employees experience this interaction; 2) to develop a new work-nonwork interference instrument that is suitable for the South African context and that addresses measurement and theoretical issues relating to previous work-family instruments; and 3) to test the psychometric properties of the newly developed work-nonwork interference instrument.

1.2.2 Specific objectives

The specific research objectives are as follows:

• To investigate the interaction between work and personal life and the experiences thereof in the South African context.
• To develop a more comprehensive work-nonwork interference instrument that measures the interaction between work and several nonwork roles (e.g. parent, spouse, religion/spirituality, domestic).
• To evaluate the performance of the newly developed items.
• To determine the internal validity (i.e. construct validity and dimensionality, discriminant and convergent validity, reliability) of the new instrument.
• To determine the external validity (i.e. relationship with theoretically relevant external variables) of the new instrument.
• To make recommendations to organisations and future research.

1.3 RESEARCH DESIGN

The research design for each of the three research articles which are submitted for the purposes of this thesis consists of a brief literature review and an empirical study. Because separate chapters were not targeted for literature reviews, the paragraphs relating to the research designs focus on aspects relevant to the empirical studies that were conducted in each article. A thorough literature study was conducted for the purposes of each research article.

1.3.1. Empirical study

The empirical study in this thesis consisted of three phases which each included separate empirical studies (presented in the three separate research articles). During the first phase, exploratory interviews were conducted in order to gather information regarding the interaction that individuals experience between their work and their personal lives. Thereafter, a new instrument that measures work-nonwork interference was developed and tested with a pilot study and evaluation study in order to overcome some of the measurement limitations relating to previous work-family instruments. This instrument was then used during the final phase of the study where the psychometric properties of the newly developed work-nonwork interference instrument were tested during a validation study (i.e. construct validity, discriminant validity, convergent validity and external validity).
Phase 1: Exploratory interviews

1.3.1.1 Research approach

During this phase, a qualitative research design with an exploratory approach was used to explore and describe the interaction between participants’ work and all facets of their personal lives. With qualitative studies, researchers attempt to understand the world from the participants’ point of view and unfold the meaning of people’s experiences to their lived world prior to any scientific explanations (Kvale, 1996). A qualitative approach is especially beneficial to this phase since participants are allowed to describe what is meaningful or important to them in their own words rather than being restricted to predetermined categories regarding work-personal life interaction.

1.3.1.2. Sampling

A non-probability purposive voluntary sample was taken from 92 South African employees from four different occupational groups (i.e. police officers, secondary educators, mineworkers and university academic staff) within the North West and Free State Provinces. With this sampling technique, participants can randomly decide if they want to participate in the study. Although employees were chosen in a non-random manner, inclusion criteria were implemented to ensure a more representative sample of different cultural or language groups. The sample size in each occupational group was directed by the number of participants willing and accessible to participate, and interviews were continued until data saturation was reached after 92 interviews (Burns & Grove, 1997).

1.3.1.3. Research setting

Prior to data collection, it is important to establish the research setting, which included determining the research field and gaining permission to enter the field of research. According to De Vos, Strydom, Fouche and Delport (2005), the specific field in which the inquiry is to be undertaken, is directly linked to the choice of problem. The research field was determined by
identifying high-risk groups regarding stress experienced in their work environments. This identification was done based on previous literature in South Africa, where the following industries were identified: South African Police Services (SAPS), the educational sector (i.e. secondary and tertiary institutions) and the mining industry (Jorgenson & Rothmann, 2008; Mostert, Rothmann, Mostert & Nell, 2008; Mostert & Oldfield, 2008; Oosthuizen & Berndt, 2008; Pienaar & Rothmann, 2006). Therefore, prior to the interviews, written consent was obtained from management bodies in the various organisations (i.e. police stations, schools, universities and mines) to conduct the research within these four occupational groups.

1.3.1.4. Data collection methods

Data collection was done by means of semi-structured interviews with participants from the various occupational groups. Prior to the interviews, an interview schedule was developed and evaluated where only one broad open-ended question was included in the interview schedule ("You have a work and a personal life. Can you describe how you experience the interaction between your work and all facets of your personal life?"). In conjunction with the open-ended question, the researcher used communication techniques (such as minimum verbal response, paraphrasing, reflection, clarifying and summarising) to encourage elaboration (Okun, 1992). Depending on the language preference of the respective participants, interviews were conducted in Afrikaans, English or Setswana. In addition to verbal information obtained during the interviews, researchers also took observation notes of participants' behaviours throughout the interviews. These observation notes included the manner in which the participants acted or reacted when answering the questions as well as their behaviour during the interview (e.g. being distant when asked questions, and long pauses).

1.3.1.5. Recording of data

With the permission of participants, interviews were audio-taped and transcribed verbatim for further analysis. In order to ensure confidentiality, the corresponding transcriptions and tapes were labelled using specific coding according to occupation and language groups where participants were allocated a specific number within their occupational group (e.g. PA1-Police-
Afrikaans-participant 1; TA1-Teachers-Afrikaans-participant 1; MA1-Mine-Afrikaans-participant 1; EA1-Educators-Afrikaans 1; in the case of English language codes were PE1, TE1, ME1, EE1 respectively). Only the researchers involved in the study had access to these coding schemes, which ensured privacy for the participants. Throughout the process, attention was given to the rights of the participants (right to privacy, right to anonymity, right to fair treatment, and right to protection from discomfort and harm) (Burns & Grove, 1997).

1.3.1.6. Data analyses

The verbatim transcripts were analysed by means of content analysis. While analysing the data, close adherence was given to methods described by a number of previous authors (Appleton, 1995; Bumard, 1991; Hsieh & Shannon, 2005; Weber, 1990). To obtain an overall picture of the context, interviews were read thoroughly several times, after which the actual text was condensed into meaningful units (sentences or paragraphs) that emerge from the responses of the participants regarding their experiences. Subsequently, all these meaningful units were sorted or categorised into major themes. From these broad themes, similar smaller themes and words were explored and summarised, resulting in various sub-themes. In this study, two researchers were independently involved in the data analysis, and one of the researchers acted as co-coder. The steps described by Weber (1990) were discussed beforehand between the researcher and co-coder as part of the data analysis and coder agreement and included defining the recorded units, defining the coding categories, testing the coding on a sample of text, assessing the accuracy of the sample coding, revising the coding rules, and the coding of all the text. During an open and critical evaluation, all themes and the analysis process were discussed between both researchers until consensus was reached. Finally, the themes were refined and a consensus discussion clarified the main themes and sub-themes.

1.3.1.7. Strategies employed to ensure quality data

Trustworthiness of the findings was also ensured by attending to the principles of credibility (checking the truth value of the findings), transferability (ensuring applicability of the findings), dependability (ensuring consistency of the findings) and conformability (which was
accomplished by using the criterion of neutrality or freedom from bias) (Appleton, 1995; Guba, 1981; De Vos et al., 2005). During this study, these principles were adhered to by means of peer examination and independent coding, the dense description of the data, keeping of the raw material and applying the same procedure throughout, triangulation, peer examination and the code-recode procedure.

**Phase 2: Scale development**

During this phase, a new work-nonwork interference instrument was developed. In order to develop the new instrument, a four-step procedure was followed, i.e. initial construct conceptualisation, item generation and evaluation, item development, and item refinement (more detail description in Chapter 3). This procedure closely adhered to procedures described in psychometric and scale development literature (Boyar, Carr, Mosley & Carson, 2007; Carlson, Kacmar, Wayne & Grzywacz, 2006; DeVellis, 2003; Geurts et al., 2005; Kirchmeyer, 1992; Netemeyer et al., 1996). A pilot study and an evaluation study were conducted as part of the scale development. The main objective of the pilot study was to purify the measure by eliminating undesirable items. The main objective of the item evaluation study was to establish how the remaining items of the new scale were performing, which items could be eliminated and which items were most desirable to retain for further validation. According to DeVellis (2003), it is always advisable to administer the items to a developmental sample and undertake a pilot study so as to investigate the performance of the items before developing the final scale items.

**1.3.1.8. Research approach**

In both studies a cross-sectional survey design was used to collect the data. Cross-sectional designs are used to observe a group of people at a particular point in time – for a short period, such as a day or a few weeks (Du Plooy, 2002).
1.3.1.9. Research participants and procedure

During the pilot study the newly developed 89-item, multidimensional work-nonwork interference instrument was administered to employees working at a South African mine \((n = 245)\), and a response rate of 49\% was obtained. Although work-nonwork interference is an important research topic in various occupational and demographic groups, it is particular evident in the mining environment, which is widely acknowledged to be a very stressful and demanding occupation (Singer, 2002). Due to their important contribution to the economy of South Africa, many companies in the mining industry need to maintain a competitive advantage in complying with the demands of change, and are consequently imposing various forms of stressors on their employees – where work-nonwork interference seems to be the result one of these stressors (Mostert & Oldfield, 2009; Oldfield & Mostert, 2007).

During the evaluation study the 48-item instrument (items that were retained during the pilot study) was specifically administered to a different sample than in the pilot study in order to test the items in a context other than the mining industry. The study sample in the evaluation study included employees working at a tertiary institution in the North West Province \((n = 366)\). Due to the conceptual restrictions in the work-nonwork interference scale (i.e. specific nonwork role interference of specific roles such as spouse and parent roles), only married individuals with children were included in the sample. The instrument administered among the tertiary educators during this study was the newly developed work-nonwork interference instrument and the data gathered was also used for further analysis in the validation study which investigated the psychometric properties of the instrument. Thus, the same instrument (i.e. the newly developed work-nonwork interference instrument) was employed in both studies among the tertiary educators.

1.3.1.10. Statistical analysis

The statistical analysis for the pilot study includes the refinement of items and the elimination of items. In order to establish which items were the most desirable to retain for further analyses, a process of item elimination was followed. For this process, certain guidelines were used from
previous studies (Curbow, Spratt, Ungaretti, McDonell & Breckler, 2006; Devellis, 2003; Foxcroft & Roodt, 2005) to determine poor-performing items, including the investigation of descriptive statistics (mean, standard deviation, variance and distribution), inter-item correlations, item-total correlations and the qualitative investigation of items highly redundant in terms of wording.

To eliminate poor items, the following cut-off criteria were used: (1) items with a mean closer to the centre of the range of possible scores were more desirable; (2) items with low standard deviations (<1,00) were less desirable; and (3) items with high variance were more desirable. With regard to the inter-item correlations, more desirable items are items that have a moderate to strong correlation with all the other items, and inter-item correlations should be substantial with a minimum significant level of 0,05. The items that did not correlate well with other items were therefore discarded. Regarding item-total correlations, items with higher item-total correlations were more desirable than items with low values. Positive item-total correlations indicate that the items measure the same thing that is being measured by the test. An item-total correlation near zero indicates that the item does not discriminate between high and low scores. After the above-mentioned criteria were taken into consideration, all the items were evaluated in a more qualitative manner, where attention is paid to item wording. This qualitative elimination technique forms a crucial part in the elimination process of items in the pilot study, where various items are discarded and changed.

After the item elimination process was completed, only 48 items were retained (24 W-NWI-items and 24 NW-WI-items). Based on recommendations from scale development literature, the same number of items for all the dimensions were retained (Carlson et al., 2006). As a result, the instrument used in phase 3 included only six items for each dimension.

The statistical analyses used during the evaluation study included Rasch analyses. The Rasch analyses were carried out using the WINSTEPS program (Linacre, 2005). During the Rasch analyses consideration was given to issues relating to reliability, item measures and item fit. The Rasch model provides two reliability estimates, i.e. the person reliability and the item reliability. The person reliability index measures the degree to which the scale can differentiate persons on
the measured variables (by subtracting the average person measurement variance from the observed person variance) (Cervellione et al., 2009; Fox & Jones, 1998), whereas the item reliability index measures the degree to which the relative difficulties of items are differentiated along the measured variables (by dividing true item variances by observed item variances) (Cervellione et al., 2009; Fox & Jones, 1998). In other words: the extent to which the items in each dimension are able to discriminate between persons and items, and the ability to measure the same latent trait. With these reliability calculations, an adjustment for measurement errors is made by not using raw scores, and is a very important advantage for using the Rasch reliability in assessing the functioning of an instrument (Boone & Rogan, 2005). In both these cases of reliabilities, values range from 0 to 1, where a value greater than or equal to 0.80 is considered acceptable (Fox & Jones, 1998). Similarly, a separation index is measured which estimates the spread of a person, or items, on the measured variables. In order to indicate adequate separation for persons, items or both, the separation index should be at least 2.00 (Fox & Jones, 1998).

In addition to reliability, Rasch analyses also allow for closer investigation of items (i.e. item measures and item fit). With item measures, the intensity with which the items measure the latent trait is investigated, whereas item fit relates to how probable a person’s response is. According to Boone and Rogan (2005), one of the most important aspects to consider when developing or analysing an instrument is to identify problematic items. Fit statistics are usually used to identify persons or items that behave idiosyncratically, i.e. items which are answered in inconsistent and erratic ways for whatever reason. In the Rasch model, two chi-square-based fit statistics are used to report the item fit, namely infit and outfit. According to Linacre (2005), outfit statistics are more sensitive to responses where the item difficulty and person ability differs drastically and are more likely to indicate lucky guesses and careless mistakes, while infit statistics report smaller differences in the comprehension of the items. Infit statistics are usually used to identify problems with the measurement items. According to Bond and Fox (2007), reasonable item mean square ranges for infit and outfit for Likert surveys data are between 0.60 and 1.40.
1.3.1.11 Research procedure

During the pilot study a protocol was given to the HR Manager explaining the research in order to get permission for participation from the specific operation. Participants included employees of different Patterson grade levels (C1-D4), mostly middle management. The questionnaires were distributed and included a letter, explaining the goal and importance of the study, as well as a list of contact persons for any enquiries. Participants were assured of the anonymity and confidentiality with which the information would be handled. Participants were given three weeks to complete the questionnaires in their own time.

For the evaluation study permission was granted by the university’s Ethics Committee, where after lists of all married employees with children were obtained from the various faculties and departments at the university. With the help of field workers, questionnaires were distributed among the selected employees and participants were given various options for returning the questionnaires to the researchers (e.g. internal post, personal collection, personal delivering). Participants were given two to three weeks to complete the questionnaires. In the questionnaires, a letter was also included that explained the goal and importance of the study, and assurances were given to participants regarding the anonymity and confidentiality with which the information would be handled.

Phase 3: Investigation of psychometric properties

During phase 3, the psychometric properties of the newly developed work-nonwork interference instrument were investigated.

1.3.1.12. Research approach

In order to obtain the specific research objectives, a cross-sectional survey design was used. With a cross-sectional survey design researchers are able to assess interrelationships among variables within a population (Struwig & Stead, 2001). Cross-sectional designs entail the collection of data on more than one case at a single point of time, which is then examined to detect patterns of association (Bryman & Bell, 2003).
1.3.1.13. Research participants

During this phase, the instrument was specifically administered to a different sample than in the pilot study in order to test the items in a context other than the mining industry. Currently, tertiary education institutions in South Africa face many challenges: transformation with regard to different languages and cultures, continuous upgrading to ensure a high standard of education with the ever-increasing student numbers, and the retention of employees in the midst of the current recession (Wolhuter, Van der Walt, Higgs & Higgs, 2007). These challenges point to the pressures on these institutions and, alternatively, to the increasing pressures that employees have to deal with which could result in work-nonwork interference. Accordingly, a sample was taken from a tertiary institution. The study sample in this study was married employees with children, working at a tertiary institution in the North West Province \((n = 366)\). Due to the conceptual restrictions in the work-nonwork interference scale (i.e. specific nonwork role interference of specific roles such as spouse and parent roles), only married individuals with children were included in the sample.

1.3.1.14. Measuring instruments

The following measures were utilised in this study:

**Job demands:** *Work pressure* is measured with a three-item scale developed by Bakker, Demerouti and Schaufeli (2003). The items refer to demanding quantitative aspects of the job. An example is: “You have to work extra hard in order to meet your deadlines”. Emotional demands are measured with the five-item scale by Bakker et al. (2003). An example is: “People at work upset you emotionally with their words?”. Cognitive demands are measured by the four-item scale developed by Peeters, Montgomery, Bakker and Schaufeli (2005). An example is: “Your work requires you to concentrate continuously”. All these job demands items are rated on a 4-point Likert scale ranging from 0 (*never*) to 3 (*always*). Reliable Cronbach alpha coefficients were found in these studies (Bakker et al., 2003; Peeters et al., 2005).
Job resources: Autonomy is measured with the scale developed by Bakker, Demerouti, and Verbreke (2004) (three items, e.g. “You have freedom in carrying out your work-related duties?”). Support is measured with the scale developed by Bakker et al. (2004) (three items, e.g. “You ask your colleagues for help if necessary.”). Job development possibilities are assessed by three items that were conceptually mirrored from existing scales of home developmental possibilities developed by Demerouti, Bakker and Voydanoff (2010). An example item: “Can you develop yourself sufficiently in your work?” All these job resources items are rated on a 4-point Likert scale ranging from 0 (never) to 3 (always). Reliable Cronbach alpha coefficients were found that ranged between 0.68 and 0.74 for autonomy, and between 0.81 and 0.85 for social support (Bakker et al., 2004; Bakker, Demerouti & Euwema, 2005).

Home demands: Home pressure is measured with a three-item scale developed by Bakker, Demerouti, Taris, Schaufeli and Schreurs (2003). The items refer to demanding quantitative aspects of the home. An example is: “You have many duties at home (e.g. housekeeping, care giving”. Home emotional demands are measured with a three-item scale developed by Peeters et al. (2005). The scale assesses whether participants have to deal with emotionally charged situations at home, and whether they are confronted with events that touch them personally. A sample item is: “Emotions build up at home”. All these home demands items are rated on a 4-point Likert scale ranging from 0 (never) to 3 (always). Acceptable alpha coefficients were found in previous studies (Bakker et al., 2003; Peeters et al., 2005).

Home resources: The home resources were developed by Demerouti et al. (2010) and conceptually mirror existing scales of job resources, since several scholars have successfully used a job-related measure as a model for constructing a symmetrical home-related measure (Frone & Rice, 1987; Frone et al., 1992; Parasuraman, Purohit, Godshalk & Beutell, 1996). Home autonomy is assessed with four items, including “You have control over how you use your free time”. Home support is measured with four items, including “If necessary, your partner or family members will help you with a particular task”. Home developmental possibilities are assessed by three items, including “You can develop your talents during your free time”. All these home resources items are rated on a 4-point Likert scale ranging from 0 (never) to 3 (always). Acceptable alpha coefficients were found by Demerouti et al. (2010).
**Burnout:** Emotional exhaustion is measured using eight items (e.g. “I feel emotionally drained by my work”) and depersonalisation is measured by five items (e.g. “I do not really care what happens to some recipients”) from the MBI-HSS (Maslach & Jackson, 1986). The items are rated on a 7-point scale ranging from 0 (never) to 6 (every day). Cognitive weariness is measured using the five items of Van Horn, Taris, Schaufeli and Schreurs (2004) (e.g. “I have trouble concentrating”). The items are rated on a 7-point scale ranging from 0 (a few times a year) to 6 (every day). Van Horn et al. (2004) found the scale to be reliable with an alpha coefficient of 0.92.

**Ill-Health:** Items are adapted from the General Health Questionnaire (GHQ, Goldberg & Williams, 1988) to measure physical ill-health (four items, e.g. “Have you recently been getting any headaches?”), anxiety (five items, e.g. “Have you recently been getting edgy and bad-tempered?”) and depression (four items, e.g. “Have you recently felt that life is entirely hopeless?”). Items are rated on a 4-point scale ranging from 0 (not at all) to 3 (much more than usual). Reliable alpha coefficients were found that ranged between 0.83 and 0.81 for physical ill-health, between 0.84 and 0.89 for anxiety, and between 0.79 and 0.89 for depression (Mostert, 2009; Oldfield & Mostert, 2007).

**Life satisfaction:** Items are used from the Satisfaction With Life Scale (SWLS, Diener, Emmons, Larson & Griffin, 1985), to measure life satisfaction (5 items, e.g. “I am satisfied with my life.”; “The conditions of my life are excellent”.). Items are rated on a 7-point scale, ranging from 1 (strongly disagree) to 7 (strongly agree). Diener et al. (1985) found the scale to be reliable and valid with an alpha coefficient of 0.87 and test-retest reliability of 0.82.

### 1.3.1.15. Research procedure

After permission was granted by the university’s Ethics Committee, lists of all married employees with children were obtained from the various faculties and departments at the university. With the help of field workers, questionnaires were distributed among the selected employees and participants were given various options for returning the questionnaires to the
researchers (e.g. internal post, personal collection, personal delivering). Participants were given two to three weeks to complete the questionnaires. In the questionnaires, a letter was also included that explained the goal and importance of the study, and assurances were given to participants regarding the anonymity and confidentiality with which the information would be handled.

1.3.1.16. Statistical analysis

In order to examine the construct validity of the newly developed instrument, confirmatory factor analyses (CFA) were used with the AMOS structural modelling software (Arbuckle, 2007). Although exploratory factor analysis (EFA) is usually used for analysing newly developed instruments, using a confirmatory approach is known to be a very meaningful approach since researchers are required to specify the number of factors according to the literature and substantive theoretical knowledge. This leads to the testing of the adequacy of fit of a theoretical factor model (Bollen, 1989).

The goodness-of-fit of the models was evaluated using the following absolute goodness-of-fit indices (Jöreskog & Sörbom, 1993): the likelihood ratio chi-square ($\chi^2$), the ratio of the chi-square to the degrees of freedom ($\chi^2/df$) and the root square of approximation (RMSEA). Since $\chi^2$ is sensitive to sample size – i.e. the probability of rejecting a hypothesised model increases with sample size – the use of relative goodness-of-fit measures is strongly recommended (Bentler, 1990). Therefore, the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI) and the Incremental Fit Index (IFI) are used. Values smaller than 0.08 for RMSEA are indicative of an acceptable fit, while values greater than 0.10 should lead to model rejection (Cudeck & Brown, 1993). For CFI, TLI and IFI, as a rule of thumb, a value greater than 0.90 is considered as indicating a good fit (Hoyle, 1995) and $\chi^2/df < 5.00$ (Bentler & Bonett, 1980).

Due to the complexity, extensiveness and conceptual directional distinction of interference, two theoretical models were tested: a four-factor model for work→nonwork interference (consisting of work-parent interference, work-spouse interference, work-religion/spirituality interference, work-domestic interference) and a four-factor model for nonwork→work interference
(consisting of parent-work interference, spouse-work interference, religion/spirituality-work interference, domestic-work interference). The items identified by Koekemoer et al. (in press) were used as indicators of the latent factors. Using alternative models (Lehmann, 2001), the two hypothesised four-factor models were compared with several competing models. Similar models were tested separately for the two directions of interference (i.e. five alternative models for work→nonwork interference and five alternative models for nonwork→work interference). These competing models were similar to models used in previous scales (Carlson & Frone, 2003; Carlson & Kacmar, 2000; Carlson et al., 2000; Curbow et al., 2003; Geurts et al., 2005; Netemeyer et al., 1996) and models based on theoretical knowledge. In order to illustrate the directionality of the work-nonwork interference instrument an additional second-order factor model was tested with CFA.

CFA analyses were also used in order to prove the discriminant validity of the various dimensions. Following the example of previous researchers (Anderson & Gerbing, 1988; Bagozzi & Philips, 1982; Mallard & Lance, 1998), discriminant validity was tested by making use of the chi-square (χ²) difference test. By calculating the difference between one model, which allowed the correlation between the constructs (with multiple indicators) to be constrained to unity (i.e. perfectly correlated), and another model, which allowed the correlations to be free (unconstrained model or target model), discriminant validity can be tested. If the two models do not differ significantly on a chi-square difference test, the researcher cannot conclude that the constructs differ.

Convergent validity was assessed by investigating the correlation coefficients between the various dimensions of the work-nonwork interference scale and the SWING instrument (Geurts et al., 2005) using the SPSS program (SPSS Inc., 2009). The SWING was selected because it is a widely used, well-researched and psychometrically sound instrument that measures the interference in both directions (work→home and home→work). Although Polit and Beck (2006) recommend that correlations greater than 0,70 may be regarded as evidence for strong correlations (or similarities) between the measures in social research, other researchers indicate that correlation coefficients should only meet or exceed 0,35 in order to be cited as evidence for convergent validity (Hammill, Brown & Bryant, 1989). In order to assess the reliability of the
newly developed scales, Cronbach alpha coefficients were used. Descriptive statistics (means, standard deviations) were used to describe the data. To determine the relationship between the scales and various external variables, product-moment correlations were used.

1.4 ETHICAL CONSIDERATIONS

For the entire research project, ethical considerations were taken into account during the planning and execution of the empirical studies. Because separate chapters were not targeted for literature reviews and ethical considerations, the following paragraphs relating to ethical considerations focus on four ethical aspects relevant to the empirical studies that were conducted in the three research articles. Ethical considerations were strictly adhered to in every empirical study, although not discussed in detail in each article.

1.4.1. Potential benefits and hazards

Participants are not exposed to any potential physical, psychological or disclosure dangers. Prior to the study, permission was obtained from the Ethics Committee of the North-West University to undergo the study. Permission was also granted to collect data at the North-West University. Participants were only requested to be interviewed or to participate in a survey which included questions pertaining to their work environment, their general well-being and some aspects in their personal lives. Participants could benefit from these research results, as they would be more informed regarding the interaction between their work and personal life. All personal information gained from participants was kept private and confidential; participants did not reveal their identities at any point in time. Questionnaires were completed anonymously. The identities of the participants that were interviewed were known only to the researchers involved in the study; however, the information was still kept confidential.
1.4.2. Recruitment and sampling procedures

Although the sample used in the empirical studies in phase two and three was purposive (since only married individuals with children were approached to participate in the study), participation was still voluntary. Individuals were personally approach by trained field workers, and were informed about the research process and goal of the research, after which individuals could decide whether they wanted to participate or not. Prior to approaching the individuals, written permission was obtained from the management bodies of the various organisations and institutions to conduct the research.

1.4.3. Informed consent

During the data collection process, field workers orally communicated to the potential participants what the goal and process of the research project were. Also included in the questionnaire booklets was a section that explained the research and the process thereof. Participants were informed that their participation in the research was voluntary. Participants were also informed that if they participated in the research and completed a questionnaire, they were giving consent to the researcher to use the data for research purposes only. No personal information was made available to any other organisations or persons.

1.4.4. Data protection

All data collected was kept confidential by the researchers. Only the researchers involved in the study were allowed to analyse or capture the data. The completed questionnaires and transcribed interviews and tapes were protected at all times and kept in a safe, secure location (locked cupboards in the office of the main researcher), even after data capturing and analyses. No personal information was released which could lead to the identification of participants. Booklets were completed anonymously and only included numbers for record-keeping purposes.
1.5. RESEARCH PARADIGMS

Three paradigms are relevant to this research. Firstly, the literature review is done within the humanistic paradigm and secondly the empirical studies are done within the phenomenological and positivistic paradigms.

1.5.1. Literature review

The humanistic paradigm is a school of thought that highlighted that people are free agents who have the ability to make choices, be intentional and aware during their actions. According to this paradigm, people can be influenced by their relationships with others and that they are more than the just the sum of their parts. This is considered an essential criterion for psychological health (De Carvalho, 1991).

1.5.2. Empirical studies

1.5.2.1 Exploratory/qualitative study

During the qualitative study a phenomenological approach is used. In this approach, the researcher is interested in the meaning a person attributes to his or her experiences of reality, his or her world and his or her relationships. The person’s cognitive experience must be understood and defined because it is only through this that the true essence of the person’s experience can be realised. Thus, allowing the researcher to study the selected phenomenon in depth and in detail. Such in depth and detailed analysis of phenomenon is especially important when the goal of research is of an exploratory nature and to investigate experiences and perceptions of employees (Neuman, 2003).

1.5.2.2. Scale development and validation study

The positivistic paradigm is based on the assumption that only observable and measurable data should be considered in research (Winberg, 1997). Traditional social science, with random samples, operationally defined variables, and statistical analysis, is positivistic. This paradigm is based on the assumption that we can scientifically discover the rules governing social life. It is a theoretical and general scientific position that emphasises parsimony and operationalism in data
and language and disdains theorising and inference. Therefore positivist attempts to use only data 
provided by direct observation to research “positive” facts (Lundin, 1996).

1.6 OVERVIEW OF CHAPTERS

Chapter 2 deals with experiences regarding the interaction between work and personal life for 
South African employees. In Chapter 3, a new instrument is developed to measure this 
interaction – i.e. work-nonwork interference. Chapter 4 focuses on the psychometric properties 
of the newly developed work-nonwork interference instrument where internal and external 
validity of the instrument are measured and discussed. Conclusions, recommendations and 
limitations of the study follow in Chapter 5.

1.7 CHAPTER SUMMARY

This chapter discussed the problem statement, the contribution and value-add of this research and 
research objectives. The research designs used in the empirical studies were explained, followed 
by a brief overview of the chapters that follow.
REFERENCES


Arbuckle, J. L. (2007). Amos 17.0.0. Amos Development Company


RESEARCH ARTICLE:

AN EXPLORATORY STUDY OF THE INTERACTION BETWEEN WORK AND PERSONAL LIFE: EXPERIENCES OF SOUTH AFRICAN EMPLOYEES

F.E. KOEKEMOER
K.MOSTERT

A revised version of this article was submitted and successfully accepted to be published in the South African Journal of Industrial Psychology in 2010. The following table indicates the contributions made by each author:

<table>
<thead>
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<th>Author</th>
<th>% contribution</th>
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<td>K. Mostert</td>
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AN EXPLORATORY STUDY OF THE INTERACTION BETWEEN WORK AND PERSONAL LIFE: EXPERIENCES OF SOUTH AFRICAN EMPLOYEES

ABSTRACT

The interaction between work and personal life is an important field of research in the 21st century and of pressing concern for various individuals and organisations internationally and in South Africa. The objective of this study was to investigate the interaction between work and personal life and the experiences thereof in the South African context. South African employees are faced with various circumstances which could influence the interaction between their work and personal life and which could constitute different/unique experiences regarding their work and personal life. A non-probability purposive voluntary sample was used. Data collection was done by means of semi-structured in-depth interviews with 92 participants. Content analysis was used to analyse and interpret the research data. Four main themes (i.e. the experience of work, experiences and domains in the personal life, interaction between work and personal life, consequences associated with the interaction) were extracted from the data. Participants indicated stressful and supportive aspects in their work as well as additional personal dimensions in their personal life (such as religion, extended family). Interaction between work and various personal dimensions were indicated, as well as consequences associated with different types of interaction. Individuals experienced interaction between their work and various other personal dimensions, where the forms of interaction were associated with certain consequences (i.e. spillover of emotions, energy depletion). Compared to international findings, unique findings were obtained relating to individuals' personal life and the consequences associated with the interaction.

Keywords: experiences in workplace, experiences in personal life; work-personal life interaction, consequences of interaction, exploratory
INTRODUCTION

One domain in the private life that has mainly received research attention is the family domain (for overviews, see Byron, 2005; Eby, Casper, Lockwood, Bordeaux & Brinley, 2005; Mesmer-Magnus & Viswesvaran, 2005), where the majority of previous researchers recognised and used family life synonymously with personal life. However, one's personal life also consists of other roles or domains apart from family life (e.g. religion, social, leisure) (Barnett & Baruch, 1985; Holahan & Gilbert, 1979; Lingard & Francis, 2005; Pietromonaco, Manis & Frohardt-Lane, 1986; Plaisier et al., 2008; Small & Riley, 1990) that are important to individuals (also referred to as the saliency of roles). Since individuals are involved in multiple roles in their personal life, some researchers have suggested that conflict could arise between the work domain and these other specific roles or domains in their personal lives (Holohan & Gilbert, 1979; Kirchmeyer, 1992). This conflict arising between the work domain and other nonwork roles in individuals’ lives might be due to the stressors, demands or lack of resources that they are experiencing, and might also contribute to different consequences or outcomes, depending on the various roles and the saliency thereof (Aryee, 1992; Holahan & Gilbert, 1979; Keene & Reynolds, 2005; Luchetta, 1995; Nasurin & Hsia, 2008; Plaisier et al., 2008; Voydanoff, 2005). Therefore, the need exists to explore the interaction between work and various other domains in an individual’s personal life.

The interest in the interaction between work and family can largely be contributed to the dramatic changes that occurred in family structures, the nature of jobs, and organisations (Bailyn & Harrington, 2004; Lewis & Cooper, 1999; Lewis & Cooper, 2005; Parasuraman & Greenhaus, 2002). The growing representation of dual-earner families, single-parent families and families with elder-care responsibilities, the influx of women into non-traditional occupations and jobs, and the increased involvement of men in the family domain are just some of the changes that have influenced family structures (Greenhaus & Parasuraman, 1999; Stevens, Minnotte, Mannon & Kiger, 2007). Technological and telecommunications advancements (e.g. portable computers and mobile phones) have made it possible for employees to work longer hours and to perform their job tasks at a variety of locations (Polach, 2003). Also, the constant need for upgrading household standards has driven people to work more in order to keep up with their own economic demands (Polach, 2003). As a result, the boundaries between work and family have become blurred, making a balance between work and private life a pressing concern for women, men, families and organisations.
Work is a domain that is salient in many individuals' lives – not only do people work for the fulfillment of their economic needs and desires, but also to provide them with a sense of identity and opportunities to engage in meaningful relationships with others (Lewis, Rapoport & Gambles, 2003; Thompson & Bunderson, 2001). Many people view work as the centre of their lives, the means to structure their lives, their contact with social reality and the achievement of status and self-esteem (Haworth & Lewis, 2005). However, the labour market is becoming increasingly competitive and the pressure is high on employees to perform. As a result, paid work is becoming highly intrusive into other aspects of employees' personal lives (Lewis et al., 2003). Not surprisingly, a steady stream of research has been produced over the past 25 years with regard to the interaction between work and other domains in employees' lives (Allen, Herst, Bruck & Sutton, 2000; Bulger, Matthews & Hoffman, 2007; Frone, 2003; Geurts & Demerouti, 2003; Greenhaus & Beutell, 1985; Greenhaus, Collins & Shaw, 2003; Kirchmeyer, 1992; Lewis et al., 2003; Olson-Buchanan & Boswell, 2006).

Over the past years, various centres of interest have been highlighted in work and family overview studies (see Eby et al., 2005; Lewis & Cooper, 1999). These areas of interests include the changing nature of work, work role stress, work schedules and changing work patterns, career outcomes, gender roles within the work and family domains, work-family relationships in dual-earner couples, multiple social roles of employees, organisational strategies relating to work-family assistance, work-family linkages and relationships among life domains. Developments in the field of work and family research have mainly been studied within an integrative framework set by international researchers, where the majority of research focused on the measurement, the direction, antecedents and consequences relating to the interaction between work and family (Allen et al., 2000; Bellavia & Frone, 2005; Frone, 2003; Geurts & Demerouti, 2003).

Although some researchers have recognised that various domains of an individual's life interact with one another (Frone, 2003; Kirchmeyer, 1992), the greater part of international research has focused on the measurement of conflict that arises from simultaneous pressures experienced in both work and family domains (commonly known as work-family conflict (WFC), see Greenhaus & Beutell, 1985). Also, the directionality of dimensions influencing each other (i.e. work influencing the family domain and the family influencing the work domain) has substantially been addressed by various researchers (Carlson, Kaçmar & Williams, 2000; Curbow, McDonnell, Spratt, Griffin & Agnew, 2003; Geurts, Taris, Kompier, Dikkers, Van Hooff & Kinnunen, 2005; Grzywacz & Marks,
In the work-family literature, various researchers have classified previously researched antecedents into three main categories — i.e. demographic and personal characteristics (e.g. gender, age, family status, negative affectivity, personality), family or nonwork characteristics (e.g. social support, parental stressors, family role ambiguity, family stressors) and work or job-related characteristics (e.g. work stressors, work demands, hours spent at work, job stress, job support, flexibility at work) (Ballout, 2008; Bellavia & Frone, 2005; Byron, 2005; Geurts & Demerouti, 2003). In addition, various consequences have been studied that relate to the interaction between work and family, including physical, psychological, behavioural, attitudinal and organisational (Geurts & Demerouti, 2003). Other researchers classified the consequences differently as work-related consequences (e.g. job satisfaction, turnover intension), nonwork-related consequences (e.g. life satisfaction, marital satisfaction) and stress or general health-related consequences (e.g. burnout, somatic or physical symptoms) (Allen et al., 2000; Bellavia & Frone, 2005; Frone, Russel & Cooper, 1992b; Frone, 2003).

From the above, it is clear that there is a need to explore the interaction between work and personal life for employees within the South African context distanced or separate from the integrative framework provided by international researchers. The main objective of this study is thus to explore the interaction between work and all other life domains and to gain insight into the experience and views of work-personal life interaction in the South African context.

Even though a variety of work-family studies have been done in South Africa, the majority of these studies were cross-sectional quantitative studies. These studies, in accordance with previous international research trends and integrative frameworks, focused on the prevalence of work-family interaction (Rost & Mostert, 2007), demographic differences (Coetzer, 2006; De Klerk & Mostert, 2010; Mostert & Oldfield, 2008; Pieterse & Mostert, 2005), psychometric properties of WFC instruments (Marais, Mostert, Geurts & Taris, 2009; Pieterse & Mostert, 2005; Rost & Mostert, 2007), possible antecedents and well-being outcomes of WFC (Koekemoor & Mostert, 2006; Mostert. Cronjé & Pienaar, 2005; Mostert & Rathbone, 2007; Patel, Govender, Paruk & Ramgoon, 2006). With only a few additional studies exploring the occupancy of multiple social roles and role salience, along with limited qualitative studies (Donald & Linington, 2008; Mclellan & Uys, 2009), very little is known about the specific way in which employees in the South African context
experience the interaction between their work and personal life – i.e. as opposed to employees from other societies and social contexts.

Although research has progressed substantially over the past decades, studies on work-family interaction originated mostly from Western societies, notably the USA and Europe. Much work remains to be done in order to develop a comprehensive understanding of the complex relationships between work and family life within various other social contexts and societies, including South Africa. According to Cariku (2002), understanding the effects and interaction between work and personal life across cultures and societies has become increasingly important, especially since employees from different societies and cultures may experience their work environments and areas in their personal life very differently, which may contribute to different types of interaction.

In the section to follow, work and personal life will be explored by means of a qualitative approach. Results will be discussed where various themes regarding the interaction of work and personal life of South African employees will be presented and discussed.

RESEARCH DESIGN

Research approach

In this study, a qualitative research design with an exploratory approach was used to explore and describe the interaction between participants’ work and all facets of their personal lives. With qualitative studies, researchers attempt to understand the world from the participants’ point of view and unfold the meaning of people’s experiences to their lived world prior to any scientific explanations (Kvale, 1996). According to Salkind (2009), the purpose of qualitative research is to examine human behaviour and the social, cultural, and political contexts within which it occurs. Qualitative studies are based on meanings expressed through words and other symbols or metaphors, and the designs most often used include case study research, participant observation, unstructured in-depth interviews, focus groups and participatory research (Welman, Kruger & Mitchell, 2005). A qualitative approach is especially beneficial to this study since participants are allowed to describe what is meaningful or important to them in their own words rather than being restricted to predetermined categories regarding work-personal life interaction. This study is located in the post-positivism paradigm within the broad field of qualitative research (Guba & Lincoln, 1994). The methodology used in this paradigm aims to enquire information in more natural settings,
collecting more situational information, and determining the meanings and purposes that individuals ascribe to their actions.

Research method

Sampling
A non-probability purposive voluntary sample was taken of 92 South African employees from four different occupational groups (i.e. police officers, secondary educators, mineworkers and university academic staff) within the North West and Free State Provinces. A non-probability purposive sample was taken which indicates that participants could randomly decide if they want to participate in the study. They do however had to comply with the inclusion criteria since the study focused specific on work and personal life, thus the need for employed individuals (work role). Although employees were chosen in a non-random manner, inclusion criteria were implemented to ensure a more representative sample of different cultural or language groups. These inclusion criteria determined that a participant should (1) have been employed in one of the selected occupations; (2) have been working for at least two years in the specific occupation; (3) have been able to communicate in Afrikaans, English or Setswana; and (4) have given written consent to participate in the interviews. The white group consisted of Afrikaans-speaking participants, whereas the African group included Setswana-, isiXhosa- and Sesotho-speaking participants. The isiXhosa- and Sesotho-speaking participants preferred to be interviewed in Afrikaans. The sample size in each occupational group was directed by the number of participants willing and accessible to participate, and interviews continued until data saturation was reached after 92 interviews (Borns & Grove, 1997). The profiles of the gender, cultural and occupational characteristics of the employees are provided in Table 1.
Table 1

Demographic characteristics of the participants (n = 92)

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<th>Item</th>
<th>Category</th>
<th>Total</th>
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<th>(%)</th>
<th>Educators</th>
<th>Freq</th>
<th>(%)</th>
<th>Mine</th>
<th>Freq</th>
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N/A – Information not available

Table 1 indicates that the sample was representative of gender, ethnic and occupational groups. Some of the participants were African (15,21%), of whom 18,48% were working in the mining
industry, 15.21% in the police, 15.21% in the education industry and 10.87% in academia. Some of the participants were married (16.30%), of whom 19.5% were working in the mining industry and 16.3% in the police, education and academia respectively.

Research setting and establishing researcher roles

Prior to data collection, it was important to establish the research setting, which included determining the research field and gaining permission to enter the field of research. According to De Vos, Strydom, Fouche and Delport (2005), the specific field in which the inquiry is to be undertaken, is directly linked to the choice of problem. The research field was determined by identifying high-risks groups regarding stress experienced in their work environments. This identification was done based on previous literature in South Africa, where the following industries were identified: SAPS, the educational sector (i.e. secondary and tertiary institutions) and also the mining industry (Jorgenson & Rothmann, 2008; Mostert, Rothmann, Mostert & Nell, 2008; Mostert & Oldfield, 2008; Oosthuizen & Berndt, 2008; Pienaar & Rothmann, 2006). Therefore, prior to the interviews, written consent to conduct the research within these four occupational groups was obtained from management bodies in the various organisations (i.e. police stations, schools, mines and universities). The participating police stations and secondary schools were located within the North West Province, while the participating mine and university were located in the Free State Province.

According to De Vos et al. (2005), maintaining proper relationships with the participants is of great importance and will largely determine the accuracy and reliability of the information gathered. Since some participants may view researchers as intruders, it is advisable for researchers to begin relationships somewhat unobtrusively, rather than being too involved from the start. For this reason, within each of the participating organisations a person was identified to assist the researcher and to act as inter-mediator in the research process. The role of the inter-mediator was to identify employees willing to participate in the research and to provide the researcher with the necessary contact details and other biographical information (see Appendix A). With the assistance of the inter-mediator, participants were informed of the objectives and procedures of the study. They consented in writing, after which interviews were scheduled on dates that suited each of the participants. Other ethical issues were also communicated beforehand to the participants with the assistance of the inter-mediator and also during the interviews (i.e. deception, right to withdraw and confidentiality) (Willig, 2008).
Although the interviews took place where it best suited the participants, special attention was given to the climate/atmosphere of the room and to establishing a relaxed environment. In order to ensure privacy and no interruptions during the interview, a 'do not disturb' sign was put up outside the door. At the outset of the interviews, the participants were put at ease by the friendly and warm manner in which the researcher introduced herself, after which the researcher explained the context of the interview. Permission was obtained for the use of tape-recorders. Participants were informed that they could withdraw from the study at any time (see appendix A for example of informed consent form).

Data collection methods
Data collection was done by means of semi-structured interviews with participants from the various occupational groups. Prior to the interviews, an interview schedule was developed and evaluated where only one broad open-ended question was included in the interview schedule (“You have a work and a personal life. Can you describe how you experience the interaction between your work and all facets of your personal life?”). This question was asked once rapport had been established and the participants felt comfortable and open for conversation. In conjunction with the open-ended question, the researcher used communication techniques (such as minimum verbal response, paraphrasing, reflection, clarifying and summarising) to encourage elaboration (Okun, 1992). Depending on the language preference of the respective participants, interviews were conducted in Afrikaans, English or Setswana. In addition to verbal information that was obtained during the interviews, researchers also took observation notes of participants’ behaviours throughout the interviews (See Appendix A for example of observation notes). These observation notes included the manner in which the participants acted or reacted when answering the questions as well as their behaviour during the interview (e.g. being distant when asked questions and long pauses). According to De Vos et al. (2005), observation notes (also referred to as field notes) contain a comprehensive account of the participants, the events taking place, the actual discussions and communication. Comprehensive observation notes enable the researcher to maintain maximum control over the situation.

Recording of data
With the permission of participants, interviews were audio taped and transcribed verbatim for further analysis (see appendix A for an extraction of transcription). In order to ensure confidentiality the corresponding transcriptions and tapes were labelled using specific coding according to occupation and language groups where participants were allocated a specific number
within their occupational group (e.g. PA1- Police-Afrikaans-participant 1; TA1-Teachers-Afrikaans-participant 1; MA1-Mine-Afrikaans-participant 1; EA1-Educators-Afrikaans 1; in the case of English language codes were PE1,TE1, ME1, EE1 respectively. Only the researchers involved had access to these coding schemes which ensured privacy for the participants. This coding is also used in the referencing of quotes further in the article. Participants were informed that the tapes would be kept in a safe place as part of recordkeeping after completion of the research and that their identity would remain anonymous. Interviews conducted in Setswana were translated into English by an accredited translator. Interviews were conducted in suitable settings for the participants and continued until data saturation was reached within each occupational group. Throughout the process, attention was given to the rights of the participants (right to privacy, right to anonymity, right to fair treatment, and right to protection from discomfort and harm) (Burns & Grove, 1997).

Data analyses
For the purpose of this study, the verbatim transcripts were analysed by means of content analysis. According to White and Marsh (2006), content analysis is a research technique used to make replicable and valid inferences from text or meaningful matters. Content analysis in qualitative research focuses on and gives attention to content or contextual meaning of the text (Hsieh & Shannon, 2005) and was therefore applicable to this study. While analysing the data, close adherence were given to methods described by a number of previous authors (Appleton, 1995; Burnard, 1991; Hsieh & Shannon, 2005; Weber, 1990). To obtain an overall picture of the context, interviews were read thoroughly several times, after which the actual text was condensed into meaningful units (sentences or paragraphs) that emerged from the responses of the participants regarding their experiences. Subsequently, all these meaningful units were sorted or categorised into major themes. From these broad themes, similar smaller themes and words were explored and summarised, resulting in various sub-themes. Although observation notes were taken during interviews (and were examined as part of the data analysis process), no significant new additional meaning or value was obtained from the observation notes and no contrasting findings or evidence was suggested in the notes. According to De Vos et al. (2005), researchers will not necessarily utilise all observation notes in the final report, but it is better to have adequate information as researchers can use the observation notes to decide if additional value was added.

In order to overcome concerns regarding rater bias in the critical stages of content analysis, the suggested steps for creating, testing and implementing a coding scheme as developed by Weber
(1990) were closely adhered to. In this study, two researchers (the authors) were independently involved in the data analysis, and one of the researchers acted as co-coder (see Appendix A for work protocol for co-coder). The steps described by Weber (1990) were discussed beforehand between the researcher and co-coder as part of the data analysis and coder agreement and included defining the recorded units, defining the coding categories, testing the coding on a sample of text, assessing the accuracy of the sample coding, revising the coding rules, and the coding of all the text. During an open-and-critical evaluation, all themes and the analysis process were discussed between both authors until consensus was achieved. Finally, the themes were refined and a consensus discussion clarified the main themes and sub-themes. As part of the data analysis, a literature control was conducted in order to compare and contrast the findings of the research with similar studies, which is presented in the discussion.

**Strategies employed to ensure quality data**

In addition to observation notes, the trustworthiness of the findings was also ensured by attending to the principles of credibility (checking the truth value of the findings), transferability (ensuring applicability of the findings), dependability (ensuring consistency of the findings) and conformability (which was accomplished by using the criterion of neutrality or freedom from bias) (Appleton, 1995; Guba, 1981; De Vos et al., 2005). According to Appleton (1995), researchers could adhere to these principles by means of (1) going back to participants to discuss interpretations of the findings (truth value), (2) asking other expert researchers to read through some transcripts independently and to identify themes to confirm the agreement between researchers (applicability), (3) carrying out pre-pilot interviews to develop interviewing skills (consistency) and (4) clearly describing each stage of the research process and explaining what was done and why (neutrality). During this study, these principles were adhered to by means of peer examination and independent coding, the dense description of the data, keeping of the raw material and applying the same procedure throughout, triangulation, peer examination and the code-recode procedure.

**Reporting**

In the findings that follow, each of the main broader themes that emerged from the data will be described separately, indicating more specifically how respondents experienced each of the main themes. For illustrative purposes, selected quotes (interview excerpts) that contain the experiences of respondents and that are typical of other responses were used (referencing was also included based on the coding reported in recording of data). Some modifications were made to the interview excerpts below in order to make the excerpts easier to grasp. These modifications were made
without affecting meaning and only involved the omission of words in order to achieve a more compact statement as well as the omission of ‘nonsensical’ noises such as ‘hmm’ from quoted text (Lombaard & Mouton, 2005; Weiss, 1994).

FINDINGS

From the data analysis of the interviews, four main themes were identified – i.e. the experience of work, experiences and domains in the personal life, the interaction between work and domains in the personal life, and the consequences associated with the interaction. These themes are described in detail below.

Theme 1: The experience of work

The first and strongest theme that emerged from the responses was participants’ experiences in their work environment. From the responses, it was evident that participants experienced certain aspects of their work as stressful, while other aspects were seen as more supportive. Subsequently, these aspects were categorised as stressors at work and resources at work. Table 2 shows the different stressors and resources as described and experienced by the participants. For illustrative purposes, associated keywords are also shown as mentioned by the participants.
Table 2

*Experiences in the work environment*

<table>
<thead>
<tr>
<th>Sub-theme</th>
<th>Associated keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stressors at work</strong></td>
<td></td>
</tr>
<tr>
<td><em>Pressure, overload and workload</em></td>
<td>More responsibilities; Making difficult decisions; High workload; Time constraints; Heavy work demands.</td>
</tr>
<tr>
<td><em>Stressful working arrangements</em></td>
<td>Irregular and long hours; Overtime work; Shift work; Unfair promotions; Poor remuneration; Heavy work schedules.</td>
</tr>
<tr>
<td><em>Strenuous relationships at work</em></td>
<td>Managing different people’s attitudes; Conflict with co-workers; Difficult parents (in the case of teachers*); Difficult co-workers and/or supervisors; Interacting with different role players with different views and opinions; Dealing with negative attitudes of people.</td>
</tr>
<tr>
<td><em>Nature of the job</em></td>
<td>Dangerous working conditions (in the police*); Exposure to traumatic situations; Lack of resources; Difficult class situations (in the case of teachers*); Dealing with abused or raped children (in the police*).</td>
</tr>
<tr>
<td><em>A lack of being valued in an unsupportive work environment</em></td>
<td>Oppressive work environment; Top-down commanding approach (in the police*); Lack of empowerment, recognition, support, or appraisal; Lack of support for personal problems; Lack of communication channels and strategic planning.</td>
</tr>
<tr>
<td><strong>Resources at work</strong></td>
<td></td>
</tr>
<tr>
<td><em>Occupation satisfaction</em></td>
<td>Enjoying your work; Passion for your work; Understanding the purpose of your work; Experiencing work engagement; Showing love and care for the children (in the case of teachers*).</td>
</tr>
<tr>
<td><em>Supportive working arrangements</em></td>
<td>Flexible working hours; Extra remuneration for working overtime; Help from temporary workers; Working better shifts.</td>
</tr>
<tr>
<td><em>Supportive relationships at work</em></td>
<td>Good interpersonal relationships; Support and help from co-workers/supervisors; Mutual respect and understanding between colleagues; Friendships at work.</td>
</tr>
</tbody>
</table>

* Some stressors are more specific to certain occupations and are indicated in parentheses.

**Stressors at work**

Participants were confronted with a great deal of work-related pressure and time constraints — to such a degree that feelings of overload became present and the quality of their work seemed to be compromised. Pressure experienced by participants originated from various role players and sources in their work. Whether it entails more demanding work arrangements (e.g. working irregular and
long hours, working shifts) or stressful interpersonal work relationships (conflict with co-workers, dealing with negative attitudes, etc.), a large number of participants experienced taxing and strenuous demands in their work environment, while their personal problems were often seen as unimportant and insignificant. In addition, expectations were set for workers to deal with other people’s personal problems and provide support for various groups of people in their work environment and community. Sometimes participants were expected to do work that was not their responsibility. With a lack of support, recognition or appreciation from management, the presence of these chronic demands placed severe strain on participants. This created inner tension and caused them to have negative work experiences, which unconsciously influenced their work performance and their perceived ability to work. The following example, can be provided to illustrate some of the above-mentioned stressors:

They give you so much work to do at a time. While you are busy with that task, something else comes up. Then you are expected to abandon that task and carry out the next one. As a result, you end up working overtime or you are behind with your work because you have not completed the tasks given to you initially. We have too much work and so little time to do it. Everyone expects you to complete their tasks and is pushing you all the time. Then I don’t do my job to the best of my ability. (participant PE11).

In addition to the strain and tension that participants experienced with regard to their workload, they were also confronted with inner conflict that arose from aspects such as unfair promotions, poor remuneration, irregular and long hours, overtime and shift work. As a result of working long hours and overtime, without receiving the necessary recognition, remuneration or promotions, participants became demoralised and negative towards their work situation and colleagues. As a result, they began to question their own value as well as the value of their work. Feelings of disrespect and distrust towards their superiors began to emerge as a result of unfair or unreachable promotions, which in turn caused additional tension and conflict between participants and their superiors/colleagues. The following quote from a police officer serves as illustration:

Take for example promotions: you want to know the reasons for not getting promoted, but you are treated inappropriately. Then someone less capable than you gets promoted. These are the things that demoralise us. You end up thinking, it is actually better to stay home than be at work. I end up being demoralised so much that I do not want to go to work when I leave home. (participant PE8). Another statement follows: I start to convince myself that maybe that is how things have to be for me, not getting promoted. It is their decision not to promote me and I cannot do anything about it. You lose respect and trust towards the high-ranking officers, and this causes conflict between us (participant PE 10).

In addition to the high work pressure, stressful working arrangements and strenuous relationships at work, some participants also experienced the nature of their job as stressful, specifically in the case of police officers and teachers. The constant exposure to dangerous or difficult working situations, circumstances or relationships caused additional strain for participants. One police officer mentioned:
The other thing that stresses me at work is that you could find that I deal with traumatising cases. Especially rape cases whereby you find a child being injured. I see many things that break my heart which give me stress. You work with so many different characters of people, which are straining as well (participant PE1).

One teacher also described the nature of her job as stressful:

I am teaching a class. The department tells us that we have to give all the children attention. But it's difficult with fifty or more children in the classroom. You can't give individual attention. It's not possible. It's difficult again, it's like a class that is dirty, it's the facilities again, and it is also the children's attitude and when you enter the class it's dirty again (participant TE2).

The lack of being valued and respected as individuals and employees was also mentioned as a stressor at work. Some participants felt that they were treated as numbers or impersonal objects instead of human beings. This resulted in feelings of low self-worth, as the following quotes from police officers illustrate:

The problem is actually at work – our managers do not have our interest at heart. They only like you when they have something to benefit from at the office. However, when you have problems they are not interested in you (participant PE5).

Some participants also experienced the bureaucratic structure of the organisation, the lack of support from management and the oppressive work environment as stressful. As one police officer mentioned:

The thing is those at the top oppress those at the bottom; they want those that are at the bottom to feel that they are at the bottom. On top management side, they still use a harsh decision and approach (participant PE1).

**Resources at work**

Although participants experienced negative aspects in their work, several participants mentioned that – even in the face of difficult work circumstances – they also experienced resourceful and supportive aspects. The first intrinsic/inherent aspect mentioned was their feelings of satisfaction, enjoyment and passion for their occupation. In some instances this passion was such that participants referred to their work as a calling, and not only as a means that allowed them to reap monetary rewards.

Some participants gained such intrinsic satisfaction and value from their work, that it enabled them to do their work as expected from them, regardless of the various stressors present. This type of resource seemed to be internal to the participant and manifested itself through participants' positive attitudes, love and care with which they performed their work (described as 'wholeheartedly'). The following quote illustrates this attitude:
I like this job and that is why I perform it wholeheartedly (participant PE1).; I enjoy my work very much – it is really nice and challenging for me. I have worked at this company for 30 years, and I still enjoy my work (participant MA1).; I love my work – that’s what I can tell you, I like my job [laughter]. I like my job even though I travel from Johannesburg to Potchefstroom every day (participant TE8).; To be a teacher is a calling, since I am so close to God, and I know he has given me the right job. I want to say that I really live my life to the fullest. I believe it is a calling and what God wanted. From that perspective you cope and you handle problems differently (participant TA7).

In addition to the internal feelings of satisfaction and love for their work, participants also seemed to experience support, which either originated from supportive working arrangements or supportive relationships at work. These resources provided participants with the ability to deal with the more strenuous aspects in their work environment. Participants indicated that having supportive relationships where people have mutual respect for each other was very important. More structural arrangements at work, such as working flexitime, having temporary workers to help, and being able to manage one’s own time at work, were also regarded as helpful resources. The following quotes illustrate the resourceful and supportive aspects in participants’ work environment:

It boosts us to have support from our co-workers. Furthermore, support you get from maybe a co-worker who has a family problem and you can relate to the story he or she has. Then as a friend and a co-worker we can sit down and advise each other – or we can refer each other to the relevant person or we can go to the station commissioner. The station commissioner can help where he can to support a co-worker who has a problem. So all in all we do get support (participant PB9).

**Theme 2: Experiences and domains in the personal life**

In the second theme that emerged from the responses, participants emphasised their personal life. Table 3 illustrates the different dimensions that formed part of participants’ personal life.
Table 3

Experiences in the personal life

<table>
<thead>
<tr>
<th>Sub-theme</th>
<th>Associated keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td>Involvement and interaction with family members (family includes parents, spouses/partners and children).</td>
</tr>
<tr>
<td>Domestic responsibilities</td>
<td>Taking care of children (e.g. getting ready for school, bathing, putting children to bed); Doing house chores (e.g. cooking, cleaning; doing laundry, preparing meals).</td>
</tr>
<tr>
<td>Religion / Spirituality</td>
<td>Attending church activities; Believing in God; Praying; Practising religious activities (e.g. attending prayer meetings, attending Bible study groups).</td>
</tr>
<tr>
<td>Self</td>
<td>Taking time to reflect; Taking personal time; Experiencing personal growth.</td>
</tr>
<tr>
<td>Socializing</td>
<td>Spending time with friends; Going out with friends or colleagues; Taking time to relax with friends; Socialising with people outside your work.</td>
</tr>
<tr>
<td>Exercise</td>
<td>Being active in a gym; Participating in sports activities such as athletics, netball, rugby, tennis, football, soccer; Participating in running and jogging.</td>
</tr>
<tr>
<td>Leisure activities</td>
<td>Participating or pursuing activities outside work such as gardening, farming, and taking painting lessons; Practising a hobby outside work.</td>
</tr>
<tr>
<td>Extended family</td>
<td>Taking responsibility and care for relatives (relatives included cousins, aunts, brothers, sisters and their children).</td>
</tr>
<tr>
<td>Community activities</td>
<td>Doing community work; Trying to empower the community; Receiving support from community members.</td>
</tr>
<tr>
<td>Studies</td>
<td>Pursuing studies outside work.</td>
</tr>
<tr>
<td>Work (second job)</td>
<td>Pursuing a second job after hours.</td>
</tr>
</tbody>
</table>

First, a very strong family dimension emerged from the responses, indicating the importance and value of the dimension. The family dimension included various family members (e.g. spouse, parents, and children) and the responsibility that participants had towards them. Although participants experienced family responsibilities as strenuous at times (the pressure to assist with problems that other family members may experience, the pressure to spend time with family while occupied with other activities, the high expectations that family members have towards the role of participants in the family, etc.), some participants seemed to experience their family life as a safe haven away from work, where they not only gave support to family members but also received support. This support originated mainly from the spouse or parents. Whether it entailed more
practical support (having a spouse/partner to help with the demands of raising children or with domestic matters) or more emotional support (having a spouse/partner who understands your work situation), participants indicated the meaning and value of this supportive role:

Your home life is a type of safe zone away from what is going on in your working environment (participant EA2); Yes, they help me — my husband helps with the food in the evening if I have to go to work. He makes sure that the children are in bed on time, and awakens them in the morning, and makes sure they get to school (participant MA11); I have a lot of help, I really have a wonderful husband that stands by me (participant TA9); For me it is not difficult, because, I have someone who are at home during the day, I am a single parent, and my parents stay with me, so they stay with my child. If I come home from work I can do the house chores (participant ME7); The thing is, we don’t have a house right now, we are living at the hostel at Seshego. The children are at home, the one is staying with my mom and the other one is staying with my mother in law in Batselo (participant ME10).

As a result of the responsibilities toward the well-being of their family members, participants were confronted with both domestic matters and matters relating to caring for their children, which both formed part of their home life. It seemed that in addition to participants’ responsibilities at home (which included house chores such as cooking, cleaning, doing laundry, preparing meals), participants also have to attend to the needs and demands of their children (helping them with homework, putting them to bed, etc.). Some participants indicated that they had domestic workers to assist with the responsibilities in the house or with activities related to the children, a great source of support to deal with the challenges in this dimension.

Sometimes I come home much stressed and then there is lots of work to do. I am a mother, with a boy in grade 1, where I have to help him with his homework. And then I also have to cook and do all those things, it is really stressful (participant MA8); ... but I always like to be home on time to do the cooking, you know so, you’ve got to cook and then you are a wife and a mother and then you have a career and you still have a social life and you know it is a lot of responsibilities (participant EB5); I have someone who is looking after my children during the day (participant ME12).

Apart from their involvement with family members and taking care of domestic matters, participants also mentioned other dimensions in their personal life, including religious/spiritual activities, focusing on themselves, exercising, socialising with friends or colleagues, taking responsibility for members in their extended family and community, or studying. Participants emphasised the value and meaning of these various dimensions and mentioned that involvement in other activities fulfilled certain needs, goals and aspirations. It also offered various forms of support, meaning and opportunity for growth.

Also of particular importance was the religious or spiritual dimension. In the literature, the distinction between religion and spirituality has given rise to various views (Elkins, 1988; Emmons, 2006; Hill et al., 2000; Marler & Hadaway, 2002; Pargament, 1999; Zinnbauer, Pargament, Cole &
Rye, 1997; Zinnbauer, Pargament & Scott, 1999), which do not feature within the scope of this study since it was not possible to know from the responses what participants meant by religion or spirituality or how they viewed the distinction between the two concepts. More important, however, was the existence and significance of such a personal dimension. This was a rather complex dimension since participants not only indicated their involvement or participation in religious activities but also mentioned the supportive role of religion. Although participants mostly referred to specific religious activities (e.g. going to church, going to prayer meetings, and attending bible study groups), they also mentioned that their religious beliefs served as a resource or coping strategy in their general life. Participants indicated that when faced with difficulties or problems, their strong religious beliefs helped them in managing or coping with adversities.

You know I am a highly religious person and have a lot of problems. Whatever problems I am faced with – life will not get me down because I usually pray and the Lord answers me. This is the reason I am not in real trouble most of the time. I believe in God and I believe the Lord does help me (participant PE2); I pray and God helps me – believe me, I am a Christian, a reborn Christian, and that’s why I have a thought of believing that He is my God (participant TB6).

Others mentioned that they experienced their work as a calling, where they pursue work specifically to make a difference in the world. Participants indicated that they found meaning in their work, as they viewed work as a calling in life. The following quotes illustrate the meaning of the religion/spiritual dimension:

For me as a person my work is a calling, it is what God wants me to do. I think from that perspective I cope, and then I handle my problems differently (participant TA9).

Several participants indicated a need for personal time. Participants enjoyed spending time by themselves, which provided them with the opportunity to reflect upon their work and their life and getting some perspective. Additionally, there was a very strong need to pursue activities or aspects which are beneficial to their own well-being, including exercising and spending time on leisure activities. The following quotes illustrate the recognition of the importance of personal time:

Sometimes I use the time I have to myself to reflect upon what I do, where I am, otherwise I lose track of myself. It is important for me to spend time by myself (participant MA5); I think I should be spending more time exercising – that’s for me – or maybe go to a beauty spa for a massage. Taking care of myself physically because that is important (participant EE5); Most of the time I exercise, I jog. I run. I even do minor exercises at home in the morning and in the afternoon (participant PE1); Then for a hobby I did carpentry in the afternoons, over weekends and during the holidays – that was nice (participant TA3).

It was also clear that people wished to interact and socialise with colleagues and friends. For many participants, this served as a support system or emotional outlet. Many used relationships and interaction with other people to relieve stress or for personal development. The following quotes
illustrate the social outlet or support that individuals gain from their involvement in certain social contexts:

I’m a person that always likes to chat – have a laugh or two – or hang out with friends and relax. I enjoy inviting friends over during the weekend to have a braai – to sit and chat (participant PE4); I talk to my friends about issues of concern to them and me. Sometimes you find that they have the same problems and you get their views (participant PE8).

Apart from the above-mentioned personal dimensions, some participants also indicated that they had an obligation to take care of extended family (cousins, aunts, brothers and sisters) and community members (friends, neighbours or other individuals in their community). However, this responsibility towards extended family and community members was only mentioned by African participants and not by any of the white participants. Thus, for the African participants, contributing and taking responsibility for these members was very important and meaningful, but at the same time very strenuous. This is mainly because it was expected from them and caused a great deal of financial strain. In some cases they were also expected to provide a home or shelter:

In my life at home, I am not only married, but I am also the breadwinner. I look after my brother (who stays with me) as well as my sister’s daughter – who is still in school (participant TE3); My sister’s children, my child, and my brother’s child are staying with me (participant TE6).

Lastly, some participants were also studying (which provided personal meaning, value and growth) or had another job after hours. For many participants, studying entailed extra time pressures relating to assignments and studying for exams, while for other participants consulting work as an additional job also implied additional time pressures and work.

Yes the children are in grade 4, and with the maid not here, you have to do that work also, and then I also have FLM course. I am writing exam, we are doing it through Unisa, so I have to submit assignments and study and at times it is really rough (participant MA10); Having a second job, which is doing consultation work for companies or starting an own practice, which takes more time away from work because you have responsibilities towards your other job (participant EA1).

In addition to the meaning and value that participants experienced in each life dimension, it also seemed that involvement in certain dimensions provided some resources that served as coping mechanisms to deal with stress. Participants suggested the supportive role of family (e.g. having a supportive husband or a domestic helper), religion (e.g. prayer and believing in God as a way of coping), socialising (e.g. going out with friends to unwind) and exercise (e.g. going to the gym as stress reliever).
Theme 3: Interaction between work and domains in the personal life

The third major theme entailed different forms of interaction between work and personal life, which took on a specific direction of influence. Table 4 indicates the various forms of interaction and the meaning participants attached to these.

Table 4
Different forms of interaction

<table>
<thead>
<tr>
<th>Forms of Interaction</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influence of work on personal dimensions</td>
<td>Work→Personal life, e.g. family life, personal time, home life, religious activities, studies, leisure time, exercise and social activities.</td>
</tr>
<tr>
<td>Influence of personal dimensions on work</td>
<td>Personal dimensions→work, e.g. family, home life, the extended family, leisure time and social activities.</td>
</tr>
<tr>
<td>Interaction between various personal dimensions</td>
<td>Personal dimensions↔Personal dimensions e.g. family life, studies, social activities, exercise, home life, leisure time and the extended family.</td>
</tr>
<tr>
<td>Negative integration between work and personal dimensions</td>
<td>No proper balance, Interference was omnipresent, incompatibility of various roles, Juggling multiple responsibilities.</td>
</tr>
<tr>
<td>Segregation of work and personal dimensions</td>
<td>No interaction due to the physical and/or psychological separation of the dimensions; Segregation of domains (e.g. intentionally not thinking about home matters at work or not taking work home), Intentional cognitive decisions to separate various domains.</td>
</tr>
</tbody>
</table>

The first form of interaction participants mentioned was the influence of work on their personal life. It seemed that due to strenuous demands and responsibilities at work (e.g. working overtime or working long hours and having an overload of work), participants were unable to attend or participate in various personal dimensions – i.e. spending time with their family or children, participating in leisure or exercise activities or attending religious activities (e.g. prayer meetings). Participants also mentioned that work often hindered personal growth (explore opportunities or spend time on activities that that would enhance the quality of their lives or promote self-growth,
for example further studies). The following quote illustrates how participants miss out on their children’s activities due to work:

It feels to me that I miss out on Heintjie these days. He is involved in rugby in the afternoons, and he needs to go there, and I can’t take off from work every time to take him there. I would also like to be there, and now I miss his sport (participant MA3).

Secondly, participants mentioned how their work was influenced by various dimensions in their personal life. Due to certain responsibilities towards their families or extended families (e.g. attending school activities of their children, taking care of sick children or helping family members with crises), their work was influenced to some extent. Sometimes participants were unable to attend work or were late for work as a result of these responsibilities (e.g. taking children to the doctor before work). Occasionally, participants were even unable to concentrate at work due to constantly thinking about these demands or responsibilities in their personal life. Also, attending certain social activities or leisure activities or attending to problems in personal dimensions resulted in being unable to attend to certain work obligations or to finish important work tasks (e.g. participating in sports activities or sports matches which are scheduled during work hours in the afternoons). Sometimes participants were even unable to accept good work opportunities due to their family situation. The following quotes serve as illustration:

Yes, because of my situation and the fact that I am a single mother, I can’t really work as I would have wished to work, I can’t work as much outside as I would have wished (participant PA3).

(Response taken from a female police officer, who was unable to work outside in the field due to her children.)

Sometimes there are things on the farm that I just have to finish first. So when my shift starts, I might be late, because I had to attend to the problems on my farm first (participant PA6); When I participate in my sport, I have to play in the rugby match, and then I can’t be at work (participant PA2).”

In addition to the previous two forms of interaction, participants also experienced interaction between various personal dimensions (which excluded the work dimension). It seemed that being involved in several personal dimensions could be experienced as stressful, since participants were expected to attend to various activities and responsibilities within various dimensions in their personal lives. For example, some of the participants were confronted with simultaneous demands in various dimensions, such as attending to the needs of their children while also expected to study. Other participants found it difficult to relax or spend time on leisure activities, because they felt guilty not spending time with family. The following quote illustrates the influence of participants’ personal leisure activities (in this case coaching rugby) on their family life:

But the biggest influence at this stage is the rugby, it takes up a lot of time that I had to spend with the children, so the rugby takes my time away from the family (participant MA3).
Lastly, some participants separated the dimensions in their personal lives, resulting in minimal interference between work and personal life. Others experienced the interaction between dimensions as omnipresent and integrated, and found it very difficult to balance different responsibilities. They also experienced incompatibility between their various roles. A major reason for this complex form of interaction was that participants were often confronted with simultaneous demands in different dimensions of their lives and were unable to prevent the spillover effect between dimensions (e.g. when they experienced deadlines at work and were expected to attend to the needs of their children). Some participants even suggested that the interference was part of life and that spillover between dimensions was inevitable. Other participants indicated that the interaction between dimensions was a juggling of responsibilities and that it was not easy to separate the demands and responsibilities of the various dimensions.

Yes, it is difficult to manage because you are a people person. Sometimes it is difficult to differentiate and to say now I am at home and I don’t talk about the work or now I am at work and I don’t talk about my personal life, you must be very careful (participant ME4); You can’t really separate the two from each other. You should remember that if you are happy at work, you will also be happy at home, if you are happy at home, you will also be happy at work. That is the interaction. But if you are unhappy at home over something personal you will take it to work – there is no way you will be able to separate the two (participant MA4).

Conversely, several participants were able to keep the influences between the various dimensions apart, either by means of physical segregation (e.g. not taking work home) or psychological segregation (e.g. not thinking about work when spending time at home or with family). Illustrations of physical and psychological segregation include:

I physically don’t take work home, it is a principle in my work. I don’t take work home, because I feel I have eight hours at work to work and do my part, if it is time to go home, the time is for my family and home (participant EA11). (physical); But like I said, when I am at home, I don’t bring work with me. That thing will stay on my mind, because I haven’t shared it with someone, but I try to focus and I try not to let my children see what is going on with me. I try to focus only on my home (participant ME12). (psychological).

In all the above-mentioned forms of interaction, participants mainly referred to the negative influences between the dimensions. Although the negative forms of interaction were more prevalent, few participants indicated positive interaction between dimensions. These positive influences mostly entailed the supportive aspects between dimensions (e.g. having a supportive spouse to communicate with about work-related issues or to help with domestic matters). Illustrating these supportive positive influences between personal dimensions and work:

Well, for me, I think I am blessed to have my husband, because he is involved in everything; actually he prefers to do the groceries. If I’m lecturing till late, he doesn’t mind. He will go on a ride with my son and then he does the groceries. We cook together. If our helper is on leave or whatever, we will clean the house together; he will be scrubbing the floor, and I will be doing the dishes (participant EE5).
Theme 4: Consequences associated with the various forms of interaction

The last major theme that emerged from the responses related to the consequences associated with the interaction. It seemed that specific consequences were related to the different forms of interaction, as Table 5 indicates.
<table>
<thead>
<tr>
<th>CONSEQUENCES</th>
<th>W→P</th>
<th>P→W</th>
<th>P→P</th>
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</thead>
<tbody>
<tr>
<td><strong>Time-based consequences</strong></td>
<td>Difficulty attending to various activities or role players in one’s personal life due to time constraints; Inability to attend family activities due to lack of time; Less time to spend with family; No time or limited time available for friends or personal activities such as religion or hobbies; Lack of time to attend to children; Lack of time to spend on domestic activities such as cooking and cleaning.</td>
<td>Inability to attend to work activities due to family responsibilities (e.g. attending funerals during the week); Difficult being at work on time due to unforeseen circumstances at home; Lack of time to perform work-related tasks because of time spent with family or children.</td>
<td>Inability to attend to various activities simultaneously (e.g. attending to children and participating in leisure or exercise activities); Simultaneous demands from various roles in personal life; Simultaneous pressures and activities.</td>
</tr>
</tbody>
</table>
| **Mental preoccupation**                 | Constantly thinking of work; Inability to concentrate on domestic matters or family members outside work due to thinking of work-related matters; Overload of information and pressures/demands within the work environment; Inability to relax at home due to constantly thinking about work; Inability to do tasks at home due to preoccupation with work problems. | Thinking of personal demands or problems at work; Inability to concentrate at work due to problems in personal life (e.g. worrying about your sick child); Overload of information and pressures/demands in personal life; Unable to work effectively due to constant thinking of personal matters; Problems at home influencing your work performance (e.g. making mistakes in your work due to lack of concentration). | |}
| **Build up and spillover of emotions**   | Experiencing negative emotions (e.g. anger, frustration, hopelessness, etc.) at work that spill over to personal life; Inability to control emotions that built up during the day; Feeling irritable and edgy at home due to things that happened at work; Tension between family members due to emotional tension that arise from problems at work. | Experiencing certain emotions (e.g. anger, frustration, hopelessness) in the personal life and the spillover thereof to work; Inability to control emotions that arise from personal dimensions (e.g. feeling angry after fighting with one’s spouse); Feeling tensed and stressed due to the various demands and pressures in the personal life; Tension between family members affecting one’s emotions (e.g. having conflict with your spouse or children); Lack of happiness at work due to lack of happiness in personal life (e.g. feeling discouraged from problems at home). | Inability to control emotions which arise from having various demands and responsibilities in personal life; Having simultaneous demands and pressures affecting your emotions (e.g. feeling discouraged to miss out on exercise because of children’s activities); Experiences of certain emotions such as anger, frustration and guilt. |
| **Energy depletion**                      | High workload resulting in the total depletion of energy; Experiencing overall exhaustion, fatigue and tiredness due to long work hours; Lack of energy to perform duties at home; Feeling overworked when arriving at home after work; Tiredness mind and body due to high workload and work pressures; Limited energy left after work to attend to other activities outside work (e.g. participating in sports activities). | Lack of energy due to responsibilities in personal life (e.g. attending to small children during evenings); Feeling tired when going to work due to attending to children the previous evening; Total depletion of energy resulting in overall exhaustion, fatigue and tiredness; Lack of energy to perform work due to various demands and activities in personal life (e.g. cooking and cleaning and caring for children and family in evenings resulting in no time for rest or recovery). | Energy depletion from having too many demands from various roles in personal life (e.g. simultaneous expectations from spouse and children to give attention); Lack of energy to complete or participate simultaneously in various roles/dimensions; Limited energy left after attending to various roles in personal life. |
### Table 5 continued

**Consequences associated with the various forms of interaction**

<table>
<thead>
<tr>
<th>CONSEQUENCES</th>
<th>W→P</th>
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<tbody>
<tr>
<td><strong>Strain on relationships</strong></td>
<td>Unable to attend to spouse/children or friends due to work obligations causes strain on the relationships; Experiencing conflict in marital relationships because of the withdrawal from spouse and not communicating effectively with one spouse; Strain on relationships with friends or children as a result of not providing enough attention or not attending to their needs.</td>
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<tr>
<td><strong>Managing responsibilities</strong></td>
<td>Shifting of responsibilities between family members; Attaining more responsibilities due to spouse's workload (e.g. attending to the children when spouse is working late); Unable to perform certain tasks and responsibilities (e.g. unable to pick up children from school due to working late or unable to cook dinner because of work hours).</td>
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<tr>
<td><strong>Limiting of work opportunities</strong></td>
<td>Unable to pursue good work opportunities due to family situation (e.g. single parent can't work long distances away from family); Forfeit of certain work opportunities; Limiting your career in terms of the type of work due to personal responsibilities or circumstances (e.g. not taking work opportunities which will include working away from home for long times).</td>
<td>Feeling energized from personal life; Having meaningful experiences in personal life resulting in more energy (e.g. meaningful relationships with your spouse or children); Stimulating personal life experiences (e.g. spending quality time with your spouse or children); Having meaningful relationships in your personal life that make life worthwhile (e.g. supportive spouse or children).</td>
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</tr>
<tr>
<td><strong>Energy generation</strong></td>
<td></td>
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<tr>
<td><strong>Learned skills</strong></td>
<td></td>
<td></td>
<td>Due to the variety and simultaneous demands in personal life, learning of new skills took place (Learn more patience; Learn interpersonal skills to help with own children, etc.).</td>
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</table>
Participants mentioned various consequences which related to the various forms of interaction as well as more general consequences relating to the overall interaction being experienced. Although participants mentioned specific consequences relating to the various forms of interaction, it seemed that consequences such as time-based consequences, mental preoccupation, spillover of emotions and energy depletion were especially present. Participants indicated that due to limited time available they were unable to give attention to various activities in their lives. Participants seemed to find it difficult to spend time with all the various role-players in their lives, whether it is time spent on work activities or time spent on activities in their personal lives (e.g. not attending activities of the children due to work obligations or being late at work due to family emergencies).

Yes, there are times when you are away for a long time, and then it feels like the time is passing by, where you miss out on things. You miss being with your family, you miss your child’s rugby game, which is important. But you just can’t be there (participant MA1); It’s a problem in that even though we are supposed to go out as a family somewhere during the holidays, we can’t, this time they’ve been creating these workshops during our time of the holidays you see (participant TE5); At some stage the other consequences are, I neglected my studies because of church and work, and I quit a little bit from church (participant EE4).

Participants also found it very difficult to concentrate on a specific dimension in their life at one specific time, seeing that while they were occupying a specific dimension they were thinking about or mentally preoccupied with another dimension. It seemed that participants were sometimes confronted with problems in either their work environment or their personal life and as a result they were unable to focus on the present demands in a specific dimension (e.g. making mistakes in your work due to lack of concentration).

Unfortunately, school is not a case of coming to work at 8:00 and leaving at 17:00, closing your office door behind you. No, you always have work in the back of your head; there are always papers to draw up or tests to mark (participant TA12); It is because of my work affairs and home affairs, eventually it leads to my mind losing concentration somehow, I can’t concentrate, and I make a lot of mistakes and then I have to start everything from the beginning. So it is time-consuming in my work environment because sometimes I do not finish my work because of lack of concentration (participant ME11).

Additionally, participants experienced certain emotions which originated from the work environment or personal life and they also indicated that they found it difficult to control these emotions. Sometimes the emotions which built up in one dimension spilled over to another dimension, resulting in emotional tension or stress (e.g. taking your frustrations out on your children). Participants also experienced a great deal of guilt and anxiety because of an inability to attend to all the responsibilities in their lives.

It is the same, if you are unhappy at work, when you go home tonight, you will take out your frustrations at home, (participant MA4); When you see your wife and children in the
afternoon, you should orientate yourself so much. Sometimes it is so difficult and you are so angry from work that you will fight with someone from home, even if he doesn’t deserve it (participant TA4); Your whole life revolves around feelings of guilt, since all you do is try to solve everything at home, you feel guilty because you don’t have enough time to be with the children and also at work you have to solve everything since you don’t spend enough time at work (participant EA10).

Furthermore, participants indicated how the interaction influenced their levels of energy. Due to all the various demands and pressures, participants seemed to experience a lack of energy which led to feelings of fatigue and exhaustion.

... and the workload too, it will influence you very much. Because you have high workload, you will have less time for your family — because if you get home you are just so tired (participant TA5); You feel tired. I feel I am not up to my top function now, because at this stage I am just so tired, chronically tired (participant EA10); When I arrive at home, I am tired, I have to look after the children. Children need this and that and to be guided at school. My mind got so exhausted, so this gives me stress (participant PE1).

Regarding more specific consequences related to the influences of work on personal life, participants mentioned strain on their relationships and the process of managing responsibilities. It seemed that participants were unable to invest quality time into their relationships due to work obligations. Participants also mentioned that they were unable to maintain good relationships seeing that they did not give enough attention to these specific relationships (e.g. not giving enough attention to your spouse or children due to high workload and long work hours). Furthermore, due to work obligations such as working overtime or long hours, participants sometimes found it difficult to perform all their responsibilities at home, and as a result responsibilities were shifted between different role players (e.g. when the one spouse (wife) is not able to help with the children in the evenings or not at home on time to cook dinner for the family, the responsibilities are shifted towards the other spouse (father)).

People resigned in the same year that I had to take over, and it also frustrated my family life, because half of the time — actually I spend most of my time at the office and I have a daughter, who is still very young. She still needs me, and it became very, very difficult for her, and very difficult for me (participant EE9); Sometimes after a few hours, you realise but you are wrong — your wife is uncomfortable, and it is not her fault. Then I go to her and apologise and say I was wrong to be nasty with her (participant MA2). (strain in relationships). At this stage I am very lucky, I work permanently till 16:30, but sometimes it happens that I have to work late, and that throws everything out — because dad has to pick up the children then, and he should cook, and give them their baths (participant PA7). (managing responsibilities).

Although the majority of consequences suggested a more negative connotation, participants did indicate how having a personal life was very meaningful and resulted in the generation of energy. Participants also mentioned that they learned new skills by participating in various
dimensions in their personal lives. It seemed that sometimes participants felt more energetic when engaging in positive relationships in their personal life. Participants indicated that the skills they learned (e.g. learning to be more patient) when taking part in one dimension often transferred to another dimension.

Even when I wake up at home in the morning to go to work, I find that I am energetic from home. So that I perform my duties happily (participant PE6).

Finally, more general consequences were mentioned by participants, including influences on their physical and psychological health and their intention to quit their jobs (see Table 6).

Table 6

General consequences associated with the interaction

<table>
<thead>
<tr>
<th>General consequences</th>
<th>Feeling demoralised by all the demands in life; Feeling discouraged in the process of attempting to balance the interaction; Suffering from depression; Feeling anxious about all the various demands and responsibilities; Feeling tensed and stressed all the time; Experiencing insomnia; Having less time to sleep.</th>
</tr>
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<tbody>
<tr>
<td>Physical health</td>
<td>Being sick and experiencing health symptoms such as chronic headaches, body aches, shoulder pains, back pains, high blood pressure, etc.</td>
</tr>
<tr>
<td>Absenteeism or turnover</td>
<td>Absenteeism from work; Considering resigning from work; Considering changing occupations.</td>
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As illustrated in Table 6, participants seemed to suffer from problems such as headaches, body aches and constantly being stressed and tense. Some participants even reported experiencing problems sleeping. For some, the interaction between work and personal life became so unbearable that the thought of leaving their work or occupation became tempting.

It influences you in terms of stress and in terms of physical tense ness. Sometimes you feel the emotions building up and you feel it physically in your shoulders, you feel it in your back, you feel it in you mind. You can also say you feel the stress in terms of your blood pressure being a little high (participant MA6). The problem its like my work, I am no longer happy in teaching, the 43 years that I stayed here its like more than enough, so I want to leave (participant EB4).

It is stressful, All the muscles in your body are stiff and tense by the time you go home (participant EA3).
DISCUSSION

The field of work-family research has progressed substantially over the past few decades, providing researchers with various integrative frameworks regarding the interaction between work and personal life. The majority of these frameworks include various forms of interaction, related antecedents and consequences as well as the conceptualisation and measurement of the interaction (Allen et al., 2000; Bellavia & Frone, 2005; Frone et al., 1992b; Frone, 2003; Geurts & Demerouti, 2003). Although these frameworks and research findings are well established internationally, the aim of this study was to explore the interaction between work and personal life within a South African context and framework. With this exploratory study, very similar findings as well as unique contributions were made to existing work-family research, relating to the experiences in the workplace and personal life, the various forms of interaction and the consequences of the interaction between work and personal life.

Compared with previous research, similar findings were found with regard to employees’ experiences in the workplace, as well as the various antecedents and consequences related to the interaction between their work and personal lives. South African employees experienced similar antecedents (categorised as job characteristics in international literature: Ballout, 2008; Byron, 2005; Carnicer et al., 2004; Geurts & Demerouti, 2003), including stressors (e.g. pressure, overload, workload, stressful work arrangements and difficult relationships at work) and resources (e.g. supportive work arrangements and relationships at work). This is in line with previous international research on the Job Demands-Resources (JD-R) model of work-related well-being. According to the JD-R model, job characteristics can be categorised into certain job demands and job resources, which could influence the well-being of workers (Demerouti, Bakker, Nachreiner & Schaufeli, 2001). Job demands is the degree to which the working environment contains stimuli that require some effort and that could lead to negative consequences if they require additional effort beyond the usual way of achieving goals (Demerouti et al., 2001; Jones & Fletcher, 1996). Although job demands are not necessarily negative, they may turn into job stressors when meeting those demands requires high effort (Schaufeli & Bakker, 2004).

Given, that the participants in this study were representative of various language groups and various industries, a variety of stressors and resources were identified as being more
occupation specific. Overall, however, the stressors mentioned in this study are in line with the job demands identified by Demerouti et al. (2001) – i.e. physical workload, time pressures, physical environment, shift work and recipient contact. Job resources refers to the degree in which the working environment contains physical, psychosocial or organisational aspects that may be functional in meeting task requirements (e.g. supervisory support, job control and participation) (Schaufeli & Bakker, 2004). In this regard, participants indicated that having supportive relationships at work or having certain work arrangements is functional in performing their work tasks.

In line with previous findings, South African employees also experienced comparable consequences as a result of the interaction between work and personal life. A variety of the general consequences mentioned by South African employees (e.g. physical symptoms such as headaches or body aches, anxiety and insomnia, absenteeism and turnover intentions) are very similar to categorised consequences in international research (i.e. physical, psychological, behavioural, attitudinal, organisational consequences or work, nonwork and health-related consequences) (Allen et al., 2000; Bellavia & Frone, 2005; Geurts & Demerouti, 2003).

Apart from the above-mentioned similarities with previous research, very unique contributions were also made to work-family research with the exploratory nature of this study. Several valuable unique insights were obtained regarding employees’ experiences of their work (e.g. experiencing work as a calling), personal life (e.g. valuable personal dimensions such as leisure, exercise, religion/spirituality) and the specific way in which they perceive the interaction between these domains (e.g. work influencing personal dimensions, and vice versa) as well as the related consequences (e.g. general and specific consequences).

Regarding the experiences in their work environments (although subjected to various stressful aspects and pressures in their work), some South African employees experienced their work as a fulfilling calling in their life. According to Wrzesniewski, McCauley, Rozin and Schwartz (1997), individuals may experience their work as a calling when they do not work for financial gain but rather for the fulfilment that it brings. Alternatively, some individuals work because they are of the opinion that it is a religious calling for them, while others find it to be socially valuable. Wrzesniewski et al. (1997) also state that although having a calling for your work is not seen as occupation specific, one might expect this
While the majority of previous views of work-family interaction entailed either the direction (i.e. work influencing family life or family life influencing work), quality of influence (i.e. negative or positive) or various forms of interaction (i.e. time-, strain- or behaviour-based interaction) (Bellavia & Frone, 2005; Frone, 2003; Geurts & Demerouti, 2003), two new additional interesting views on the experiences of interaction were revealed – i.e. negative integration and segregation between work and personal life. Where some individuals experienced the interference or influences between work and personal life as omnipresent with no proper balance or integration (labelled negative integration), other employees seemed to maintain total separation between their work and areas in their personal life (labelled segregation). For many South African employees, no interaction exists between their work and personal life due to their own physical or psychological attempts or intentions to keep areas in their personal life apart. Although a theoretical perspective of segregation between domains has been hypothesised in earlier research by Dubin and Champoux (1977), more recent views seem to differ. According to Geurts and Demerouti (2003), hardly any evidence exists for a theoretical segregation approach since segregation does not occur naturally but is merely the result of workers’ active attempts to prevent work from intruding in their family life. Olson-Buchanan and Boswell (2006) continue by suggesting that the integration or the segregation of work and non-work roles are very much related to the boundaries set by individuals regarding their work and the other areas in their personal life.

Final unique contributions worth mentioning are the various consequences relating to the various forms of interaction that South African employee’s experience. Although several consequences were consistently associated with all the forms of interaction (i.e. time-based consequences, energy depletion, spillover of emotions), participants did indicate some consequences which are uniquely related to specific forms of interaction and which are also different from previous work family research (e.g. mental preoccupation as a result of work influencing personal life; limiting of career opportunities as a result of personal influences on work; strain on relationships as a result of work influencing personal life).

Notwithstanding the valuable contributions and information gained from this study, this study was only conducted among certain language groups and occupational groups, where the majority of participants were living in suburbs in large cities or towns. Since circumstances may differ between urban and rural areas, it might be that participants working a rural areas
or communities experience their interaction very differently. Also, participants were located only in two of the provinces in South Africa (i.e. North West and the Free State), thus a question of representation could be asked. In addition to occupation and provincial differences, participants from other language groups might also have different experiences.

Notwithstanding the limitations of the study, recommendations can be made for future research. Although the participants in this study included various language and occupational groups in order to have a representative South African employee sample, it was not the objective of the study to investigate possible differences between the various language and occupational groups. However, some of the experiences obtained regarding the stressors and resources experienced might have been language or occupation specific, which should be addressed in future research. Therefore it is recommended that differences regarding work-personal life interaction for various language or occupational groups be investigated to determine if the experiences found in this study were language or occupation specific and if they were a fair representation of South African employees.

With the valuable information gained in this study it is recommended that researchers continue to investigate the interaction between the work domain and all other facets in employees' personal lives. The information regarding the specific personal dimensions might be helpful in the development of a more comprehensive measuring instrument for work-personal life interaction. This instrument could include the interaction between not only the work and family domains, but also other domains, and could prove to be very useful in future quantitative studies. It is therefore recommended that future quantitative studies regarding the non-work interface include, apart from the family dimension, other personal dimensions such as religion, leisure and home life.

Moreover, better methodological and research design approaches are recommended, where instead of asking only employees about their experiences, it is important to have several sources of information from both domains, for instance, from the partner and adolescent child(ren), supervisors or observers (Geurts & Dikkers, 2002). Moreover, the profound information regarding the pressures of the work environments in South Africa could be useful for organisations and for future organisation intervention research.
To conclude, this study contributed to a better understanding of how South African employees experience the interaction between their work and personal life. Although they experience very similar stressors and supportive aspects in their work and very similar forms of interaction, South African employees do experience some aspects in their workplace and personal life differently. With the exploratory nature of this study, it was possible to gain more insight into individuals’ personal life and to gain a better understanding of the various personal dimensions that South African employees value (e.g. community, religion/spirituality, leisure, exercise). These dimensions also seem to have a unique influence on their work, and vice versa, contributing to unique forms of interaction and related consequences. Some South African employees seem to experience consequences such as mental preoccupation, limiting of career opportunities, energy generation and learned skills which are very unique to previous work-family research.

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REFERENCES


RESEARCH ARTICLE:

INTERFERENCE BETWEEN WORK AND NONWORK ROLES: THE DEVELOPMENT OF A NEW SOUTH AFRICAN INSTRUMENT

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K. MOSTERT
I. ROTHMANN (Jnr)

A revised version of this article was submitted and successfully accepted to be published in the South African Journal of Industrial Psychology in 2010. The following table indicates the contributions made by each author:

<table>
<thead>
<tr>
<th>Author</th>
<th>% contribution</th>
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<tbody>
<tr>
<td>F.E. Koekemoer</td>
<td>70 %</td>
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<tr>
<td>K. Mostert</td>
<td>20 %</td>
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<td>I. Rothmann (Jnr)</td>
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INTERFERENCE BETWEEN WORK AND NONWORK ROLES: THE DEVELOPMENT OF A NEW SOUTH AFRICAN INSTRUMENT

ABSTRACT
Although construct measurement is of great importance when studying work/family relations, major theoretical and measurement limitations exist regarding work-family instruments. In an attempt to overcome these limitations, the purpose of this study was to 1) develop new items for a more comprehensive work-nonwork interference instrument; 2) to evaluate the newly developed items in order to retain those items that accurately capture the different dimensions; and 3) to eliminate undesirable items from the different sub-scales in the instrument. Based on Stryker’s (1968) role identity theory and the use of rigorous scale development procedures, the new instrument was developed measuring interference between work and four different roles in the private life (i.e. parent, spouse, religion/spirituality and domestic) in both directions (i.e. work→nonwork interference, W-NWI, and nonwork→work interference, NW-WI). Initially, 89 items were developed. During the pilot study among mine workers (n = 245), 41 poor items were eliminated using descriptive statistics, inter-item correlations, item-total correlations and the qualitative investigation of items highly redundant in terms of wording. Thereafter, the instrument (48 items) was administered to 366 support and academic personnel at a tertiary institution. Using Rasch analyses and item correlations, 18 additional items were eliminated, resulting in a 30-item instrument (15 items were retained to measure W-NWI and 15 items to measure NW-WI). This instrument overcomes some of the major limitations identified in the literature, and offers a promising tool that measures interference between work and various nonwork-roles.

Keywords: scale development; measurement; theoretical limitations; interference; Rasch model, work, nonwork.
INTRODUCTION

A widely studied topic in Occupational Health Psychology is the interaction between work and family. Researchers have devoted considerable attention to examine the interrelationships between these domains (Eby, Casper, Lockwood, Bordeaux & Brinley, 2005; Lewis & Cooper, 2005) and valuable insights have been gained from different perspectives and in different disciplines. However, one important issue is the one of measurement. Although the measurement of work-family relations has progressed substantially over the past decade and a variety of work-family measuring instruments exist in international literature, important theoretical and measurement issues or critique are being raised against existing instruments, which could pose potential problems for the interpretation of past research results and future measurement of work-family interference (Bellavia & Frone, 2005; Frone, 2003; Geurts & Demerouti, 2003; Tetrick & Buffardi, 2006).

When considering the measurement of work-family interference, several theoretical and measurement issues are raised. Major theoretical limitations identified by previous researchers pertain to the directionality and/or dimensionality of work-family interference (e.g. the conceptualisation of unidirectional or bidirectional constructs in work-family relations) and the inconsistent use of terminology to explain the relations between work and family (Bellavia & Frone, 2005; Frone, 2003, Geurts & Demerouti, 2003; Tetrick & Buffardi, 2006). In addition, some of the issues pertaining to the measurement of work-family interference raised by previous researchers include the wording of items, the use of appropriate response anchors and scales and the lack of comprehensive scale development procedures (Bellavia & Frone, 2005; Frone, 2003 Netemeyer, Boles & McMurrion, 1996; Small & Riley, 1990; Tetrick & Buffardi, 2006). The use of specific items in the measurement of work-family interference is especially problematic since various items in existing instruments confound with external variables, causes and consequences. Also, the amount of items to measure the different directions of interference (i.e. work-to-family and family-to-work interference) differs and is inconsistent (e.g. measuring work-family conflict with five items and family-work conflict with two items). This becomes problematic for the elimination of poor items, since some dimensions (due to the unequal number of initial items) may end up with only one-item measuring the dimension resulting in reliability issues.

In addition to the above-mentioned limitations, there is another limitation that this study specifically seeks to overcome. The majority of studies measure the conflict or interference between work and family (for overviews, see Byron, 2005; Eby et al., 2005; Mesmer-Magnus & Viswesvaran, 2005).
An additional issue closely related to confounded items is the use and measure of specific types of conflict (e.g. time-, strain-, and behaviour-based conflict). These items are developed based on the consequences of the conflict and do not necessarily measure conflict per se but rather the time, strain and behaviour consequences of the conflict or interference (Frone, 2003; Bellavia & Frone, 2005). Take for example a time-based interference item “Your work takes up time that you would have liked to spend with your spouse/friends/family”. In this item, as a result of the interference of your work, you do not have the time to spend with your family and friends. Thus, work takes up available time and as a result thereof you do not have time to spend with your family. In this item, it is clear that you are faced with a consequence that involves your time and that the item was based on the consequence (time-based consequence) of the interference.

With regard to the number of items used in existing instruments, two main issues are raised by previous researchers, namely the use of single-item measures and the inconsistent use of the number of items measuring the two directions of interference (Bellavia & Frone, 2005; Netemeyer et al., 1996; Small & Riley, 1990; Tetrick & Buffardi, 2006). Single-item measures pose the problem of random measurement error and may not adequately assess the domain of the construct (Nunnally, 1988). When items measuring the two directions of conflict are not parallel in construction (e.g. comparing five WFC items with two FWC items), the items do not really measure the dimensions or direction consistently.

Researchers have also raised the issue regarding the use of response anchors, where some studies measure the frequency of occurrence of work-family interference (e.g. a response anchor ranging from never to always) (Geurts et al., 2005; Grzywacz & Bass, 2003; Grzywacz & Marks, 2000), while other studies provide only the experience of work-family interference (Kirchmeyer, 1992; Netemeyer et al., 1996; Small & Riley, 1990; Stephens & Scmmer, 1996). Since the second type of response anchor (e.g. agree/disagree) does not provide additional information on the frequency of interference, this becomes problematic— a strongly agree response might merely represent the individual’s level of certainty that work-family conflict occurred. It is therefore impossible to estimate even the prevalence of conflict that occurred. However, with the use of frequency-based response anchors researchers can assess the prevalence of work-family conflict with more confidence.

Finally, the lack of rigorous scale development procedures for work-family instruments is raised as a concern (Tetrick & Buffardi, 2006). Although clear guidelines for scale development are given in
psychometric literature, few work-family scale development studies adhere to or follow these guidelines. A variety of scale development studies regarding work-family interference are available in the literature (Carlson et al., 2000; Curbow et al., 2003; Grzywacz & Marks, 2000; Kirchmeyer, 1992; Netemeyer, 1996; Premeaux et al., 2007). However, limited information regarding the scale development procedure is given, which could have been strong evidence for the validity of these studies. Few work family studies adhere to the basic scale development procedures and thoroughly describe these procedures (Carlson et al., 2000; Geurts et al., 2005; Netemeyer, 1996; Mallard & Lance, 1998).

Involvement in multiple social roles and the role identity theory

The notion of an individual's involvement in various social roles is closely related to the identity theory of Stryker (1968), which was originally built on the assumptions, definitions and propositions of the symbolic interactionism perspective (Mead, 1934). The basic concepts of the symbolic interactionism perspective were, however, re-developed and refined in the development of the role identity theory. According to the identity theory, an individual's self concept is the product of social interaction, and is a multifaceted social construct that emerges from the roles occupied in society (Burke, 1980; McCall & Simmons, 1966; Stryker, 1968; 1980; Stryker & Serpe, 1992). For each of the roles occupied in society, distinct role identities exist for individuals. A person's role identities may for instance include being a mother and being a wife. According to Burke (1980) andThoits (1991), role identities are self-conceptions and self-definitions that individuals apply to themselves based on the structural role positions they occupy in society, and these role identities provide meaning for them. The self-concept of an individual is thus made up of a variety of role identities which are the meanings that individuals attribute to themselves by occupying a particular position or role relationships (Burke, 1980; McCall & Simmons, 1966; Stryker, 1968; Wiley, 1991).

The role identity theory further states that identities are organised hierarchically in the self-concept on the basis of the saliency of the roles. In short, the salience hierarchy represents the probability that a particular identity will be evoked in particular situations and is closely related to the commitment of the individual to the various role identities (Burke, 1980; McCall & Simmons, 1966; Stryker, 1968; 1980; Stryker & Serpe, 1992). According to Stryker (1980), the greater the commitment, the more salient the identity and the more likely that the individual will choose behaviours confirming the particular identity in a particular setting. Thus, the commitment to a
particular role identity affects its saliency and therefore the likelihood of acting in a way that confirm the identity.

According to Wiley (1991), the identity theory can also be used to explain the source of stress or conflict that individuals experience when occupying multiple social roles. Individuals occupy a variety of roles to which certain role identities are linked. The saliency that each individual attaches to these roles may vary. Individuals view certain roles as more important than others, which will result in the individual choosing behaviours which will confirm the more salient identities. For example, individuals who attach high salience to their parental role will more likely choose to participate in activities which will confirm the parent identity in the self-concept, e.g. spending time with their children as opposed to participating in activities of another less salient role (e.g. leisure role). Wiley (1991) suggests that individuals may experience stress due to conflict between actions confirming desperate identities. In other words, when individuals are faced with a choice between role behaviours that confirm identities of similar salience or commitment, conflict arises (e.g. individuals experience conflict when they have to participate in activities of two salient roles simultaneously – spending time with their children and spending time with their husband). From the role identity perspective, individuals will experience interference between their work role and other nonwork-roles when the roles that they occupy are similarly salient and/or when they lack the opportunities to participate in certain roles.

Construct measurement is of great importance when studying the interference between work and private life. However, it is clear that some theoretical and measurement issues exist. The purpose and contribution of this study is to develop an instrument – grounded in conceptual literature and following rigid scale development procedures – to measure the interference between work and different nonwork roles in both directions. In achieving these objectives, this study seeks to overcome limitations regarding the directionality, the use of confounded items, the number of items used to measure both directions equally, the narrow focus on the interference between work and specific dimensions, and the lack of rigorous scale development procedures.
RESEARCH DESIGN

Phase 1: Scale development and pilot study

In order to develop the new scale, a four-step procedure was followed, i.e. initial construct conceptualisation, item generation and evaluation, item development, and item refinement. This procedure closely adhered to procedures described in psychometric and scale development literature (Boyar, Carr, Mosley & Carson, 2007; Carlson, Kacmar, Wayne & Grzywacz, 2006; DeVellis, 2003; Geurts et al., 2005; Kirchmeyer, 1992; Netemeyer et al., 1996) and is described in more detail below.

Initial construct conceptualisation

Prior to the development of the scale, it was important to define the construct to be measured. Drawing on the theoretical perspective of the role identity theory and previous work-family definitions (Burke, 1980; Geurts et al., 2005; McCall & Simmons, 1966; Netemeyer et al., 1996; Stryker, 1968; Wiley, 1991), work-nonwork interference was defined as:

- a process in which the involvement of an individual in one domain (or social role) interferes with the functioning or involvement in another domain (role), where the interference affects the way in which the worker's self-identity is influenced by external stimuli to such an extent that it results in an inadequate performance of behaviour to confirm to one or more highly-salient identities/roles.

Based on this definition, work→nonwork interference (W-NWI) can be defined as the process in which the involvement in the work role interferes with functioning or involvement in roles in the nonwork domain, whereas nonwork→work interference (NW-WI) is the process in which the involvement in nonwork roles interferes with the functioning in the work role.

Based on the social roles outside work that are mostly mentioned in the literature (e.g. parental, spousal and domestic or home care roles) and unique or specific nonwork roles (e.g. religion/spirituality) mentioned in the qualitative study of Koekemoer and Mostert (in press), only four social roles are used and measured in this study (i.e. parental, spousal, religion/spirituality and domestic roles). Spirituality/religion was specifically used, based on previous researchers indicating the importance and meaning of such a personal domain in an individual’s life (Bosworth, 2006; Mattis, 2003). According to Bosworth (2006), spirituality/religion brings a sense of meaning and
purpose to one’s life. This instrument is different from previous work family instruments which almost exclusively measure the work domain interfering with family life, ignoring the potential interference with other nonwork roles (Bellavia & Frone, 2005; Frone, 2003; Geurts & Demerouti, 2003; Tetrick & Buflardi, 2006). Therefore, depending on the direction and roles interfered with, individuals might experience W-NWI, including work-parent role interference (WPI), work-spouse interference (WSI), work-religion/spirituality interference (WRI) or work-domestic interference (WDI) and/or NW-WI, including parent-work interference (PWI), spouse-work interference (SWI), religion/spirituality-work interference (RWI), or domestic-work interference (DWI).

The following definitions were developed, and derived from literature (Baruch & Barnett, 1986; Glaser, Evandrou & Tomassini, 2006; Pietromonaco et al., 1985), to describe the different roles included in the instrument:

- **A worker** is defined as a person who is currently working or employed and who is actively involved in paid work.
- **A parent** is defined as a person who is providing and/or caring for one or more child(ren) living at home and/or who is/are dependent on the person in some way.
- **A spouse** is defined as a person who is married or is living with a partner with whom he/she has a serious, committed and intimate relationship.
- **Religion/spiritual role** is defined as deriving a personal sense of meaning through religious or spiritual activities.
- **Domestic role** is defined as performing a variety of house chores or domestic activities in order to maintain or provide a well-kept household and/or to enhance the aesthetic appearance of the home environment.

**Item generation and item evaluation**

During this step, an initial item pool (172 items) was generated from existing instrument measuring the negative interference between work and family/home (Carlson & Frone, 2003; Carlson et al., 2000; Curbow et al., 2003; Frone et al., 1992; Geurts et al., 2005; Grzywacz & Bass, 2003; Grzywacz & Marks, 2000; Holahan & Gilbert, 1979; Kirchmeyer, 1992; Kopelman et al., 1983; Marks & McDermid, 1996; Netemeyer et al., 1996; Premeaux et al., 2007; Small & Riley, 1990; Stevens, Minnott, Mannon & Kiger, 2007; Stephens & Sommer, 1996). Based on the theoretical perspective, as well as previous findings and recommendations regarding work-life interference measurement (Bellavia & Frone, 2005; Frone, 2003; Kirchmeyer, 1992; Small & Riley,
1990; Tetrick & Buffardi, 2006), certain criteria were developed for the evaluation of the items: (1) items should only fit one of the dimensions (i.e. specify a clear direction with an origin in one domain (e.g. work) and an impact on a role in the other domain (e.g. spouse); (2) items should not confound with external variables; and (3) items should be stated in general terms (e.g. not include-time, strain or behaviour-based types of interaction).

During the item evaluation process, two work-family subject matter experts (i.e. researchers in the area of work and family) independently classified the items into the following categories using the above-mentioned criteria: items 100% correct or applicable for the new scale; items mostly correct but which may require some changes in terms of the wording; items where some part of the item could be used; time-, strain- and behaviour-based items; items not applicable at all; and items where some words may be used to construct new items. The classifications of these judges (researchers) were then brought together in order to discuss which items could be used in the process that followed. During this process of item evaluation, 77 items were discarded based on the evaluation criteria and categorisation. The remaining items were then used in the item development process which followed.

**Item development**

During the item development phase, the remaining items from the initial item pool were re-evaluated and adapted in order to fit the different proposed definitions in the best possible way. Some items were also adapted in terms of wording for items to correspond with the selected frequency-based response format scale: How often does it happen that ... with responses varying between 0 ('never'), 1 ('some of the time'), 2 ('most of the time'), and 3 ('always'). The decision to use a frequency-based response format scale where no midpoint is provided was based on suggestions from previous researchers in the work-life interaction field (Bellavia & Frone, 2005; Kirchmeyer, 1992). According to these researchers, frequency data and responses are less biased and fixed-frequency response anchors can shape respondents’ answers and can ensure a positive or negative standing on each question.

In addition to the re-adapted items, new items were written for the dimensions that were not present in the initial item pool (e.g. religion/spirituality items) and for scales that did not have a sufficient number of items that could be used from the initial item pool. Additional items were thus developed in order to ensure that each dimension contained a representative set of items. According to
Research approach

A cross-sectional survey design was used to collect the data. Cross-sectional designs are used to observe a group of people at a particular point in time — for a short period, such as a day or a few weeks (Du Plooy, 2002).

Participants and procedure

During the pilot study, the newly developed 89-item, multidimensional work-nonwork interference instrument was administered to employees working at a South African mine \( (n = 245) \), where a response rate of 49% was obtained. Fifty-five percent of the respondents were female, and nearly sixty-four percent (63.70%) of the respondents indicated Afrikaans or English as their home language, while 36% indicated African languages as their preferred language. The majority of the participants were either white (54.30%) or African (38.80%). The majority of the employees possessed a grade 12 certificate (33.50%) or a university degree (25.70%). Nearly 60% of the participants were between the ages of 20 and 39; 22.40% of the participants were between 40 and 49; while only 15.50% were older than 50.

Item refinement

In order to establish which items were most desirable to retain for further analyses, a process of item elimination was followed. For this process, certain guidelines were used from literature and previous studies (Curbow, Spratt, Ungaretti, McDonell & Breckler, 2006; DeVellis, 2003; Foxcroft & Roodt, 2005) to determine poor performing items. This process included the investigation of descriptive statistics (mean, standard deviation, variance and distribution), inter-item correlations, item-total correlations and the qualitative investigation of items highly redundant in terms of wording. Refer to appendix B for descriptive statistics and item-total correlations of initial work-nonwork interference items and nonwork-work interference items.

Item elimination process

To eliminate poor items, the following cut-off criteria were used: (1) items with a mean closer to the centre of the range of possible scores are more desirable; (2) items with low standard deviations (<1.00) are less desirable; and (3) items with high variance are more desirable. With regard to the inter-item correlations, more desirable items are items that have a moderate to strong correlation
with all the other items. Inter-item correlations should be substantial, with a minimum significant level of 0.05. The items that did not correlate well with other items were therefore discarded. Regarding item-total correlations, items with higher item-total correlations are more desirable than items with low values. Positive item-total correlations indicate that the items measure the same thing that is measured by the test. An item-total correlation near zero indicates that the item does not discriminate between high and low scores. After the above-mentioned criteria were taken into consideration, all the items were evaluated in a more qualitative manner, where attention was paid to item wording. This qualitative elimination technique formed a crucial part in the elimination process of items in the pilot study, where various items were discarded and changed.

After the item elimination process was completed, only 48 items were retained (24 W-NWI items and 24 NW-WI items). Based on recommendations from scale development literature, the same number of items for all the dimensions were retained (Carlson et al., 2006). As a result, the scale used in the item evaluation study (Phase 2) included only six items for each dimension.

**Phase 2: Item evaluation**

Following the scale development and the pilot study, 48 items were retained after the pilot study to measure the various dimensions of work-nonwork interference. According to DeVellis (2003), shorter scales are better because they place less of a burden on respondents, which implied that further item elimination was needed. The main objective of the item evaluation study was to establish how the remaining items of the new scale were performing, which items could be eliminated and which items were most desirable to retain for further validation. The first part of the item elimination of the item evaluation study was based on the Rasch Model (Rasch, 1960) whereas the second part gave attention to item correlations.

**Background of the Rasch Model**

In psychometric literature, the Classical Test Theory (CTT) and Item Response Theory (IRT) are recognised as fundamental theories for the development and analysis of standardised instruments. According to Allen and Yen (2002), CTT relies on minimal assumptions which can be interpreted with relative ease. CTT is, however, based on the fundamental assumption of an individual having a true score and an observed score, where the differences between the two scores are attributed to measurement error. The main criticism against this theory lies in the observed score, which relies on
the content of the instrument (test), making it possible for individuals with similar trait levels to score differently depending on the item bias (Fan, 1998).

In contrast to the CTT, the fundamental assumption associated with the IRT is one where the latent traits of individuals are independent of the content of an instrument, thus enabling researchers to compare various individuals' latent traits sensibly even if different items are applied. According to Meads and Bentall (2008), IRT is a general statistical theory about item (question) and scale (questionnaire) performance and how that performance relates to the factor(s) that is/are measured by the items in the scale. In IRT, there are different models with varying complexities. These models include one-, two- and three-parameter IRT models where the simplest logistic latent trait IRT model is the Rasch one-parameter model (Rasch, 1960).

The basic criterion of invariance, which is a crucial feature of fundamental measurement, is reflected in the Rasch model (Bond & Fox, 2007). Since invariance means that an instrument is required to work in the same way for all individuals, invariant functioning across any group of respondents is implied. According to Bond and Fox (2007), the Rasch model states that the probability of a person to correctly answer an item is a logistic function of the person's ability minus the item difficulty. Within the framework of the Rasch model, person ability refers to the level of the construct being measured, whereas the item difficulty refers to the intensity of the item rather than the difficulty of the items. Additionally, the Rasch model also takes into account the different categories on the scales, where persons with the same ability (or level of the construct) will respond differently for items with different intensities. It therefore indicates that the probability of the person to select a certain point on a scale is the logistic function of the person's ability minus the item difficulty (intensity), plus the difficulty of the threshold between the current scale category and the next category (Bond & Fox, 2007).

Recently, the use of Rasch analysis specifically for the development and analysis of questionnaires or instruments has increased within the field of psychology and psychiatry (Betemps & Baker, 2004; Cervellione, Lee & Bonanno, 2009; Merrell & Tymms, 2005; Pallant & Tennant, 2007; Prieto, Alonso & Lamarca, 2003). The use of Rasch analysis in assessing questionnaire scaling properties is preferred by several authors, as opposed to the use of classical test theory and factor analysis (Prieto et al., 2003; Wright, 1996), given that factor analysis does not necessarily provide a conceptual linear assessment of the construct and may provide misleading evidence (Wright, 1999; Waugh & Chapman, 2005). According to Meads and Bentall (2008), the use of the Rasch model
only informs whether items can be considered unidimensional; however, it is only once unidimensionality is confirmed that it is justifiable to claim that the items measure one construct. Although the Rasch model has recently been used in some South African studies (De Bruin & Taylor, 2005; Kagee & De Bruin, 2007; Maree, Maree & Collins, 2008a; Maree, Maree & Collins, 2008b; Mpofu et al., 2006; Potgieter, Davidowitz & Venter, 2008; Rothmann, (in press); Taylor, 2008) no studies could be found which use the Rasch model specifically for scale development within the field of work and family research.

Research approach

For the item evaluation study a cross-sectional survey design was used to collect the data and to attain the research objectives. Cross-sectional designs are used to observe a group of people at a particular point in time – for a short period, such as a day or a few weeks (De Plooy, 2002). The design is also used to assess interrelationships among variables within a population and will thus help to achieve the various specific objectives of this research (Struwig & Stead, 2001).

Participants and procedure

The study sample was obtained from employees working at a tertiary institution in the North West Province. Only married employees with children were selected to participate in the study \( (n = 366) \). This decision was based on the conceptual development of the instrument which is constricted to specific nonwork role interference, which include specific roles such as that of spouse and parent. Prior to the study, permission was obtained from (and granted by) the university through the Ethics Committee. In order to attain the specific sample, lists of all married employees with children were obtained from the various faculties and departments at the university. Using this information, the questionnaires were personally distributed to the selected employees with the help of field workers. In the questionnaires a letter was included which explained the goal and importance of the study. Although the identities of these selected employees were known at first, questionnaires were returned anonymously. Participants were also assured of the anonymity and confidentiality with which the information was handled. The participants were given two to three weeks to complete the questionnaires, after which they were personally collected by the field workers. Although most of the participants were white \( (80,35\%) \), participants from African \( (14,75\%) \), Indian \( (3,00\%) \) and Coloured \( (0,80\%) \) groups were also included in the sample. Males \( (34,70\%) \) as well as females \( (65,00\%) \) were included in the study. The majority of participants had postgraduate degrees
(47.81%), while other participants possessed university degrees (12.57%), technical college diplomas (6.00%), technicon diplomas (8.20%) or grade 12 certificates (19.95%). In total, 26.77% of the participants worked as administrative assistants, while 25.68% worked within the administrative office. The majority of participants worked within academic faculties, including the faculty of health sciences (13.39%); natural sciences (11.46%); education (10.38%); engineering (9.58%); arts (5.83%); economic and management sciences (6.56%); and the faculty of theology (2.70%). A number of participants worked as lecturers (9.84%), senior lecturers (11.46%), associated professors (6.56%) and professors (7.10%).

**Statistical analysis**

The Rasch analyses were carried out using the Winsteps program (Linacre, 2005). According to Tennant and Conaghan (2007), the Rasch measurement model has become the standard for modern psychometric evaluations of outcome scales and is a unidimensional measurement model which is based on the assumption that the items summed together form a unidimensional scale. With the Rasch model the operating characteristics of all the items are examined across the whole continuum of a latent trait, seeing that the model is based on latent trait theory (Hagquist, 2007). With the development of the new instrument in this study, this measurement model is very much applicable, and is used to evaluate all the items measuring the various different dimensions of the work-nonwork interference instrument. For the purpose of the analyses in this item evaluation study, the assumption is made that the newly developed instrument consists of various different unidimensional dimensions where each dimension was analysed separately using Rasch analyses. The evaluation of the overall dimensionality of the work-nonwork interference instrument, however, was not yet evaluated or addressed in this study, since the main objective was first to evaluate the performance of items in each dimension.

A crucial feature of fundamental scale development is the number of items used in a scale to measure the specific construct(s) (DeVellis, 2003). In psychometric literature, the number of items is closely related to the reliability of the scale, which is one of the most important indicators of a scale's quality (DeVellis, 2003; Foxcroft & Roodt, 2005). According to DeVellis (2003), researchers are constantly confronted with the matter of developing shorter scales with fewer items without influencing or compromising the reliability of the scale. Various researchers have indicated that shorter scales are more advisable as they place less of a burden on respondents (Netemeyer et al., 1996; Stephens & Sommer, 1996). The responsibility is thus on researchers to develop
instruments with the fewest possible items, while still measuring the construct(s) adequately. Thus, in order to obtain only the items which most adequately represent the construct(s), special attention is given to item evaluation and item elimination during scale development.

During the Rasch analyses consideration was given to issues relating to reliability, item measures and item fit. Where traditionally a Cronbach alpha is calculated to express the reliability of an instrument, the Rasch model provides two reliability estimates, i.e. the person reliability and the item reliability. The person reliability index measures the degree to which the scale can differentiate persons on the measured variables (by subtracting the average person measurement variance from the observed person variance) (Cervellione et al., 2009; Fox & Jones, 1998), whereas the item reliability index measures the degree to which the relative difficulties of items are differentiated along the measured variables (by dividing true item variances by observed item variances) (Cervellione et al., 2009; Fox & Jones, 1998). In other words: the extent to which the items in each dimension are able to discriminate between persons and items, and the ability to measure the same latent trait. With these reliability calculations, an adjustment for measurement errors is made by not using raw scores, and is a very important advantage for using the Rasch reliability in assessing the functioning of an instrument (Boone & Rogan, 2005). In both these cases of reliabilities, values range from 0 to 1, where a value greater than or equal to 0.80 is considered acceptable (Fox & Jones, 1998). Similarly, a separation index is measured which estimates the spread of a person, or items, on the measured variables. In order to indicate adequate separation for persons, items or both, the separation index should be at least 2.00 (Fox & Jones, 1998).

In addition to reliability, Rasch analyses also allow for closer investigation of items (i.e. item measures and item fit). With item measures, the intensity with which the items measure the latent trait is investigated, whereas item fit relates to how probable a person’s response is. According to Boone and Rogan (2005), one of the most important aspects to consider when developing or analysing an instrument is to identify problematic items. Fit statistics are usually used to identify persons or items that behave idiosyncratically, i.e. items which are answered in inconsistent and erratic ways for whatever reason. In the Rasch model, two chi-square-based fit statistics are used to report the item fit, namely infit and outfit. According to Linacre (2005), outfit statistics are more sensitive to responses where the item difficulty and person ability differs drastically and are more likely to indicate lucky guesses and careless mistakes, while infit statistics report smaller differences in the comprehension of the items. Infit statistics are usually used to identify problems
with the measurement items. According to Bond and Fox (2007), reasonable item mean square ranges for infit and outfit for Likert surveys data are between 0.60 and 1.40.

The results of the Rasch analysis were used to eliminate undesirable items from the different dimensions in the instrument. Although the Rasch results did indicate problematic items, which were subsequently eliminated, further analyses were needed to attain fewer items that could adequately measure the interference between work and nonwork roles. In order to eliminate items that correlate exceptionally high with items from other dimensions, or exceptionally low with items from the same dimensions, item correlations were investigated.

RESULTS

In the results to follow, a summary of the reliability and separation index as well as the measure and fit statistics for the items based on the Rasch analysis are given for all the various dimensions of the newly developed instrument. Thereafter, results pertaining to the investigation of item correlations are given.

Rasch analyses

Reliability and Separation Index
The person and item reliability and separation indices for the various dimensions are presented in Table 1.
Table 1

Summary of item fit and person fit statistics for the various work→nonwork interference and nonwork→work interference dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Average Measure (SD)</th>
<th>Separation</th>
<th>Reliability</th>
<th>Average Infit MNSQ (SD)</th>
<th>Average Outfit MNSQ (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work-Parent</td>
<td>0,00 (0,42)</td>
<td>3,65</td>
<td>0,93</td>
<td>0,99 (0,31)</td>
<td>1,00 (0,33)</td>
</tr>
<tr>
<td>Work-Spouse</td>
<td>0,00 (0,56)</td>
<td>4,35</td>
<td>0,95</td>
<td>0,99 (0,27)</td>
<td>0,96 (0,30)</td>
</tr>
<tr>
<td>Work-Religion</td>
<td>0,00 (0,64)</td>
<td>4,93</td>
<td>0,96</td>
<td>1,03 (0,23)</td>
<td>0,97 (0,25)</td>
</tr>
<tr>
<td>Work-Domestic</td>
<td>0,00 (0,25)</td>
<td>1,56</td>
<td>0,71</td>
<td>0,99 (0,21)</td>
<td>0,94 (0,22)</td>
</tr>
<tr>
<td>Parent-Work</td>
<td>0,00 (0,79)</td>
<td>5,98</td>
<td>0,97</td>
<td>1,03 (0,19)</td>
<td>0,94 (0,21)</td>
</tr>
<tr>
<td>Spouse-Work</td>
<td>0,00 (0,56)</td>
<td>4,35</td>
<td>0,95</td>
<td>0,99 (0,27)</td>
<td>0,96 (0,30)</td>
</tr>
<tr>
<td>Religion-Work</td>
<td>0,00 (0,52)</td>
<td>3,61</td>
<td>0,93</td>
<td>0,96 (0,22)</td>
<td>0,99 (0,20)</td>
</tr>
<tr>
<td>Domestic-Work</td>
<td>0,00 (0,51)</td>
<td>3,96</td>
<td>0,94</td>
<td>1,01 (0,11)</td>
<td>0,97 (0,14)</td>
</tr>
</tbody>
</table>

Person statistics for the various work→nonwork interference and nonwork→work interference dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Average Measure (SD)</th>
<th>Separation</th>
<th>Reliability</th>
<th>Average Infit MNSQ</th>
<th>Average Outfit MNSQ (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work-Parent</td>
<td>-1,41 (1,93)</td>
<td>1,95</td>
<td>0,79</td>
<td>1,00 (0,81)</td>
<td>1,00 (0,85)</td>
</tr>
<tr>
<td>Work-Spouse</td>
<td>-2,17 (2,32)</td>
<td>2,12</td>
<td>0,82</td>
<td>0,97 (0,96)</td>
<td>0,96 (1,00)</td>
</tr>
<tr>
<td>Work-Religion</td>
<td>-2,35 (1,67)</td>
<td>1,41</td>
<td>0,66</td>
<td>1,01 (0,94)</td>
<td>0,96 (1,01)</td>
</tr>
<tr>
<td>Work-Domestic</td>
<td>-1,96 (2,92)</td>
<td>2,59</td>
<td>0,87</td>
<td>0,93 (0,98)</td>
<td>0,94 (0,99)</td>
</tr>
<tr>
<td>Parent-Work</td>
<td>-2,97 (1,65)</td>
<td>1,31</td>
<td>0,63</td>
<td>0,99 (0,75)</td>
<td>0,94 (0,81)</td>
</tr>
<tr>
<td>Spouse-Work</td>
<td>-2,17 (2,32)</td>
<td>2,12</td>
<td>0,82</td>
<td>0,97 (0,96)</td>
<td>0,96 (1,00)</td>
</tr>
<tr>
<td>Religion-Work</td>
<td>-1,97 (0,95)</td>
<td>0,48*</td>
<td>0,19*</td>
<td>1,02 (0,59)</td>
<td>0,99 (0,58)</td>
</tr>
<tr>
<td>Domestic-Work</td>
<td>-2,58 (1,68)</td>
<td>1,41</td>
<td>0,67</td>
<td>0,99 (0,82)</td>
<td>0,97 (0,84)</td>
</tr>
</tbody>
</table>

* Considerable low person separation and reliability estimates.

Values indicated in bold, show separation and reliability values lower or higher than the guideline.

Although the item separation and reliability indices were overall very good for the majority of dimensions, estimates for the work-domestic dimension were lower than the guidelines of Fox and Jones (1998) (item separation, 1,56 and reliability - 0,71). In addition, the item separation index for the parent-work dimension was 5,98, which is considerably higher than the minimum desired 2,00. Regarding person separation and reliability estimates, the values of various dimensions were somewhat lower than the guideline of 2,00 (for separation) and 0,80 or higher (for reliability) (Fox & Jones, 1998), including work-parent (1,95 and 0,79), work-religion (1,41 and 0,66), parent-work.
(1.31 and 0.63) and domestic–work dimensions (1.41 and 0.67). Considerable low person separation (0.48) and reliability (0.19) estimates were obtained for the religion–work dimension, indicating major possible problems with this dimension.

Regarding person average measures, the dimension with the highest average measure was the work–parent dimension (-1.41, SD = 1.93), whereas the lowest average measure was the parent–work dimension (-2.97, SD = 1.65), indicating that in the analyses of the work–parent dimension the average person measure was higher than in the analyses of the parent–work dimension. Comparisons between these scores are possible since all the scores are standardised on the same scale. Finally, the average item–fit was acceptable for all items indicating that overall there were no major problems with item–fit for the dimensions. The average person–fit was acceptable for all respondents indicating no unexpected answers, indicating that, on average, the respondents did not underfit or overfit (guideline between 0.60 and 1.40; Bond & Fox, 2007).

**Measure and Fit statistics for items**

In addition to the average measures reported above, the measure and infit and outfit mean squares are presented in Table 2 and Table 3 below. With the measure values, an indication can be obtained regarding the intensity of the items. The infit and outfit mean squares indicate the predictability of items.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Item fit statistics for the work→nonwork interference items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>Items</td>
</tr>
<tr>
<td></td>
<td>...you have to ask someone else to help out with your child(ren) (e.g. babysitting, transporting your children, picking up your children from school/day-care centre) because you have to take care of work-related aspects?</td>
</tr>
<tr>
<td>Work-Parent</td>
<td>-0.49</td>
</tr>
<tr>
<td>Item 6</td>
<td>...you do not spend quality time with your children in the evenings / over weekends because you have work to do?</td>
</tr>
<tr>
<td>Item 4</td>
<td>0.71</td>
</tr>
<tr>
<td>Item 1</td>
<td>...you are unable to attend important events of your child(ren) because of work-related obligations?</td>
</tr>
<tr>
<td>Item 0</td>
<td>-0.17</td>
</tr>
</tbody>
</table>
### Table 2 continued

**Item fit statistics for the work→nonwork interference items**

<table>
<thead>
<tr>
<th>Item</th>
<th>Question</th>
<th>Measure</th>
<th>Inf. Mean</th>
<th>Outfit Mean</th>
<th>Squared Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 3</td>
<td>...your relationship with your child(ren) suffers because of your work?</td>
<td>0.19</td>
<td>0.81</td>
<td>0.83</td>
<td></td>
</tr>
<tr>
<td>Item 5</td>
<td>...because of your work, you find it difficult to be the kind of parent you would like to be?</td>
<td>0.20</td>
<td>0.72</td>
<td>0.72</td>
<td></td>
</tr>
<tr>
<td>Item 2</td>
<td>...your work keeps you from your child(ren) more than you would like?</td>
<td>-0.43</td>
<td>0.64</td>
<td>0.62</td>
<td></td>
</tr>
<tr>
<td>Work-Spouse</td>
<td>...you spend evenings/weekends on work-related activities instead of spending time with your spouse/partner?</td>
<td>-0.67</td>
<td>1.55</td>
<td>1.59</td>
<td></td>
</tr>
<tr>
<td>Item 4</td>
<td>...your work keeps you from maintaining a good relationship with your spouse/partner?</td>
<td>0.25</td>
<td>1.08</td>
<td>1.02</td>
<td></td>
</tr>
<tr>
<td>Item 2</td>
<td>...arrangements you make with your spouse/partner have to be cancelled/rescheduled because of work-related obligations?</td>
<td>0.24</td>
<td>0.86</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>Work-Spouse</td>
<td>...your work causes problems in the relationship with your spouse/partner?</td>
<td>0.98</td>
<td>0.84</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>Item 3</td>
<td>...your job keeps you from doing the best you can for your spouse/partner?</td>
<td>-0.25</td>
<td>0.82</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>Item 1</td>
<td>...your marriage/relationship with your spouse/partner suffers because of your work?</td>
<td>-0.53</td>
<td>0.80</td>
<td>0.73</td>
<td></td>
</tr>
<tr>
<td>Work-Religion</td>
<td>...when you are busy with religious/spiritual matters (e.g. praying, listening to a sermon, meditating) you are thinking about things at work?</td>
<td>-1.29</td>
<td>1.31</td>
<td>1.36</td>
<td></td>
</tr>
<tr>
<td>Item 1</td>
<td>...your work interferes with your religious/spirituality?</td>
<td>0.35</td>
<td>1.36</td>
<td>1.23</td>
<td></td>
</tr>
<tr>
<td>Item 2</td>
<td>...because of your work, it is difficult to be the kind of religious/spiritual person you would like to be?</td>
<td>-0.13</td>
<td>1.00</td>
<td>0.94</td>
<td></td>
</tr>
<tr>
<td>Item 5</td>
<td>...you are kept from practising religious/spiritual activities because of your work schedule?</td>
<td>0.75</td>
<td>0.91</td>
<td>0.73</td>
<td></td>
</tr>
<tr>
<td>Item 4</td>
<td>...you have to cancel religious/spiritual activities because of work that needs to be done?</td>
<td>0.23</td>
<td>0.83</td>
<td>0.81</td>
<td></td>
</tr>
<tr>
<td>Item 3</td>
<td>...because your work is demanding, it is difficult for you to attend religious/spiritual activities during the week or over weekends?</td>
<td>0.08</td>
<td>0.76</td>
<td>0.72</td>
<td></td>
</tr>
<tr>
<td>Work-Domestic</td>
<td>...you do not get to spend time taking care of your house/garden because you spend that time doing work-related things?</td>
<td>0.53</td>
<td>1.31</td>
<td>1.30</td>
<td></td>
</tr>
<tr>
<td>Item 3</td>
<td>...your job is so demanding, you find it difficult to also run your household?</td>
<td>-0.04</td>
<td>1.25</td>
<td>1.17</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3

**Item fit statistics for the nonwork→work interference items**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Items</th>
<th>Measure</th>
<th>Infit Mean Square</th>
<th>Outfit Mean Square</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parent-Work</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 4</td>
<td>...your work is not done in time because you have to take care of your children?</td>
<td>0.33</td>
<td>1.36</td>
<td>1.23</td>
</tr>
<tr>
<td>Item 6</td>
<td>...due to parental obligations, you are unable to attend to important events at work?</td>
<td>0.36</td>
<td>1.11</td>
<td>1.01</td>
</tr>
<tr>
<td>Item 3</td>
<td>...you have to call in late / have to leave work early to attend to the needs of your child(ren)?</td>
<td>-1.13</td>
<td>1.06</td>
<td>1.04</td>
</tr>
<tr>
<td>Item 1</td>
<td>...you find it difficult to concentrate at work, because you worry about your child(ren)?</td>
<td>-1.05</td>
<td>1.01</td>
<td>1.03</td>
</tr>
<tr>
<td>Item 5</td>
<td>...taking care of your child(ren) makes it difficult for you to do your best at work?</td>
<td>0.59</td>
<td>0.88</td>
<td>0.73</td>
</tr>
<tr>
<td>Item 2</td>
<td>...your work suffers because you need to take care of your child(ren)?</td>
<td>0.90</td>
<td>0.74</td>
<td>0.59</td>
</tr>
<tr>
<td><strong>Spouse-Work</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 6</td>
<td>...because of your marriage/relationship with your spouse/partner, you are unable to pursue your work goals or work interests?</td>
<td>0.18</td>
<td>1.19</td>
<td>1.11</td>
</tr>
<tr>
<td>Item 3</td>
<td>...you have responsibilities towards your spouse/partner that you need to take care of during office hours?</td>
<td>-1.07</td>
<td>1.17</td>
<td>1.15</td>
</tr>
<tr>
<td>Item 4</td>
<td>...your spouse/partner disturbs or distracts you while you are working?</td>
<td>-0.75</td>
<td>1.07</td>
<td>1.08</td>
</tr>
<tr>
<td><strong>Spouse-Work</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 1</td>
<td>...problems in the relationship with your spouse/partner make it difficult for you to concentrate at work?</td>
<td>-0.12</td>
<td>1.00</td>
<td>0.95</td>
</tr>
<tr>
<td>Item 2</td>
<td>...because your spouse/partner makes demanding requests, you are unable to perform effectively in your job?</td>
<td>1.09</td>
<td>0.97</td>
<td>0.69</td>
</tr>
<tr>
<td>Item 5</td>
<td>...your relationship with your spouse/partner interferes with your work?</td>
<td>0.67</td>
<td>0.83</td>
<td>0.61</td>
</tr>
</tbody>
</table>
Table 3 continued

*Item fit statistics for the nonwork→work interference items*

<table>
<thead>
<tr>
<th>Religion-Work</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 3  ...your religious/spiritual beliefs influence the type of tasks at work you would commit yourself to?</td>
<td>-1.02</td>
<td>1.40</td>
<td>1.34</td>
</tr>
<tr>
<td>Item 2  ...your religious/spiritual beliefs create uneasiness with work colleagues?</td>
<td>0.29</td>
<td>0.98</td>
<td>1.18</td>
</tr>
<tr>
<td>Item 6  ...due to your participation in religious/spiritual activities, you do not pay full attention to certain aspects of your job?</td>
<td>0.18</td>
<td>1.02</td>
<td>0.93</td>
</tr>
<tr>
<td>Item 4  ...aspects that bother you in your religious/spiritual life, keep you from enjoying your work?</td>
<td>-0.11</td>
<td>0.88</td>
<td>0.91</td>
</tr>
<tr>
<td>Item 5  ...because of your religious/spiritual beliefs, you are unwilling to accept certain tasks at your work?</td>
<td>0.69</td>
<td>0.77</td>
<td>0.81</td>
</tr>
<tr>
<td>Item 1  ... because of your responsibility towards certain religious/spiritual activities, you find it difficult to attend to certain work-related activities?</td>
<td>-0.09</td>
<td>0.72</td>
<td>0.81</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Domestic-Work</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 4  ...you have to arrange, schedule or perform domestic activities during work hours or at work?</td>
<td>-0.69</td>
<td>1.23</td>
<td>1.25</td>
</tr>
<tr>
<td>Item 1  ...you have difficulty concentrating on your work, because you are preoccupied with domestic matters at home?</td>
<td>0.16</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Item 3  ...you have to rearrange your work schedule because you have to take care of domestic matters at home?</td>
<td>-0.72</td>
<td>0.99</td>
<td>0.99</td>
</tr>
<tr>
<td>Item 5  ...activities and chores at your home interfere with your work?</td>
<td>0.50</td>
<td>0.83</td>
<td>0.83</td>
</tr>
<tr>
<td>Item 6  ...domestic responsibilities reduce the effort you invest in your job?</td>
<td>0.30</td>
<td>0.94</td>
<td>0.94</td>
</tr>
<tr>
<td>Item 2  ...domestic activities interfere with your work?</td>
<td>0.44</td>
<td>0.83</td>
<td>0.83</td>
</tr>
</tbody>
</table>

*Lowest measure values: Highest measure values: infit and outfit mean square outside the guideline of 0.60 and 1.40, Bond & Fox, 2007)*

Regarding the fit statistics presented in Table 3, it is evident that item 3 of the parent-work dimension had the lowest intensity, while item 2 seemed to measure with the highest intensity and seemed to overfit (outfit=0.59). Fit statistics for the spouse-work dimension indicated that item 3 had the lowest intensity, while item 2 measured with the highest intensity. For the religion-work items, item 3 indicated underfit (infit=1.40) and measured with the lowest intensity, while item 5 measured with the highest intensity. Although this item underfits, it is in line with the guideline of 1.4. Regarding the domestic–work dimension, item 3 had the lowest intensity, while item 5 had the highest intensity.
Based on the above Rasch results, the following items should be eliminated from the work→nonwork interference dimensions: WPI item 6, WSI item 5, WDI item 3 and 6. The only item that should be eliminated from the nonwork→work interference dimensions based on the Rasch analyses is RWI item 3.

**Item correlations**

Subsequent to the Rasch analyses, items were also evaluated and investigated using item correlations. In order to ensure items that could discriminate well between dimensions, it is advisable to eliminate items with low correlations within dimensions and high correlations with items from other dimensions and only retain items that correlate high within dimensions (DeVellis, 2003). Item correlations for the W-NWI items and NW-WI items are indicated in Table 4 and Table 5. For illustrative purposes, low correlations within dimensions are in bold blocked together, while high correlations with items from other dimensions are in bold outside blocks.
<table>
<thead>
<tr>
<th></th>
<th>WR.1</th>
<th>WR.2</th>
<th>WR.3</th>
<th>WR.4</th>
<th>WR.5</th>
<th>WR.6</th>
<th>WR.7</th>
<th>WR.8</th>
<th>WR.9</th>
<th>WR.10</th>
<th>WR.11</th>
<th>WR.12</th>
<th>WR.13</th>
<th>WR.14</th>
<th>WR.15</th>
<th>WR.16</th>
<th>WR.17</th>
<th>WR.18</th>
<th>WR.19</th>
<th>WR.20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work-Parent item 2</td>
<td>0.63</td>
<td></td>
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<tr>
<td>Work-Parent item 3</td>
<td>0.53</td>
<td>0.70</td>
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<tr>
<td>Work-Parent item 4</td>
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<td>0.61</td>
<td>0.60</td>
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<tr>
<td>Work-Parent item 5</td>
<td>0.60</td>
<td>0.77</td>
<td>0.71</td>
<td>0.62</td>
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</tr>
<tr>
<td>Work-Spouse item 1</td>
<td>0.51</td>
<td>0.58</td>
<td>0.77</td>
<td>0.60</td>
<td>0.62</td>
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</tr>
<tr>
<td>Work-Spouse item 2</td>
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<td>0.48</td>
<td>0.54</td>
<td>0.69</td>
<td>0.55</td>
<td>0.61</td>
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</tr>
<tr>
<td>Work-Spouse item 3</td>
<td>0.55</td>
<td>0.66</td>
<td>0.65</td>
<td>0.68</td>
<td>0.72</td>
<td>0.67</td>
<td>0.62</td>
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<tr>
<td>Work-Spouse item 4</td>
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<td>0.43</td>
<td>0.58</td>
<td>0.61</td>
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<tr>
<td>Work-Spouse item 5</td>
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<td>0.59</td>
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</tr>
<tr>
<td>Work-Domestic item 1</td>
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<td>0.70</td>
<td>0.60</td>
<td>0.70</td>
<td>0.65</td>
<td>0.54</td>
<td>0.65</td>
<td>0.54</td>
<td>0.60</td>
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</tr>
<tr>
<td>Work-Domestic item 2</td>
<td>0.54</td>
<td>0.67</td>
<td>0.66</td>
<td>0.63</td>
<td>0.66</td>
<td>0.61</td>
<td>0.59</td>
<td>0.67</td>
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*Items indicated in bold are items to be eliminated*
Table 5

Item correlations for the nonwork→work interference items

|                  | I1  | I2  | I3  | I4  | I5  | I6  | I7  | I8  | I9  | I10 | I11 | I12 | I13 | I14 | I15 | I16 | I17 | I18 | I19 | I20 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Parent-Work Item 2 | 0.39 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Parent-Work Item 3 | 0.29 | 0.44 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Parent-Work Item 4 | 0.29 | 0.47 | 0.55 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Parent-Work Item 5 | 0.42 | 0.54 | 0.39 | 0.41 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Parent-Work Item 6 | 0.35 | 0.48 | 0.31 | 0.44 | 0.46 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Spouse-Work Item 1 | 0.33 | 0.32 | 0.19 | 0.25 | 0.30 | 0.50 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Spouse-Work Item 2 | 0.34 | 0.45 | 0.18 | 0.22 | 0.63 | 0.28 | 0.42 |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Spouse-Work Item 3 | 0.34 | 0.40 | 0.32 | 0.52 | 0.33 | 0.26 | 0.27 | 0.35 |     |     |     |     |     |     |     |     |     |     |     |     |
| Spouse-Work Item 4 | 0.28 | 0.22 | 0.25 | 0.22 | 0.28 | 0.26 | 0.24 | 0.34 | 0.27 |     |     |     |     |     |     |     |     |     |     |
| Spouse-Work Item 5 | 0.35 | 0.39 | 0.27 | 0.36 | 0.38 | 0.33 | 0.53 | 0.52 | 0.33 | 0.39 |     |     |     |     |     |     |     |     |     |
| Spouse-Work Item 6 | 0.32 | 0.39 | 0.25 | 0.40 | 0.44 | 0.50 | 0.56 | 0.43 | 0.21 | 0.27 | 0.45 |     |     |     |     |     |     |     |     |
| Domestic-Work Item 1 | 0.55 | 0.51 | 0.27 | 0.32 | 0.57 | 0.42 | 0.46 | 0.48 | 0.38 | 0.29 | 0.46 | 0.35 |     |     |     |     |     |     |     |
| Domestic-Work Item 2 | 0.34 | 0.49 | 0.41 | 0.40 | 0.45 | 0.39 | 0.35 | 0.41 | 0.35 | 0.27 | 0.38 | 0.33 | 0.49 |     |     |     |     |     |     |
| Domestic-Work Item 3 | 0.35 | 0.39 | 0.43 | 0.35 | 0.45 | 0.31 | 0.20 | 0.29 | 0.32 | 0.35 | 0.28 | 0.30 | 0.41 | 0.42 |     |     |     |     |     |
| Domestic-Work Item 4 | 0.39 | 0.40 | 0.37 | 0.28 | 0.37 | 0.25 | 0.28 | 0.35 | 0.53 | 0.27 | 0.35 | 0.28 | 0.43 | 0.39 | 0.41 |     |     |     |     |
| Domestic-Work Item 5 | 0.38 | 0.53 | 0.34 | 0.43 | 0.56 | 0.42 | 0.35 | 0.40 | 0.31 | 0.51 | 0.42 | 0.38 | 0.49 | 0.61 | 0.47 | 0.38 |     |     |     |
| Domestic-Work Item 6 | 0.40 | 0.54 | 0.32 | 0.38 | 0.59 | 0.32 | 0.35 | 0.45 | 0.35 | 0.21 | 0.39 | 0.30 | 0.56 | 0.50 | 0.37 | 0.37 | 0.54 |     |     |
| Religion-Work Item 1 | 0.27 | 0.33 | 0.17 | 0.29 | 0.33 | 0.39 | 0.25 | 0.59 | 0.29 | 0.20 | 0.39 | 0.32 | 0.33 | 0.40 | 0.28 | 0.23 | 0.36 | 0.30 |     |
| Religion-Work Item 2 | 0.19 | 0.16 | 0.04 | 0.10 | 0.21 | 0.07 | 0.22 | 0.32 | 0.21 | 0.21 | 0.29 | 0.22 | 0.29 | 0.25 | 0.21 | 0.33 | 0.17 | 0.27 | 0.28 |
| Religion-Work Item 3 | 0.37 | 0.13 | 0.39 | 0.40 | 0.50 | 0.29 | 0.43 | 0.24 | 0.22 | 0.36 | 0.38 | 0.33 | 0.37 | 0.26 | 0.28 | 0.41 | 0.34 | 0.37 | 0.30 |
| Religion-Work Item 4 | 0.24 | 0.40 | 0.20 | 0.20 | 0.31 | 0.24 | 0.17 | 0.49 | 0.26 | 0.22 | 0.28 | 0.33 | 0.36 | 0.30 | 0.27 | 0.27 | 0.31 | 0.26 | 0.37 |
| Religion-Work Item 5 | 0.23 | 0.30 | 0.16 | 0.25 | 0.34 | 0.30 | 0.23 | 0.37 | 0.18 | 0.33 | 0.37 | 0.31 | 0.34 | 0.35 | 0.30 | 0.19 | 0.33 | 0.27 | 0.53 |

Items indicated in bold are items to be eliminated.
As can be seen in Table 4 and Table 5, several items have low correlations within dimensions, including WRI item 6, PWI item 1, SWI item 1, SWI item 3 and RWI item 2. Various items also had high correlations with items from other dimensions, including WPI item 3 with WSI item 1 and with WDI item 1, WDI item 4 with WPI item 4, WSI item 3 with WDI item 5, and RWI item 2 with WPI item 5. Regarding NW-WI items, items that correlated high between dimensions were PWI item 6 with SWI item 6, DWI item 1 with PWI item 1, 2 and 5, DWI item 5 with PWI items 2 and 5, DWI item 6 with PWI items 2 and 5.

To conclude, 18 items in total were eliminated (five in the Rasch analysis and 13 based on the item correlations). In total, 15 items were retained to measure W-NWI and 15 items to measure NW-WI. In the final work-nonwork interference instrument, work→nonwork interference was measured with: four WPI items (WPI1, 2, 4, and 5), four WSI items (WSI1, 2, 4, and 6), four WRI items (WRI1, 3, 4, and 5) and three WDI items (WDI1, 2, and 5) while nonwork→work interference were measured by four PWI items (PWl2, 3, 4, and 5), four SWI items (SWI2, 4, 5, and 6), four RWI items (RWI1, 4, 5, and 6), and three DWI items (DWI2, 3, and 4) (also refer to appendix B for summary of item evaluation process).

DISCUSSION

The interference between work and personal life is one of the central issues in the 21st century, since employees are attempting to balance or integrate their involvement in multiple social roles (Lingard & Francis, 2005). Although the interaction between work and personal life has received extensive attention in the work-family fields of research, various theoretical, empirical and measurement issues exist (Bellavia & Frone, 2005; Frone, 2003; Tetrick & Buffardi, 2006). In an attempt to address the limitations pertaining to measuring work-nonwork interference, the purpose of this study was to develop a work-nonwork interference instrument in order to measure the interference between work and nonwork roles. With the development of this new instrument, several of the theoretical and measurement limitations voiced by previous researchers were addressed, which illustrates various distinct advantages of this instrument over previous work-family measurements.

Firstly, researchers have raised theoretical issues regarding the dimensionality, directionality and narrow focus of interference between work and specific dimensions of previous work-family instruments (Bellavia & Frone, 2005; Frone, 2003; Geurts & Demerouti, 2003; Tetrick & Buffardi,
2006). Grounded in the theoretical perspective of the role identity theory (Burke, 1980; McCall & Simmons, 1966; Stryker, 1968), the newly developed W-NWI instrument measures the interference between work and different nonwork roles (i.e. parental role, spousal role, religion/spiritual role and domestic role). In contrast to previous work-family measurements, this instrument differentiates between various interference dimensions and is bidirectional in nature.

Secondly, various measurement issues were expressed relating to item development and item use (i.e. items confounded with external variables, causes and consequences, measuring different types of conflict and the inconsistent use of the number of items measuring each direction). In an attempt to address these issues close attention was given to the process of item development and item selection. Only items stated in general terms (e.g. items that do not include time, strain or behaviour-based types of interference) and items that are not confounded with external variables, causes or consequences were included. In addition, based on recommendations from scale development literature, the same amount of items for all the interference dimensions were retained (Carlson et al., 2006).

Thirdly, the issue of the use of certain response anchors and scales in work-family instruments was also addressed. As suggested by previous researchers, response anchors that do not provide additional information on the frequency of interference (e.g. agree/disagree) were not used. Instead, a frequency-based response format scale was used. The decision to use a frequency-based response format scale where no midpoint is provided was based on suggestions of Bellavia and Frone (2005) and Kirchmeyer (1992) who state that frequency data and responses are less biased. Additionally, fixed-frequency response anchors can shape respondents' answers and can ensure a positive or negative standing on each question.

Finally, in order to address the issue of scale development procedures, during the scale development process close adherence was given to procedures described in psychometric and scale development literature (Boyar et al., 2007; Carlson et al., 2006; DeVellis, 2003; Geurts et al., 2005; Kirchmeyer, 1992; Netemeyer et al., 1996). Particular attention was given to construct conceptualisation, item generation and evaluation, item development, and item refinement.

Careful attention was given to the evaluation of items in order to identify items that accurately capture the different dimensions of interference and to discard items that are inefficient. Different from previous work-family scale development studies, items of the work-nonwork interference
instrument were evaluated and eliminated based on the Rasch measurement model, a technique that has become the standard for modern psychometric evaluations of outcome scales (Tennant & Conaghan, 2007). Since Rasch is a unidimensional measurement model that is based on the assumption that all items summed together form a unidimensional scale, the operating characteristics of all the items are examined across the whole continuum of a latent trait (Hagquist, 2007; Rasch, 1960).

From the Rasch analyses, two problematic aspects emerged – problems relating to dimensions (i.e. Person separation and reliability problems) and problems relating to specific items (e.g. problematic items). Although no item separation and reliability problems were found in the majority of dimensions, based on person separation and reliability indices, some of the dimensions were not able to separate or discriminate adequately between persons (i.e. RWI, PWI, DWI, WRI, WPI, dimensions), indicating possible sample-specific problems.

The RWI dimension (and to an extent the WRI dimension) indicated the poorest discrimination between persons. The inclusion of a religion/spiritual role was largely based on the qualitative study of Koekemoer and Mostert (in press), where religion/spirituality emerged as a very strong personal dimension in the life of South African employees. A possible explanation for the poor discrimination between persons on this dimension might be the homogeneity of the sample, where the majority of the participants were white people working in a tertiary institution previously known for its traditional religious background. Administering the scale to a more diverse group might yield very different results, with less person separation and reliability problems.

In contrast with the person separation and reliability problems, item separation and reliability problems were only found in the WDI dimension, indicating item-specific problems rather than sample-specific problems. It seems that although the WDI dimension was able to separate between persons, the items were unable to discriminate, suggesting that formulation of items could be improved, or that participants were unable to understand what was being measured. When considering the measure levels of the items more closely, it is clear that the majority of these items measure the dimension on the same level (i.e. WDI items 3, 2, 6, 5).

In addition to problems relating to dimensions, another advantage using Rasch analyses is the ability to identify problematic items for elimination purposes (Boone & Rogan, 2005). With the
Rasch analyses, five problematic items were identified and eliminated based on the infit and outfit statistics of the items (i.e. WPI item 6, WSI item 5, RWI item 3, WDI item 3, WDI item 6).

Although WPI item 6 and WSI item 5 had the lowest measures which indicate the high endorsement of the items by participants, they seemed to underfit (based on infit statistics), indicating the unpredictability of these items. In addition, on close investigation of the phrasing of the other WPI items and WSI items, it appeared that all the items related to the quality of relationships with one’s spouse or child(ren). However, both WPI item 6 and WSI item 5 related more to schedules or arrangements with one’s children or spouse, and not necessarily to the quality of relationships.

RWI item 3 also seemed to be problematic due to the low measure (indicating the high endorsement of the item) and underfit (indicating the unpredictability of the item). When considering the RWI items, all the items appeared to measure current interference of one’s religion/spirituality with work, whereas WRI item 3 measured more the potential of religion/spirituality matters interfering with one’s work. This item could be classified as a more emotional item that suggests potential or future interference, unlike the current interference measured with the other items, and was therefore eliminated.

Items were also eliminated by means of investigation of item correlations. Regarding the W-NWI items, four items were eliminated due to high correlations between dimensions (i.e. WPI item 3 correlating high with WSI item 1 and WDI item 1; WDI item 4 correlating high with the majority of WPI items; WSI item 3 correlating high with all the WDI items; WRI item 2 correlating high with several items in other dimensions). In the majority of these cases, the domestic items correlated very high with the spouse and parent dimensions, indicating that participants found it difficult to discriminate between interference of domestic activities and activities or obligations relating to their children or spouse. In addition, WRI item 6 was also eliminated due to its low correlation with all the other WRI items. When considering the wording of this item, the item appears to indicate a more cognitive type of interference, whereas the other WRI items suggest a more physical interference of activities. Various NW-WI items were also eliminated based on low correlations within dimensions (i.e. PWI item 1, PWI item 6, SWI item 1, SWI item 3, RWI item 2) and high correlations with other dimensions (i.e. DWI item 1, DWI item 5, DWI item 6 with PWI items 1, 2, 5). It seems that in the case of the DWI items, high correlations were mostly found with PWI items, which could indicate that individuals were unable to distinguish certain domestic-related activities or interferences from parental-related activities or interference. Regarding RWI item 2, it seems to
differ from all the other RWI items since all the items appear to suggest religion/spiritual activities interfering with ones work, whereas item 2 reflects more interference or uneasiness in the relationships at work due to religion/spirituality. After the elimination process, a work-nonwork interference scale with 30 items was retained.

Notwithstanding the valuable contributions and advantages of the newly developed W-NWI instrument, some limitations do exist. Based on the suggestions of previous researchers regarding the development of new instruments (DeVellis, 2003; Nunnally, 1988), a large number of items were initially developed and included in the pilot study. Since the same dimensions were initially measured with various items (between 8 and 12 items per dimensions), some of the participants did complain about the length of the questionnaire, the amount of items measuring the same construct and the repetition of the items. This could have had an influence on how participants responded to the items (e.g. responding randomly). This limitation was, however, addressed in the evaluation study where fewer items were used and items measuring different dimensions were randomly combined with items of other questionnaires. Participants could therefore not easily identify the nature of specific items. With the Rasch analyses, random selection problems were possible to detect and no problems were identified.

Another limitation that was indicated with the Rasch analyses was the homogeneity of the sample used in this study – the participants displayed no diversity. This definitely influenced the results and the items that had to be eliminated. It is plausible that these items could have performed better in more diverse samples in terms of culture, background, etc. Although two samples were used in this study to evaluate the instrument, the samples were not very large, especially the sample used in the evaluation study. Larger samples could also have provided different results.

Despite the limitations of the study, recommendations can be made for future studies regarding the use of the newly developed W-NWI instrument. First, related to the limitation of homogeneity, it is recommended that the instrument be administered to more diverse samples. In this study, the focus was only on item elimination; therefore no analyses were conducted to determine the psychometric properties. It is, however, recommended to further investigate the validity of the instrument – first by analysing the internal psychometric properties of the instrument (i.e. construct validity, convergent validity, discriminant validity) and second the external validity (i.e. relationships with causes and consequences of work-nonwork interference). This instrument also only measures the negative interference between dimensions, and does not allow for any possible positive influences.
or spillover between dimensions. According to Tetrick and Buffardi (2006), researchers are starting to place more emphasis on 'positive psychology' and the need exists to explore the ways in which work and family roles or nonwork roles can also enhance each other. According to Carlson et al. (2006), the fundamental thinking behind the positive influences between work and personal life is that these domains provide individuals with resources or other benefits that may help them to perform better across the domains in their life. Since few instruments are available that measure the positive interaction between work and family, possible future studies could include the development of an instrument measuring positive influences between work and other nonwork roles.

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ABSTRACT

**Keywords:** Work-nonwork interference, construct validity, convergent validity, discriminant validity, job characteristics, home characteristics, burnout, ill-health, life satisfaction

Different nonwork roles in employees' private lives.

This study provides evidence for the psychometric properties of the new instrument, external validity, for consistent, discriminant and convergent validity, reliability, and significant relations with home characteristics, ill-health, burnout and life satisfaction were measured. The results provided.

Institution in the North West Province (n = 366). In addition to the new instrument, job characteristics, design was used for the larger population of married employees with children working at a certain nonwork-work interference (W-NW) dimensions of the new instrument a cross-sectional survey and demonstrate the empirical discrepancy of the various work—nonwork interference (W-NW) dimensions with the theoretically relevant variables (of the instrument). The study attempts to relationship with the theoretically relevant external variables (of the instrument) and (2) the external validity (i.e., discriminant, construct and convergent validity, reliability) and the external validity (i.e., construct and convergent validity, reliability) of the instrument by investigating the interference. The general objective of this study was to validate a newly developed work—nonwork work-family interaction is a key topic receiving significant research attention. In order to facilitate
INTRODUCTION
Interaction—Mixture. The SWING of Cenzal et al. (2005) identified work-home interference as the most frequently cited problem. This study supports the findings of the SWING study. Various external variables (e.g., age, gender, race, education, income) were used to measure the relationship between work and family. The instrument was designed to measure the interaction between work and family. The instrument was developed in South Africa and has been used in South Africa. The instrument was also used to measure the interaction between work and family. The instrument was developed in South Africa and has been used in South Africa. The instrument was also used to measure the interaction between work and family. The instrument was developed in South Africa and has been used in South Africa.

The use of valid and reliable or psychometrically sound instruments for work-family relations in South Africa also seems problematic. Since no South African-developed instruments exist to measure the interaction between work and family, researchers are forced to use instruments developed in other countries. The use of these instruments may not be appropriate for the South African context.

In summary, the relationship between work and family is complex and multifaceted. The use of valid and reliable instruments is crucial for accurate measurement. The development of instruments specific to the South African context is necessary to accurately assess the interaction between work and family relations.
validity).

In press: did recommend the use of the instrument in various other samples in South Africa in order to
conducted with regard to the internal or external validity of the instrument. However, Kok Herman et al.
The means of the instrument, reach higher-quality items and directed good items. No analyses were
to the development of the new instrument where the statistical analyses employed were used to calculate
the purpose of this study was
provided regarding the psychometric properties of the instrument. The main purpose of this study was
with cautious and conservative and the use of rigorous scale development procedures, no evidence was
measurement of interest and different work and nonwork roles, excluding items that contributed
addressed several theoretical and measurement limitations (e.g., lack of directionality, and
work–work interference (W-WI)). Although this study provided a valuable new instrument that
network–work interference (NW–WI) and network interference (NI) in both directions (i.e., work–nonwork
measures the interaction between work and various nonwork roles (e.g., personal, social, work)
In a very recent attempt to address certain issues relating to the measurement of interference between
community and extended family).

work and nonwork roles in employees’ lives (e.g., family, leisure, domestic, exercise,
South African employees, Kok Herman and Monseret (in press) found that interference occurs between
work and home) and fails to measure interference between work and other dimensions in the nonwork
domain. This limitation is of particular importance in South Africa in an exploratory study among
work and home (see Belavady & Piro, 2005; Piro, 2003). A final issue
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Psychometric properties of work-family instruments

Although a variety of instruments are widely found across international work-family conflict studies (for summaries of work-family conflict (WFC) and family-work conflict (FWC) studies, see Allen, Herst, Bruck & Sutton, 2000; Byron, 2005; Mesmer-Magnus & Viswesvaran, 2005), the use thereof may be problematic when researchers compare results without being aware of the psychometric properties (i.e. the validity and reliability) of the instruments (DeVellis, 2003; Robinson et al., 1991). Although a variety of indicators of psychometric properties of instruments measuring work-family interaction are found in the literature (i.e. internal validity, construct validity, discriminant validity, convergent validity, reliability and external validity, relationships with external variables), the reporting and use thereof are inconsistent across studies.

One of the main psychometric properties being reported across work-family scale development studies is the construct validity of instruments. However, there is not always consistency regarding the analyses employed during factor analysis (e.g. exploratory (EFA) vs. confirmatory factor analysis (CFA)). Although the use of exploratory factor analysis during the development of new instruments is highly recommended in psychometric literature (DeVellis, 2003; Nunnally & Bernstein, 1944), few work-family studies have made use of exploratory factor analysis (Aryee, 1992; Grzywacz & Marks, 2000; Kopelman, Greenhaus & Connolly, 1983; Premeaux et al., 2007). Instead, the majority of work-family studies used confirmatory factor analysis, which has become a very popular data-analytic technique for the clinical and social sciences (Carlson & Frone, 2003; Curbow et al., 2003; Geurts et al., 2005).

An additional indicator of validity that is seldom reported or tested in work-family studies is discriminant validity. According to Small and Riley (1990), discriminant validity is the extent to which measures of different dimensions are indexing different factors (i.e. when factors do not correlate highly). Discriminant validity is specifically used to indicate clear distinctiveness between constructs in order to further provide prove of empirically distinct dimensions in instruments (Carlson & Frone, 2003). In the literature, few work-family studies tested or provided evidence for discriminant validity (Carlson & Frone, 2003; Carlson et al., 2000; Grzywacz & Marks, 2000; Small & Riley, 1990). In the majority of these studies, correlations, factor correlations from CFA or different correlates with
outcomes were used as evidence for discriminant validity. Only Netemeyer, Boles and McMurrian (1996) tested for discriminant validity using the chi square ($\chi^2$) difference test. Although the use of the chi square ($\chi^2$) difference test is not well known among work-family studies, it has been recommended by previous researchers (Anderson & Gerbing, 1988; Deery, Erwin & Iverson, 1999).

Similar to discriminant validity, convergent validity is also not widely used in work-family studies. Of the main work-family studies, only Small and Riley (1990) tested convergent validity using correlations with similar instruments. Although not always found within the work-family field of scale development, the use of correlations with other instruments as evidence for convergent validity is widely found or tested in other scale development studies (Cowin, Hengstberger, Eagar, Gregory, Andrew & Rolley, 2008; Taormina, 2004; Trout, Ryan, Vigne & Epstein, 2003). In contrast to the inconsistency of the use and reporting of validity indicators, reliability measures (i.e. Cronbach alpha coefficients) are found in the majority of work-family studies.

With regard to the relationship of work-family instruments with external variables (i.e. antecedents and outcomes), the majority of studies report or indicate these relationships. Some studies use correlations to indicate these relationships (Carlson & Frone, 2003; Geurts et al., 2005; Kopelman et al., 1983; Mallard & Lance, 1998; Netemeyer et al., 1996), while other studies use multiple regression analyses (Curbow et al., 2003; Grzywacz & Marks, 2000; Premeaux et al., 2007) or combine correlation analyses and multiple regression analyses (Aryee, 1992; Kirchmeyer, 1992). Some studies also do not indicate the relationship of work-family instrument with external variables (Small & Riley, 1990; Stephens & Sommer, 1996).

**Relations with cause and consequences**

In the literature, various overview studies summarise the relationship between WFC and FWC and various external variables, which include a variety of antecedents and consequences (e.g. Geurts & Demerouti, 2003; Guest, 2002; Voydanoff, 2005a). Some of the more recent studies indicate specifically the relationship of WFC with antecedents such as work demands (i.e. time demands and strain demands), job schedule demands, emotional demands, quantitative demands, work pressures and work support (i.e. managerial support), role autonomy, and role overload (Boyar, Carr, Mosley &
Carson, 2007; Choi, 2008; Greenhaus & Powell, 2003; Fu & Shaffer, 2001; Lingard & Francis, 2005; Montgomery, Panagopolou & Benos, 2006; Nasurdin & Hsia, 2008; Voydanoff, 2005b). FWC has been found to be related with antecedents such as family demands (e.g. household demands), autonomy, work and family pressure, and parental demands (Boyar et al., 2007; Fu & Shaffer, 2001; Greenhaus & Powell, 2003; Keene & Reynolds, 2005; Voydanoff, 2005b). Consequences related to WFC include emotional exhaustion, depersonalisation, quality of life, quality of family life, career outcomes, depression, job satisfaction, organisational commitment, and life stress (Aryee, Srinivas & Tan, 2005; Choi, 2008; Greenhaus, Collins & Shaw, 2002; Lingard & Francis, 2005; McLean, 2002; Montgomery et al., 2006; Nikandrou, Panayotopoulou & Apsopori, 2008; Weigel, Weigel, Berger, Cook & DelCampo, 1995). Consequences related to FWC include (increased) emotional exhaustion and turnover intention, decreased job performance and job satisfaction, cognitive difficulties, anxiety and depression (Namasivayam & Mount, 2004; Macewen & Barling, 1994; Yavas, Babakus & Karatepe, 2008)

**Newly developed work-nonwork interference instrument**

During the scale development study of Koekemoer et al. (in press), close attention and adherence were given to the scale development procedures described in psychometric literature (i.e. construct conceptualisation, item generation and evaluation, item development, and item refinement), and various of the theoretical and measurement limitations voiced in the literature were addressed (e.g. the new instrument measures interference between work and different nonwork roles in both directions, items are not confounded with external variables, items are stated in general terms, a frequency-based response format scale is used). Considerable attention was given to the items measuring the various interference dimensions, where items were rigorously evaluated and eliminated in order to retain only the most efficient items.

Since the main purpose of their study was the development and evaluation of items, Rasch analyses and investigation of item correlations were used. Items were evaluated and eliminated in order to retain only the items that best captured the interference dimensions. A total of 18 items were eliminated and 30 items were retained. In the final instrument, work→nonwork interference was measured with 15 items: four work-parent interference (WPI) items, four work-spouse interference items (WSI), four
work-religion/spirituality interference items (WRI) and three work-domestic interference items (WDI). Nonwork→work interference was also measured with 15 items: four parent-work interference items (PWI), four spouse-work interference items (SWI), four religion/spirituality-work interference items (RWI), and three domestic-work interference items (DWI). All the items were rated on a four-point Likert scale ranging from 0 (never) to 3 (always).

Purpose and contribution
This validation study attempts to demonstrate the empirical distinctiveness of the various work→nonwork interference (W-NWI) and nonwork→work interference (NW-WI) dimensions, by examining their interrelationships (internal validity) as well as their relationships with other variables (external validity).

Hypotheses
The following hypotheses will be tested in this study:

- **Hypothesis 1a**: Work-nonwork interference is a four-dimensional construct, consisting of work-parent interference (WPI), work-spouse interference (WSI), work-religion/spirituality interference (WRI) and work-domestic interference (WDI) dimensions.
- **Hypothesis 1b**: Nonwork-work interference is a four-dimensional construct, consisting of parent-work interference (PWI), spouse-work interference (SWI), religion/spirituality-work interference (RWI) and domestic-work interference (DWI) dimensions.
- **Hypothesis 2**: A second-order two-factor model that distinguishes between the different directions is superior to a one-factor model.
- **Hypothesis 3**: The four work-nonwork dimensions and four nonwork-work dimensions are, although highly related, empirically distinct constructs (i.e. evidence of discriminant validity).
- **Hypothesis 4**: Work-nonwork dimensions correlate strongly with the negative WHI scale of the SWING, whereas nonwork-work dimensions will correlate strongly with the negative HWI scale of the SWING (i.e. evidence of convergent validity).
- **Hypothesis 5**: The different work-nonwork dimensions are related in unique ways to job characteristics and well-being.
• **Hypothesis 6:** The different nonwork-work dimensions are related in unique ways to home characteristics and well-being.

**Objectives**

In view of the literature and hypotheses, the general objective of this study was to validate the newly developed W-NWI instrument by investigating 1) the internal validity (i.e. construct validity and dimensionality, discriminant and convergent validity, reliability) and 2) the external validity (relationship with theoretically relevant external variables such as job characteristics and indicators of well-being) of the instrument.

**RESEARCH DESIGN**

**Research approach**

In order to obtain the specific research objectives, a cross-sectional survey design was used. With a cross-sectional survey design researchers are able to assess interrelationships among variables within a population (Struwig & Stead, 2001). Cross-sectional designs entail the collection of data on more than one case at a single point in time, after which the data is examined to detect patterns of association (Bryman & Bell, 2003). With cross-sectional designs there is no time ordering to the variables; it is thus only possible to examine relationships between variables, which make this design suitable for this study.

**Participants and procedure**

The study sample in this study was married employees with children, working at a tertiary institution in the North West Province \((n = 366)\). Due to the conceptual restrictions in the work-nonwork interference scale (i.e. specific nonwork role interference of specific roles such as spousal and parental roles) only married parents were included in the sample. After permission was granted by the university’s Ethics Committee, lists of all married employees with children were obtained from the various faculties and departments. With the help of field workers, questionnaires were personally distributed to the selected employees and participants were given various options for returning the questionnaires to the researchers (e.g. internal post, personal collection, personal delivering). These
options were given to participants in order to ensure a better response rate and also to ensure anonymity and confidentiality. Participants were given two to three weeks to complete the questionnaires. Although a total of 656 married parents were working at the institution and were given the questionnaires for participation in the study, a response rate of only 56% was obtained. According to DeVellis (2003), samples should be large enough to eliminate subject variance as a significant concern and, although a sample of 300 is generally regarded as adequate, scales have been developed successfully with smaller samples. In the questionnaires, a letter was included which explained the goal and importance of the study, and assurances were given to participants regarding the anonymity and confidentiality with which the information would be handled. Although most of the participants were white (80.35%), participants from African (14.75%), Indian (3.00%) and Coloured (0.80%) groups were also included in the sample. Males (34.70%) as well as females (65.00%) were included in the study. The majority of participants had postgraduate degrees (47.81%), while other participants possessed university degrees (12.57%), technical college diplomas (6.00%), technicon diplomas (8.20%) or grade 12 certificates (19.95%). In total, 26.77% of the participants worked as administrative assistants, while 25.68% worked within the administrative office. The majority of participants worked within academic faculties, including the faculty of health sciences (13.39%); natural sciences (11.46%); education (10.38%); engineering (9.58%); arts (6.83%); economic and management sciences (6.56%) and the faculty of theology (2.70%). A number of participants worked as lecturers (9.84%), senior lecturers (11.46%), associated professors (6.56%) and professors (7.10%).

**Measures of external variables**

Items of the job and home characteristics measures were randomly combined with items of the work-nonwork interference and nonwork-work interference scales (i.e., job-related items combined with work-nonwork interference items; and home-related items combined with nonwork-work interference items) in order to ensure more accurate and valid responses from participants. In each instance the questions to participants were phrased: “How often does it happen that...”.

The following measures were utilised in this study:
Job demands: Work pressure was measured with a three-item scale developed by Bakker, Demerouti and Schaufeli (2003a). The items referred to demanding quantitative aspects of the job. An example is: “You have to work extra hard in order to meet your deadlines”. Emotional demands were measured with the five-item scale by Bakker, Demerouti and Schaufeli (2003b). An example is: “People at work upset you emotionally with their words?”. Cognitive demands were measured by the four-item scale developed by Peeters, Montgomery, Bakker and Schaufeli (2005). An example is: “Your work requires you to concentrate continuously”. All these job demands items were rated on a four-point Likert scale ranging from 0 (never) to 3 (always). Reliable Cronbach alpha coefficients were found in these studies (Bakker et al., 2003a; Bakker et al., 2003b; Peeters et al., 2005).

Job resources: Autonomy was measured with the scale developed by Bakker, Demerouti and Verbreke (2004) (three items, e.g. “You have freedom in carrying out your work-related duties?”). Support was measured with the scale developed by Bakker et al. (2004) (three items, e.g. “You ask your colleagues for help if necessary.”). Job development possibilities were assessed by three items that were conceptually mirrored from existing scales of home developmental possibilities developed by Demerouti, Bakker and Voyeranoff (2010). An example item: “Can you develop yourself sufficiently in your work? All these job resources items were rated on a four-point Likert scale ranging from 0 (never) to 3 (always). Reliable Cronbach alpha coefficients were found that ranged between 0.68 and 0.74 for autonomy, and between 0.81 and 0.85 for social support (Bakker et al., 2004; Bakker, Demerouti & Eeuwema, 2005).

Home demands: Home pressure was measured with a three-item scale developed by Bakker, Demerouti, Taris, Schaufeli and Schreurs (2003). The items referred to demanding quantitative aspects of the home. An example is: “You have many duties at home (e.g. housekeeping, care-giving”). Home emotional demands were measured with a three-item scale developed by Peeters et al. (2005). The scale assessed whether participants have to deal with emotionally charged situations at home, and whether they are confronted with events that touch them personally. A sample item is: “Emotions build up at home”. All these home demands items were rated on a four-point Likert scale ranging from 0 (never) to 3 (always). Acceptable alpha coefficients were found in previous studies (Bakker et al., 2003; Peeters et al., 2005).
**Home resources:** The home resources were developed by Demerouti et al. (2010) and conceptually mirror existing scales of job resources, since several scholars have successfully used a job-related measure as a model for constructing a symmetrical home-related measure (Fronc & Rice, 1987; Fronc, Russell & Cooper, 1992; Parasuraman, Purohit, Godshalk & Beutell, 1996). *Home autonomy* was assessed with four items, including “You have control over how you use your free time”. *Home support* was measured with four items, including “If necessary, your partner or family members will help you with a particular task”. *Home developmental possibilities* were assessed by three items, including “You can develop your talents during your free time”. All these home resources items were rated on a four-point Likert scale ranging from 0 (never) to 3 (always). Acceptable alpha coefficients were found by Demerouti et al. (2010).

**Burnout:** *Emotional exhaustion* was measured using eight items (e.g. “I feel emotionally drained by my work”) and *depersonalisation* was measured by five items (e.g. “I do not really care what happens to some recipients”) from the MBI-HSS (Maslach & Jackson, 1986). The items were rated on a seven-point scale ranging from 0 (never) to 6 (every day). *Cognitive weariness* was measured using the five items of Van Horn, Taris, Schaufeli and Schreurs (2004) (e.g. “I have trouble concentrating”). The items were rated on a seven-point scale ranging from 0 (a few times a year) to 6 (every day). Van Horn et al. (2004) found the scale to be reliable with an alpha coefficient of 0,92.

**Ill-health:** Items were adapted from the General Health Questionnaire (GHQ, Goldberg & Williams, 1988) to measure *physical ill-health* (four items, e.g. “Have you recently been getting any headaches?”), *anxiety* (five items, e.g. “Have you recently been getting edgy and bad-tempered?”) and *depression* (four items, e.g. “Have you recently felt that life is entirely hopeless?”). Items were rated on a four-point scale ranging from 0 (not at all) to 3 (much more than usual). Reliable alpha coefficients were found that ranged between 0,83 and 0,81 for *physical ill-health*, between 0,84 and 0,89 for *anxiety*, and between 0,79 and 0,89 for *depression* (Mostert, 2009; Oldfield & Mostert, 2007).

**Life satisfaction:** Items were used from the Satisfaction With Life Scale (SWLS, Diener, Emmons, Larson & Griffin, 1985) to measure *life satisfaction* (5 items, e.g. “I am satisfied with my life.”; “The conditions of my life are excellent”). Items were rated on a seven-point scale, ranging from 1 (strongly
*disagree* to 7 (*strongly agree*). Diener et al. (1985) found the scale to be reliable and valid with an alpha coefficient of 0.87 and test-retest reliability of 0.82.

The construct validity of these measuring instruments was tested using structural equation modelling. The results supported a six-factor model for job characteristics (work pressure, emotional work demands, cognitive work demands, work autonomy, work support and work developmental possibilities): $\chi^2 = 398.98$ (N = 360), IFI = 0.92, TLI = 0.91 and CFI = 0.93; RMSEA = 0.06); a five-factor model for home characteristics (home pressure, emotional home demands, home autonomy, home support and home developmental possibilities): $\chi^2 = 161.63$ (N = 360), IFI = 0.97, TLI = 0.96 and CFI = 0.97; RMSEA = 0.04); a three-factor model for burnout (emotional exhaustion, depersonalisation and cognitive weariness: $\chi^2 = 422.80$ (N = 360), IFI = 0.92, TLI = 0.90 and CFI = 0.92; RMSEA = 0.08); a three-factor model for ill-health (physical health, anxiety and depression: $\chi^2 = 167.49$ (N = 360), IFI = 0.97, TLI = 0.96 and CFI = 0.97; RMSEA = 0.07); and a one-factor model for life satisfaction ($\chi^2 = 47.20$ (N = 360), IFI = 0.97, TLI = 0.93 and CFI = 0.97; RMSEA = 0.15).

**Statistical analysis**

In order to examine the construct validity of the newly developed instrument, confirmatory factor analysis (CFA) was used with the AMOS structural modelling software (Arbuckle, 2007). Although exploratory factor analysis (EFA) is usually used for analysing newly developed instruments, using a confirmatory approach is known to be very meaningful since researchers are required to specify the number of factors according to the literature and substantive theoretical knowledge that result in the testing of the adequacy of fit of the theoretical factor model (Bollen, 1989). Since CFA is a theory-driven comprehensive statistical approach for testing theory-based hypotheses that has a number of strengths and is a very popular data-analytic technique for the clinical and social sciences, the use of CFA is very much applicable for this study (Tomarken & Waller, 2005). With CFA, researchers have the ability to specify latent variable models that provide separate estimates of relations among latent constructs and their manifest indicators (the measurement model). Also, the availability of measures of global fit that can provide a summary evaluation of even complex models is known as a key strength of CFA. In addition, via nested chi-square tests and other means, users can comparatively evaluate the fit of alternative models that differ in complexity.
The goodness of fit of the models was evaluated using the following absolute goodness-of-fit indices (Jöreskog & Sörbom, 1993): the likelihood-ratio chi square ($\chi^2$), the ratio of the chi square to the degrees of freedom ($\chi^2/df$) and the root square of approximation (RMSEA). Since $\chi^2$ is sensitive to sample size – i.e. the probability of rejecting a hypothesised model increases with sample size – the use of relative goodness-of-fit measures is strongly recommended (Bentler, 1990). Therefore, the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI) and the Incremental Fit Index (IFI) were used. Values smaller than 0.08 for RMSEA are indicative of an acceptable fit, while values greater than 0.10 should lead to model rejection (Cudeck & Brown, 1993). For CFI, TLI and IFI, as a rule of thumb, a value greater than 0.90 is considered a good fit (Hoyle, 1995) and $\chi^2/df < 5.00$ (Bentler & Bonett, 1980).

Because of the large number of items, it was not possible to conduct CFA analysis on a full disaggregation model. Therefore, due to the complexity, extensiveness and the conceptual directional distinction of interference, two theoretical models were tested: a four-factor model for work→nonwork interference (consisting of work-parent interference, work-spouse interference, work-religion/spirituality interference, work-domestic interference) and a four-factor model for nonwork→work interference (consisting of parent-work interference, spouse-work interference, religion/spirituality-work interference, domestic-work interference). The items identified by Koekemoer et al. (in press) were used as indicators of the latent factors. Because the factors are theoretically so closely related, errors were allowed to correlate. Using alternative models (Lehmann, 2001), the two hypothesised four-factor models were compared with several competing models. Similar models were tested separately for the two directions of interference (i.e. five alternative models for work→nonwork interference and five alternative models for nonwork→work interference). These competing models were similar to models used in previous scales (Carlson & Frone, 2003; Carlson & Kacmar, 2000; Carlson et al., 2000; Curbow et al., 2003; Geurts et al., 2005; Netemeyer et al., 1996) and models based on theoretical knowledge.

In order to illustrate the directionality of the work-nonwork interference instrument, an additional 2nd order factor model was tested with CFA. First, a one-factor model was tested. This model assumes that all the work→nonwork interference and nonwork→work interference dimensions load onto one factor
(i.e. directionality is not distinguished). Second, a two-factor model was tested. This model assumes that work→nonwork interference and nonwork→work interference are distinct constructs, each measured with the four work→nonwork interference and nonwork→work interference dimensions as indicators (i.e. distinguishing between the direction of interference).

CFA analyses were also used in order to prove the discriminant validity of the various dimensions. Following the example of previous researchers (Anderson & Gerbing, 1988; Bagozzi & Philips, 1982; Mallard & Lance, 1998), discriminant validity was tested by making use of the chi square ($\chi^2$) difference test. By calculating the difference between a model which allows the correlation between the constructs (with multiple indicators) to be constrained to unity (i.e. perfectly correlated), and another model which allows the correlations to be free (unconstrained model or target model), discriminant validity can be tested. If the two models do not differ significantly on a chi-square difference test, the researcher fails to conclude that the constructs differ. However, a significantly lower chi-square value for the model in which the trait correlations are not constrained to unity would indicate that the traits are not perfectly correlated and that discriminant validity is achieved (Bagozzi & Philips, 1982; Bagozzi, Yi & Phillips, 1991). According to Anderson and Gerbing (1988), discriminant validity can be assessed for two estimated constructs by constraining the estimated correlation parameter between them to 1.0 and then performing a chi-square difference test on the values obtained for the constrained and unconstrained models. This procedure was carried out for one pair of constructs at a time, thus calculating the $\chi^2$ difference test for all the various correlations between different dimensions.

Convergent validity was assessed by investigating the correlation coefficients between the various dimensions of the work-nonwork interference scale and the SWING instrument (Geurts et al., 2005) using the SPSS program (SPSS Inc., 2009). The SWING was selected because it is a widely used, well-researched and psychometrically sound instrument that measures the interference in both directions (work→home and home→work). The SWING was also validated in different South African samples (Marais et al., 2009; Mostert & Oldfield, 2009; Pieterse & Mostert, 2005; Rost & Mostert, 2007). Although Polit and Beck (2006) recommend that correlations greater than 0.70 may be regarded as evidence for strong correlations (or similarities) between the measures in social research, other researchers indicate that correlation coefficients should only meet or exceed 0.35 in order to be cited as evidence for convergent validity (Hammill, Brown & Bryant, 1989). In order to assess the
reliability of the newly developed scales, Cronbach alpha coefficients were used. Descriptive statistics (means, standard deviations) were used to describe the data. To determine the relationship between the scales and various external variables, product-moment correlations were used.

RESULTS

Construct validity of the work-nonwork interference instrument

First, the four-factor hypothesised model was tested for the work→nonwork interference scale. This model assumes that work will interfere differently with specific nonwork roles, resulting in four expected interference dimensions (i.e. work-parent interference, work-spouse interference, work-religion/spirituality interference and work-domestic interference). Although the results showed acceptable fit for this hypothesised four-factor model ($\chi^2 = 272, 25 \text{ (df=366)}, \chi^2/\text{df} = 3.24$, IFI = 0.95, TLI = 0.94 and CFI = 0.95; RMSEA = 0.08) inspection of the modification indices and a high standardised residual covariance (3.40) between work-parent item 4 and work-spouse item 2 suggested that the hypothesised model could be improved. The hypothesised model was modified by omitting work-parent item 4, which resulted in a better improved theoretical model (M1). This improved theoretical four-factor model explained the associations between the items significantly better compared to the initial model ($\Delta \chi^2 = 103,80 \ p \leq 0.001$). Consequently, this model was used as the final and baseline model in subsequent analyses (see appendix C for finale W-NWI items). Next, various alternative factor models were systematically compared to the four-factor work-nonwork interference theoretical model (M1). (refer to appendix C for figures of the various competing work-nonwork interference and nonwork-work interference models). The results are summarised in Table 1.
Table 1

*Goodness-of-fit statistics and chi-square difference tests of nested alternative work → nonwork interference and nonwork → work interference models*

<table>
<thead>
<tr>
<th>Nested alternative work → nonwork interference models</th>
<th>( \chi^2 )</th>
<th>( \chi^{2/df} )</th>
<th>IFI</th>
<th>TLI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>( \Delta \chi^2 )</th>
<th>( \Delta df )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1 Four-factor</td>
<td>168.45</td>
<td>2.37</td>
<td>0.97</td>
<td>0.96</td>
<td>0.97</td>
<td>0.06</td>
<td>***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;theoretical model&quot;</td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>M2 One-factor</td>
<td>735.18</td>
<td>8.17</td>
<td>0.83</td>
<td>0.81</td>
<td>0.83</td>
<td>0.14</td>
<td>566.73</td>
<td>19</td>
<td>***</td>
</tr>
<tr>
<td>M3 Two-factor</td>
<td>475.70</td>
<td>5.35</td>
<td>0.90</td>
<td>0.88</td>
<td>0.90</td>
<td>0.11</td>
<td>307.25</td>
<td>18</td>
<td>***</td>
</tr>
<tr>
<td>&quot;home/reigion model&quot;</td>
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<tr>
<td>M4 Three-factor</td>
<td>378.27</td>
<td>4.35</td>
<td>0.93</td>
<td>0.91</td>
<td>0.93</td>
<td>0.10</td>
<td>209.82</td>
<td>16</td>
<td>***</td>
</tr>
<tr>
<td>&quot;family model&quot;</td>
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<tr>
<td>M5 Three-factor</td>
<td>347.72</td>
<td>4.00</td>
<td>0.93</td>
<td>0.92</td>
<td>0.93</td>
<td>0.09</td>
<td>179.27</td>
<td>16</td>
<td>***</td>
</tr>
<tr>
<td>&quot;caretaker model&quot;</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nested alternative nonwork → work interference models</th>
<th>( \chi^2 )</th>
<th>( \chi^{2/df} )</th>
<th>IFI</th>
<th>TLI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>( \Delta \chi^2 )</th>
<th>( \Delta df )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1 Four-factor</td>
<td>248.73</td>
<td>2.96</td>
<td>0.92</td>
<td>0.90</td>
<td>0.92</td>
<td>0.07</td>
<td>***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;theoretical model&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2 One-factor</td>
<td>413.15</td>
<td>4.59</td>
<td>0.85</td>
<td>0.82</td>
<td>0.85</td>
<td>0.10</td>
<td>164.42</td>
<td>6</td>
<td>***</td>
</tr>
<tr>
<td>M3 Two-factor</td>
<td>354.36</td>
<td>3.98</td>
<td>0.87</td>
<td>0.85</td>
<td>0.87</td>
<td>0.09</td>
<td>105.63</td>
<td>5</td>
<td>***</td>
</tr>
<tr>
<td>&quot;home/reigion model&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M4 Three-factor</td>
<td>340.28</td>
<td>3.91</td>
<td>0.88</td>
<td>0.85</td>
<td>0.88</td>
<td>0.09</td>
<td>91.55</td>
<td>3</td>
<td>***</td>
</tr>
<tr>
<td>&quot;family model&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M5 Three-factor</td>
<td>269.77</td>
<td>3.10</td>
<td>0.91</td>
<td>0.90</td>
<td>0.91</td>
<td>0.08</td>
<td>21.04</td>
<td>3</td>
<td>***</td>
</tr>
<tr>
<td>&quot;caretaker model&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*** \( p \leq 0.001 \)

First, a one-factor model (M2) – that assumes that all 15 items measuring the interference from work to nonwork roles load on the same underlying latent variable (i.e. work → nonwork interference) – was compared to the theoretical four-factor model (M1). This alternative model assumes that items cannot be distinguished on the basis of the specific role being influenced by the work domain (see Tetrick &
Buffardi, 2006 for discussion of various factor structures in work-family research). With all 15 items loading onto one factor, the fit of M2 was significantly worse compared to M1 ($\Delta \chi^2 (19) = 566,73, p \leq 0,001$).

Next, a two-factor model (M3) was compared to the theoretical model (M1). This model distinguishes between two latent variables (i.e. work-home interference and work-religion/spirituality interference) and is based on previous work-family literature and positive psychology literature, where no distinction is made between home-related roles (such as parent, spouse or domestic roles) and religion/spirituality is seen as an additional well-being dimension (Snyder & Lopez, 2002). When compared to the hypothesised model (M1), the fit of this alternative model was also significantly worse ($\Delta \chi^2 (18) = 307,25, p \leq 0,001$).

Two three-factor models (M4 and M5) were also compared to the theoretical model (M1). Model 4 distinguishes between interference of domestic-related activities and family relationship interference (thus consisting of three latent variables, i.e. work-family interference, work-domestic interference and work-religion/spirituality interference). Model 5, however, differs from model 4 in the sense that the assumption is made that the parental items and domestic items load together to form a caretaker latent variable, in addition to the spouse latent variable and the religion/spirituality latent variable. Model 5 therefore assumes that parental activities are closely related to domestic activities and are different from the relationship with one’s spouse. Results indicate that the fit of both these models (M4 and M5) were also significantly worse than the theoretical model (M1) (for $M4 = \Delta \chi^2 (16) = 209,82, p \leq 0,001$ and $M5 = \Delta \chi^2 (16) = 179,27, p \leq 0,001$). Finally, all of the fit indices suggested that the theoretical four-factor model (M1) for work-nonwork interference was a better fit of the data, where all the values (i.e. IFI, TLI, CFI) far exceeded the conventional standard of 0,90 (Hoyle, 1995).

For the nonwork→work interference scale, similar procedures were employed where a four-factor theoretical model of nonwork→work interference was compared to alternative models similar to the work→nonwork interference models. First, a four-factor hypothesised model was tested for the nonwork→work interference scale. This model also assumed that the interference between nonwork-roles and the work domain will differ depending on the specific roles and will result in four expected interference dimensions (i.e. parent-work interference, spouse-work interference, religion/spirituality-
work interference and domestic-work interference). The results showed acceptable fit for this hypothesised four-factor model (see Table 1 – M1 – four-factor theoretical model). All the fit indices suggested that this theoretical four-factor model (M1) for nonwork-work interference fit the data well where all the values (i.e. IFI, TLI, CFI) far exceeded the conventional standard of 0.90 (Hoyle, 1995). Consequently, this model was used as the baseline model in subsequent analyses regarding nonwork-work interference. Next, various alternative factor models were systematically compared to this four-factor nonwork-work interference theoretical model (M1). The results are also summarised in Table 1.

First, a one-factor model (M2) was compared to the theoretical four-factor model (M1). For this alternative model (where all 15 items loaded onto one factor), the fit of M2 was significantly worse compared to M1 (Δχ² (6) = 164.42, p ≤ 0.001). Next, a two-factor model (M3) was compared to the theoretical model (M1). Upon comparison with the hypothesised model (M1), the fit of this alternative model (M3) was again significantly worse (Δχ² (5) = 105.63, p ≤ 0.001). Additionally, two three-factor models (M4 and M5) were compared to the theoretical model (M1). Results indicated that the fit of both these models (M4 and M5) were also significantly worse than the theoretical model (M1) (for M4 = Δχ² (3) = 91.55, p ≤ 0.001 and M5 = Δχ² (3) = 21.04, p ≤ 0.001). Although M5 showed fit closest to M1, the fit indices suggested that the theoretical four-factor model (M1) for nonwork-work interference was still a better fit of the data, where all the values (i.e. IFI, TLI, CFI) far exceeded the conventional standard of 0.90 (Hoyle, 1995). See appendix C for final NW-WI items.

These results provide support for Hypotheses 1a and 1b.

**Discriminant validity**

Several CFA models were compared to investigate if the dimensions of work→nonwork interference were distinct from each other (**Hypotheses 3 and 4**). In the case of work→nonwork interference and nonwork→work interference, the target model or unconstrained model was the hypothesised four-factor model (M1 for each direction in Table 1). In each comparison model, one correlation between two different dimensions was fixed equal to 1.06. For example, in the first comparison model shown in Table 2, the correlation between work-parent interference and work-spouse interference was fixed equal to 1.00, suggesting a perfect correlation. The extent to which the target or unconstrained model
fits the data better than each of the comparison models ($\Delta \chi^2$) supports the discriminant validity for the pair of constructs for which the correlation was restricted equal to 1.00. The results of the analyses done for one pair of constructs at a time for all the various dimensions are indicated in Table 2 below.

**Table 2**

**Goodness-of-fit statistics for tests of discriminant validity for the work-nonwork interference instrument**

<table>
<thead>
<tr>
<th>Model</th>
<th>Work→nonwork interference</th>
<th>$\chi^2$</th>
<th>df</th>
<th>IFI</th>
<th>TLI</th>
<th>CFI</th>
<th>$\Delta \chi^2$</th>
<th>$\Delta df$</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>Unconstrained model</td>
<td>168.45</td>
<td>71</td>
<td>0.97</td>
<td>0.97</td>
<td>0.97</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>Constrained model: WPL, SFI=1.00</td>
<td>320.43</td>
<td>72</td>
<td>0.93</td>
<td>0.91</td>
<td>0.92</td>
<td>151.98</td>
<td>1</td>
</tr>
<tr>
<td>M3</td>
<td>Constrained model: WPL, WRI=1.00</td>
<td>445.78</td>
<td>72</td>
<td>0.89</td>
<td>0.87</td>
<td>0.89</td>
<td>277.33</td>
<td>1</td>
</tr>
<tr>
<td>M4</td>
<td>Constrained model: WPL, WDI=1.00</td>
<td>252.60</td>
<td>72</td>
<td>0.95</td>
<td>0.94</td>
<td>0.95</td>
<td>84.15</td>
<td>1</td>
</tr>
<tr>
<td>M5</td>
<td>Constrained model: WSL, WRI=1.00</td>
<td>374.33</td>
<td>72</td>
<td>0.92</td>
<td>0.89</td>
<td>0.91</td>
<td>205.88</td>
<td>1</td>
</tr>
<tr>
<td>M6</td>
<td>Constrained model: WSL, WDI=1.00</td>
<td>309.94</td>
<td>72</td>
<td>0.93</td>
<td>0.92</td>
<td>0.93</td>
<td>140.59</td>
<td>1</td>
</tr>
<tr>
<td>M7</td>
<td>Constrained model: WRL, WDI=1.00</td>
<td>467.71</td>
<td>72</td>
<td>0.89</td>
<td>0.86</td>
<td>0.89</td>
<td>299.26</td>
<td>1</td>
</tr>
</tbody>
</table>

**NOTE:** WPL = work-parent interference, WSI = work-spouse interference, WRI = work-religion/spirituality interference, WDI = work-domestic interference, PWI = parent-work interference, SWI = spouse-work interference, RWI = religion/spirituality-work interference, DWI = domestic-work interference.
Table 2 continued

*Goodness-of-fit statistics for tests of discriminant validity for the work-nonwork interference instrument*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>IFI</th>
<th>TLI</th>
<th>CFI</th>
<th>$\Delta\chi^2$</th>
<th>$\Delta$df</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1 Unconstrained model</td>
<td>248,73</td>
<td>84</td>
<td>0.92</td>
<td>0.90</td>
<td>0.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2 Constrained model: PWLSWI=1.00</td>
<td>306,35</td>
<td>85</td>
<td>0.90</td>
<td>0.87</td>
<td>0.89</td>
<td>57,62</td>
<td>1</td>
</tr>
<tr>
<td>M3 Constrained model: PWLRWI=1.00</td>
<td>360,01</td>
<td>85</td>
<td>0.87</td>
<td>0.84</td>
<td>0.87</td>
<td>111,28</td>
<td>1</td>
</tr>
<tr>
<td>M4 Constrained model: PWLDWI=1.00</td>
<td>263,95</td>
<td>85</td>
<td>0.91</td>
<td>0.89</td>
<td>0.92</td>
<td>15,22</td>
<td>1</td>
</tr>
<tr>
<td>M5 Constrained model: SWLRWI=1.00</td>
<td>269,39</td>
<td>85</td>
<td>0.91</td>
<td>0.89</td>
<td>0.91</td>
<td>20,66</td>
<td>1</td>
</tr>
<tr>
<td>M6 Constrained model: SWLDWI=1.00</td>
<td>281,76</td>
<td>85</td>
<td>0.91</td>
<td>0.88</td>
<td>0.91</td>
<td>33,03</td>
<td>1</td>
</tr>
<tr>
<td>M7 Constrained model: RWLDWI=1.00</td>
<td>289,58</td>
<td>85</td>
<td>0.90</td>
<td>0.88</td>
<td>0.90</td>
<td>40,85</td>
<td>1</td>
</tr>
</tbody>
</table>

*NOTE:* WPI = work-parent interference, WSI = work-spouse interference, WRI = work-religion/spirituality interference, WDI = work-domestic interference, PWI = parent-work interference, SWI = spouse-work interference, RWI = religion/spirituality-work interference, DWI = domestic-work interference.

As can be seen in Table 2, each of the more restricted models fits the data significantly worse than the target or unconstrained model, thus supporting the discriminant validity of each dimension of both scales. These results provide support for Hypothesis 3.

Consequently, the 2nd order factor models were tested (i.e. the one-factor model and the two factor model). Results of the CFA analyses showed that the one-factor model indicated poor fit to the data ($\chi^2 = 568,02$ (N = 366), IFI = 0.66, TLI = 0.52 and CFI = 0.66; RMSEA = 0.27), whereas the two-factor model showed a good fit to the data ($\chi^2 = 136,58$ (N = 366), IFI = 0.93, TLI = 0.90 and CFI = 0.93; RMSEA = 0.13). Upon comparison of the one-factor and two-factor models, it seems that the two-factor model fitted the data significantly better than the one-factor model ($\Delta \chi^2 (1) = 431,44, p \leq 0.001$), which provides support for Hypothesis 2.
**Convergent validity**

Convergent validity was tested by examining the correlation matrix. The correlation coefficients between the work→nonwork and nonwork→work interference scales and the negative work-home interference (WHI) and negative home-work interference (HWI) scales of the SWING are reported in Table 3.

Table 3  
**Correlation coefficients between work-nonwork interference dimensions and the negative WHI and negative HWI scales of the SWING**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Negative WHI</th>
<th>Negative HWI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Work→nonwork interference dimensions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-parent interference</td>
<td>0.71***</td>
<td>0.37*</td>
</tr>
<tr>
<td>Work-spouse interference</td>
<td>0.75***</td>
<td>0.34*</td>
</tr>
<tr>
<td>Work-religion/spirituality interference</td>
<td>0.54***</td>
<td>0.23*</td>
</tr>
<tr>
<td>Work-domestic interference</td>
<td>0.75***</td>
<td>0.35*</td>
</tr>
<tr>
<td><strong>Nonwork→work interference dimensions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent-work interference</td>
<td>0.36*</td>
<td>0.49*</td>
</tr>
<tr>
<td>Spouse-work interference</td>
<td>0.43**</td>
<td>0.51***</td>
</tr>
<tr>
<td>Religion/spirituality-work interference</td>
<td>0.36*</td>
<td>0.37***</td>
</tr>
<tr>
<td>Domestic-work interference</td>
<td>0.41**</td>
<td>0.45**</td>
</tr>
</tbody>
</table>

* Statistically significant (p < 0.05)  
** Correlation is practically significant r > 0.30 (medium effect), *** Correlation is practically significant r > 0.50 (large effect)

As can be seen in Table 3, the correlation analysis revealed very strong statistically and practically significant relationships between the work→nonwork interference dimensions and negative WHI (i.e. work-parent interference $r = 0.71$, work-spouse interference $r = 0.75$ and work-domestic interference $r = 0.75$). Although the relationship between negative WHI and work-religion/spirituality is somewhat lower ($r = 0.54$), the overall high correlations suggest that these scales measure highly related dimensions and can be indicative of convergent validity (Polit & Beck, 2006). Furthermore, stronger correlations are found between the work→nonwork interference dimensions and negative WHI as opposed to weaker correlations with negative HWI. Therefore, the validity of directionality for work→nonwork interference is relatively strong. In the case of the relationship between nonwork→work interference dimensions and negative HWI, significant correlations do exist (parent-work interference $r = 0.49$, spouse-work interference $r = 0.51$ and domestic-work interference $r = 0.45$,
religion/spirituality-work interference $r = 0.37$). However, these correlations are somewhat lower compared to the correlations between the work→nonwork interference dimensions and negative WHI. Furthermore, although correlations with negative HWI are higher compared to negative WHI, these correlations are not as distinct or clear as the work→nonwork interference dimensions. However, when considering the guideline of Hammil et al. (1989), evidence for convergent validity can still be suggested (correlations with spouse-work interference $r = 0.51$, parent-work interference $r = 0.49$, religion/spirituality-work interference $r = 0.37$, domestic-work interference $r = 0.45$. These results provide support for Hypothesis 4.

**Descriptive statistics**

Following the evidence of the internal validity of the instrument, descriptive statistics for the various constructs and dimensions were analysed. Table 4, indicates the descriptive statistics and reliability coefficients of the different dimensions.

**Table 4**

*Descriptive statistics and Cronbach’s alpha coefficients*

<table>
<thead>
<tr>
<th>Item</th>
<th>$M$</th>
<th>$SD$</th>
<th>$\alpha$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work pressure</td>
<td>1.46</td>
<td>0.72</td>
<td>0.83</td>
</tr>
<tr>
<td>Emotional work demands</td>
<td>0.90</td>
<td>0.56</td>
<td>0.84</td>
</tr>
<tr>
<td>Cognitive work demands</td>
<td>2.01</td>
<td>0.56</td>
<td>0.71</td>
</tr>
<tr>
<td>Work autonomy</td>
<td>1.69</td>
<td>0.62</td>
<td>0.67</td>
</tr>
<tr>
<td>Work support</td>
<td>1.90</td>
<td>0.67</td>
<td>0.75</td>
</tr>
<tr>
<td>Work developmental possibilities;</td>
<td>1.74</td>
<td>0.69</td>
<td>0.81</td>
</tr>
<tr>
<td>Home pressure</td>
<td>1.56</td>
<td>0.66</td>
<td>0.81</td>
</tr>
<tr>
<td>Emotional home demands</td>
<td>0.94</td>
<td>0.49</td>
<td>0.74</td>
</tr>
<tr>
<td>Home autonomy</td>
<td>1.93</td>
<td>0.60</td>
<td>0.64</td>
</tr>
<tr>
<td>Home support</td>
<td>1.75</td>
<td>0.66</td>
<td>0.70</td>
</tr>
<tr>
<td>Home developmental possibilities;</td>
<td>1.45</td>
<td>0.69</td>
<td>0.82</td>
</tr>
<tr>
<td>Work-parent interference</td>
<td>0.91</td>
<td>0.77</td>
<td>0.88</td>
</tr>
<tr>
<td>Work-spouse interference</td>
<td>0.67</td>
<td>0.63</td>
<td>0.88</td>
</tr>
<tr>
<td>Work-religion/spirituality interference</td>
<td>0.40</td>
<td>0.54</td>
<td>0.86</td>
</tr>
<tr>
<td>Work-domestic interference</td>
<td>0.92</td>
<td>0.78</td>
<td>0.91</td>
</tr>
</tbody>
</table>
Table 4 continued

*Descriptive statistics and Cronbach’s alpha coefficients*

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent-work interference</td>
<td>0.44</td>
<td>0.48</td>
<td>0.76</td>
</tr>
<tr>
<td>Spouse-work interference</td>
<td>0.35</td>
<td>0.44</td>
<td>0.77</td>
</tr>
<tr>
<td>Religion/spirituality-work interference</td>
<td>0.20</td>
<td>0.34</td>
<td>0.74</td>
</tr>
<tr>
<td>Domestic-work interference</td>
<td>0.57</td>
<td>0.51</td>
<td>0.82</td>
</tr>
<tr>
<td>Emotional exhaustion</td>
<td>2.45</td>
<td>1.29</td>
<td>0.91</td>
</tr>
<tr>
<td>Depersonalisation</td>
<td>1.66</td>
<td>1.00</td>
<td>0.69</td>
</tr>
<tr>
<td>Cognitive weariness</td>
<td>1.89</td>
<td>1.09</td>
<td>0.87</td>
</tr>
<tr>
<td>Physical ill-health</td>
<td>0.90</td>
<td>0.70</td>
<td>0.85</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.99</td>
<td>0.74</td>
<td>0.90</td>
</tr>
<tr>
<td>Depression</td>
<td>0.51</td>
<td>0.74</td>
<td>0.92</td>
</tr>
<tr>
<td>Life satisfaction</td>
<td>4.90</td>
<td>1.40</td>
<td>0.91</td>
</tr>
</tbody>
</table>

As indicated in Table 4, the alpha coefficients of all the measuring instruments were considered acceptable compared to the guideline of $\alpha > 0.70$ (Nunnally & Bernstein, 1994), except for the measures of work autonomy, home autonomy and depersonalisation. However, Kline (1999) notes that when dealing with psychological constructs, values below 0.70 can realistically be expected because of the diversity of the constructs being measured. Nevertheless, these constructs should be interpreted with caution.

*Product-moment correlations*

Product-moment correlation analyses were conducted separately for 1) the work $\rightarrow$ nonwork interference dimensions, related job characteristics and well-being outcomes and 2) nonwork $\rightarrow$ work interference dimensions, related home characteristics and well-being outcomes. Table 5 presents the results of the product-moment correlation coefficients of the four work $\rightarrow$ nonwork interference dimensions with the related job characteristics and the indicators of health and well-being (i.e. burnout, health and life satisfaction). Table 6 indicates the product-moment correlation coefficients of the four nonwork $\rightarrow$ work interference dimensions with the related home characteristics and the indicators of health and well-being (i.e. burnout, health and life satisfaction).
### Product-moment Correlations for Job Characteristics' Work–Non-work Interference Dimensions and Well-being Outcomes

**Table 5**

<table>
<thead>
<tr>
<th>Item</th>
<th>16</th>
<th>15</th>
<th>14</th>
<th>13</th>
<th>12</th>
<th>11</th>
<th>10</th>
<th>9</th>
<th>8</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work pressure</td>
<td>0.33</td>
<td>0.35</td>
<td>0.37</td>
<td>0.39</td>
<td>0.41</td>
<td>0.43</td>
<td>0.45</td>
<td>0.47</td>
<td>0.49</td>
<td>0.51</td>
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**Note:** Correlation is practically significant if |r| > 0.30 (medium effect)." Correlation is practically significant if |r| > 0.30 (medium effect)."
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Product-moment correlations for home characteristics, non-work—work interference dimensions and well-being outcomes.

Table 6
**Job characteristics.** High levels\(^1\) of the four work→nonwork interference dimensions were statistically and practically significantly associated with high levels of work pressure and emotional demands. Work-parent and work-spouse interference were statistically and practically significantly associated with low levels of work autonomy and work support. Additionally, low statistically significant correlations were found between the other work→nonwork interference dimensions and cognitive work demands, work autonomy, work support and developmental possibilities.

**Home characteristics.** High levels of the parent-work, spouse-work and domestic-work interference dimensions were statistically and practically significantly associated with high emotional home demands and statistically significantly associated with home pressure. Also, statistically significant correlations were found between the nonwork→work interference dimensions and home autonomy. High levels of parent-work and spouse-work interference were also related to statistically significant levels of home support and home developmental possibilities.

**Indicators of well-being.** High levels of the four work→nonwork interference dimensions were statistically and practically significantly associated with high levels of emotional exhaustion, depersonalisation and cognitive weariness. Spouse-work interference was statistically and practically significantly associated with high levels of emotional exhaustion, depersonalisation and cognitive weariness. Parent-work interference was also statistically and practically significantly associated with high levels of depersonalisation and cognitive weariness, while religion/spirituality-work interference was only statistically and practically significantly associated with high levels of depersonalisation. Lastly, parent-work interference was statistically and practically significantly associated with high levels of emotional exhaustion and cognitive weariness.

**Indicators of ill-health.** High levels of the four work→nonwork interference dimensions were statistically and practically significantly associated with high levels of physical ill-health, anxiety and depression and only statistically significantly related with religion/spirituality-work interference. High levels of all four nonwork→work interference dimensions were statistically and practically significantly associated with high levels of anxiety. Moreover, religion/spirituality-work interference

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\(^1\) High levels indicate correlations which are practically significant with a medium or large effect \((r > 0.30 \text{ or } r > 0.50)\); low levels indicate correlations which are only statistically significant and not practically significant thus \(r < 0.30\).
was statistically and practically significantly associated with high levels of physical ill-health and depression. High levels of spouse-work interference were also statistically and practically significantly associated with high levels of depression.

*Life satisfaction.* High levels of work-parent, work-spouse and work-domestic interference were statistically and practically significantly associated with life satisfaction. Only low statistically significant associations were found between life satisfaction and parent-work, spouse-work and religion/spirituality-work interference.

These results provide support for Hypothesis 5 and 6.

**DISCUSSION**

The focus on interference between work and nonwork roles has become increasingly important, especially the use of psychometrically sound instruments to measure work-nonwork interference. Although Koekemoer et al. (in press) recently developed a new work-nonwork interference instrument, the psychometric properties of the instrument have not yet been tested. The general objective of this study was therefore to determine the psychometric properties of the instrument by investigating the internal as well as the external validity of the instrument. In this study four specific aspects with regard to psychometric properties were addressed, namely 1) construct validity; 2) discriminant validity; 3) convergent validity; and 4) the relationship with theoretically relevant external variables (including job and home characteristics, burnout, ill-health and life satisfaction).

With regard to the construct validity and directionality, it was proposed that work-nonwork interference (as developed and measured by Koekemoer et al. (in press)) consists of two directions of interference and thus two constructs – i.e. work-nonwork interference (W-NWI) and nonwork-work interference (NW-WI). Each direction of interference consists of work interfering with four nonwork roles (e.g. parent, spouse, religion/spirituality and domestic). The hypothesis was tested using CFA analyses. Competing models were tested and compared with the hypothesised four-factor models for each directions of interference (i.e. work-nonwork interference and nonwork-work interference). The use of CFA analyses and the proposition of two directions of interference were based on previous work-
family studies that tested and confirmed two directions of interference with the use of CFA (Carlson & Frone, 2003; Curbow et al., 2003; Geurts et al., 2005; Netemeyer et al., 1996).

With regard to W-NWI, the results indicated that the four-factor hypothesised model of W-NWI explained the associations between the items significantly better compared to the competing models that were tested (i.e. one-factor model, two-factor home/religion model, three-factor family model, three-factor caretaker model). However, inspection of the modification indices and a high standardised residual covariance between WPI item 4 and WSI item 2 suggested an improvement in the hypothesised model. It was therefore decided to delete one problematic item (work-parent item 4). Results regarding the comparison of the four-factor NW-WI model and competing models also indicated that the hypothesised model explained associations between the 15 items significantly better compared to the alternative models. In order to provide additional evidence for the two directions of interference, a second-order two-factor model that distinguishes between the different directions was compared with a one-factor model. Results indicated that the second order two-factor model fitted the data significantly better than the one-factor model.

Closely related to construct validity is the aspect relating to the empirical distinctiveness of the dimensions of the two constructs (i.e. proving discriminant validity for the various dimensions of the instrument). Discriminant validity was tested using CFA analyses (i.e. the chi square ($\chi^2$) difference test) in order to provide evidence that the four W-NWI dimensions and four NW-WI dimensions are empirically distinct dimensions. The results indicated that the dimensions relating to W-NWI and NW-WI are, although highly related, indeed distinct. For example, interference between the work and parent role is distinct from the interference between the work and spouse role.

These results contribute to existing work-family interference literature as it indicates that employees experience interference between the work role and different roles in the private life. The results are also in line with some of the limited studies available on the interference between work and different nonwork roles (Aryee, 1992; Frone & Rice, 1987; Kirchmeyer, 1992; Mallard & Lance, 1998; Premeaux et al., 2007; Small & Riley, 1990). It is also clear that the interference between the work role and different roles in the private life is bi-directional – i.e. work-nonwork interference consists of two dimensions (work role to nonwork role interference and nonwork role to work role interference) and is
congruent with previous work-family studies indicating that the interference between work and family or personal life is two constructs (Carlson & Frone, 2003; Curbow et al., 2003; Geurts et al., 2005; Grzywacz & Marks, 2000; Netemeyer et al., 1996).

With regard to the convergent validity between the new instrument and the SWING, results indicated that overall high correlations were found between the four W-NWI dimensions and the negative work-home interaction (WHI) scale of the SWING (Geurts et al., 2005), which suggests that these scales measure highly related dimensions. The strong correlations were expected since the SWING is a well-known work-family relations measurement (i.e. measuring interference between work and home). However, a weaker relationship was found between negative WHI and the work-religion/spirituality role. This finding could possibly be attributed to the uniqueness of the religion/spirituality interference dimension in work-family research and the fact that the SWING does not differentiate between specific roles or dimensions of interference as it was merely developed to measure the overall interaction with the home dimension.

Although significant relationships were found between NW-WI and the negative HWI dimension of the SWING, these were somewhat weaker relationships compared to the relationships between the W-NWI dimensions and negative WHI. This may relate to the prevalence of WFC, where it has been well established that WFC is more prevalent than FWC (Geurts & Demerouti, 2003), which could also be true in the case of W-NWI and NW-WI. An additional interesting finding regarding the correlations of the NW-WI dimensions was that although high correlations with negative HWI were reported, these correlations were not as distinct compared to the work→nonwork interference, since the majority of these correlations were somewhat similar in strength. These findings may suggest that it is more difficult for individuals to differentiate between the interference that originates from the nonwork roles as opposed to interference that originates from the work role; individuals may be unable to recognise how various nonwork roles in their private lives interfere with their work. Individuals may thus find it easier to recognise overall interference from their home domain with their work (i.e. negative HWI measured with the SWING) rather than specific interferences originating from specific nonwork roles which influence their work domain (NW-WI measured with the new instrument). Furthermore, acceptable Cronbach alpha coefficients were obtained for all the dimensions of W-NWI and NW-WI,
indicating that the instrument is a reliable instrument which could be used to measure interference between work and nonwork roles.

Regarding the relationship with external variables, results indicated that the W-NWI dimensions were differentially related to various job characteristics and indicators of well-being. In accordance with the hypotheses, the four dimensions of W-NWI were associated with high levels of work pressure and emotional demands, which corresponds with the assumption that certain job characteristics may lead to interference between work and nonwork roles. Although all four dimensions of W-NWI were related to work pressure and emotional demands, these correlations were somewhat different in strength, indicating the unique relationships with the various W-NWI dimensions. Additionally, work-parent and work-spouse interference were associated with low levels of work autonomy and work support, indicating that individuals experience difficulty (interference) in their relationships with their spouse and children when they do not have enough support or autonomy at work. These findings regarding W-NWI and antecedents are in line with previous studies (Boyar et al., 2007; Choi, 2008; Greenhaus & Powell, 2003; Fu & Shaffer, 2001; Lingard & Francis, 2005; Montgomery et al., 2006; Nasurdin & Hsia, 2008; Voyer, 2005).

With regard to W-NWI and indicators of well-being, high levels of the four work→nonwork interference dimensions were associated with high levels of emotional exhaustion, depersonalisation, cognitive weariness, physical ill-health, anxiety and depression (again the correlations differed in strength). Only high levels of work-parent, work-spouse and work-domestic interference were associated with low levels of life satisfaction, indicating that when individuals’ work interferes with their relationships with their spouse, children and their domestic activities, their levels of satisfaction in life decrease. These results are in accordance with previous research that also indicated the influence of WFC on individuals’ emotional exhaustion, depersonalisation, depression and quality of life (Greenhaus et al., 2003; Lingard & Francis, 2005; Montgomery et al., 2006; Weigel et al., 1995).

NW-WI dimensions were also differentially related to several home characteristics and indicators of well-being. High levels of the parent-work, spouse-work and domestic-work interference were associated with high emotional home demands and home pressure. High levels of parent-work and spouse-work interference were also related to home support and home developmental possibilities.
Prior studies also indicated the relationship of FWC with antecedents such as family demands (e.g., household demands), autonomy, work and family pressure and parental demands (Boyar et al., 2007; Fu & Shaffer, 2001; Greenhaus & Powell, 2003; Keene & Reynolds, 2005; Voydanoff, 2005b). High levels of all the four NW-WI dimensions were associated with high levels of anxiety (although the strength of these relationships differed). Additionally, religion/spirituality-work interference was associated with high levels of physical ill-health and depression. High levels of spouse-work interference were also associated with high levels of depression. Only low statistically significant associations were found between life satisfaction and parent-work, spouse-work and religion/spirituality-work interference.

To conclude, this study contributed to existing work-family research by validating a new work-nonwork interference instrument. Evidence of internal validity (i.e. construct validity and dimensionality, discriminant and convergent validity, reliability) and external validity (i.e. relationship with theoretically relevant external variables) of the instrument was reported. The study further demonstrated the empirical distinctiveness of the various work→nonwork interference (W-NWI) and nonwork→work interference (NW-WI) dimensions of the new instrument and was found valid and reliable for use in the South African context.

Although the research showed promising results pertaining to the psychometric properties of the new work-nonwork interference instrument, the current study is not without its limitations. The first and obvious limitation of this study was the use of a cross-sectional design, which means that no hard conclusions could be drawn with regard to causation in terms of the relationships of dimensions with external variables. The second limitation was the exclusive use of self-report measures, which could increase the problem of common method variance. The third limitation of this study was the use of individuals in only one specific occupation, namely tertiary educators. This limits the study’s ability to generalise the findings and to develop a comprehensive conceptual model that can be applied to a variety of job settings and groups of workers. The sample size of this study was also very small and no advanced structural models could be tested. According to DeVellis (2003), although a sample of 300 is generally regarded as adequate, scales have been developed successfully with smaller samples.
Despite these limitations, the current study has important implications for organisations and for future research. The new instrument can be used by managers in organisations as a tool to measure the interference between work and nonwork roles of their employees. Since this study provides ample evidence of validity and reliability, this instrument can be used to measure interference between work and different nonwork roles in the South African context. Recommendations for future research include the use of the instrument in various occupations. Future analyses could also include more advanced statistical analyses in order to further prove the distinctiveness of the various dimensions with external variables, and could possibly include the testing of a structural model (i.e. multiple regression or path analyses). It is also recommended that various occupations and their job characteristics and family situations be investigated. Since working conditions are unique within the different occupations – but are still related to work-nonwork interface and health – the investigation of heterogeneous populations is important.

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CHAPTER 5

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

In this chapter, conclusions are drawn regarding the specific objectives of this study. The limitations of the research are discussed, followed by recommendations made to the organisation with regard to the specific research problem. Lastly, suggestions and recommendations are made for future research.

5.1 CONCLUSIONS

South African research on work-family conflict (WFC) has progressed considerably over the past ten years. However, work-family researchers in South Africa are still confronted with several areas in the field that are not clearly understood. There is for instance no thorough understanding of how South African employees experience the interaction between work and their personal lives, and how these experiences compare with international models and theories. Researchers are also faced with measurement issues. Several points of critique are raised against WFC measuring instruments currently used, including the wording of items, the use of appropriate response anchors and scales and the lack of comprehensive scale development procedures (Bellavia & Frone, 2005; Frone, 2003; Netemeyer, Boles & McMurrian, 1996; Small & Riley, 1990; Tetrick & Buffardi, 2006). These limitations were addressed in this study, and valuable contributions were made not only to work-family research but also to employees and organisations in South Africa.

The first objective of this study was to investigate the interaction between work and personal life and the experiences thereof in the South African context. An important aspect of concern for South African researchers is how South African employees experience the interaction between their work and personal life and whether these experiences differ from those of employees in other countries. Currently, international work-family literature provides researchers with various integrative frameworks, and most of these frameworks include various forms of interaction,
related antecedents and consequences as well as the conceptualisation and measurement of the interaction (Allen, Herst, Bruck & Sutton, 2000; Bellavia & Frone, 2005; Frone, 2003; Frone, Russell & Cooper, 1992; Geurts & Demerouti, 2003).

From the results obtained during the exploratory study (i.e. the interviews with employees from four occupational groups, namely police officers, secondary educators, mineworkers and university academic staff), very similar findings as well as unique contributions were made to existing work-family literature. At the outset, it became evident that South African employees experience various forms of interaction between their work and other dimensions in their personal lives. It seems that in addition to the well-known conflict between work and family life (i.e. WFC, Greenhaus & Beutell, 1985), South African employees experience specific influences between their work and additional personal dimensions in their personal lives (e.g. domestic, leisure, exercise, studies, community, extended family and religion/spirituality). South African employees seem to value not only the salient domains in life (i.e. work and family), but also other personal dimensions. However, having to participate in these various personal dimensions simultaneously can become very strenuous to employees, resulting in various forms of interaction (i.e. influences of work to personal dimensions, influences of personal dimensions to work, influences between personal dimensions, negative integration, and segregation).

Similar to international frameworks regarding antecedents of WFC, responses from the interviews revealed that South African employees experience various stressors in their work environment which contribute to the interaction (commonly categorised as job characteristics in international literature: Ballout, 2008; Byron, 2005; Carnicer, Sánchez, Perez & Jimenez, 2004; Geurts & Demerouti, 2003). Some of these stressors are more general stressors (e.g. pressure, overload, workload, stressful working arrangements, and strenuous relationships at work, which are in line with job demands identified by Demerouti, Bakker, Nachreiner & Schaufeli, (2001) – i.e. physical workload, time pressures, physical stressors, shift work and recipient contact), while other stressors seem to be more occupation specific (e.g. stressful nature of the job, not being valued in an unsupportive work environment). Employees also indicated supportive aspects that were present in their work environment (resources) (e.g. supportive work arrangements,
supportive relationships at work and occupation satisfaction). It seems that these resources are often used by employees to help them cope with the strain they experience.

In addition to the antecedents, results from the interviews also revealed various consequences of the strain that employees experience (i.e. general consequences, such as a decline in physical or psychological health, and absenteeism or turnover intentions). These consequences are very similar to categorised consequences reported in international research (i.e. physical, psychological, behavioural, attitudinal, organisational consequences or work, nonwork and health-related consequences) (Allen et al., 2000; Bellavia & Frone, 2005; Geurts & Demerouti, 2003). Results also indicated consequences specifically related to all the forms of interaction (e.g. time-based consequences, build up and spillover of emotions and energy depletion) and consequences that are more related to a specific form of interaction (e.g. mental preoccupation, strain on relationships, managing responsibilities, limiting of work opportunities, energy generation, learned skills). The results of this study indicated a vast amount of consequences that employees experience as a result of their work-personal life interaction, emphasising the importance of work-personal life interaction research in South Africa even more.

The second objective of this study was to develop a more comprehensive work-nonwork interference instrument that measures the interaction between work and several nonwork roles (e.g. parent, spouse, religion/spirituality, domestic). Following a four-step procedure described in psychometric and scale development literature (i.e. initial construct conceptualisation, item generation and evaluation, item development, and item refinement: Boyar, Carr, Mosley & Carson, 2007; Carlson, Kacmar, Wayne & Grzywacz, 2006; DeVellis, 2003; Geurts, Taris, Kompier, Dikkers, Van Hooft & Kinnunen, 2005; Kirchmeyer, 1992; Netemeyer, Boles & McMurrian 1996), a new work-nonwork interference (W-NWI) instrument was developed. Grounded in the theoretical perspective of the role identity theory (Burke, 1980; McCall & Simmons, 1966; Stryker, 1968), and in contrast to previous work-family measuring instruments (Frone et al., 1992; Geurts et al., 2005; Grzywacz & Bass, 2003; Netemeyer et al., 1996; Stephens & Sommer, 1996), the new instrument differentiates among interference between work and various specific roles in an individual’s personal life (i.e. work-parent interference, parent-work interference, work-spouse interference, spouse-work interference, work-religion/spirituality
interference, religion/spirituality-work interference, work-domestic interference, domestic-work interference).

During the development of the new instrument, several of the theoretical and measurement issues voiced by previous researchers were taken into consideration (i.e. dimensionality and directionality, item development and item use, the use of response anchors and scales and scale development procedures: Bellavia & Frone, 2005; Tetrick & Buffardi, 2006). First, in contrast to previous work-family measurements, the newly developed instrument differentiates between various interference dimensions between work and nonwork roles and is bidirectional in nature. Second, close attention was given to the process of item development and item selection. Only items stated in general terms and items that were not confounded with external variables, causes or consequences were included. Also, the same number of items for all the interference dimensions were retained (Carlson et al., 2006). Third, a frequency-based response format scale was chosen where no midpoint was provided, based on suggestions of Bellavia and Frone (2005) and Kirchmeyer (1992) who state that frequency data and responses are less biased. Fourth, rigorous scale development procedures were followed and described where the new instrument was evaluated rigorously. Particular attention was given to construct conceptualisation, item generation and evaluation, item development, and item refinement.

The third objective was to evaluate the performance of the newly developed instrument. In order to identify items that accurately capture the different dimensions of interference and to discard items that were inefficient, careful attention was given to the evaluation of items. Using the Rasch measurement model, a technique that has become the standard for modern psychometric evaluations of outcome scales (Tennant & Conaghan, 2007), items of the work-nonwork interference instrument were evaluated and eliminated. From the Rasch analyses, two problematic aspects emerged – problems relating to dimensions (i.e. person separation and reliability problems) and problems relating to specific items (e.g. problematic items). Five problematic items were identified and eliminated based on the infit and outfit statistics of the items. Items were also eliminated by means of investigation of item correlations. Regarding the work-nonwork interference (W-NWI) items, four items were eliminated due to high correlations between dimensions. Various nonwork-work interference (NW-WI) items were also eliminated.
based on low correlations within dimensions and high correlations with other dimensions. After the elimination process, a work-nonwork interference scale with 30 items was retained for the validation study.

The fourth objective of this study was to determine the psychometric properties of the new W-NWI instrument. First, the internal validity was investigated by testing six specific hypotheses relating to the construct validity, discriminant validity, convergent validity and reliability of the instrument. With the use of confirmatory factor analysis (CFA) analyses, the construct validity and directionality of the new W-NWI instrument were tested. Competing models were tested and compared with the hypothesised four-factor models for each direction of interference (i.e. work-nonwork interference and nonwork-work interference). The results regarding W-NWI revealed that a four-factor model fitted the data significantly better compared to the competing models that were tested (i.e. one-factor model, two-factor home-religion model, three-factor family model, three-factor caretaker model). However, a high standardised residual covariance suggested an improvement in the hypothesised model by deleting one problematic item (work-parent item 4). Results of adjusted four-factor model indicated that this model explained the associations between the 14 items best. Results regarding the hypothesised four-factor NW-WI model showed that this model also fitted the data significantly better compared with the alternative models. As a result, the two hypotheses stating that work-nonwork interference is a four-dimensional construct, consisting of work-parent interference, work-spouse interference, work-religion/spirituality interference and work-domestic interference and nonwork-work interference is a four-dimensional construct, consisting of parent-work interference, spouse-work interference, religion/spirituality-work interference and domestic-work interference, was accepted.

In addition to the construct validity, other measures of internal validity were also tested (i.e. discriminant and convergent validity). Regarding the discriminant validity of the four W-NWI dimensions and four NW-WI dimensions, the results of CFA analyses revealed that the dimensions relating to W-NWI and NW-WI are indeed distinct. Additionally, 2nd order factor models were also tested (i.e. the one-factor model and the two factor model) to prove that W-
NWI and NW-WI are distinct constructs. Results of the CFA analyses showed that the one-factor model indicated poor fit to the data, whereas the two-factor model showed a good fit to the data. Upon comparison of the one-factor and two-factor models, it seemed that the two-factor model fitted the data significantly better than the one-factor model. These results therefore supported the hypothesis that work-nonwork interference consists of two constructs, namely W-NWI and NW-WI, and are congruent with previous work-family studies, indicating that the interference between work and family or personal life are two constructs (Carlson & Frone, 2003; Curbow et al., 2003; Geurts et al., 2005; Grzywacz & Marks, 2000; Netemeyer et al., 1996). Therefore, the hypothesis of a second-order, two-factor model that distinguishes between the different directions is superior to a one-factor model that assumes no directionality, was also accepted.

With regard to the convergent validity, results indicated that overall high correlations were found between the four W-NWI dimensions and the negative work-home interaction (WHI) scale of the SWING (Geurts et al., 2005), suggesting that these scales measure highly related dimensions. These strong correlations were expected since the SWING is a well-known work-family relations measurement (i.e. measuring interference between work and home). Significant correlations were also found between the four NW-WI dimensions and negative home-work interaction (HWT), although they were somewhat lower compared to the correlations between the W-NWI dimensions and negative WHI. This may relate to the prevalence of WFC, where previous researchers have established that WFC is more prevalent than family-work conflict (FWC) (Geurts & Demerouti, 2003), which could also be true in the case of W-NWI and NW-WI. As a result, the three hypotheses relating to the discriminant and convergent validity were also accepted. Furthermore, acceptable Cronbach alpha coefficients were obtained for all the dimensions of W-NWI and NW-WI, indicating that the instrument is a reliable instrument that can be used to measure interference between work and nonwork roles. Therefore, the final hypothesis relating to the reliability of the instrument was accepted.

The fifth objective of the study was to determine the external validity (i.e. relationship with theoretically relevant antecedents and consequences) of the new instrument. Two specific hypotheses were tested, which hypothesised that the different work-nonwork dimensions are related in unique ways to job characteristics and well-being and the different nonwork-work
dimensions are related in unique ways to home characteristics and well-being. The results obtained indicated that the different W-NWI dimensions were differentially related to various job characteristics and indicators of well-being, while NW-WI dimensions were differentially related to several home characteristics and indicators of well-being. As a result, these two hypotheses were thus also accepted.

The four dimensions of W-NWI were associated with high levels of work pressure and emotional demands, which corresponds with the assumption that certain job characteristics impact on the interference between work and nonwork roles. Although all four dimensions of W-NWI were related to work pressure and emotional demands, these correlations were somewhat different in strength, indicating the unique relationships with the various W-NWI dimensions. These findings regarding W-NWI and antecedents are in line with previous studies (Boyar et al., 2007; Choi, 2008; Fu & Shaffer, 2001; Greenhaus & Powell, 2003; Lingard & Francis, 2005; Montgomery, Panagopoulou & Benos, 2006; Nasurdin & Hsia, 2008; Voydanoff, 2005b). Regarding W-NWI and the relationship with well-being, high levels of the four work-nonwork interference dimensions were associated with high levels of emotional exhaustion, depersonalisation, cognitive weariness, physical ill-health, anxiety and depression (again, the correlations differed in strength), which also corresponds with previous research that indicated the influence of WFC on individuals’ emotional exhaustion, depersonalisation, depression and quality of life (Greenhaus et al., 2003; Lingard & Francis, 2005; Montgomery et al., 2006; Weigl et al., 1995).

NW-WI dimensions were also differentially related to several home characteristics and indicators of well-being. High levels of the parent-work, spouse-work and domestic-work interference dimensions were associated with high emotional home demands and home pressure. High levels of parent-work and spouse-work interference were also related to home support and home developmental possibilities. Prior studies indicated the relationship of FWC with antecedents such as family demands (e.g. household demands), autonomy, work and family pressure and parental demands (Boyar et al., 2007; Fu & Shaffer, 2001; Greenhaus & Powell, 2003; Keene & Reynolds, 2005; Voydanoff, 2005). High levels of all four NW-WI dimensions were associated with high levels of anxiety (but the strength of relationships differed).
5.2 LIMITATIONS OF THIS RESEARCH

The first limitation of this study concerned the homogeneous samples used. Only individuals of specific occupational groups from two provinces in South Africa were included in the different empirical studies. Employees who participated in the first exploratory study were obtained from four different occupational groups (i.e. police officers, secondary educators, mineworkers and university academic staff) which could be considered high-risk groups regarding the stress experienced in their work environments (Jorgenson & Rothmann, 2008; Mostert, Rothmann, Mostert & Nell, 2008; Mostert & Oldfield, 2008; Oosthuizen & Berndt, 2008; Pienaar & Rothmann, 2006). The majority of these participants were living in suburbs of large cities or in towns. Since circumstances may differ between urban and rural areas (e.g. availability of transport, standard of accommodation and living), participants working in rural areas or communities might experience the interaction between their work and private life very differently. Also, some of the results obtained regarding the stressors and resources experienced by South African employees may have been language or occupation specific (e.g. the unique stressors related to the nature of the job for South African police services (SAPS) employees). Participants in the exploratory study resided in only two provinces of South Africa (i.e. North West and the Free State). The implication is that the results should be interpreted with caution with regard to generalisation to other provinces or contexts.

A major limitation concerning the sample used in the second phase of this research (i.e. the evaluation study and the study testing the psychometric properties of the newly developed instrument) was that no diversity was displayed. This might be due to the specific tertiary institution used. This institution has personnel from one major language group and has unique characteristics in terms of the organisational culture and historical background, which could have influenced the participants’ responses. Other tertiary institutions that are more representative of the South African population in terms of cultural and language groups and historical background might yield very different results. Also, the fact that the participants in the validation sample (tertiary educators) were from a highly educated group of employees could have impacted their responses to the items of the questionnaire. The specific work conditions at the university could have influenced their specific experiences regarding the interaction between their work and
personal life. Another limitation was that individuals who participated in the second phase of empirical studies resided only in the North West Province. Therefore, the results should be interpreted with caution with regard to generalisation to other provinces, contexts or professions. There is still a need for replication in other occupational groups in other provinces of South Africa with more heterogeneous samples.

The second limitation of this study related to respondent fatigue due to the large number of items used in the new W-NWI instrument. The feedback from participants during the pilot study included complains about the length of the questionnaire, the amount of items measuring the same construct and the repetition of the items. This could have had an influence on how participants responded to the items (e.g. responding randomly). According to Netemeyer et al. (1996), long measures can become cumbersome for respondents and do not always enhance psychometric properties. Scales with fewer items are preferable to scales with many items, given comparable coefficient alpha and construct validity estimates (Cortina, 1993; Podsakoff & MacKenzie, 1994). One of the main objectives of the study was the development of a new instrument. To this end, suggestions of previous researchers (DeVellis, 2003; Nunnally, 1988) regarding instrument development were followed, which resulted in the compilation of a large number of items measuring work-nonwork interference. Although the number of items were considerably reduced during the pilot study (i.e. item evaluation study), the final W-NWI instrument administered in the final evaluation study still included a large number of items (30 items).

A third limitation pertained to an aspect regarding the conceptual development of the new instrument -- i.e. the specific roles being measured in the new instrument. Based on the more prevalent roles mentioned and discussed in the exploratory study as well as the roles mainly found in the literature (Baruch & Barnett, 1986; Glaser, Evandrou & Tomassini, 2006; Pietromonaco, Manis & Frohardt-Lane, et al., 1986), the new instrument was developed to measure interference between work and four specific roles in private life (i.e. parent, spouse, religion/spirituality and domestic). However, these may not be the only social roles that individuals engage or participate in. According to Swindle and Moos (1992), life offers a wealth of potential domains or roles within which a person can realise a variety of personal agendas.
Each role may fulfil different goals or needs and could consist of many activities with one’s spouse, children, extended family, work or friends. This is evident from the exploratory study, and also from previous researchers suggesting other social roles, such as the roles of leisure, social, community, studies and extended family (Lingard & Francis, 2005; Plaisier et al., 2008). Particular interesting roles emerging in the South African context are the community and extended family roles which are present in some cultures in South Africa (as mentioned in the exploratory study). Although these roles might be unique to the South African context, individuals may participate in so many other social roles outside work that only the more prevalent roles were included for the new instrument. However, the possible influences or interference between work and these nonwork-roles other than those measured in this study should not be ignored or dismissed.

In addition, it may be argued that the specific roles (i.e. parent, spouse and domestic) may all imply or be related to a larger, general “family” dimension, suggesting that religion/spirituality presents the only non-family nonwork role. Although this may be true and the specific “family” roles limits the instrument to be used only among samples of employees who are married and have children, it can still be a very valuable tool/instrument to measure the specific complex interference that married parents may experience between their work and personal life. Future research could explore the development of instruments more applicable to other employees who are for example single and do not have children, where interference between work and other social roles exists.

The fourth limitation also relating to the conceptual development of the instrument is the negative or interference connotation of the measurement between work and nonwork roles (Parasuraman & Greenhaus, 2002). The new instrument focuses exclusively on the negative interaction (i.e. interference) that might occur between these roles. This was again based on the prevalence of the negative interference found in the exploratory study as well as previous work-family conflict/interference research (Carlson & Frone, 2003; Carlson & Kacmar, 2000; Carlson, Kacmar & Williams, 2000; Curbow et al., 2003; Geurts et al., 2005; Grzywacz & Marks, 2000; Mesmer-Magnus & Viswesvaran, 2005). However, researchers have recently started to place more emphasis on ‘positive psychology’ and the need to explore the ways in which work and
nonwork roles can enhance each other (Carlson et al., 2006; Greenhaus & Powell, 2006; Grzywacz & Butler, 2005; Wayne, Grzywacz, Carlson & Kacmar, 2007; Hanson, Hammer & Colton, 2006; Tetrick & Buffardi, 2006). Although the possibility of positive influences between work and nonwork roles was not ignored and was mentioned to a lesser extent in the exploratory study, due to the comprehensiveness and extensiveness of the new instrument it was decided to focus only on measuring the negative interference between work and nonwork. However, researchers have suggested the distinctiveness and uniqueness regarding positive influences between domains, and the unique processes and mechanisms which might be related to positive aspects (Greenhaus & Powell, 2006; Stevens, Minotte, Mannon & Kiger, 2007; Tetrick & Buffardi, 2006). Therefore the need does exist to not only investigate or measure the negative interaction between work and personal life but to also investigate positive influences between work and personal life.

The fifth limitation was the exclusive use of self-report measures, which could increase the problem of common method variance. Although the strength of this type of variance cannot be tested, several studies have indicated that common method variance is not as troublesome as might be expected, and several authors have argued that this phenomenon is not a major threat if interactions are found (Dollard & Winefield, 1998; Semmer, Zapf & Grief, 1996; Spector, 1992; Wall, Jackson, Mullarkey & Parker, 1996).

The final limitation was the relative small sample sizes (i.e. \( n = 245 \) in pilot study; \( n = 366 \) in evaluation study) of the empirical studies in the second phase (i.e. the evaluation study and validation study). In order to focus on the adequacy of the items during scale development studies, DeVellis (2003) suggests that samples should be large enough to eliminate subject variance as a significant concern. Although a sample of 300 is generally regarded as adequate, DeVellis (2003) states that scales have been successfully developed with smaller samples.
5.3 RECOMMENDATIONS

The following recommendations are made to the organisation as well as for future research.

5.3.1 Recommendations to the organisation

Recently, there has been an increase in the reporting of strain experienced in work environments or industries in South Africa and the influence thereof on the well-being of employees (Jorgenson & Rothmann, 2008; Mostert, Rothmann, Mostert & Nell, 2008; Mostert & Oldfield, 2008; Oosthuizen & Berndt, 2008; Pienaar & Rothmann, 2006). Keeping the results of this study in mind, it is recommended that South African organisations should become more aware of the pervasiveness and extensiveness of strain experienced by employees, especially stressors inherent to specific occupations (e.g. dealing with traumatic cases in the SAPS, inability to discipline children in schools). If organisations are more aware of the particular strain/stressors experienced by employees and the type of resources available, valued or used by employees, organisations can use their available resources to benefit the employees or to increase their well-being.

When organisations are fully informed about the stressors/strains that employees experience, they can help employees by providing specific resources to help buffer the consequences of these stressors, as suggested in previous international research relating to the Job Demands-Resources (JD-R) model of work-related well-being (Demerouti et al., 2001; Schaufeli & Bakker, 2004). These resources could include more support from supervisors, more empathy for personal situations of employees or more emotional support to deal with severe stressors which are inherent to specific occupations (e.g. counselling opportunities for SAPS members) (Schaufeli & Bakker, 2004). Since the results of this study indicate that various occupations yield specific circumstances of strain, it is important that managers of organisations be informed about the way in which their employees experience their work environments and about how they as managers or organisations can enhance or increase their workers’ well-being.
Although work is one of the more salient domains in individuals’ personal lives, it is important for organisations to realise that employees are not only workers of the organisation but also spouses, parents, students, friends, family or community members to other individuals in society outside the work domain (Kirchmeyer, 1992). This is especially important for organisations to understand since the participation in other social roles also fulfils certain needs and agendas that are valuable to employees (Swindle & Moos, 1992). As indicated in the results of the exploratory study, South African employees are under severe pressure to keep a balance between their work domain and the various roles in their personal lives which often lead to interference and also to a decrease in their well-being (i.e. consequences such as energy depletion, mental overload, and a decline in physical health). Organisations should become more aware of the various roles which individuals fulfil outside their work and of the value that employees attach to these roles. Results indicate that although employees value time with their family they also enjoy spending time with friends, socialising and participating in exercise or leisure activities. This is important information from an organisational perspective since employees use these social/leisure, religion/spiritual times to recover from their work (Sonntag & Fritz, 2007).

Previous researchers have indicated that recovery from work can be regarded as a buffer between stressful working conditions and health (Akerstedt, Kecklund, Gillberg, Lowden & Axelsson, 2000) and that insufficient recovery from work can be associated with poor psychological and physical health (Elfering, Grebner, Semmer & Gerber, 2002; Sluiter, van der Beek & Frings-Dresen, 1999). Also, individuals’ well-being increases when they feel in control of important life domains (Bandura, 1997); and deriving a sense of reward or meaning from work or other life domains can buffer the negative effects of stressors (Carlson et al, 2006; Curbow et al., 2003). Organisations thus need to understand that although for many employees work is one of the most important or salient life domains, individuals also need time away from work in order to be more efficient workers in the workplace. When managers show more interest, empathy and support towards their workers and their participation in other life domains or roles, it produces more positive attitudes towards the organisation as workers feel valued and respected (as opposed to feelings of disrespect and no care attitudes). According to Kirchmeyer (1992), managers should encourage employees to pursue interests in their nonwork domains, and should consider
employees’ nonwork needs and responsibilities when setting work schedules, job assignments, and company transfers.

Closely related to the above are the influences between employees’ work and personal lives. Employees do not function in isolation and various aspects in their lives do spill over between the different domains or roles (Kirchmeyer, 1992). In both the exploratory and validation study, results indicate that various roles are influenced by the work domain and vice versa, which has certain implications for employees’ health and well-being. This is very important for organisations since the work domain not only influences employees’ personal lives but also leads to outcomes related to the bottom line of organisations, i.e. turnover intention and absenteeism (Heilmann, Bell & McDonald, 2009) In the exploratory study some participants indicated absenteeism from work and their intention to leave their organisation due to the various stressors, the lack of support and the interference which they experienced. Although few organisational outcomes were mentioned in the exploratory study, organisations should further investigate other possible implications that could directly influence the bottom line of organisations.

From the results in this study, the new work-nonwork interference instrument has been proven to be a useful, reliable and valid instrument that could be used by South African organisations for purposes such as organisation development and for employees’ personal development. Once problem areas of interference or well-being outcomes are identified, more specific interventions can be recommended or implemented in organisations. Individual-based interventions to reduce work-nonwork interference or health symptoms may also be an avenue to pursue. These interventions could include techniques such as self-monitoring, self-assessment, didactic stress management, promoting a healthy lifestyle and relaxation (Schaufeli & Enzmann, 1998). Organisational development interventions in general, as well as interventions to influence culture and values, could also be implemented to contribute to healthier workplaces.
5.3.2 Recommendations for future research

Regardless of the limitations of this study, the present findings have important implications for future research. First, from the results obtained in the exploratory study, recommendations can be made with regard to the investigation of interference between work and nonwork roles, and possible antecedents and consequences for specific occupation and language groups. From the interviews, it became evident that South African employees are exposed to severe stressful work environments that influence various nonwork roles in their personal lives (i.e. work-nonwork interference). Although numerous stressors and resources were mentioned by employees, which provided valuable information regarding South African organisations, some of these stressors and resources might be language or occupation specific – something which should be addressed in future research. It is therefore recommended that differences regarding work-personal life interaction be investigated further for various language or occupational groups in order to determine if the experiences found in the exploratory study were language or occupation specific and if they were a fair representation of South African employees’ experiences. Moreover, according to Geurts and Dikkers (2002), it is also important to have several sources of information from several domains, for instance from the partner, child(ren), supervisors and observers. This implies that instead of asking only employees about their experiences regarding work and personal life, it might be valuable and useful to also ask family members and friends/colleagues.

Second, from the evaluation and validation studies of the work-nonwork interference instrument, several recommendations can be made for future research relating to the use of homogeneous samples, the external validity of the instrument, possible positive conceptual development and the salience of nonwork roles. Regarding the use of homogenous samples, it is recommended that the newly developed instrument be administered to occupational groups that are more representative of the South African population. Although the new instrument did indicate adequate measures of validity and reliability, it was only validated in one occupational sample (i.e. a tertiary education institution). According to Carlson et al., (2000), additional validation of scales across organisations and occupations is important to further establish scales and provide generalisability. Future research should thus include the validation of the instrument across
numerous organisations and occupations in South Africa. This will lend confidence to the use of the instrument and add to the generalisation of the results obtained. Also, since the new instrument measures interference between work and nonwork roles with a large number of items, future studies could also investigate the performance of the specific items of the instrument. Future studies from other occupation or language groups could lead to different results pertaining to the performance of the items, which could imply further elimination of poor items.

Despite the evidence that provided support for the external validity of the new instrument with various external variables (i.e. antecedents and consequences), several aspects can be explored more adequately in future studies. This includes the variety/range of demands, resources and outcomes as well as the specific processes associated with each role (Frone & Rice, 1987). According to Voydanoff (2007), research regarding work-family interaction should include a more comprehensive variety of demands and resources – which could include additional variables such as psychological involvement, performance feedback and psychological rewards. For example, specific demands and resources related to a particular roles may contribute more to a specific work-nonwork interference dimension than general demands/resources and general work-family conflict outcomes (Stevens et al., 2007). This is supported by Premeaux et al. (2007), who provided empirical support for the need to differentiate among the various types of work-family conflict that workers experience. Premeaux, Adkins and Mossholder, (2007) also suggested that the investigation of roles is important since various roles are dissimilarly associated with work and family characteristics and work outcomes. According to Carlson et al. (2000), future research is needed on the unique antecedents and outcomes for each of the dimensions of work-family conflict. Research is also needed on more unique antecedents and consequences and outcomes for each of the dimensions measured in the new work-nonwork interference instrument as opposed to the more general demands, resources and outcomes measured in this study (i.e. work and home pressure, demands, cognitive demands, autonomy and support, life satisfaction, health and burnout). With the newly developed work-nonwork interference instrument, such future research will be possible and very valuable to work-family research.
Although a variety of antecedents and consequences were included in this study, and proposed relationships were found with several of the W-NWI dimensions, future research should include the investigation and testing of structural models regarding W-NWI and well-being of South African employees. The development of a structural model would result in a better understanding of W-NWI and well-being within organisations, and provide valuable information for the development of future wellness programmes. According to Marais (2005) structural models regarding work life interaction can be applied for workplace interventions aimed at optimising employees' health and psychological well-being.

In conjunction with studying the negative interference between work and nonwork roles, future research should also include, or focus on, the possible positive influences between work and various nonwork roles. The fundamental thinking behind the positive influences between work and personal life is that these domains provide individuals with resources or other benefits that may help them to perform better across the domains in their life (Carlson et al., 2006). However, this notion of positive interaction between domains has only recently been investigated by international researchers, and a very limited number of positive interaction instruments are currently available (Grzywacz & Butler, 2005; Hanson et al., 2006; Wayne et al., 2007). These instruments, however, vary in the use of concepts/terminology and linking mechanisms to describe these positive interactions (e.g. facilitation, enhancement, positive spillover) (Grzywacz & Butler, 2005; Hanson et al., 2006; Wayne et al., 2007). Similar to the exploratory phase in this study, the experiences of positive influences between work and nonwork roles within the South African context have recently been investigated (Botha, 2010; Britz, 2010; Labuschagne, 2010). Although these studies can be considered a valuable starting point for exploring positive interaction in South Africa, limited information was obtained regarding the underlying processes and mechanisms of positive interaction and the specific manner in which specific nonwork roles can influence each other positively. Therefore, following the procedures used in this study, it is recommended that future studies in South Africa investigate the possible positive interaction between work and various nonwork roles. Research studies focusing on investigating positive interaction from an exploratory perspective within the South African context could provide valuable information, which may lead to the development of an instrument which captures positive interaction more accurately for the South African context.
The final recommendation for future research concerns the investigation of the salience of roles occupied by individuals and the influence thereof in a comprehensive model of W-NWI and well-being. Recently, various researchers have suggested or recommended the investigation of role salience in the work-family research field. It is suggested that the salience of specific roles may influence individuals' experiences of work-family conflict and ultimately influence their well-being (Baldwin, Ellis & Baldwin, 1999; Noor, 2004; Plasier et al., 2008; Wickrama, Conger, Lorenz & Mathews, 1995; Wiley, 1991). Although the salience of roles was not measured specifically in this study, the new W-NWI instrument was developed based on the role identity theory of Stryker (1986), which indicated the importance and role of salient roles for the self-concept of individuals. Individuals occupy a variety of roles to which certain role identities are linked, and the salience that individuals attach to these roles may vary. Individuals view certain roles as more important than others, which will result in the individual choosing behaviours which will confirm the more salient identities. From the role identity perspective, individuals will experience interference between their work role and other nonwork-roles when the roles that they occupy are similarly salient and/or when they lack the opportunities to participate in certain roles. Since the new instrument measures specific W-NWI dimensions, it is recommended that the salience of the specific roles be measured where the possible moderating effect thereof can be tested, as suggested by previous researchers (Aryee, 1999; Bagger, Li & Gutek, 2009; Carr, Boyar & Gregory, 2008; Noor, 2004).
REFERENCES


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INFORMED CONSENT

The following consent form was obtained from all participants in the study, after participants were informed about the general information about the study.

CONSENT FORM TO PARTICIPATE IN RESEARCH STUDY

I, .............................................................. hereby consent to participate in the research study regarding the balance between work and family life. I am informed about the following regarding the research:

- The process and procedures of the research;
- My rights to terminate my involvement at any specific time;
- Tape recorded interviews; and
- The confidentiality and anonymity with which the information given by me will be handled.

Signed at..........................................................

Date ..............................................................

...........................................

Participant

...........................................

Researcher
To whom it may concern

INFORMATION REGARDING THE RESEARCH PROJECT

This is a research study regarding the balance between work and family life. The following information is important:

Process and procedure

The process and procedure entails interviews that should be held with participants. The researcher will contact the participant beforehand and make an appointment that will best suit the participant and the researcher. The interview will be held at a location where the participants feel most comfortable, and is private. Written consent will be given by the participant prior to the interview.

Rights of the participants

Should the participant at any time feel uncomfortable or unwilling to proceed with the interview, he/she has the right to stop and terminate his involvement in the research. Participating in the research is voluntary and participants have the right to decide to participate or not. The researcher will at no time force the participant to continue an interview if the participant is unwilling.

Tape recorded interviews

All interviews will be recorded in order for the researcher to recall the conversation. These taped recorded interviews will only be available to the researcher and the promoter. After the conversation has been transcribed the tapes will be kept in secure locking.

Confidentiality and anonymity of information gathered

The information given by the participants during the interviews will at all times be held anonymously and confidential. Only the researcher and promoter will have access to the information.
EXTRACTION OF TRANSCRIPTION

All interviews were transcribed verbatim from the tapes recorded during the interviews. The following is an extraction from one of the transcriptions of an interview conducted with a Tswana teacher. This is an extraction of the translated transcription.

Researcher: You have your life at work and your life at home (personal life), when I say your life at home, I mean all the things that you do at home apart from your work, can you tell me how do you experience the interaction between these two parts, your life at work and your life at home?

Interviewee: Like how they interact?

Researcher: Yes, like interaction between the two of them.

Interviewee: Life at work is at work and life at home is at home.

Researcher: Mh

Interviewee: They don’t interact.

Researcher: They don’t interact? Its like you keep them apart?

Interviewee: Yes they don’t interact, because its like when I have problems at home I will never bring them at work, I keep them apart and I focus on my work, but when I have work at school I can take it home but still it doesn’t affect my life at home.

Researcher: Ok, you are telling me that they don’t interact, its like, like when you have problems at home you don’t bring them to work but some other times when you have a lot of work at school you take it home, can you tell me about your work?

Interviewee: At school my work is to teach, to talk to children when they have problems they come to me, but not all of them, anyone that feels that they have problems comes to me with their problems

Researcher: Yes

Interviewee: They will tell you they have certain problems and then you can help them where you can, like problems at home, you know children have a lot problems at home, you will see them performing weak not knowing what is going on, some other times you call them asking
them why their performance is so weak, then they will start explaining to you why they perform so poorly.

[Pause]

Researcher: Ok. Is there something else that you would like to add?

Researcher: You tell me that at work the children comes to you when they have problems, that is, you can help them maybe when they tell you what their problems are at home and then you can help them with their performance, like that?

Interviewee: Yes, its like you can see that at least, let me say even you when you have problems and then you tell someone, you know at least someone that knows can help you, it becomes better you know, you ca be focused, so even them, when they see that they've found help, they start to pick up, now their performance becomes better at school, some other times when they are demotivated they start to give up, not being able to be positive about life, so when they are like that there is nothing you can do, its like there is a lot of things, other times there is peer pressure, other times their in relationships, they will be boyfriends and girlfriends, even those count, but they never say anything about them.

Researcher: Can you tell me how do you feel, like maybe something happens like you've just told me that other times they give up and then they live school, demotivated, how do you feel about it as a teacher?

Interviewee: Its not nice you know, its like I take it like with me, like my problems I started experiencing it when I was in Std 9, it was difficult, too much, like it would happen that I will wake up early without money, and go to school, during lunch time I won't eat, but I was able to pass, knowing that when they say exam, its time for exams I study, I know that tomorrow is time for school I polish the shoes, I was my clothes doing everything, myself I was very positive, so them I don't know what makes them to give up, they don't believe that if you work hard, you will reap the good results.

Researcher: What you've been telling me about your work, is that of your relationship with the children at school, like helping them, is there something else that you would like to add about your work, other things that you do at work?

Interviewee: That I want to add?

Researcher: Yes, is there something else that you can tell me?

[Pause]

Interviewee: Nothing.

Researcher: You have been telling me about your life at work, about your relationship with the children at school, can you tell me about your personal life, like I told you your life at home apart from your work?
Interviewee: My life at home, I am not married, I am a breadwinner, I look after my sister's daughter, she goes to school, again I have my brother that stays with me at home, I am a person that likes, its like most of the time I like a private life, I can't, its like I like company but most of the time I am at home and then I like going to church [Pause] yes, that's all.

Researcher: Ok, you tell me that your life at home you are a breadwinner at home, you look after the people at home, like your sister's child, its your niece, and your brother and that you go to church, you like a private life, its like you are not a person that goes everywhere unless at a certain time if you want company, about your church life can you tell me more about that?

Interviewee: Its like I am used to going to church because when its Sunday and then I don’t go to church, I feel that there is something that I didn’t do, you see. So when I go to teach I have problems and the children at school have problems, I pray for them and I believe that God can hear us and he answers, so with me, its important to go to church, to believe that God is there.

Researcher: Ok, you have been telling me about your life at home, is there something else that you would like to tell me that you didn’t say?

Interviewee: I don’t think there is something else important that you would like to know.

Researcher: You can add it even if its not important.

Interviewee: There is nothing.

Researcher: Ok. Let me thank you again as you’ve been telling me about your life at work about your relationship with the children, and that especially when they have, like their performance is weak, you talk to them, and that you feel sad in a way when they drop out of school, the way you’ve been telling me......

Interviewee: Its like I will ask myself, again a person, you see to be a learner, it takes a school child and me as a teacher and at home like how they motivate them, myself I don’t remember the time I attended school, a teacher struggling with me about work, or at home my mother telling me to study because its time for exams, its like I thanked God for that, but I was still responsible, I knew that I had to study when I had to study, the only time that I remember, is only the time when I went to Std 8, I wanted to study commerce, my teacher called me asking me to study Math and Science, and I refused, that is the only time I remember a teacher talking to me about school work, other than that, I wasn’t a trouble child, a teacher calling me saying I am troubling with home- work?... and I remember with Biology, the teacher that taught us Biology only gave us notes, other than that, it was like, when he came into class he will tell us to go to the laboratory, when we go to the lab it’s a lot of notes only, you will find that I will read them myself, and during that time, we had a lot of riots at 1986, while in Std 8, so some times we would seat, you find we have to go home, at that time, I will get home
and read, I taught myself Biology but I passed, I don’t remember a teacher explaining but these children, you can give them a tip saying look at this ones tomorrow I am going to ask about them but still they don’t perform well after you told them, you can give them a question paper like that before June, I gave them a question paper to prepare for June exams, but still they failed it, its only a few that passed it, you see, they are not motivated.

Researcher: Yes

Interviewee: And sometimes we write letters calling parents, when they come they will cry, its like they’ve given up, they looking at you so that you can fix their children and they understand their children better than you because its their child, you know, you only see them at school, you see, so its up to them, these children they can’t fail if they learn.

Researcher: Ok. Is the something else that you would like to add?  
[Pause]

Interviewee: There is nothing.

Researcher: Ok. Let me thank you again for the time you’ve given me to interview you, if there is anything else we need, can I contact you for more information?

Interviewee: Yes

Researcher: Ok. Let me thank you again.
WORK PROTOCOL FOR CO-CODER

The data analysis includes the following:

- Field notes for each interview
- Transcriptions of each interview (original and translated transcriptions)
- Initial themes identified from transcriptions

Analysis protocol

- During the coding process the following is done as part of the data analysis:
- To obtain an overall picture of the context, thoroughly read interviews several times.
- Condense the actual text into meaningful units (sentences or paragraphs) that emerge from the responses of the participants regarding their experiences.
- Sort or categorise all the meaningful units into major themes.
- From the broad themes, explore and summarise similar smaller themes in order to obtain various sub-themes.

The following steps are also used during the data analysis and coding process:

- Defining the recorded units
- Defining the coding categories
- Testing the coding on a sample of text
- Assessing the accuracy of the sample coding
- Revising the coding rules
- Coding of all the text
EXAMPLE OF OBSERVATION NOTES

Interview notes
Participant: PA1
Date: 13 June 2006
Place: Police station, Potchefstroom, participant’s office

The following are observed during the course of the interview:
Setting: Office is very neat and quiet and suitable for interview process.

Comfort level: Participant is relaxed and very friendly. Participant talks very freely and don’t need much encouragement.

Body language: Participant becomes very excited when talking about the work environment in the SAPS. Participant seem to enjoy the interview and seems like a very sociable individual.

Environment: conducive for interviewing. No interruptions during interview.

ROLE OF THE INTER-MEDIATOR
Role of the inter-mediator is to identify employees willing to participate in the research and to provide the researcher with the necessary contact details and other biographical information. Inter-mediator also assist with the explanation of the objective of the study and the research process.

The inclusion criteria determined that a participant should
(1) have been employed in one of the selected occupations;
(2) have been working for at least two years in the specific occupation;
(3) have been able to communicate in Afrikaans, English or Setswana; and
(4) have given written consent to participate in the interviews.

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Table 1

Summary of key work-family measurement instruments

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Name of scale</th>
<th>Measure</th>
<th>Direction</th>
<th>Anchors</th>
<th>Scale</th>
<th>Number of items</th>
<th>Dimensions</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Job-spouse conflict,</td>
<td>W→S,</td>
<td>Strongly disagree (5)</td>
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<td>Job-homemaker conflict</td>
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<td></td>
<td>F→W</td>
<td>Almost always/Always</td>
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<td></td>
<td>WFC</td>
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<tr>
<td>Curlew, McDonell, Spratt, Griffen and Agnew (2003)</td>
<td>Work-family interface</td>
<td>WFC, WFS, FWC, FWS</td>
<td>W→F,</td>
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<td>5-point</td>
<td>16</td>
<td>Work, Family</td>
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<td></td>
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<td>F→W</td>
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<td>Some of the time (3),</td>
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<td>Most of the time (4),</td>
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<td>All of the time (5)</td>
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<td>Strongly agree (5)</td>
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<td>Dex and Bond (2005)</td>
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<td>Work-life balance</td>
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<td>W→S</td>
<td>high internal conflict (5)</td>
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<tr>
<td>Frone, Russell, Cooper (1992)</td>
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<td>5-point</td>
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<td>Occasionally,</td>
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<td>About half the time,</td>
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<td>Almost always/Always</td>
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<td>Scale</td>
<td>Score</td>
<td>Reference</td>
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<td>Geurts, Taris, Kompler, Dikkers, Van Hoof and Kinnunen, 2005</td>
<td>Work-home interaction</td>
<td>Negative and Positive WHI, Negative and Positive HWI</td>
<td>W→H, H→W</td>
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<td>-</td>
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<td>W→F, F→W</td>
<td>Never (1), All of the time (5)</td>
<td>5-point 16</td>
<td>Work, Family</td>
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<td>Role conflict</td>
<td>Conflict with professional, self, spouse and parent roles</td>
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<td>Cause no internal conflict (1), Causes some internal conflict (3), Causes high internal conflict (5)</td>
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<td>Professional, Self, Spouse, Parent</td>
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<td>Kirchmeyer (1992)</td>
<td>Nonwork-to-work spillover</td>
<td>Negative and Positive NWWS</td>
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<td>Work, Parent, Community, Recreation</td>
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<td>W→H spillover</td>
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</tbody>
</table>

**Note:** Abbreviations. WFC - Work-family conflict; FWC - Family-work conflict; WIF - Work interference with family; FIW - Family interference with work; WFS - Work-family spillover; FWS - Family-work spillover; WHI - Work-home interaction; HWI - Home-work interaction; WMS - Work-marital relationship spillover; WPS - Work-parent spillover; WLS - Work-leisure spillover; WHS - Work-home spillover; NWWS - Nonwork-to-work spillover; WIP - Work interfering with parenting.
Table 2

*Descriptive statistics and item-total correlations of initial work-nonwork interference items in the pilot study (n = 245)*

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>SD</th>
<th>Item-total correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work-spouse item 1</td>
<td>0.94</td>
<td>0.81</td>
<td>0.72</td>
</tr>
<tr>
<td>Work-spouse item 2</td>
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<td>0.82</td>
<td>0.79</td>
</tr>
<tr>
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<td>0.83</td>
</tr>
<tr>
<td>Work-spouse item 4</td>
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<td>0.83</td>
<td>0.83</td>
</tr>
<tr>
<td>Work-spouse item 5</td>
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</tr>
<tr>
<td>Work-spouse item 6</td>
<td>1.14</td>
<td>0.81</td>
<td>0.83</td>
</tr>
<tr>
<td>Work-spouse item 7</td>
<td>0.97</td>
<td>0.92</td>
<td>0.87</td>
</tr>
<tr>
<td>Work-spouse item 8</td>
<td>1.02</td>
<td>0.86</td>
<td>0.79</td>
</tr>
<tr>
<td>Work-spouse item 9</td>
<td>1.06</td>
<td>0.85</td>
<td>0.86</td>
</tr>
<tr>
<td>Work-spouse item 10</td>
<td>0.93</td>
<td>0.83</td>
<td>0.86</td>
</tr>
<tr>
<td>Work-spouse item 11</td>
<td>0.86</td>
<td>0.85</td>
<td>0.83</td>
</tr>
<tr>
<td>Work-spouse item 12</td>
<td>0.96</td>
<td>0.88</td>
<td>0.82</td>
</tr>
<tr>
<td>Work-parent item 1</td>
<td>1.02</td>
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<td>Work-parent item 2</td>
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<td>Work-parent item 4</td>
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<td>0.83</td>
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<tr>
<td>Work-parent item 5</td>
<td>0.93</td>
<td>0.88</td>
<td>0.81</td>
</tr>
<tr>
<td>Work-parent item 6</td>
<td>1.09</td>
<td>0.90</td>
<td>0.87</td>
</tr>
<tr>
<td>Work-parent item 7</td>
<td>1.06</td>
<td>0.90</td>
<td>0.84</td>
</tr>
<tr>
<td>Work-parent item 8</td>
<td>0.98</td>
<td>0.82</td>
<td>0.77</td>
</tr>
<tr>
<td>Work-parent item 9</td>
<td>0.99</td>
<td>0.87</td>
<td>0.82</td>
</tr>
<tr>
<td>Work-parent item 10</td>
<td>0.90</td>
<td>0.85</td>
<td>0.77</td>
</tr>
<tr>
<td>Work-parent item 11</td>
<td>1.01</td>
<td>0.83</td>
<td>0.77</td>
</tr>
<tr>
<td>Work-parent item 12</td>
<td>0.96</td>
<td>0.80</td>
<td>0.74</td>
</tr>
<tr>
<td>Work-religion/spirituality item 1</td>
<td>0.85</td>
<td>0.92</td>
<td>0.81</td>
</tr>
<tr>
<td>Work-religion/spirituality item 2</td>
<td>0.80</td>
<td>0.93</td>
<td>0.78</td>
</tr>
<tr>
<td>Work-religion/spirituality item 3</td>
<td>0.76</td>
<td>0.85</td>
<td>0.84</td>
</tr>
<tr>
<td>Work-religion/spirituality item 4</td>
<td>0.81</td>
<td>0.86</td>
<td>0.85</td>
</tr>
<tr>
<td>Work-religion/spirituality item 5</td>
<td>0.92</td>
<td>0.92</td>
<td>0.81</td>
</tr>
<tr>
<td>Work-religion/spirituality item 6</td>
<td>0.84</td>
<td>0.91</td>
<td>0.81</td>
</tr>
<tr>
<td>Work-religion/spirituality item 7</td>
<td>0.75</td>
<td>0.85</td>
<td>0.85</td>
</tr>
<tr>
<td>Work-religion/spirituality item 8</td>
<td>0.80</td>
<td>0.84</td>
<td>0.88</td>
</tr>
<tr>
<td>Work-religion/spirituality item 9</td>
<td>0.75</td>
<td>0.81</td>
<td>0.87</td>
</tr>
<tr>
<td>Work-religion/spirituality item 10</td>
<td>0.81</td>
<td>0.82</td>
<td>0.81</td>
</tr>
<tr>
<td>Work-religion/spirituality item 11</td>
<td>0.81</td>
<td>0.83</td>
<td>0.83</td>
</tr>
<tr>
<td>Work-religion/spirituality item 12</td>
<td>0.82</td>
<td>0.83</td>
<td>0.87</td>
</tr>
<tr>
<td>Work-domestic item 1</td>
<td>0.98</td>
<td>0.84</td>
<td>0.76</td>
</tr>
<tr>
<td>Work-domestic item 2</td>
<td>0.95</td>
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<tr>
<td>Work-domestic item 3</td>
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<td>0.89</td>
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<td>Work-domestic item 4</td>
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<td>Work-domestic item 5</td>
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<td>0.88</td>
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<td>Work-domestic item 6</td>
<td>0.93</td>
<td>0.79</td>
<td>0.86</td>
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<tr>
<td>Work-domestic item 7</td>
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<td>0.85</td>
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<td>Work-domestic item 8</td>
<td>1.02</td>
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<td>0.81</td>
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<td>Work-domestic item 9</td>
<td>1.05</td>
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<td>0.82</td>
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<td>Work-domestic item 10</td>
<td>0.98</td>
<td>0.79</td>
<td>0.84</td>
</tr>
</tbody>
</table>
Table 3

Descriptive statistics and item-total correlations of initial nonwork-work interference items in the pilot study (n = 245)

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
<th>Item-total correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spouse-work item 1</td>
<td>0.89</td>
<td>0.85</td>
<td>0.84</td>
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<td>0.84</td>
<td>0.86</td>
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<td>Spouse-work item 3</td>
<td>0.87</td>
<td>0.75</td>
<td>0.79</td>
</tr>
<tr>
<td>Spouse-work item 4</td>
<td>0.78</td>
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<td>0.83</td>
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<td>Spouse-work item 5</td>
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<td>0.92</td>
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<td>0.90</td>
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<td>0.81</td>
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<td>0.88</td>
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<td>Parent-work item 4</td>
<td>0.74</td>
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<td>0.89</td>
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<td>0.90</td>
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<tr>
<td>Parent-work item 6</td>
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<td>0.86</td>
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<td>Parent-work item 7</td>
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<td>Parent-work item 8</td>
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<td>0.81</td>
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<td>0.84</td>
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<td>Parent-work item 10</td>
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<td>0.88</td>
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<td>Parent-work item 11</td>
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<td>0.86</td>
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<td>Parent-work item 12</td>
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<td>Religion/spirituality-work item 1</td>
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<td>0.89</td>
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<td>0.82</td>
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<td>0.91</td>
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<td>Religion/spirituality-work item 9</td>
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<td>0.92</td>
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<td>0.87</td>
</tr>
<tr>
<td>Domestic-work item 2</td>
<td>0.73</td>
<td>0.82</td>
<td>0.87</td>
</tr>
<tr>
<td>Domestic-work item 3</td>
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<td>0.80</td>
<td>0.85</td>
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<tr>
<td>Domestic-work item 4</td>
<td>0.60</td>
<td>0.77</td>
<td>0.89</td>
</tr>
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<td>Domestic-work item 5</td>
<td>0.62</td>
<td>0.82</td>
<td>0.88</td>
</tr>
<tr>
<td>Domestic-work item 6</td>
<td>0.57</td>
<td>0.78</td>
<td>0.89</td>
</tr>
<tr>
<td>Domestic-work item 7</td>
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<td>0.76</td>
<td>0.83</td>
</tr>
<tr>
<td>Domestic-work item 8</td>
<td>0.56</td>
<td>0.77</td>
<td>0.86</td>
</tr>
<tr>
<td>Domestic-work item 9</td>
<td>0.55</td>
<td>0.79</td>
<td>0.90</td>
</tr>
</tbody>
</table>
Table 4

Summary of item elimination process

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Rasch analyses</th>
<th>Correlations</th>
<th>Final items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of items eliminated</td>
<td>Item number</td>
<td>Number of items eliminated</td>
</tr>
<tr>
<td>Work-nonwork interference dimensions</td>
<td>1</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Work-parent interference</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Work-spouse interference</td>
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<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Work-religion/spirituality interference</td>
<td>2</td>
<td>3,5</td>
<td>1</td>
</tr>
<tr>
<td>Nonwork-work interference dimensions</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Parent-work interference</td>
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<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Spouse-work interference</td>
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<td>0</td>
<td>2</td>
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<tr>
<td>Religion/spirituality-work interference</td>
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<td>1</td>
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<tr>
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<tr>
<td>Total</td>
<td>5</td>
<td>13</td>
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</tbody>
</table>
Table 1

Final 14 work-nonwork interference items from validation study in article 3 (n = 366)

<table>
<thead>
<tr>
<th>Work-parent interference items</th>
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</thead>
<tbody>
<tr>
<td>How often does it happen that...</td>
</tr>
<tr>
<td>Item 1</td>
</tr>
<tr>
<td>Item 2</td>
</tr>
<tr>
<td>Item 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work-spouse interference items</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often does it happen that...</td>
</tr>
<tr>
<td>Item 1</td>
</tr>
<tr>
<td>Item 2</td>
</tr>
<tr>
<td>Item 4</td>
</tr>
<tr>
<td>Item 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work-religion/spirituality interference items</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often does it happen that...</td>
</tr>
<tr>
<td>Item 1</td>
</tr>
<tr>
<td>Item 3</td>
</tr>
<tr>
<td>Item 4</td>
</tr>
<tr>
<td>Item 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work-domestic interference items</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often does it happen that...</td>
</tr>
<tr>
<td>Item 1</td>
</tr>
<tr>
<td>Item 2</td>
</tr>
<tr>
<td>Item 5</td>
</tr>
</tbody>
</table>
Table 2

**Final 15 nonwork-work interference items from validation study in article 3 (n = 366)**

<table>
<thead>
<tr>
<th>Parent-work interference items</th>
<th>How often does it happen that...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 2</td>
<td>your work suffers because you need to take care of your child(ren)?</td>
</tr>
<tr>
<td>Item 3</td>
<td>you have to call in late / have to leave work early to attend to the needs of your child(ren)?</td>
</tr>
<tr>
<td>Item 4</td>
<td>your work is not done in time because you have to take care of your children?</td>
</tr>
<tr>
<td>Item 5</td>
<td>taking care of your child(ren) makes it difficult for you to do your best at work?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spouse-work interference items</th>
<th>How often does it happen that...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 2</td>
<td>because your spouse/partner makes demanding requests, you are unable to perform effectively in your job?</td>
</tr>
<tr>
<td>Item 4</td>
<td>your spouse/partner disturbs or distracts you while you are working?</td>
</tr>
<tr>
<td>Item 5</td>
<td>your relationship with your spouse/partner interferes with your work?</td>
</tr>
<tr>
<td>Item 6</td>
<td>because of your marriage/relationship with your spouse/partner, you are unable to pursue your work goals or work interests?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Religion/spirituality-work interference items</th>
<th>How often does it happen that...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 1</td>
<td>because of your responsibility towards certain religious/spiritual activities, you find it difficult to attend to certain work-related activities?</td>
</tr>
<tr>
<td>Item 4</td>
<td>aspects that bother you in your religious/spiritual life, keep you from enjoying your work?</td>
</tr>
<tr>
<td>Item 5</td>
<td>because of your religious/spiritual beliefs, you are unwilling to accept certain tasks at your work?</td>
</tr>
<tr>
<td>Item 6</td>
<td>due to your participation in religious/spiritual activities, you do not pay full attention to certain aspects of your job?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Domestic-work interference items</th>
<th>How often does it happen that...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 2</td>
<td>domestic activities interfere with your work?</td>
</tr>
<tr>
<td>Item 3</td>
<td>you have to rearrange your work schedule because you have to take care of domestic matters at home?</td>
</tr>
<tr>
<td>Item 4</td>
<td>you have to arrange, schedule or perform domestic activities during work hours or at work?</td>
</tr>
</tbody>
</table>
Competing models for work-nonwork interference

Figure 1
MI – Four-factor “theoretical” model
Figure 2
*M2 – One-factor model*
Figure 3
M3 – Two-factor “home/religion” model
Figure 4
M4 – Three-factor “family” model
Figure 5
M5 – Three-factor “caretaker” model
Competing models for nonwork-work interference

Figure 6
M1 – Four-factor “theoretical” model
Figure 7
M2 – One-factor model
Figure 8
M3 – Two-factor “home/religion” model
Figure 9
*M4 – Three-factor “family” model*
Figure 10
M5 – Three-factor “caretaker” model
TAALVERSORGING VAN EILEEN KOEKEMOER SE PROEFSKRIF

Ek, WH Cloete, is 'n geakkrediteerde lid van die Suid-Afrikaanse Vertalersinstituut (SAVI-lidnommer 1000520) en bevestig hiermee dat ek Eileen Koekemoer se proeverskrif getiteld Work-nonwork interference in the SA context taalversorg het.

WH CLOETE