

Self-regulation and psychological well-being in a cohort of black South African teachers: The SABPA study

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Summary

Self-regulation and psychological well-being in a cohort of Black South African teachers: The SABPA study

Keywords: Self-regulation, well-being, stress, Black teachers, South Africa, longitudinal

The teaching profession is widely regarded as being very stressful (Klassen, Usher & Bong, 2010; Otero, Castro, Santiago & Villardefrancos, 2010). South African teachers, especially Black teachers working in previously disadvantaged areas, have to cope with serious stressors such as overcrowded classrooms and limited resources on a daily basis (Ngidi & Sibaya, 2002; Moloi, 2010). Occupational stress of this nature is known to have significant negative implications for well-being, and chronic stress has been linked to mood and anxiety disorders, and other forms of psychopathology (Bellingrath, Weigl & Kudielka, 2009; Brock & Buckley, 2012; Mundai, 2010). However, psychological buffers could enable individuals to sustain normal development and even experience well-being, despite the presence of long-term stress (Friborg, Hjemdal, Rosenvinge & Martinussen, 2003; Ryff & Singer, 2003). Noted among these so-called protective factors, the process of self-regulation has been found to be predictive of positive outcomes with regard to physiological and psychological well-being (Hofer, Busch & Kärtner, 2011; Peterson & Seligman, 2004). Self-regulation has, however, been found to represent a resource susceptible to depletion with repeated use, and there have been contradictory reports regarding the long-term sustainability of self-regulation capacity (Converse & DeShon, 2009; Ryan & Deci, 2008). No longitudinal studies could be found that explore the natural progression of self-regulation in a highly stressful context, and how changes in self-regulation are associated with changes in stress and well-being levels.

This thesis consists of three sub-studies that are reported in three manuscripts. In the first of these sub-studies the levels of occupational stress and mental well-being in a cohort of Black South African teachers were investigated, including how these two variables are related to each other. The second sub-study aimed firstly to investigate the association between self-regulation and Black South African teachers' self-reported levels of mental well-being. Secondly, it aimed to determine the role of the sub-constructs of the self-regulation process in the teachers' self-reported levels of mental well-being. The aim of the third article was also two-fold. It first aimed to determine the natural progression of self-regulation within a highly stressful work context over a period of three years. It then aimed to determine how long-term changes in the self-regulation of individuals finding themselves in high-stress working conditions are associated with changes in their self-reported levels of stress and mental well-being. Black South African teachers (N=200, 101 men, 99 women) of ages ranging from 25 to 65 years from the North-West province of South Africa participated in the baseline phase of the SABPA project in 2008. Of the original 200 participants, a total of 173 teachers (88 men, 85 women) took part in data collection for the follow-up study in 2011. Data were collected by making use of quantitative measures (Teacher Stress Inventory (Boyle, Borg, Falzon & Baglion, 1995); General Health Questionnaire-28 (Goldberg & Hillier, 1979); Mental Health Continuum-Short Form (Keyes, 2006); Short Self-Regulation Questionnaire (Carey, Neal & Collins, 2004)) that have been validated for use in the South African context.

The findings indicate that this group of teachers experienced high levels of stress, and symptoms indicative of mental illness to an extent that warrants psychiatric intervention. However, participants also reported higher than expected levels of mental health. The findings further indicated that self-regulation contributed positively to the participants' mental health

levels. The longitudinal findings also indicated improvements in this group of teachers' self-regulation levels over time, and that these long-term changes in self-regulation were positively associated with changes in participants' mental health. Recommendations for future investigations on the role of self-regulation in well-being that flowed from this research include extending research to other cultural groups and general populations; use of multiple or mixed-method approaches to provide more insight into the participants' short- and long-term experience of their working environment, their levels of stress and well-being and their self-regulation levels; investigating the psychological perspective on stress and exploring the concept of optimal self-regulation and the maintenance thereof. The study provided a holistic insight into the importance of self-regulation as protective factor in a highly stressed context, especially with regards to the promotion of mental well-being on a short term and long term basis.

Opsomming

Self-regulering en psigologiese welstand in 'n kohort van Swart Suid-Afrikaanse onderwysers:
Die SABPA studie

Sleutelwoorde: Self-regulering, welstand, stres, Swart onderwysers, Suid-Afrika, longitudinaal

Die onderwys professie word wêreldwyd beskou as baie stresvol (Klassen, Usher & Bong, 2010; Otero, Castro, Santiago & Villardefrancos, 2010). Suid Afrikaanse onderwysers, veral Swart onderwysers wat in voorheen benadeelde gebiede werk, moet uitdagings en situasies, soos oorvol klaskamers en beperkte hulpbronne, op 'n daaglikse basis oorkom (Ngidi & Sibaya, 2002; Moloi, 2010). Beroepstres van hierdie aard is bekend daarvoor om beduidende negatiewe implikasies vir welstand in te hou en chroniese stres is al aangedui om verband te hou met gemoeds- en angsversteurings en ander psigopatologie (Bellingrath, Weigl & Kudielka, 2009; Brock & Buckley, 2012, Mundai, 2010). Psigologiese buffer faktore kan wel individue in staat stel om normale ontwikkeling te volhou, en selfs welstand te ervaar, ten spyte van die teenwoordigheid van langtermyn stres (Friborg, Hjemdal, Rosenvinge & Martinussen, 2003; Ryff & Singer, 2003). Die proses van self-regulering, aangedui as een van die sogenaamde beskermende faktore, is al gevind om voorspellend te kan wees van positiewe uitkomst rakende fisiologiese en psigologiese welstand (Hofer, Busch & Kärtner, 2011; Peterson & Seligman, 2004). Alhoewel self-regulering aangedui was as 'n hulpbron wat moontlik uitgeput mag word deur herhaalde gebruik, was daar ook kontrasterende resultate gerapporteer rakende die langtermyn volhoubaarheid van self-regulering kapasiteit (Converse & DeShon, 2009; Ryan & Deci, 2008). Geen longitudinale studies kon gevind word wat die natuurlike verloop van self-regulering binne 'n hoë stres konteks ondersoek nie. Geen longitudinale studies kon ook gevind

word wat ondersoek ingestel het na die assosiasie tussen veranderinge in self-regulering en veranderinge in stres en welstand vlakke nie.

Hierdie tesis bestaan uit drie sub-studies wat gerapporteer word in drie manuskripte. In die eerste van hierdie sub-studies word die vlakke van werkstres en geestes-welstand in 'n kohort van Swart Suid-Afrikaanse onderwysers ondersoek, insluitend hoe hierdie veranderlikes verband hou met mekaar. Die tweede sub-studie het eerstens gepoog om die assosiasie tussen self-regulering en Swart Suid-Afrikaanse onderwysers se self-gerapporteerde vlakke van geestes-welstand te bepaal. Die sub-studie het verder gepoog om die rol van die sub-konstrukte van die self-regulering proses in die onderwysers se self-gerapporteerde vlakke van geestes-welstand te bepaal. Die doel van die derde sub-studie was ook tweeledig. Dit het eerstens gepoog om die natuurlike verloop van self-regulering binne 'n hoë stres konteks oor 'n tydperk van drie jaar te bepaal. Dit het verder gepoog om te bepaal hoe langtermyn veranderinge in die self-regulering van individue wat hulleself in 'n hoë stres werksomgewing bevind, geassosieer is met veranderinge in hulle self-gerapporteerde stresvlakke en geesteswelstand. Swart Suid-Afrikaanse onderwysers (N = 200, 101 mans, 99 vrouens) met ouderdomme wat wissel van 25 tot 65 jaar van die Noord-Wes provinsie van Suid-Afrika het deelgeneem in die opvolg studie in 2011. Van die oorspronklike 200 deelnemers, het 'n totaal van 173 onderwysers (88 mans en 85 vroue) deelgeneem in die opvolg studie in 2011. Data is ingesamel deur middel van kwantitatiewe meetinstrumente (Teacher Stress Inventory (Boyle, Borg, Falzon & Baglion, 1995); General Health Questionnaire-28 (Goldberg & Hillier, 1979); Mental Health Continuum-Short Form (Keyes, 2006); Short Self-Regulation Questionnaire (Carey, Neal & Collins, 2004)) wat gevalideer is binne die Suid-Afrikaanse konteks.

Die resultate dui aan dat hierdie groep onderwysers hoë vlakke van stres ervaar het, tesame met simptome wat aanduidend is van psigopatologie tot die mate dat dit psigiatriese intervensie benodig. In teenstelling het die deelnemers ook hoër as verwagte geestesgesondheidsvlakke gerapporteer. Die resultate het verder aangedui dat self-regulering 'n positiewe bydrae lewer tot die deelnemers se geestesgesondheidsvlakke. Die longitudinale bevindinge het ook aangedui dat die onderwysers se vlakke van self-regulering verbeter het oor die drie jaar tydperk, en dat hierdie langtermyn veranderinge in self-regulering positief geassosieer was met veranderinge in die deelnemers se geestesgesondheid. Voorstelle vir toekomstige studies rakende die rol van self-regulering in welstand sluit die volgende in: uitbreiding van die navorsing na ander kulturele populasies en die algemene populasie; gebruik van meervoudige of multi-metode ontwerp om insig te verkry in die deelnemers se ervaring van hulle werksomgewing, stres en wel-stand vlakke asook hulle self-regulering vlakke; ondersoeking van psigologiese perspektief oor stres en die verkenning van die konsep van optimale self-regulering en die onderhoud daarvan. Hierdie studie het 'n holistiese insig verskaf in die belangrike rol van selfregulering as beskermende faktor in 'n hoë stresvolle konteks, veral rakende die bevordering van geestesgesondheid in die kort en langtermyn.

Preface

- This thesis is presented in article format in accordance with rule A.8.2.b of the North-West University.
- The first and second manuscripts comprising this thesis have been submitted to the *Journal of Psychology in Africa*. The first manuscript has been accepted for publication in 2014 and article 2 is under review. The third article has been submitted to the *Journal of Educational Psychology* and is also currently under review.
- The referencing style and editorial approach as prescribed by the *Publication Manual* (6th edition) of the American Psychological Association (APA) were used, save for instances where the intended journal for publication indicated otherwise. A copy of the guidelines for prospective authors as set out by the *Journal for Psychology in Africa* and *Journal of Educational Psychology* precedes each of the three manuscripts.
- The page numbering of the thesis as a whole is consecutive. It should, however, be noted that each article was numbered individually starting from page 1 on submission to a journal.
- The co-authors of these manuscripts, Proff J.C. Potgieter and E. van Rensburg and Dr. S. Ellis, have signed a letter authorising the candidate to submit these manuscripts for examination towards obtaining a PhD degree in Psychology.

Letter of Permission

The co-authors, Proff J.C. Potgieter and E. van Rensburg and Dr. S. Ellis, hereby grant permission that the first author, N. Boshoff, may submit the following three manuscripts for the purposes of examination toward obtaining a PhD degree in Psychology:

1. Occupational stress and mental well-being in a cohort of Black South African teachers:
The SABPA study.
2. Self-regulation and mental well-being in a cohort of Black South African teachers: The
SABPA study.
3. A longitudinal perspective on the progression of self-regulation and mental well-being in
a high-stress work context: The SABPA study.

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Chapter 1: Introduction and problem statement

Stress and the work environment

The negative effects of occupational stress have been documented worldwide. These effects are of such a serious nature that the United Nations (UN) and the World Health Organisation (WHO) have labelled occupational stress as a worldwide epidemic (De Vries & Wilkerson, 2003). Stress has come to be regarded as serious as a public health predicament as HIV/AIDS and other infectious diseases (De Vries & Wilkerson, 2003). Occupational stress has been associated with a variety of physiological conditions and mental illness, such as depression and burnout (Peltzer, Shisana, Zuma, Van Wyk & Zungu-Dirwayi, 2008). The resultant absenteeism from work, high staff turnover and staff replacement also negatively affect worker productivity, resulting in alarming losses and escalating medical treatment costs. It has been estimated that in the UK alone, a total of 40 million working days per year are lost due to stress-related illness (Peltzer et al., 2008). In South Africa, the number is estimated at over 12 million working days per year with an annual loss of approximately R30 billion (Peltzer et al., 2008; Sieberhagen, Rothmann & Pienaar, 2009). The cost of physical and mental illness on micro and macro-economic scale warrants the need for continued research on stress and intervention options (Adams, 2009; De Vries & Wilkerson, 2003; Wright, Cropanzano, Bonett & Diamond, 2009). There has been a call for the expansion of research to include a focus on preventive measures, protection factors against stress, and ultimately, well-being (Adams, 2009; Wright et al., 2009).

Different perspectives on stress

An investigation into the different definitions of stress makes it clear that a holistic approach towards individuals' functioning within stressful environments seems

most appropriate. Stress is defined as the combination of an individual's cognitive, emotional, behavioural and physiological responses when confronted with a stressor (Clark, Bond & Hecker, 2007). The term "stressor" indicates any perceived challenge or threat to the individual's normal functioning (Clark et al., 2007; Nash & Theborge, 2006). A review of current research reveals three conceptualisations of stress (environmental, biological and psychological) (Clark et al., 2007).

The environmental conceptualisation of stress

The *environmental approach* defines stress as change, quantifying it as the extent or impact of key life events or stressors experienced during a specific time period (Clark et al., 2007). It represents a variety of situations, ranging from catastrophic events to major life events to daily disturbances originating from individuals' environment, including their working environment (Sadock & Sadock, 2007). The teaching profession in particular is recognised to be a stressful occupation (Austin, Shah & Muncer, 2005; Bellingrath, Weigl & Kudielka, 2009; Otero, Castro, Santiago & Villardefrancos, 2010). Teachers have significant responsibilities placed on them as they are required to fulfil several roles (Harley, Barasa, Bertram, Mattson & Pillay, 2000). In addition to these roles, teachers have to face various stressors, including difficult interactions with parents and learners, shifting policies and inadequate salaries, and a lack of acknowledgement (Klassen, Usher & Bong, 2010; Steyn & Kamper, 2006). Other stressors include high job demands, low job control, effort-reward imbalances (Bellingrath et al., 2009), disruptive student behaviour, lack of resources, role conflict, inadequate financial compensation and poor professional relationships with colleagues (Clunies-Ross, Little & Kienhuis, 2008).

In South Africa a nationwide study conducted in 2009 on a sample group of 21 307 educators confirmed that South African teachers are experiencing high levels of stress (Peltzer et al., 2009). Steyn and Kamper (2006) report on other South African studies conducted in the Pietermaritzburg area and in the Free State and North West provinces, where teachers were reported to be experiencing very high levels of stress. The significant contributing factors were time pressures, administrative problems, professional distress and pupil misbehaviour, in conjunction with the other previously mentioned factors (Peltzer et al., 2009; Steyn & Kamper, 2006). Furthermore, due to the implementation of the South African Schools Act of 1996, and specifically the implementation of “Outcomes-Based Education” (OBE), the education sector has changed significantly (Ngidi & Sibaya, 2002). Teachers are expected to adapt to the increases in responsibilities and rapid changes in policies and practices without receiving the necessary support in the form of training and resources (Ngidi & Sibaya, 2002). Black South African teachers working in previously disadvantaged areas have been found to face additional challenges such as overcrowded classrooms and a lack of resources such as textbooks, libraries and electricity (Harley et al., 2000; Ngidi & Sibaya, 2002; Steyn & Kamper, 2006). Due to Apartheid, previously disadvantaged areas have been deprived of sufficient resources, resulting in poor school management, elevated failure rates and unpleasant school environments. Since the abolishment of Apartheid, these rural and township schools have been uplifted to an extent but are still faced with problematic learner discipline, often as a result of gangsterism and drug abuse, poor infrastructure, vandalism, theft, lacking security, poor financial management, lack of a functional school program and the poor involvement of parents in their children’s education, to name just a few problems (Motseke, 2013).

Given the significant number of expectations and responsibilities placed on teachers, it is understandable that teachers experience very high levels of job strain and burnout (Stroebe & Rennert, 2008). From an environmental perspective, one can therefore conclude that the circumstances and changes associated with the teaching profession are prominent sources of stress.

The biological conceptualisation of stress

Environmental, and specifically occupational, stressors as described above are known to have significant implications for an individual's physiological and mental functioning. The *biological conceptualisation* of stress focuses on the manner in which specific physiological systems are activated in the presence of a stressor as a compensatory response to protect and restore the body's functioning to normal (Clark et al., 2007). This process is known as allostasis, and it protects the body from the effects of internal and external stress, thereby enhancing long-term well-being and survival (Nicolson, 2008; Sun, Wang, Zhang & Li, 2007). The allostatic response is highly beneficial, but when the various systems (e.g. the cardiovascular and metabolic systems) are continuously activated due to chronic stress, the wear and tear on the systems (also known as allostatic overload) may increase vulnerability to pathology (Goldstein & McEwen, 2002; Michaud, Matheson, Kelly & Anisman, 2008). This is one mechanism by which chronic stress has been linked to observed increases in mood, anxiety, burnout and other mental disorders (Bellingrath et al., 2009; Fornari et al., 2007; Mundai, 2010).

Within the biological conceptualisation of stress the role of ethnicity should be considered, as significant differences have been noted in the prevalence of certain

psycho- and physiopathology conditions that exist between different ethnic groups (Lopez, 2002; Seedat, 1999; Schutte et al., 2008). In the case of mental disorders, studies conducted in the United States and Europe indicated that Black people may have lower-than-expected rates of most major mental disorders compared to their White counterparts (Jackson, Knight & Rafferty, 2010). Currently, there seems to be a lack of research into the prevalence of mental disorders in Black South Africans. Hence factors such as ethnicity should be considered when investigating the effect of chronic stress and job strain on an individual's mental functioning within a South African context.

The seemingly strong association between stress and mental disorder present a bleak picture of the negative impact of stress on the individuals' psycho-physiological functioning. However, individuals differ significantly in their response to stressors and in their vulnerability to stress-related disorders (Koolhaas, de Boer & Buwalda, 2006). Thus, even when controlling for environmental and biological factors, there are still individual differences in the psycho-physiological outcomes in reaction to stress. It cannot be assumed that the experience of negative life events will result in mental illness (Skomorovsky & Sudom, 2011). Questions therefore arise regarding the possible role of protective factors and their influence on the individual's stress response. There is a growing acknowledgment of the role that certain health-promoting factors and individual characteristics could play to buffer the effects of stressful life events and life transitions (Keyes, 2002; Skomorovsky & Sudom, 2011). The answers to these questions may be found when considering the psychological view of stress.

The psychological conceptualisation of stress

The *psychological conceptualisation* of stress acknowledges the importance of the individual's perception, appraisal and appropriate use of personal and social resources during stressful life events in predicting the eventual development of stress-related pathology (Clark et al., 2007; Koolhaas et al., 2006; Louw & Viviers, 2010). The psychological approach states that the individual's perception and appraisal of life events or stressors are important aspects to consider (Clark et al., 2007; Nash & Theberge, 2006). Koolhaas et al. (2006) state that it is not so much the physical nature of the stressor that induces stress-related pathology, but rather the individual's perception of the degree to which the stressor can be predicted and controlled. An individual will experience stress in a situation where his or her expectations, either established by prior learning or due to deductions made from circumstances, do not match the existing or anticipated perception of the internal or external environment. This discrepancy elicits patterned, compensatory responses (Clark et al., 2007). Once an event or stimulus is identified, a series of appraisals take place. During this time the nature of the stimulus, the availability of resources required to deal with the stressor, as well as the appropriate coping strategies, are determined (Kaplan, 1996). Therefore, depending on factors such as perceived controllability (locus of control and job control) as well as the availability of personal and social resources and various coping strategies, the extent of the threat that the work place conditions and events may pose to the individual's psychological and physical functioning are determined, which in turn will determine the level of the individual's distress (Kaplan, 1996; Louw & Viviers, 2010; Shimazu, Shimazu & Odara, 2005).

The three conceptualisations of stress should not be seen in isolation or separate from each other, but as a holistic overview of the sources of stress and its effect on physiological and mental functioning. It further illustrates how stress does not necessarily result in pathology and thus allows for the investigation of factors that influence the effects of stress.

Positive psychology: An alternative perspective on stress and well-being

Within the growing movement of Positive Psychology, the roles of various factors that affect the negative outcomes of stress have increasingly become a focal point for research. Through Positive Psychology, the focus of psychology has broadened to include the study of strengths and virtues, and is not limited just to the study of disease and damage (Seligman, 2003). For that reason, the very definition of well-being and mental health has been revisited. Instead of well-being being referred to as the absence of pathology, it is now defined as individuals' ability to function well within their communities, to work productively and fruitfully, to maintain meaningful interpersonal relationships and to realise their own abilities despite having to face stressors and challenges (Keyes, 2007; World Health Organization, 2004).

Two distinct though compatible perspectives regarding the origin and nature of well-being, have emerged within Positive Psychology literature (Keyes, Myers & Kendler, 2010; Negovan, 2010; Westerhof & Keyes, 2010). The *hedonic perspective* on well-being focuses on feelings of happiness, satisfaction and interest in life. The *eudaimonic perspective* on well-being, on the other hand, is centred on optimal functioning in terms of individual development (Westerhof & Keyes, 2010). Westerhof and Keyes (2010) suggest that the definition of positive mental health should include

hedonic well-being as well as the psychological and societal aspects of eudaimonic well-being. According to the holistic conceptualisation of well-being offered by Keyes (2002), social, emotional and psychological well-being collectively contribute towards an individual's ability to function and flourish in spite of stress or even psychological disorder. Social well-being refers to the individuals' feeling that they value and are valued by their society. Emotional well-being includes the feeling of happiness and satisfaction, whereas psychological well-being is defined as the individuals' subjective evaluation of their own optimal functioning (Fledderus, Bohlmeijer, Smit & Westerhof, 2010; Keyes, 2002). Research on Keyes' model has found that flourishing individuals (i.e. those experiencing a combination of social, emotional and psychological well-being), even when diagnosed with mental or physical illness, have positive mental health and are able to function better than individuals who are free of physical and mental illness but who are not flourishing (Keyes, 2002; Keyes, 2007; Lamers, Westerhof, Bohlmeijer, Ten Klooster & Keyes, 2011). Furthermore, flourishing individuals were less likely to experience a major depressive episode, generalised anxiety and panic disorder, or to develop a substance abuse problem (Strümpfer, Hardy, de Villiers & Rigby, 2009).

Within the movement of Positive Psychology, factors such as an individual's psychological strengths, which act as a buffer against the development of mental and physical illness, have received increasing research attention (Ryff & Singer, 2003; Seligman, 2003). Such protective factors often moderate the individual's reaction to a stressful situation, resulting in successful adaptation. Protective factors can affect problems (a) by directly decreasing the problem; (b) by interacting with the risk factors to buffer its effects; (c) by disrupting the process leading from the risk factor to the

problem; and (d) by undoing the risk factor (Peterson & Seligman, 2004). Therefore it enables an individual, despite the presence of long-term stress or adversity, to be able to sustain normal development and experience well-being (Friborg, Hjemdal, Rosenvinge & Martinussen, 2003; Ryff & Singer, 2003).

Among these so-called protective factors, which include aspects like courage, future-mindedness, perseverance, hope, optimism, self-determination and self-mastery to name but a few (McCarthy, Fouladi, Juncker & Matheny, 2006; Seligman & Csikszentmihalyi, 2000), the process of self-regulation has attracted a great deal of research attention, and is considered to be a key to mental well-being (Hofer, Busch & Kärtner, 2011; Toering, Elferink-Gemser, Jordet & Visscher, 2009).

Self-regulation as a protective factor

Self-regulation is a broad term that refers to an intricate and multi-faceted process that involves the setting of clear and realistic short and long-term goals and the subsequent regulation of thoughts, emotions and actions in such a way that the chances of goal achievement are optimised (Park, Edmondson & Lee, 2012; Terry & Leary, 2011). In addition to the engagement in goal-directed behaviour, successful self-regulation entails that the progress towards goal achievement is constantly monitored, and behaviour is changed when the progress is insufficient (Ader & Erkin, 2010; Human-Vogel, 2006; Peterson & Seligman, 2004; Terry & Leary, 2011).

According to Baumeister and Vohs (2005), three components can be identified in the process of self-regulation. The first component involves the establishing of a goal or desired state. The second component involves engaging in appropriate behaviour to obtain the set goals or desired state. The third component involves the monitoring of the

individual's progress towards the goal or desired state. Every day individuals are confronted with internal and external stimuli but have to overrule their natural, habitual or learned responses to ensure their responses and progress towards goal attainment are optimal and adaptive (Baumeister & Vohs, 2007; Peterson & Seligman, 2004). They are able to do so through the use of the different aspects identified as part of the self-regulation process, such as mindfulness, self-efficacy, self-monitoring, goal focus and internal locus of control (Vosloo, Potgieter & Temane, 2013). As a result, individuals will engage in specific and intentional acts that will enable them to be the persons they ideally want to be or should be (Baumeister & Vohs, 2005). When individuals have the perception that they are progressing towards or attaining these personal goals, the perception will contribute significantly to their well-being (TerDoest, Maes, Gebhardt & Koelewijn, 2006). This ability to alter the self is seen as strength (Peterson & Seligman, 2004).

Self-regulation and well-being

Self-regulation is related to the capacity to tolerate sensations of distress (Perry, 2010) and has been found to be predictive of a wide range of positive outcomes with regard to physiological and psychological well-being (Hofer et al., 2011; Peterson & Seligman, 2004). When individuals are able to understand the early signs of discomfort and distress, they are more likely to be able to tolerate emotions and feelings such as anxiety, and act less reactively and impulsively. These individuals are then able to distinguish between a feeling and an action, which gives them time to plan an appropriate response to the stressor (Perry, 2010). Furthermore, when individuals are able to focus on their selected goals in the face of adversity, it is thought to enable them

to master challenging developmental tasks. As a result of successfully resolving the developmental conflicts, well-being levels are likely to increase (Hofer et al., 2011).

This may explain why individuals who have good self-regulation report improved personal adjustment, improved skill attainment, self-acceptance, self-esteem and interpersonal relationships (Baumeister & Vohs, 2005; McCrory, Cobley & Marchant, 2012; Park et al., 2012; Peterson & Seligman, 2004). Similarly, self-regulation can be predictive of the absence of negative outcomes as individuals with good self-regulation report fewer incidences of depression, anxiety, pathological eating patterns, excessive alcohol use and bad spending habits (Neal & Carey, 2005; Peterson & Seligman, 2004).

A longitudinal perspective on self-regulatory capacity

The capacity for self-regulation does not, however, remain constant. The process of self-regulation draws on a pool of resources or psychological energy (Converse & DeShon, 2009; Peterson & Seligman, 2004). Some researchers have found that these resources are not infinite, and that they become depleted with each individual act of self-control (Baumeister et al., 2006; Converse & DeShon, 2009). This is often compared to the exercise of a muscle that will grow tired with continued exertion. It is thought that due to ego depletion, individuals will become less successful in self-regulatory tasks with each consecutive task as they will be less interested in or capable of performing volitional actions (Baumeister et al., 2006; Converse & DeShon, 2009; Ryan & Deci, 2008). Thus within the context of a highly stressful working environment, individuals may find that they have to draw so much on their self-regulatory resources

to manage their work stress that they have fewer resources available to perform other self-regulatory tasks (Wa Chan & Wen Wan, 2012).

However, not all researchers concur regarding this so-called depletion effect. Firstly, several studies have indicated that self-regulatory resources can be replenished (Tyler & Burns, 2008). Ryan and Deci (2008) have found that self-directed acts that are intrinsically motivated require fewer resources and are more harmonious and efficient. They found that individuals who are self-directed experience maintained or even improved vitality (defined as energy available to the self for self-regulatory purposes) after completion of self-regulatory tasks (Ryan & Deci, 2008). Furthermore, similar to muscle use, the capacity for self-regulation appears to become stronger through regular self-control exercise (Baumeister & Vohs, 2005; Peterson & Seligman, 2004). Individuals may therefore be able to increase their inner resources and self-regulatory strength over time, thereby reducing their vulnerability to ego depletion (Baumeister et al., 2006; De Witte, Bruyneel & Geyskens, 2009; Gailliot et al., 2007; Oaten & Cheng, 2007). Although all these improvements in self-regulatory strength were found to be due to specific training exercises, Converse and DeShon (2009) suggested that individuals' self-regulation abilities may also improve due to natural adaptation processes which allow individuals to become accustomed to the exertion levels required, but that more research is required to understand the development of self-regulation over a longer time period.

Conclusion and preamble to research

From the literature cited above, one can conclude that both internationally and locally, the teaching profession is viewed as stressful due to the difficult working

conditions teachers have to deal with on a daily basis. Furthermore, it has been established that chronic work strain may negatively affect an individual's mental well-being to such an extent that various forms of pathology such as depression and burnout may develop. However, the outcomes of chronic work strain seem not to be constant and predictable, which has been ascribed to the possible role of protective factors, such as self-regulation. Few studies could be found that explored the stress and well-being profile of teachers in South Africa, especially Black teachers. Furthermore, few studies could be found that investigated the role of protective factors, such as self-regulation, that could potentially influence the stress experience and well-being of this group. In addition, few longitudinal studies have been done that explore the natural progression of self-regulation in a highly stressful context, and how changes in self-regulation over the long term are associated with changes in stress and well-being levels.

This study therefore aims to answer the following research questions:

1. What are the levels of stress and mental well-being in a cohort of South African teachers?
2. What is the association between self-regulation and teachers' mental well-being?
3. What is the natural progression of self-regulation in the highly stressful teaching situation, and how are changes in self-regulation associated with changes in teachers' levels of stress and mental well-being?

Research aims

The aims of the study are as follow:

The first aim relates to research question number one, which is to investigate the levels of occupational stress and mental well-being in a cohort of Black South African teachers, and the association that exists between the variables.

The second aim relates to research question number two, which is two-fold:

- a) To investigate the association between self-regulation and Black South African teachers' self-reported levels of mental well-being.
- b) To determine the association between the subcomponents of the self-regulation process and Black South African teachers' self-reported levels of mental well-being.

The third aim is related to research question number three, which is also two-fold:

- a) To determine the natural progression of self-regulation in a highly stressful work situation over a period of three years.
- b) To determine how long-term changes in the self-regulation of individuals finding themselves in high-stress work situations are associated with changes in stress and mental well-being.

Brief description of research methodology

Design

The first and second sub-studies used a cross-sectional design with a purposively selected study population. The third sub-study used a longitudinal design with a purposively selected study population. The study, as a whole, forms part of the Sympathetic Activity and Ambulatory Blood Pressure in Africans (SABPA) project.

Participants

The participant group focused on teachers to allow the study of a homogeneous group that shares similar working conditions and occupational stressors. The first and second sub-studies made use of the data collected during the baseline phase (2008) of the SABPA study. A total of 200 Black teachers (101 men and 99 women) between the ages of 25 and 65 years from the Dr Kenneth Kaunda Education District in North West province were recruited and screened according to the exclusion criteria pertaining to the broader SABPA study. The third sub-study made use of data collected during the three-year follow-up (2011) of the SABPA study. A total of 173 (88 men and 85 women) of the original 200 participants took part in this data collection phase.

Procedure

The same protocol was used in 2008 and 2011 to ensure the trustworthiness of data in this longitudinal project design. Data collection for the baseline and follow-up phases took place from February to May of 2008 and 2011 respectively. During both phases the participants were briefed regarding the SAPBA project's aims and objectives in their home language, and they gave written consent for their participation. On each occasion the participants were involved in data collection for two days, and spent one night at the North-West University's Metabolic Unit research facility. In addition to several physiological measurements that were taken, the participants also completed the psychosocial battery questionnaires with the assistance of trained field workers. Only psychological data were utilised for the purpose of this study.

The current study is subdivided into three sub-studies.

Sub-study 1: Occupational stress and mental well-being in a cohort of Black South African teachers: The SABPA study

The data from the SABPA I (2008) study was used to compile a profile of the participants' stress levels and their self-reported well-being, as well as the association between these constructs.

Sub-study 2: Self-regulation and mental well-being in a cohort of Black South African teachers: The SABPA study

Sub-study 2 was an in-depth analysis of the role that self-regulation and several of its subcomponents played in teachers' self-reported levels of well-being. For the purposes of this sub-study, the teachers were divided into tertiles based on their self-regulation scores, and results from the first and third tertiles were compared. The first tertile consisted of participants with low self-regulation scores (henceforth referred to as Group 1). The third tertile consisted of participants with high self-regulation scores (henceforth referred to as Group 2).

Sub-study 3: A longitudinal perspective on the progression of self-regulation and mental well-being in a high-stress work context: The SABPA study

Sub-study 3 investigated the natural progression of self-regulation in a highly stressful situation over a period of three years, as well as the effect of self-regulation on the participants' long-term well-being. Data collected during both the baseline (2008) and the three-year follow-up (2011) phases of the SABPA project were used.

Measures

Four scales were used during the above sub-studies and will be discussed in detail in each of the following chapters. Cronbach's alpha coefficient was used to determine the internal consistency of each of these scales for use in the South African context.

1. Teacher Stress Inventory (TSI) (Boyle, Borg, Falzon & Baglion, 1995)

The Teacher Stress Inventory (TSI) is a 20-item self-report scale and measures the level and sources of occupational stress in teachers.

2. General Health Questionnaire (GHQ-28) (Goldberg & Hillier, 1979)

The General Health Questionnaire (GHQ) is a 28-item self-report scale used as a screening measure to identify individuals who are at risk for developing psychiatric disorders, and is often used as a measure of psychological well-being (Nagyova et al., 2000).

3. Mental Health Continuum – Short Form (MHC-SF) (Keyes, 2006)

The Mental Health Continuum (MHC-SF) consists of 14 items and is a clinical approach to the continuous assessment and categorical diagnoses of mental health that is more than just the absence of psychopathology.

4. Short Self-Regulation Questionnaire (SSRQ) (Carey, Neal & Collins, 2004)

The Short Self-Regulation Questionnaire (SSRQ) is a 31-item version of the Self-Regulation Questionnaire designed by Brown, Miller and Lawendowski (1999) to assess self-regulation capacity.

Data analysis

The SPSS program (version 20) was used to conduct descriptive and inferential statistical analyses. The specific analyses that were done will be discussed in detail in each section dealing with the sub-studies. Structural equation modelling (SEM) was used to determine the structure of the relationships among the above variables (McQuitty & Wolf, 2013). The AMOS application in the SPSS statistical software package was used to explore different models.

Ethical considerations

Ethical approval for the SABPA project was obtained (NWU-00036-07-S6) from the North-West University's Ethics Committee, for the period from its commencement in November 2007 up to the final data collection in November 2012. Each participant was given a participant number which remained the same for the duration of the project to ensure confidentiality. The participants signed consent forms for each of the phases of the SABPA project after all the aspects of the research were explained, and they had the opportunity to ask questions and raise concerns. The fieldworkers collecting the physiological data were trained practitioners, and the psychological data were collected by field workers with at least post-graduate training in psychology, who were supervised by registered psychologists. The field workers ensured that the psychological test battery was correctly completed in a consistent environment. The participants received feedback on both the physiological and psychological data after initial analysis, and referrals were made for appropriate follow-up where deemed necessary. Feedback on psychological results was provided at an

information session, during which the participants also participated in a stress management workshop.

Outline of the manuscript

Chapter 1 provides an introduction and the problem statement of the study.

Chapter 2 contains manuscript 1, which addresses research question 1. The manuscript provides a holistic overview of the levels of occupational stress and mental well-being of a cohort of Black South African teachers. Furthermore, it explores the complex association between stress and well-being within this group.

Chapter 3 contains manuscript 2, which addresses research question 2. This manuscript explores the role of self-regulation in the well-being of Black South African teachers as a collectivistic group working within a highly stressful environment. It also investigates the role that specific sub-constructs of self-regulation play in the well-being of this group of teachers.

Chapter 4 contains manuscript 3, which addresses research question 3. This manuscript is in the form of a longitudinal study and explores the natural progression of self-regulation within a highly stressful environment. It furthermore explores how long-term changes in the self-regulation of individuals finding themselves in high-stress working conditions are associated with changes in stress and mental well-being.

Chapter 5 gives the conclusions, limitations and recommendations based on the integration of the results obtained from each of the sub-studies. The limitations of this

study are discussed, and recommendations and suggestions are offered for future research.

The complete reference list for Chapters 1 and 5 is included at the end of Chapter 5.

Chapter 2

Occupational stress and mental well-being in a cohort of Black South African teachers: The SABPA study

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2.1 Guidelines to authors

JOURNAL OF PSYCHOLOGY IN AFRICA

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Appoh, L. (1995). *The effects of parental attitudes, beliefs and values on the nutritional status of their children in two communities in Ghana*. Unpublished masters dissertation, University of Trondheim, Norway.

Peltzer, K. (2001). Factors at follow-up associated with adherence with directly observed therapy (DOT) for tuberculosis patients in South Africa. *Journal of Psychology in Africa*, 11, 165-185.

Sternberg, R. J. (2001, June). *Cultural approaches to intellectual and social competencies*. Paper presented at the Annual Convention of the American Psychological Society, Toronto, Canada.

Cook, D. A., & Wiley, C. Y. (2000). Psychotherapy with members of the African American churches and spiritual traditions. In P. S. Richards & A. E. Bergin (Ed.), *Handbook of psychotherapy and religiosity diversity* (pp. 369-396). Washington DC: American Psychological Association.

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2.2. Manuscript

OCCUPATIONAL STRESS AND MENTAL WELL-BEING IN A COHORT OF BLACK SOUTH AFRICAN TEACHERS: THE SABPA STUDY

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Abstract

OCCUPATIONAL STRESS AND MENTAL WELL-BEING IN A COHORT OF BLACK SOUTH AFRICAN TEACHERS: THE SABPA STUDY

Key words: Occupational stress, mental well-being, teachers, Black, South Africa

This study aimed to obtain a holistic overview of the levels of occupational stress and mental well-being of a cohort of Black South African teachers. Furthermore, it aimed to determine the complex association between stress and well-being within this group. The quantitative study incorporated a cross-sectional design. The measuring instruments used included the Teacher Stress Inventory (TSI), General Health Questionnaire (GHQ-28) and Mental Health Continuum–Short Form (MHC-SF). Descriptive statistics indicated that the teachers perceive their working environment as very stressful. Furthermore, the teachers reported experiencing symptoms indicative of mental disorder to an extent that warrants psychiatric intervention. The teachers' self-reported mental health levels indicated that despite the high levels of stress and presence of mental illness symptoms, 28% of the teachers were flourishing, 70% were moderately healthy and only 1.5% were languishing. Correlation analysis indicated significant associations between stress and symptoms of mental illness. No significant correlation could however be found between stress and mental well-being. Structural equation models were evaluated to gain an understanding of the relationship between stress and mental health, and the results of this indicate the possibility that protective factors might mediate the effect of work-related stressors on the mental well-being of this particular group.

OCCUPATIONAL STRESS AND MENTAL WELL-BEING IN A COHORT OF BLACK SOUTH AFRICAN TEACHERS: THE SABPA STUDY

Occupational stress is considered a worldwide epidemic and is increasingly regarded to be as serious a public health predicament as HIV/AIDS and other infectious diseases (De Vries & Wilkerson, 2003). Due to stress, individuals become more likely to engage in unhealthy lifestyles resulting in poor physical and mental functioning. The associated impairment in worker productivity and high staff turnover has serious economic implications. The negative impact of stress on both employees' well-being and corporate profitability is therefore of serious concern and has recently received substantial research attention (Brock & Buckley, 2012; Wright, Cropanzano, Bonett & Diamond, 2009). The cost of stress-related illness on a micro- and macro-economic scale warrants continued research into intervention options that also include a focus on preventative measures and protective factors that will ultimately help to preserve psycho-physiological well-being (Wright et al., 2009).

When the vast array of stress-related outcomes is considered, the adoption of a holistic approach in the conceptualisation, definition and management of stress seems most appropriate. A review of current research reveals three conceptualizations (environmental, biological and psychological) of stress (Clark, Bond & Hecker, 2007). Within the *environmental conceptualization*, stress is defined as change, and quantified as the impact of key life events experienced during a specific time period which elicit compensatory or stress reactions (Clark et al., 2007; Goldstein & McEwen, 2002). These events range from catastrophic events (e.g. natural disasters), or major life events

(e.g. job loss or change of marital status) to daily disturbances (e.g. family problems and occupational stress) (De Vries & Wilkerson, 2003; Sadock & Sadock, 2007).

The extensive research literature on the occupational environment and associated stressors (Brock & Buckley, 2012; Guimont et al., 2006; Ngidi & Sibaya, 2002), recognizes the teaching profession as being particularly stressful (Otero, Castro, Santiago & Villardefrancos, 2010; Stroebe & Rennert, 2008). Factors that contribute to teachers' stress include their fulfilment of several demanding roles (Harley, Barasa, Bertram, Mattson & Pillay, 2000), managing difficult interactions with parents and learners (Klassen, Usher & Bong, 2010), disruptive student behaviour, a lack of resources, role conflict, inadequate financial compensation and poor professional relationships with colleagues (Clunies-Ross, Little & Kienhuis, 2008). These stressors affect teachers both internationally and within the South African context (Peltzer, Shisana, Zuma, van Wyk & Zungu-Dirwayi, 2009). In addition to the above, South African teachers are expected to adapt to increased responsibilities and rapid changes in policies and practices without receiving the necessary training and resources (Ngidi & Sibaya, 2002; Peltzer et al., 2009). It is understandable that teachers (both local and international) experience high levels of job strain and burnout (Stroebe & Rennert, 2008). Historically, due to the apartheid system, the education provision for previously disadvantaged areas have been lacking, resulting in poor school management, elevated failure rates and unpleasant school environment. Although progress has been made in uplifting these schools, rural and township schools are still faced with problematic learner discipline, often as a result of gangsterism and drug abuse, poor infrastructure, poor financial management, lack of a functional school program and the poor

involvement of parents in their children's education, to name just a few problems (Motseke, 2013).

Environmental, and specifically occupational, stressors are known to hold significant implications for an individual's physiological and mental functioning. The *biological conceptualization* of stress focuses on the manner in which specific physiological systems are activated in the presence of a stressor as a compensatory response to protect and restore the body's functioning to normal (Clark et al., 2007). This process, known as allostasis, both protects the body from the effects of internal and external stress and enhances long-term well-being and survival (Nicolson, 2008; Sun, Wang, Zhang & Li, 2007). However, continuous activation of these systems due to chronic stress will cause wear and tear to the systems (allostatic overload) and may increase vulnerability to various forms of pathology (Guilliams & Edwards, 2010). This is one mechanism by which chronic stress has been linked to observed increases in mood, anxiety and other mental disorders (Bellingrath, Weigl & Kudielka, 2009; Fornari et al., 2007; Mundai, 2010).

Although these associations predict a bleak outcome regarding teachers' health and well-being, there is a growing acknowledgment for the role that certain health-promoting factors could play to buffer the effects of stressful life events and life transitions (Keyes, 2002). Where health, and especially mental health, has previously been defined as the absence of pathology, it has been argued that the presence of these buffer factors could enable an individual to sustain normal development and even experience a sense of well-being, despite the presence of long-term stress or adversity (Friborg, Hjemdal, Rosenvinge & Martinussen, 2003; Ryff & Singer, 2003).

This perspective fits within the *psychological conceptualization* of stress, which acknowledges the importance of the individual's perception, appraisal and appropriate use of personal and social resources during stressful life events in predicting the eventual development of stress-related pathology (Clark et al., 2007; Koolhaas, de Boer & Buwalda, 2006; Louw & Viviers, 2010).

The relative absence of studies focusing on the differences in individuals' vulnerability to stress warrants the call to investigate the psychological conceptualization of stress (Koolhaas et al., 2006). Furthermore, the lack of research focusing on psychological well-being among Black South Africans, and especially those who find themselves in a high-stress environment (like the teaching profession), highlights the importance of studies that investigate the complex association between stress levels and well-being within this group. The aim of this study was therefore to determine the levels of occupational stress and mental well-being experienced by a cohort of Black South African teachers, and to describe how these two variables are related to each other.

Method

Design

This study made use of a cross-sectional design with a purposively selected study population. The current study forms part of the Sympathetic Activity and Ambulatory Blood Pressure in Africans (SABPA) study.

Participants

Black teachers (N= 200) from the North-West Province of South Africa took part in this study. The participants, who included 101 men and 99 women, were between the ages of 25 and 65 years.

Procedure

Two months prior to the commencement of the SABPA study, participants who met the specific criteria for purposes of the physiological section of the SABPA study were recruited, provided with information regarding the aims and objectives of the study in their home language, and asked to sign informed consent forms. Each participant was involved in the study for two days, and spent one night at the Metabolic Unit research facility on the North-West University's Potchefstroom campus for data collection purposes. Several physiological measurements were taken during the two days as part of the physiological component of the SABPA study. During the first day, the participants completed a battery of psychosocial questionnaires with the help of trained fieldworkers. During the second day a number of physiological measurements were taken, and participants completed a biographic questionnaire that enquired about lifestyle habits such as smoking and alcohol consumption as well as their general health status. Upon completion of the procedures, the participants were provided with breakfast and transported back to their respective schools. The psychological data was utilized for the purpose of this study.

Measures

The following measuring instruments were used in this study:

Teacher Stress Inventory (TSI) (Boyle, Borg, Falzon & Baglion, 1995).

The Teacher Stress Inventory (TSI) is a 20-item self-report scale that measures the occupational stress experienced by teachers. In a comprehensive survey of occupational stress among primary school teachers, Boyle et al. (1995) identified five distinct sources of stress: Workload, Pupil Misbehavior, Time/Resource Difficulties, Professional Recognition Needs and Poor Relationships. Boyle et al. (1995) found that the first two contributed most to the levels of stress experienced by teachers. This instrument uses a five-point Likert type response format, which includes the following response options: no stress, mild stress, moderate stress, much stress, and extreme stress. The TSI has been validated for use within the South African context (Boshoff, Potgieter, Ellis & Malan, 2011). Factor analysis indicated that two factors, General circumstance related stress and Learner related stress, best represented aspects of occupational stress associated with the South African teaching environment. Cronbach alpha coefficients of 0.84 and 0.82 were yielded for the TSI General and TSI Learner subscales, which attest to the internal consistency of the TSI. Furthermore, the criterion-related validity of the scale proved sufficient, as the stress levels measured with the TSI in general exhibited the expected associations with measures of mental illness and well-being (Boshoff et al., 2011).

General Health Questionnaire (GHQ-28) (Goldberg & Hillier, 1979).

The General Health Questionnaire (GHQ) is a 28-item self-report scale used as a screening measure to identify individuals who are likely to have or who are at risk of

developing psychiatric disorders. Often used as a measure of mental well-being (Jackson, Rothmann & van de Vijver, 2006), the subscales of the GHQ-28 include Somatic Symptoms (SS), Anxiety and Insomnia (AS), Social Dysfunction (SD) and Severe Depression (DS). The four response options to the different items that enquire about the presence of symptoms range from “Not at all” to “Much more than usual”. The GHQ items were scored by making use of the GHQ scoring method (0,0,1,1), which yields a potential minimum score of 0 and a maximum of 28. A Cronbach alpha coefficient of 0.91 has been reported for the Total Scale Score in a South African sample (Wissing & van Eeden, 2002). Khumalo, Temane and Wissing (2011) reported Cronbach alpha reliabilities for the various subscales as 0.79 (GHQ-SS); 0.81 (GHQ-AS); 0.65 (GHQ-SD) and 0.78 (GHQ-DS). These results confirm the questionnaire’s internal consistency when used within the South African context. The GHQ-28 and its subscales will be used to indicate the presence of mental illness symptoms.

Mental Health Continuum–Short Form (MHC-SF) (Keyes, 2006).

The Mental Health Continuum–Short Form (MHC-SF) consists of 14 items which measure participants’ levels of positive mental health over the past 30 days. Keyes (2002) describes mental health as a “syndrome of symptoms of positive feelings and positive functioning” (p. 208). The 14 items represent the construct definition for each of the three facets of well-being, namely emotional (EWB), social (SWB) and psychological well-being (PWB), and the response options included the following: never, once or twice, about once a week, 2 or 3 times a week, almost every day and every day. After completion, individuals can be diagnosed with the presence (flourishing) or the absence (languishing) of mental health (Keyes, 2006). Flourishing

here refers to the combination of high levels of subjective, psychological and social functioning whereas languishing refers to the combination of low levels of the three facets (Westerhof & Keyes, 2010). The MHC-SF has been validated in a random sample of Setswana-speaking adults residing in the North-West Province of South Africa, and has produced a Cronbach alpha reliability coefficient of 0.75 for the overall MHC-SF score (Keyes et al., 2008). Khumalo et al. (2011) report the Cronbach alpha coefficients of the subscales within a sample of Setswana-speaking adults to be 0.79 (MHC-EWB); 0.78 (MHC-PWB) and 0.68 (MHC-SWB). The MHC-SF can therefore be regarded as producing reliable results within the South African context. The MHC-SF will be correlated with the GHQ-28 to provide a holistic view of the participants' mental health.

Ethical aspects

Ethical approval for the SABPA study (NWU-00036-07-S6) was obtained from the North-West University's Ethics Committee. The approval was granted for the time from its commencement in November 2007 up to the final data collection in November 2012. The current study falls within the scope of this ethical approval. To ensure confidentiality, each participant was given a participant number during data collection. The participants signed consent forms after all the aspects of the research were explained. In addition, they had the opportunity to ask questions and raise concerns. Trained fieldworkers, supervised by registered psychologists, were responsible for collecting psychological data. These fieldworkers ensured that the psychological test battery was correctly completed in a structured environment. Feedback with regard to psychological results was provided after completion of the data collection in the form of

an information session, during which participants also participated in a stress management workshop.

Data analysis

The SPSS program (version 20) was used to perform the descriptive and inferential statistics, e.g. t-tests and correlations. In order to determine the associations between variables, structural equation modelling (SEM) was used. SEM incorporates multiple independent and dependent variables with hypothetical latent constructs. These may represent clusters of observed variables (Savalei & Bentler, 2006). Through SEM it is possible to determine and estimate a system of hypothesized relationships among observable and latent variables, with the further aim of determining whether associations are consistent with the obtained sample of data (Stephenson, Holbert & Zimmerman, 2006). Guidelines regarding the reporting of indices of fit suggest that a variety of indices representing the absolute, parsimonious and incremental classes should be reported (Hooper, Coughlan & Mullen, 2008). Relevant indices of fit, including chi-square statistic divided by its degrees of freedom, Root Mean Square Error of Approximation (RMSEA) and Comparative Fit Index (CFI) were thus included. The different models were explored with the AMOS application within the SPSS statistical software package.

Results

Descriptive statistics

Descriptive statistics and the t-test values for the difference between the male and female subgroups are reported in Table 1. Effect sizes were calculated to determine

the practical significance of the difference between the two gender groups (Berben, Sereika & Engberg, 2012). An effect of $d = 0.8$ is usually considered to be large, one of $d = 0.5$ is considered to be a medium effect, and an effect size of $d = 0.2$ is considered to be a small effect (Berben et al., 2012). For the purpose of this study, data with a d value of approximately 0.5 and larger were considered to be of practical significance.

As indicated by Table 1, t-tests revealed statistically significant differences between men and women with regard to the TSI General ($p < 0.01$), Learner subscale ($p < 0.01$) and Total scale ($p < 0.001$) scores, but this was of small practical significance. Due to the lack of statistically significant differences between the gender groups regarding the measures of mental well-being (i.e. the GHQ-28 and MHC-SF), the gender data were combined into a single set for all subsequent analyses. Except for the GHQ-Depression subscale, skewness and kurtosis values for most of the subscales ranged between -1.00 and 1.00, indicating that the data was relatively normally distributed (DeCarlo, 1997) and that the use of parametric analyses are therefore justified.

The total scale score of the TSI yielded a mean of 3.74 (SD = 0.72) and 4.02 (SD = 0.69) for men and women respectively. The TSI-General subscale yielded scores of 3.78 (SD = 0.71) for the male subgroup, and 4.04 (SD = 0.63) for the females. The TSI-Learner subscale yielded scores of 3.81 (SD = 0.68) and 4.11 (SD = 0.72) for men and women respectively.

The GHQ-28 total score yielded a mean of 7.41 (SD = 6.28) for men, and 9.13 (SD = 6.62) for women. In the current sample, anxiety and somatic symptoms seem to have contributed most to the GHQ-28 total score, with the GHQ-AS yielding scores of 2.36 (SD = 2.3) and 2.89 (SD = 2.52), and the GHQ-SS subscale yielding scores of 2.36

(SD = 1.98) and 2.68 (SD = 2.34) for men and women respectively. When using the binary scoring method, a score of 4 is suggested as a guideline to distinguish individuals who experience a relative absence of mental health problems (scores lower than 4) from those who do report symptoms of possible mental disorders to an extent that warrants psychiatric intervention (scores higher than 4) (Goldberg & Hillier, 1979). Both gender groups' total scale scores were substantially above 4, which indicates the presence of distress (Sterling, 2011) in this group of participants.

The MHC-SF yielded a mean total scale score of 48.93 (SD = 10.34) for men and 47.65 (SD = 11.53) for women. Surprisingly, these results indicate that the majority of the participants (70.5%) are moderately mentally healthy and that only 1.5% of them are languishing, therefore experiencing low levels of the three facets of well-being. This means that, in spite of this group's high stress levels and their self-reported experience of symptoms to the extent that it may warrant psychiatric intervention, 28% of the participants reported that they were flourishing and therefore experiencing optimal mental well-being. Possible reasons for these seemingly discrepant results will receive attention in the discussion section.

Correlation matrix

The Pearson correlation coefficients of the TSI, GHQ-28 and MHC-SF and their respective subscales are reported in Table 2. The TSI total score correlated positively with the GHQ total scale (GHQ-T) as well as the anxiety and insomnia subscale (GHQ-AS) scores at the 1% level of significance. Teachers' self-reported stress also showed a statistically significant correlation with the depression symptoms (GHQ-DS) and social dysfunction (GHQ-SD) subscales ($p < 0.05$). These results seem to indicate a relatively

strong association between the self-reported stress and symptomatology levels reported by participants. The GHQ total score also showed a statistically significant negative correlation with the MHC-SF total score ($p < 0.01$). This pattern was reflected in the subscale scores, where the GHQ subscales showed negative correlations of varying significance with all of the MHC subscales, with the exception of the social well-being subscale.

It was therefore surprising to find that the TSI total and subscale scores did not show any statistically significant correlation with the MHC-SF total score or any of the MHC-SF subscales on either the 0.01 or 0.05 levels of significance. The possible implications of this will be further explored in the discussion of the results.

Structural Equation Modelling (SEM)

A process of Structural Equation Modelling (SEM) was subsequently used to determine how the levels of stress and psychological well-being experienced by this cohort of Black South African teachers are related to each other. Different structural models, drawn from existing literature, which deal with stress and its detrimental effects, were conceptualized and evaluated with the use of SEM in order to determine which model represents the best fit to the data.

Figure 1 shows the conceptualised model. The two specified paths, representing the effect of stress on the individual's well-being as evident through the presence of symptoms of mental illness (GHQ-28) and levels of positive mental health (MHC-SF) are shown. This model's measures of fit are given in Table 3. Guidelines regarding the reporting of indices of fit suggest that a variety of indices across the three broad classes should be reported (Hooper et al., 2008). The fit indices for the chosen structural model

indicate that the chi-square test statistic divided by the degree of freedom yielded a ratio of 2.930 which, according to Hooper et al. (2008), falls within the recommended range of 2 to 5. The Tucker-Lewis Index was 0.823 and the Comparative Fit Index was 0.906, which is indicative of a good fit (Hooper et al., 2008). The RMSEA was 0.098, which is higher than the value of 0.08 and would be indicative of satisfactory fit (Hooper et al., 2008). Hooper et al. (2008) mentions that fit indices are useful guides but should not be used in isolation. A structural model must also be studied with respect to substantive theory. After consideration of various alternatives, the model depicted in Figure 1 was found to produce the best fit, both statistically and theoretically, to the data.

Figure 1 indicates the ways in which stress could have a direct effect on the teachers' well-being as measured through the presence of symptoms of mental illness and levels of positive mental health. The regression weights are represented on the paths and the standardized regression coefficients are indicated in brackets. Statistically meaningful paths are indicated with an asterisk. According to the model, stress as measured through the TSI had a direct and statistically significant positive effect on the presence of mental illness symptoms ($\beta = .265$). There is a direct and statistically significant negative relationship between the MHC-SF and GHQ-28 ($\beta = -.656$). The results further indicate that there was no evidence of a significant relationship between stress and well-being ($\beta = .012$). Possible explanations for these results will be provided in the discussion section.

Discussion

The aim of this study was to determine the levels of occupational stress and mental well-being experienced by a cohort of Black South African teachers, and to describe how these two variables are related to each other. Analyses of the psychometric properties of the measures used in this study showed results to be reliable and interpretable.

The descriptive statistics and t-tests indicated a difference of small practical significance between the men and women regarding their TSI total scale and subscale scores, and no statistically significant differences between the two groups' scores on the GHQ-28 and MHC-SF. It was therefore deemed appropriate to proceed with correlational and path analysis for the combined group.

As could be predicted from international and South African studies (Montgomery, Demers & Morin, 2010; Ngidi & Sibaya, 2002; Peltzer et al., 2009; Stroebe & Rennert, 2008), this group of teachers reported experiencing the teaching occupation to be very stressful. These results are on par with South African studies. Peltzer et al. (2009) found high levels of stress in a South Africa nationwide study involving 21 307 teachers of whom 77.4% were Black. Similarly, Ngidi and Sibaya (2002) reported that 61% of Black teachers in KwaZulu-Natal province experienced high levels of stress. In comparison to results from recent international studies, which yielded total scale scores of 2.45 (SD = 0.91) (Harlow, 2008), 2.5 (SD = 0.53) (Montgomery et al., 2010) and 2.63 (SD = 1.39) (Hanif, Tariq & Nadeem, 2011), this group of South African teachers' stress levels are very high.

The detrimental effects of stress have been well documented (Bellingrath et al., 2009; Goldstein & McEwen, 2002). Given the high levels of stress reported, it was not

surprising that the teachers from the current study reported experiencing symptoms of possible mental disorders at levels that could require psychiatric intervention. The scores on the GHQ-28 were in fact twice the cut-off score of 4 which is considered to be the guideline for the identification of possible mental disorders (Goldberg & Hillier, 1979). A study by Wissing and Van Eeden (2002) shows the GHQ-28 total and subscale scores for a group of Black South Africans from the general population to be lower than the results from the current study, with a mean of 5.25 (SD = 6.00). The trend for teachers to report more symptoms than the general population also emerges from recent international studies. Ballou (2012) reported that in comparison to civil servants in the US, the score on the GHQ-28 for US teachers was significantly higher, with a mean of 8.20 (SD = 5.80).

Correlation analysis indicated a positive and statistically significant association between teachers' stress levels and their self-reported experience of symptoms associated with mental disorder. The anxiety and insomnia subscale of the GHQ-28 in particular, and the depression symptoms and social dysfunction subscales to a slightly less extent, showed significant correlations with participants' self-reported stress levels. This seems to be in line with studies that indicate the association between chronic stress and psychopathology (Mahan et al., 2010), and specifically mood and anxiety disorders (Sun et al., 2007; Tennant, 2002). Furthermore, correlation analysis indicated significant negative correlations between the GHQ-28 and MHC-SF total and subscale scores. Again, this is in line with existing literature where significant negative associations were found to exist between symptoms of mental illness and measures of subjective well-being (Keyes, 2002). The absence of significant correlation between teachers'

stress levels and their self-reported mental well-being was however surprising and merited further investigation.

Path analysis was subsequently conducted to determine the degree to which participants' stress levels were able to accurately predict their psychological well-being. The path analysis confirmed that stress has a statistically significant effect on the experience of symptoms pertaining to possible mental disorders. However, participants' stress levels seemed to have no statistical significant effect on their self-reported levels of well-being as measured through MHC-SF.

Results regarding these teachers' self-reported levels of mental health indicated higher levels of mental health than expected, with 28% reporting that they are flourishing and only 1.5% of the participants identified as languishing. In contrast to the current group, local studies focusing on the general Black South African Setswana-speaking population as well as international studies revealed that up to 12% of adults are languishing and only between 17% and 20% of adults are flourishing (Keyes, 2002; Keyes et al., 2008). In spite of the possibility that factors such as a difference in socio-economic status and level of education could have had an impact on Keyes et al.'s (2008) results (Diener & Ryan, 2009), the level of well-being of the group of teachers' involved in this study remains higher than expected.

Possible explanations for these findings include the influence of participants' cultural background on their responses. Black South Africans are more likely to adhere to a collectivistic or afro-centric approach (Niemann, 2006), where emphasis is placed on contributing toward the common good, and the individual is expected to fit in with the group's social needs and expectations (Niemann, 2006; Oyserman & Lee, 2008). The possibility therefore exists that the high levels of stress, symptomatology and

mental health reported may be a result of over-reporting or acquiescence, as individuals may have used the group as a point of reference instead of focusing on their own personal experiences. A further consideration should be that certain racial groups seem to be more vulnerable to the development of specific conditions than others (Jackson, Knight & Rafferty, 2010) and that, although there are conflicting results in this regard, Blacks tend to report higher levels of mental well-being in comparison to Whites (Jackson et al., 2010; Keyes, 2009).

Considering the definition of well-being, it is however possible for the teachers to experience well-being, even in the presence of severe stressors and symptoms of mental illness. Well-being is defined as more than just the absence of disease but rather in terms of individuals' continued ability to realize their potential, to cope with stress, to work productively and to contribute to their community (WHO, 2004). In line with this definition, Keyes's (2002) two continua model of mental health and mental illness proposes that although mental illness and health are related they belong to two separate dimensions where one indicates the presence or absence of mental health, and the other indicates the presence or absence of mental illness (Keyes, 2002; Westerhof & Keyes, 2010). Therefore, an individual with a high level of mental health will not necessarily be free of mental illness, but will be functioning well in their daily life nonetheless (Westerhof & Keyes, 2010). Taken at face value the current study's results certainly suggest that these teachers are able to maintain a relatively high level of mental health, despite experiencing severe occupational stress and even symptoms indicative of stress-related mental disorder.

This remarkable ability of the teachers to withstand, cope with, or even adapt to stress whilst maintaining their mental health is referred to as resilience, a concept that

has received increasing research attention (Herrman et al., 2011; Schetter & Dolbier, 2011). Resilience is often linked to the existence and effective use of resources, protective factors and processes within the individual and the environment (Herrman et al., 2011; Schetter & Dolbier, 2011). These protective factors often play a mediating role in the relationship between stress and psychological well-being, and may well offer an explanation for our participants' high levels of self-reported mental health. However, more research is required to investigate the presence and possible mediating role of specific protective factors that enable these teachers to maintain a sense of mental well-being, even in the face of severe occupational stress. The limits and additional directions for future research should also be noted. The influence of culture on participants' responses needs to be investigated further to determine the effect thereof on the response patterns of the participants. Furthermore, a mixed-method approach may provide more detailed insight into the teachers' experience of, and response to stress. Lastly, a comparison between Black and White South African teachers may provide valuable information on the impact of culture and ethnicity on stress and well-being. Despite these limitations, however, this study provides noteworthy insight into the interplay between stress and well-being for a population group about whom relatively little data are available. The results from this study could contribute to the development of appropriate intervention strategies to deal with stress more effectively and in doing so, improve well-being.

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Table 1

Descriptive statistics of the study population and the t-test values for the difference between genders

Measure	Men n = 101				Women n = 99				Effect size	p-values	α
	Mean	SD	Skewness	Kurtosis	Mean	SD	Skewness	Kurtosis			
TSI_Total	3.740	0.720	-0.140	-0.703	4.020	0.690	-0.433	-0.188	0.43*	0.002	0.91
TSI_General_Mean	3.785	0.717	-0.300	-0.614	4.046	0.631	-0.520	-0.034	0.37*	0.006	0.84
TSI_Learner_Mean	3.816	0.687	-0.158	-0.780	4.115	0.727	-0.769	0.045	0.41*	0.003	0.82
GHQ_SS	2.366	1.988	0.421	-0.885	2.681	2.340	0.319	-1.325	0.12	0.353	0.74
GHQ_AS	2.367	2.321	0.558	-1.025	2.893	2.524	0.314	-1.275	0.21	0.127	0.74
GHQ_SD	1.815	2.109	0.946	-0.309	2.213	2.114	0.743	-0.637	0.19	0.184	0.55
GHQ_DS	0.859	1.508	2.109	4.023	1.363	2.135	1.526	1.109	0.24	0.055	0.75
GHQ_T	7.414	6.289	0.659	-0.494	9.130	6.624	0.547	-0.591	0.26	0.062	0.89
MHC_EWB	10.445	2.643	-0.778	0.378	9.818	3.333	-0.791	0.073	0.19	0.142	0.82
MHC_SWB	15.336	5.235	-0.257	-0.548	14.479	5.407	-0.323	-0.403	0.16	0.256	0.79
MHC_PWB	23.148	4.731	-0.737	0.076	23.325	5.258	-1.021	0.721	0.03	0.803	0.84
MHC_TOT	48.932	10.343	-0.236	-0.542	47.650	11.535	-0.560	-0.044	0.11	0.409	0.72

* $d \geq 0.2$ (small); ** $d \geq 0.5$ (medium); *** $d \geq 0.8$ (large)

Note: SD = standard deviation, α = Cronbach's Alpha, TSI_Total = Teacher Stress Inventory Total Score, TSI_Gen = Teacher Stress Inventory General Mean, TSI_Learner_Mean = Teacher Stress Inventory – Learner Mean, GHQ-T = General Health Questionnaire – Total Score, GHQ_SS = General Health Questionnaire – Somatic Symptoms subscale, GHQ_AS = General Health Questionnaire – Anxiety and Insomnia subscale, GHQ_SD = General Health Questionnaire – Social Dysfunction subscale, GHQ_DS = General Health Questionnaire – Depression Symptoms subscale, MHC_EWB = Mental Health Continuum – Emotional Well-being subscale, MHC_SWB = Mental Health Continuum – Social Well-being subscale, MHC_PWB = Mental Health Continuum – Psychological Well-being subscale, MHC = Mental Health Continuum- Total Scale Score.

Table 2

Pearson correlation coefficients

Measures	TSI_TOTAL	TSI_GENERAL _MEAN	TSI_LEARNER _MEAN	GHQ_ SS	GHQ_ AS	GHQ_ SD	GHQ_ DS	GHQ_T	MHC_ EWB	MHC_ SWB	MHC_ PWB	MHC_ TOT
TSI_TOTAL	1	.925**	.878**	.100	.227**	.163*	.145*	.213**	-.006	.023	.023	.019
TSI_GENERAL _MEAN	.925**	1	.664**	.062	.190**	.139	.121	.172*	.019	.067	.031	.051
TSI_LEARNER _MEAN	.878**	.664**	1	.099	.201**	.143*	.154*	.200**	-.008	-.048	.023	-.016
GHQ_SS	.100	.062	.099	1	.570**	.405**	.321**	.773**	-.395**	-.097	-.113	-.208**
GHQ_AS	.227**	.190**	.201**	.570**	1	.424**	.461**	.835**	-.436**	-.105	-.158*	-.244**
GHQ_SD	.163*	.139	.143*	.405**	.424**	1	.342**	.718**	-.373**	-.096	-.188**	-.235**
GHQ_DS	.145*	.121	.154*	.321**	.461**	.342**	1	.679**	-.447**	-.072	-.227**	-.262**
GHQ_T	.213**	.172*	.200**	.773**	.835**	.718**	.679**	1	-.544**	-.123	-.223**	-.312**
MHC_EWB	-.006	.019	-.008	-.395**	-.436**	-.373**	-.447**	-.544**	1	.405**	.491**	.696**
MHC_SWB	.023	.067	-.048	-.097	-.105	-.096	-.072	-.123	.405**	1	.553**	.852**
MHC_PWB	.023	.031	.023	-.113	-.158*	-.188**	-.227**	-.223**	.491**	.553**	1	.861**
MHC_TOT	.019	.051	-.016	-.208**	-.244**	-.235**	-.262**	-.312**	.696**	.852**	.861**	1

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

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

Note: TSI_Total = Teacher Stress Inventory Total Score, TSI_Gen = Teacher Stress Inventory General Mean, Learner_Mean = Teacher Stress Inventory – Learner Mean
 GHQ-T = General Health Questionnaire – Total Score, GHQ_SS = General Health Questionnaire – Somatic Symptoms subscale, GHQ_AS = General Health Questionnaire – Anxiety and Insomnia subscale, GHQ_SD = General Health Questionnaire – Social Dysfunction subscale, GHQ_DS = General Health Questionnaire – Depression Symptoms subscale, MHC_EWB = Mental Health Continuum – Emotional Well-being subscale, MHC_SWB = Mental Health Continuum – Social Well-being subscale, MHC_PWB = Mental Health Continuum – Psychological Well-being subscale, MHC= Mental Health Continuum- Total Scale Score.

Table 3

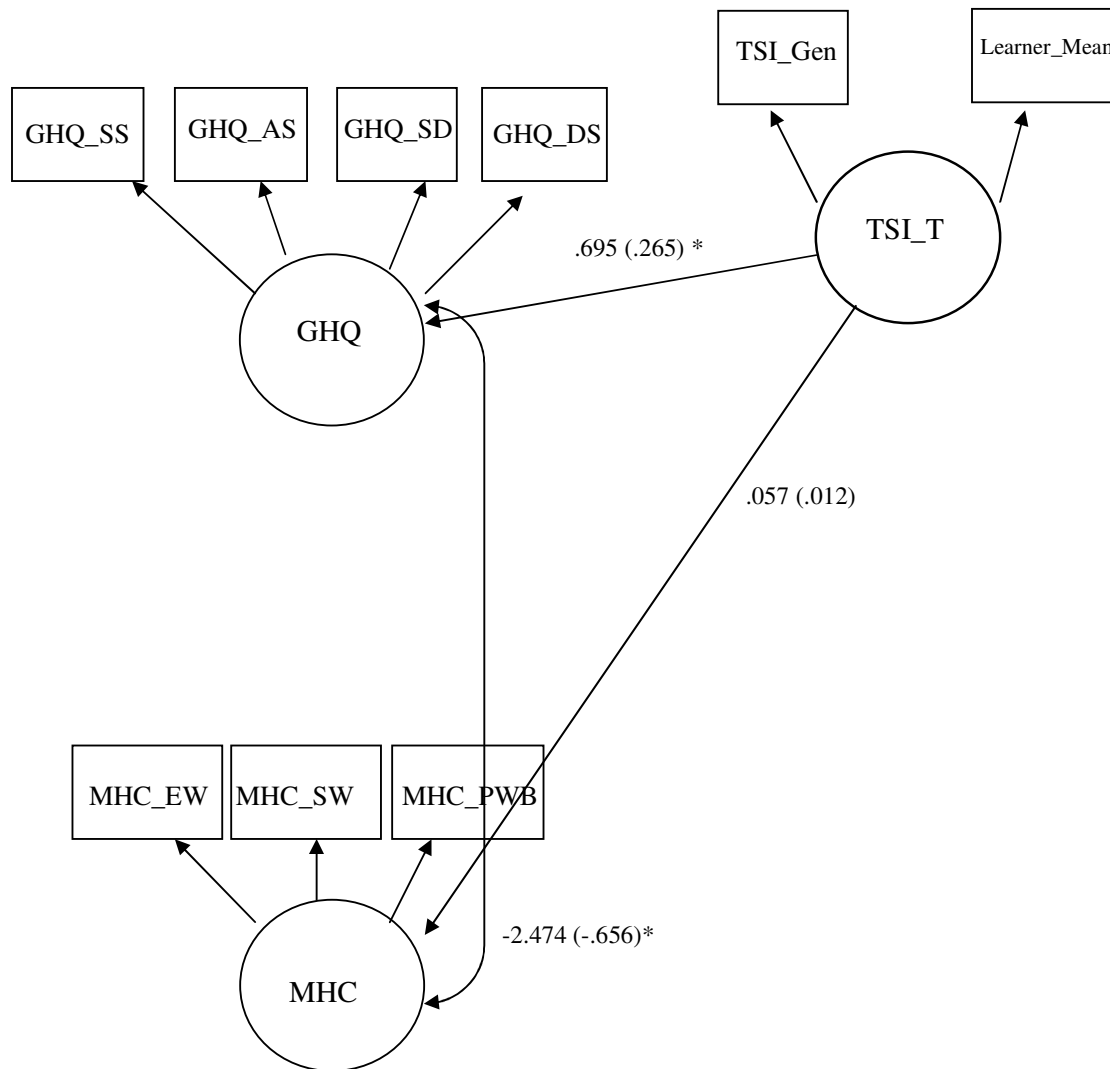
Goodness of fit indices for structural model

	CMIN/DF	TLI	CFI	RMSEA
Initial model	3.941	0.730	0.850	0.122
Structural model	2.930	0.823	0.906	0.098

Note: CMIN = Minimum Sample Discrepancy, DF = Degrees of Freedom, TLI = Tucker Lewis Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation

Figure 1.

Model relating stress and psycho-physiological functioning in African participants



Note: TSI_Gen = Teacher Stress Inventory General Mean , Learner_Mean = Teacher stress Inventory – Learner Mean, TSI_T = Teacher Stress Inventory – Total Score, GHQ_SS = General Health Questionnaire – Somatic Symptoms subscale, GHQ_AS = General Health questionnaire – Anxiety and Insomnia subscale, GHQ_SD = General Health Questionnaire – Social Dysfunction subscale, GHQ_DS = General Health Questionnaire – Depression Symptoms subscale, MHC_EWB = Mental Health Continuum – Emotional Well-being subscale, MHC-SWB = Mental Health Continuum – Social Well-being subscale, MHC-PWB = Mental Health Continuum – Psychological Well-being subscale, MHC= Mental Health Continuum- Total Scale Score.

* $p < 0.05$

** $p < 0.01$

Chapter 3

Self-regulation and mental well-being in a cohort of Black South African teachers:

The SABPA study

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JOURNAL OF PSYCHOLOGY IN AFRICA

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Title: This should be brief, sufficiently informative for retrieval by automatic searching techniques and should contain important key-words (preferably <10 words).

Author(s) and Address(es) of author(s): The corresponding author must be indicated. The author's respective addresses where the work was done must be indicated. An e-mail address, telephone number and fax number for the corresponding author must be provided.

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Appoh, L. (1995). *The effects of parental attitudes, beliefs and values on the nutritional status of their children in two communities in Ghana*. Unpublished masters dissertation, University of Trondheim, Norway.

Peltzer, K. (2001). Factors at follow-up associated with adherence with directly observed therapy (DOT) for tuberculosis patients in South Africa. *Journal of Psychology in Africa*, 11, 165-185.

Sternberg, R. J. (2001, June). *Cultural approaches to intellectual and social competencies*. Paper presented at the Annual Convention of the American Psychological Society, Toronto, Canada.

Cook, D. A., & Wiley, C. Y. (2000). Psychotherapy with members of the African American churches and spiritual traditions. In P. S. Richards & A. E. Bergin (Ed.), *Handbook of psychotherapy and religiosity diversity* (pp. 369-396). Washington DC: American Psychological Association.

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3.2. Manuscript

**SELF-REGULATION AND MENTAL WELL-BEING IN A COHORT OF
BLACK SOUTH AFRICAN TEACHERS: THE SABPA STUDY**

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Abstract

SELF-REGULATION AND MENTAL WELL-BEING IN A COHORT OF BLACK SOUTH AFRICAN TEACHERS: THE SABPA STUDY

Key words: Self-regulation, well-being, stress, Black teachers, protective factors, South Africa

The aim of this study was to obtain an understanding of the role of self-regulation in the well-being of Black South African teachers working within a highly stressful environment. It also aimed to determine the role of specific sub-constructs of self-regulation in the well-being of the teachers. The quantitative study made use of a cross-sectional design and incorporated Structural Equation Modelling (SEM). The group was divided into tertiles according to their levels of self-regulation as reported on the Short Self-Regulation Questionnaire (SSRQ). The descriptive statistics indicated that participants from the first and third tertiles experienced similar levels of stress, but that the group with high self-regulation levels experienced higher levels of well-being than the group with low self-regulation. Correlation analysis confirmed that there is a strong association between self-regulation and mental well-being. With the use of SEM, the nature of the relationship between self-regulation and its sub-constructs and well-being was determined. The results indicated that although all of the sub-constructs contribute to well-being, three sub-constructs seem to have a unique contribution to well-being. Lastly, the results indicated that self-regulation performs a similar role in the well-being of individuals from a collectivistic group as individuals with an individualistic orientation.

SELF-REGULATION AND MENTAL WELL-BEING IN A COHORT OF BLACK SOUTH AFRICAN TEACHERS: THE SABPA STUDY

The teaching profession is known both internationally and in South Africa as a stressful occupation (Austin, Shah & Muncher, 2005; Jackson, Rothmann & Van de Vijver, 2006). This can be ascribed to a number of challenges that teachers face daily, including work overload, pupil misbehaviour and difficult interactions with parents (Brown, 2012; Mahan et al., 2010). Within the South African context, teachers are expected to fulfil numerous roles, adapt to frequent policy changes and teach in poor physical conditions (Ngidi & Sibaya, 2002). Especially Black teachers teaching in impoverished, predominantly Black schools face additional challenges such as a lack of resources and equipment, including libraries, textbooks, water and electricity, as well as a lack of training, second-language difficulties and overcrowded classrooms (Harley, Barasa, Bertram, Mattson & Pillay, 2000; Hosking, 2002; Ngidi & Sibaya, 2002; Maree, 2010). All of these challenges contribute to the very high levels of stress reported by Black South African teachers (Motseke, 2013; Ngidi & Sibaya, 2002; Peltzer, Shisana, Zumba, Van Wyk & Zungu-Dirwayi, 2009).

Occupational stress is known to have negative effects on employees' productivity, job satisfaction, health and well-being (Shiet-Ching, Fatimah & Malissa-Maria, 2011). Chronic stress has been associated with various forms of psychopathology, like mood and anxiety disorders (Kadzikowska-Wrzosek, 2012; Mahan et al., 2010; Peltzer et al., 2009) as well as medical conditions such as cardiovascular disorders, hypertension and somatic complaints (e.g. headaches and back pain) (Malan et al., 2010; Shiet-Ching et al., 2011). Given the high-stress environment

teachers function in, it is not surprising that this group commonly report symptoms of depression, anxiety and burnout (Kittel & Leynen, 2003; Mahan et al., 2010).

In spite of the above factors, a growing body of literature suggests that not all individuals report symptoms of stress-related illness, despite exposure to the same stressful environment (Dolbier, Smith & Steinhardt, 2007; Jackson et al., 2006; Klassen, Usher & Bong, 2010). The growing movement of positive psychology has become increasingly interested over the past decade in the observation that some individuals seem to be more able than others to adjust to the experience of stress and are able to maintain or even enhance their experience of well-being despite stressful circumstances (Friborg, Hjemdal, Rosenvinge & Martinussen, 2003; Ryff & Singer, 2003). This observation has contributed to the revision of the very definition of well-being, so that the concept is no longer equated to the absence of illness, but rather described as individuals' ability to function well within their communities, maintain meaningful interpersonal relationships and realise their own abilities despite facing stressors and challenges (Keyes, 2007; World Health Organization, 2004). The holistic conceptualisation of well-being offered by Keyes (2002) identifies social, emotional and psychological components that collectively contribute towards an individual's ability to function and flourish in spite of stress, or even psychological disorder. Research on his model has found that flourishing individuals (i.e. those who experience a combination of social, emotional and psychological well-being) even when diagnosed with mental or physical illness, have positive mental health and are able to function better than individuals who are free of physical and mental illness but who are not flourishing (Keyes, 2002; Keyes, 2007; Lamers, Westerhof, Bohlmeijer, ten Klooster & Keyes, 2011).

Within the field of Positive Psychology, the ability of some individuals to maintain mental health, a sense of well-being and even optimal functioning in times of stress has been associated with psychological strengths and personal traits that act as buffers against stress and the development of illness (Ryff & Singer, 2003; Seligman, 2003; Seligman & Csikszentmihalyi, 2000). Among these so-called protective factors, which include aspects like courage, future-mindedness, perseverance, hope, optimism, self-determination and self-mastery to name but a few (McCarthy, Fouladi, Juncker & Matheny, 2006; Seligman & Csikszentmihalyi, 2000), the process of self-regulation has attracted a great deal of research attention, and is considered to be key to mental well-being (Hofer, Busch & Kärtner, 2011; Toering, Elferink-Gemser, Jordet & Visscher, 2009).

Self-regulation is a broad term that refers to an intricate process that involves the setting of clear and realistic short- and long-term goals and the subsequent regulation of thoughts, emotions and actions in such a way that the chances of goal achievement are optimised (Terry & Leary, 2011). In addition to the engagement in goal-directed behaviour, successful self-regulation entails the constant monitoring of progress towards goal achievement and also for behaviour to be changed when the progress is insufficient (Ader & Erktin, 2010; Human-Vogel, 2006; Peterson & Seligman, 2004; Terry & Leary, 2011). Through the different aspects identified to be part of the self-regulation process, individuals are able to alter their behaviour, thoughts or emotions in order to overrule a natural, habitual or learned response when confronted with internal and external stimuli, to ensure that their responses are optimal and adaptive (Peterson & Seligman, 2004; Baumeister & Vohs, 2007).

The successful implementation of self-regulation can thus have far-reaching effects on individuals' well-being. When individuals are able to understand the early signs of discomfort and distress, effective self-regulation will give them time to plan an appropriate response to the stressor and enable them to replace reactive and impulsive behaviour with specific and intentional acts that will optimise the chances of a successful outcome (Perry, 2010). This may explain why individuals who have good self-regulation have been found to report greater tolerance for negative emotional states, such as anxiety, fewer incidences of mood disorders, as well as improved personal adjustment, self-acceptance, self-esteem and interpersonal relationships (Baumeister & Vohs, 2007; Peterson & Seligman, 2004; Vohs & Baumeister, 2004). Therefore, the process of self-regulation increases the capacity to tolerate sensations of distress, which, in turn, allows individuals to strengthen themselves for times of stress (Perry 2010; Peterson & Seligman, 2004).

Although self-regulation's potential in protecting the well-being of individuals who function in high-stress environments has been illustrated, the majority of research on self-regulation and its effects emanate from Western or Eurocentric contexts (Klassen, 2004). Race and culture, and the related aspects of individualism and collectivism, are known to influence individuals' experiences of stress (Oyserman & Lee, 2008). It cannot, therefore, be assumed that the findings for Western individuals are similar for non-Western individuals (Klassen, 2004). Black South Africans mostly embrace the Afrocentric or collectivism approach, which places an emphasis on the individual becoming subordinate to the group's social needs (Niemann, 2006). This approach is in contrast to the individualistic view of Western cultures that places the emphasis on the individual's own needs and independence (Niemann, 2006). Therefore,

given that self-regulation is focused on the individual and not the group, it seems important to investigate the role of self-regulation on well-being within a collectivistic community. The objectives of this study were, therefore, to determine the association between self-regulation and Black South African teachers' self-reported levels of mental well-being. The study, furthermore, aimed to determine the role of the subcomponents of the self-regulation process in Black South African teachers' self-reported levels of mental well-being.

Method

Design

A cross-sectional design with a purposively selected study population was used in the current study, which forms part of the Sympathetic Activity and Ambulatory Blood Pressure in Africans (SABPA) project.

Participants

Black South African teachers (N=200) from the North-West Province participated in this study. This participant group included 101 men and 99 women between the ages of 25 and 65 years. Potential participants were screened according to the broader SABPA study exclusion criteria, namely pregnancy, lactation, a temperature higher than 37°C, vaccinated or blood donors within previous three months, and users of alpha and beta blockers. The current study will utilize only the psychological data that were collected.

Procedure

Participants were recruited two months prior to the commencement of data collection. Details regarding the aims and objectives of the SAPBA-study were communicated to them in their home language. Each participant was involved in data collection for two days and spent one night at the Metabolic Unit Research Facility on the Potchefstroom Campus of North-West University. During the first day, each participant completed a battery of psychosocial questionnaires with assistance from trained fieldworkers who were supervised by registered psychologists. During the second day, participants completed questionnaires enquiring about their physiological functioning and lifestyle habits, and participated in the collection of various physiological measures. After completing these measures, participants were served breakfast and transported back to the schools.

Measures

The following measures were used in the study:

Teacher Stress Inventory (TSI) (Boyle, Borg, Falzon & Baglion, 1995)

The Teacher Stress Inventory (TSI) is a 20-item self-report scale that measures the occupational stress experienced by teachers (Boyle et al., 1995). This instrument enquires about various possible sources of teacher stress, and uses a five-point Likert-type response format that ranges from no stress to extreme stress. The TSI has been validated for use within the South African context (Boshoff, Potgieter, Ellis & Malan, 2011). Two factors, General-circumstance-related stress and Learner-related stress, have been indicated through factor analysis to best represent the aspects of occupational

stress associated with the South African teaching environment. The TSI General and TSI Learner subscales yielded Cronbach alpha coefficients of 0.84 and 0.82 respectively, which attests to the internal consistency of the TSI within the current context. The study by Boshoff et al. (2011) proved the criterion-related validity of the scale to be sufficient within the South African context.

General Health Questionnaire (GHQ-28) (Goldberg & Hillier, 1979)

The General Health Questionnaire (GHQ) is a 28-item self-report scale used as a screening measure to identify individuals who are at risk of developing psychiatric disorders, and is often used as a measure of psychological well-being (Jackson, 2007; Nagyova et al., 2000). The questions enquire about the participant's experience of various symptoms, categorized into four subscales namely: Somatic Symptoms (SS), Anxiety and Insomnia (AS), Social Dysfunction (SD) and Severe Depression (DS). The response options to the different items include "Not at all", "No more than usual", "Rather more than usual" and "Much more than usual". The GHQ scoring method (0,0,1,1), which yields a potential minimum of 0 and a maximum of 28, was used to score the GHQ-28. Cronbach alpha reliabilities reported for Black individuals from the general South African population ranged between 0.77 to 0.86 for the subscales and was 0.91 for the total scale score (Wissing & Van Eeden, 2002). Previous studies have also attested to the validity of the GHQ for use within the South African context (Boshoff et al., 2011; Keyes et al., 2008). The GHQ-28 will be included in this study in order to indicate the presence of symptoms indicative of mental illness.

Mental Health Continuum – Short Form (MHC-SF) (Keyes, 2006)

The Mental Health Continuum – Short Form (MHC-SF) consists of 14 items which measure participants' self-reported levels of positive mental health over the past 30 days. Mental health is defined by Keyes (2002) as a "syndrome of symptoms of an individual's subjective well-being" (p. 208). The 14 items enquire about the self-reported presence of each of three facets of well-being, which, according to Keyes' (2002) model of complete mental health include emotional well-being (EWB), social well-being (SWB) and psychological well-being (PWB). Response options range from "Never" to "Every day". Individuals can be diagnosed as flourishing (presence of mental health), languishing (absence of mental health) or as moderately mentally healthy (representing a state between the aforementioned) (Keyes, 2002). The MHC-SF total scale score's Cronbach alpha reliability coefficient was 0.75 within the South African context (Van Rooy, Wissing, Potgieter & Temane, 2007). The reliability of the overall MHC-SF scale in a random sample of Setswana-speaking adults residing in the North-West Province of South Africa was 0.74 (Keyes et al., 2008), attesting to its internal consistency. The MHC-SF was included to provide information regarding the presence of positive signs of mental health, and together with the GHQ-28 will provide a holistic view of the participants' mental well-being.

Short Self-Regulation Questionnaire (SSRQ) (Carey, Neal & Collins, 2004)

The Short Self-Regulation Questionnaire (SSRQ) is a 31-item version of the 63-item Self-Regulation Questionnaire (SRQ) that assesses seven dimensions of self-regulation (Brown, Miller & Lawendowski, 1999). Carey, Neal and Collins (2004) found that the scale contained one principal component, allowing for the SRQ to be

substantially shortened. The SSRQ makes use of a five-point Likert-type response format. Item scores are summed to create a total scale score (Neal & Carey, 2005). The SSRQ has been found to show good internal consistency, with a Cronbach alpha of 0.92 when used in an American context (Neal & Carey, 2005). The SSRQ has also recently been validated for use in an African context (Vosloo, Potgieter & Temane, 2013). Reliability coefficients yielded a Cronbach alpha of 0.86 for the SSRQ total scale score. Factor analysis revealed five different facets of self-regulation as measured by the SSRQ. These facets can be described as Mindfulness (CA = 0.80); Self-efficacy (CA = 0.74); Monitoring Change (CA = 0.68); Goal Focus (CA = 0.72) and Internal Locus of Control (CA = 0.72) (Vosloo et al., 2013).

Ethical aspects

The North-West University's Ethics Committee granted approval for the SABPA project (NWU-00036-07-S6) from its commencement in November 2007 to completion in November 2012. Participants were given a participant number to ensure confidentiality. The participants gave written consent to participate in the study after the different aspects of the research were explained to them and they had the opportunity to ask questions. The psychological data was collected by trained fieldworkers working under the supervision of registered psychologists. The psychological test battery was administered in a consistent and well-structured environment at the North-West University's Metabolic Unit. Upon completion of data collection, participants received feedback regarding their psychological results during an information session, after which they also participated in a stress management workshop.

Data analysis

The SPSS program (version 20) was used to conduct the descriptive and inferential statistics, such as t-tests and correlations. The participant group was divided into tertiles according to their scores on the SSRQ. For the purpose of this study, the participants' results from the first and third tertiles were compared. The first tertile consisted of participants with low total scale scores on the SSRQ, henceforth referred to as Group 1. The third tertile consisted of participants with high total scale scores on the SSRQ, henceforth referred to as Group 2. T-tests were conducted to determine the statistical significance of differences between Group 1 and Group 2. Effect sizes (Cohen's d) were calculated to determine the practical significance of the difference between the two groups. An effect size of $d = 0.8$ is considered to be a large effect, one of $d = 0.5$ is considered as a medium effect and $d = 0.2$ is considered a small effect (Berben, Sereika & Engberg, 2012). For the purpose of this study, a d value of approximately 0.5 and larger was considered to be of practical significance. SEM was used to determine the structure of the relationships amongst these above variables (McQuitty & Wolf, 2013). The indices of fit included the CMIN/DF (Chi-square statistic divided by its degrees of freedom), Root Mean Square Error of Approximation (RMSEA) and Comparative Fit Index (CFI) indices and these are representative of the absolute, parsimonious and incremental classes (Hooper, Coughlan & Mullen, 2008; McQuitty & Wolf, 2013). The AMOS application within the SPSS statistical software package was used to explore different models.

Results

Descriptive statistics

The descriptive statistics (means and standard deviations) with regard to the self-regulation and well-being for the whole group as well as Group 1 and Group 2 respectively are reported in Table 1. Group 1 and Group 2 were distinguished based on the SSRQ total scale scores. The reliability indices of the measures are indicated in Table 1. The Cronbach alphas for the TSI, GHQ-28, MHC-SF and SSRQ total scale scores ranged from 0.72 to 0.91, indicating the reliability of the instruments.

The results for the group as a whole (Table 1) indicate that the total scale score for the TSI yielded a mean of 77.66 (SD = 12.86). The GHQ-28 total scale score was revealed to be 8.26 (SD = 6.50). The total scale score of the MHC-SF was 48.30 (SD = 10.94). Further analysis indicates that 28% of the group reported to be flourishing with only 1.5% of the participants indicating that they are languishing. The SSRQ total scale score yielded a mean of 3.72 (SD = 0.46).

The division of the groups according to their self-regulation total scale scores highlighted a number of interesting inter-group differences. As indicated in Table 1, the TSI total scale score yielded a mean of 77.39 (SD = 12.36) and 77.67 (SD = 12.52) for the two groups respectively. T-test results revealed no differences of any practical significance between the two groups with regard to the TSI total scale or subscale scores.

In contrast to the above, the GHQ-28 total scale score yielded a mean of 10.39 (SD = 6.28) for Group 1 and 6.21 (SD = 5.97) for Group 2. This difference is both statistically ($p < 0.001$) and practically significant with a large effect ($d = 0.71$). The guidelines by Goldberg and Hiller (1979) suggest that the GHQ-28 cut-off score of 4

differentiates between individuals who experience symptoms of possible mental disorders that may necessitate psychiatric intervention (scores higher than 4), and those who do not (scores lower than 4). The results indicate that although both groups obtained scores above the suggested cut-off score of 4, participants from Group 1 reported experiencing symptoms at nearly twice the level reported by Group 2. In addition, the subscales of the GHQ-28 also indicate that, except for the SS subscale, there are medium to large practical significant differences between the two groups, with the results from Group 2 being significantly less than the results from Group 1.

The above pattern was also observed with regard to participants' results on the MHC-SF, with differences between Group 1 ($m = 45.17$; $SD = 11.98$) and Group 2 ($m = 53.41$; $SD = 8.39$) again reaching levels that were of both statistical ($p < 0.001$) and medium practical ($d = 0.69$) significance. There were also differences of medium to large practical significance ($d = 0.41-0.72$) between the two groups with regard to the subscales of the MHC-SF. Further analysis indicated that, while 25.5% of participants in Group 1 reported to be flourishing, a much higher number (49.1%) of participants from Group 2 were flourishing. It is interesting that none of the participants from high SR-group (Group 2) reported to be languishing.

Correlational analysis

The Spearman correlation coefficients of the TSI, GHQ-28, MHC-SF and SSRQ total and subscale scores are reported in Table 2. The statistically significant correlation between the teachers' TSI and GHQ-28 total scores ($p < 0.01$) suggests a positive association between their self-reported stress levels, and the symptoms of possible mental illness reported by these teachers. Interestingly though, there was not a

significant correlation between the TSI and MHC-SF total scale scores. A statistically significant negative correlation was, however, found between the GHQ-28 and MHC-SF total scale scores ($p < 0.01$).

With regard to self-regulation and participants' self-reported stress levels, the SSRQ total scale score did not correlate significantly with the TSI total scale score. When considering participants' mental health there was, however, a statistically significant negative correlation between the SSRQ total scale score and GHQ-28 total scale score ($p < 0.01$). In line with this finding, the SSRQ total scale score revealed a statistically significant positive correlation with positive signs of mental health as measured with the MHC-SF ($p < 0.01$). Both of the latter two results seem to support the strong connection between self-regulation and mental health found in literature (Editorial, 2012; Hofer et al., 2011). The possible implication of these results will be explored further in the discussion section.

As was the case with the total scale scores above, the subscales of the SSRQ revealed no correlations of any significance with the TSI total scale score. They did, however, show a number of significant correlations with the indicators of mental health included in this study. The SSRQ subscales yielded negative correlations of varying significance with the GHQ-28 total scale score. Furthermore, all of these subscales yielded statistically significant positive correlations ($p < 0.01$) with the MHC-SF total scale score.

Lastly, Table 2 indicates that all the SSRQ subscales showed significant ($p < 0.01$) positive correlations amongst themselves, as well as with the SSRQ total scale score. The implications of these results will be explored in the discussion section.

Structural Equation Modelling (SEM)

Structural Equation Modelling (SEM) was used to determine the degree to which the sub-constructs of self-regulation predicted the teachers' well-being. The initial or full model, which contains all the possible paths, is shown in Figure 1. This indicates the degree to which the various sub-constructs of self-regulation predict the mental well-being of participants. Regression weights are indicated on the different paths with the standardized regression coefficients indicated in brackets. The statistically significant paths are indicated with an asterisk.

Due to the lack of a significant difference between Group 1 and 2 with regard to their TSI total scale scores, as well as the absence of significant correlations between the TSI and measures of mental health (MHC-SF), stress (TSI) and self-regulation (SSRQ), it was decided to omit the TSI from the SEM model. Table 3 provides the measures of fit for the full and reduced models, representing various fit indices as recommend by Hooper et al. (2008), as well as McQuitty and Wolf (2013). The results indicated that the fit indices of the full model were indicative of a more acceptable fit than the reduced model. The CMIN/DF ratio yielded a more acceptable value of 1.869, indicating a good fit as the value is lower than 2 (McQuitty & Wolf, 2013). For both models the CFI values were lower than the recommended value of 0.95, indicating a less acceptable fit. Although both models' RMSEA values were indicative of an acceptable fit, the full model's value was 0.066 in comparison to the reduced model's value of 0.077. The fit indices are to be used as a guideline and instead of using individual indices in isolation, the overall impression should rather be studied together with theory (Hooper et al., 2008; McQuitty & Wolf, 2013).

As can be seen from Figure 1, the model indicates that goal focus has a direct and statistically significant negative effect on the presence of mental illness symptoms ($\beta = -.507$). The self-efficacy subscale has a direct and statistically significant positive effect on the presence of mental health ($\beta = .399$). The monitoring change subscale also showed a direct and statistically significant positive effect on the presence of mental health ($\beta = .315$). In addition, the model again confirms that there are statistically significant correlations between the subscales of the SSRQ. The possible reasons for the results will be explored in the discussion section.

Discussion

The first aim of this study was to determine the role of self-regulation as multifaceted construct in Black South African teachers' self-reported levels of mental well-being. The psychometric properties of the measures used in this study suggested the data obtained through the various measures to be reliable and interpretable.

The total group reported that they are experiencing very high levels of stress. This is on par with other South African and international studies, confirming that the teaching environment is a high-stress environment (Ballou, 2012; Jackson et al., 2006; Ngidi & Sibaya, 2002). As expected, not only did the group report symptoms indicative of possible mental disorder, but these symptoms, as measured with the GHQ, also correlated significantly with the participants' levels of stress. These results are in line with various recent studies (Kadzikowska-Wrzosek, 2012; Mahan et al., 2010; Shiet-Ching et al., 2011), suggesting that the high levels of stress reported by teachers do contribute to the development of possible mental disorders. However, against expectations, these teachers' stress levels did not show any significant correlations with

their self-reported levels of mental health as measured with the MHC-SF. In fact, the majority of the group reported that their levels of mental health ranged from moderate to flourishing. In addition, stress does not seem to have any association with the individuals' self-regulating abilities. The results suggest that the presence of severe work-related stress is not associated with these individuals' potential to exert self-regulation.

The correlation analysis further revealed that there is a strong negative association between self-regulation and the development of symptoms of mental disorders, and that self-regulation and individuals' levels of mental health are positively associated. This is on par with current literature where the beneficial effect of self-regulation on well-being is reported (Hofer et al., 2011). Further analysis indicated that the results for the men and the women revealed similar patterns. As a result, it was decided to continue with the results from the group as a whole without subdividing it according to gender.

After division of the total participant group in tertiles based on their SSRQ total scale scores, the descriptive statistics and t-test results indicated that there were no statistically significant differences between the low (Group 1) and high (Group 2) self-regulation groups regarding their self-reported stress levels. In fact, both groups reported experiencing significant stress that are on par with, and even higher than what has been reported in international (Ballou, 2012) and other South African studies (Ngidi & Sibaya, 2002; Peltzer et al., 2009). The group as a whole, therefore, experience high levels of stress, independent of their capacity for self-regulation. Further results regarding the association between self-regulation and participants' well-being are,

consequently, interpreted within a context that was experienced as highly stressful by both these subgroups.

The results did, however, indicate that there were large, practically significant differences between the two groups with regard to their experience of well-being. Overall, Group 2 reported significantly higher levels of mental health and lower occurrences of mental illness symptoms than Group 1, despite sharing the same high-stress teaching environment.

For the explanation of these results, one should consider the description of protective factors. Protective factors often influence the individual's reaction to a stressful situation in various ways, resulting in successful adaptation. According to Peterson and Seligman (2004), these so-called protective factors can affect problems (a) by directly decreasing the problem; (b) by interacting with the risk factors to buffer its effects; (c) by disrupting the process leading from the risk factor to the problem and (d) by undoing the risk factor (Peterson & Seligman, 2004). Considering that Group 2 reported high levels of self-regulation and that their reported levels of mental well-being are significantly higher and their experience of mental illness symptoms are significantly lower than Group 1's results, despite experiencing the same very high levels of stress, the results, therefore, highlight the possible role that self-regulation plays in this group as protective factor against the negative outcomes of stress. This is on par with the findings from international studies by Baumeister and Vohs (2007), Perry (2010) and Peterson and Seligman (2004). The results, in other words, strongly suggest that self-regulation, as a multi-faceted concept, has a protective role in the promotion of mental well-being and prevention of the development of mental illness.

In keeping with the second aim of the study, the focus will be on five sub-constructs of self-regulation that have been indicated by numerous international studies to be essential to self-regulation. These sub-constructs are mindfulness (Taylor & Mireault, 2008); self-efficacy (Beefink, Van Eerde, Rutte & Bertrand, 2012; Reicks, Mills & Henry, 2004); goal focus (Ter Doest, Maes, Gebhardt & Koelewijn, 2006), monitoring change (Editorial, 2012) and internal locus of control (Ignat & Clipa, 2010; Reicks et al., 2004). These five sub-constructs have also been indicated by a recent study by Vosloo et al. (2013) to be central to self-regulation within a South African context. These sub-constructs, as measured through the SSRQ, were also investigated to determine their role and contribution in the participants' level of mental well-being. Each of these sub-constructs will be discussed individually.

Mindfulness

Mindfulness is defined as “the observation of mental phenomena in a nonjudgmental way” (Taylor & Mireault, 2008, p88). Mindfulness allows for individuals to have a conscious awareness of their own thoughts and actions (Vosloo et al., 2013). The mindfulness subscale score had a significant negative correlation ($p < 0.01$) with the presence of mental illness symptoms and a significant positive correlation ($p < 0.01$) with the presence of mental health levels reported by the participants. This is on par with other studies that suggest that mindfulness contributes to individuals' well-being (Grossman, Niemann, Schmidt & Walach, 2004). Mindfulness allows for individuals to experience the present moment in a non-judgmental way. As a result, when faced with stressors, mindful individuals will refrain from being overly orientated to the past or future, which is sometimes associated with

feelings of depression and anxiety (Hofman, Sawyer, Witt & Oh, 2010; Taylor & Mireault, 2008). It is further suggested by Terry and Leary (2011) that mindfulness allows for a balanced processing of anxiety that enables individuals to focus on effective self-regulatory strategies.

Self-efficacy

Self-efficacy refers to individuals' judgment of their ability to perform a specific behaviour and complete tasks successfully (Beefink et al., 2012; Reicks et al., 2004). The self-efficacy subscale correlated negatively ($p < 0.05$) with the presence of mental illness symptoms. Self-efficacy has shown a very strong positive correlation ($p < 0.01$) with the presence of mental health. These results are on par with other studies that indicated that individuals with optimistic self-efficacy perceptions are more likely to engage in challenging tasks, are more determined to achieve their goals and are more resilient in dealing with setbacks (Steyn & Mynhardt, 2008). Furthermore, low self-efficacy expectancies have been linked with depression, anxiety and avoidant behaviour. It has also been proven that self-efficacy has an influence on individuals' physical health as it influences both the individuals' engagement in healthy behaviour as well as the body's physiological responses to stress (Maddux, 2002). Although Kononovas and Dallas (2009) reported that individuals from an individualistic culture tend to report higher levels of self-efficacy in comparison collectivistic cultures, the results from the current study seems to indicate that self-efficacy tends to have the same beneficial effect for both cultures.

Monitoring change

Monitoring change is defined as individuals' ability to keep track of their progress in reaching their goals (Vosloo et al., 2013). The monitoring change subscale had a very strong positive correlation ($p < 0.01$) with the levels of mental health and a statistically significant negative correlation ($p < 0.05$) with the presence of symptoms of mental illness. These findings are on par with studies reporting that the ability to monitor one's progress has therapeutically beneficial effects and the application thereof has been successful in lowering anxiety levels and eating disorders as well as unwanted automatic behaviours (Maas, Hietbrink, Rinck & Keijsers, 2013).

Goal focus

Goal focus refers to the ability to set goals, defined as the outcomes that an individual would like to achieve or avoid, and to keep to them (Ter Doest et al., 2006; Vosloo et al., 2013). Correlation analysis indicated that the SSRQ's goal focus subscale had a very strong positive correlation ($p < 0.01$) with mental health. The results further revealed a very strong negative correlation ($p < 0.01$) between goal focus and the presence of mental illness symptoms. These findings are confirmed by the studies as reported by Ter Doest et al. (2006), where it is described how individuals' perception that they are moving towards or achieving their selected goals contributed to their well-being and satisfaction.

Internal locus of control

Locus of control refers to the individuals' perception of their own control over life events and their control over their own achievements (April, Dharani & Peters,

2012; Ignat & Clipa, 2010; Reicks et al., 2004). This perception contributes to their understanding of how they live in their world (April et al., 2012). The internal locus of control subscale correlated negatively ($p < 0.01$) with the presence of mental illness symptoms and positively ($p < 0.01$) with the levels of mental health. Therefore, the results from the current study are on par with the studies by April et al. (2012) and Ignat and Clipa (2010) that indicate that an internal locus of control contributes significantly to individuals' level of mental well-being. Conversely, an external locus of control has been associated with higher rates of psychological distress, prevalence of depression and suicide (April et al., 2012). Furthermore, a cross-cultural study conducted on locus of control within cultures found that collectivistic groups reported less external locus of control than the individualistic group (Santiago & Tarantino, 2002). Therefore, the results from the current study suggest that although locus of control seems to be an individual process, it has similar beneficial effects for individuals from both collectivistic and individualistic cultures.

The correlation analysis provided insight into the associations of the different constructs, as described above. However, to obtain insight into the degree to which the sub-constructs of self-regulation predicts well-being, a path analysis was conducted. Results obtained from the process of SEM highlighted three sub-constructs of self-regulation that significantly predicted the presence of mental well-being. Firstly, a significant negative path was found between goal focus and the presence of mental illness symptoms. This finding indicates a negative relationship between focusing on goals and the development of mental illness symptoms. It has been indicated in literature that the planning and achieving of goals creates a sense of direction and the feeling that life has purpose and meaning (Ryff, 1995). Furthermore, heightened well-

being has been associated with intrinsic goals, the progress towards the valued goals as well as pursuing goals that is congruent with personal values (Huppert, 2009). In contrast, it is a well-established fact that mood disorders such as depression are characterised by a lack of positive affect, engagement and having meaning in life (Moeenizadeh & Salagame, 2010). Therefore, it could be suggested that the ability to set goals and keep to them can create a sense of having a purpose that ultimately combats the presence of negative feelings and emotions, and in doing so, contributes to the enhancement of well-being.

Figure 1 also shows a strong positive path between self-efficacy and the levels of mental health levels reported by participants, indicating that the presence of self-efficacy is highly predictive of the presence of mental health. This association has indeed been indicated by other studies, which reported that higher levels of self-efficacy increased individuals' persistence levels and coping efforts when they are faced with stressful and challenging situations (Beefink et al., 2012). Self-efficacy has also been proven to decrease fear of failure and improve individuals' capabilities for achieving success (Kononovas & Dallas, 2009). Klassen et al. (2010) reported on international studies that revealed how teachers' self-efficacy beliefs correlated with various positive outcomes, such as a reduction in their stress levels and career longevity.

There was also a strong positive path between the monitor change subscale and participants' mental health levels. The results, therefore, indicate that self-monitoring abilities are predictive of the presence of mental health. Through self-monitoring, individuals can increase desirable actions while decreasing the frequency of undesirable behaviour. This has been ascribed by Maas et al. (2012) to the awareness created around unwanted habitual behaviour, which, in turn, allows for it to be changed (Maas

et al., 2012). Furthermore, monitoring of behaviour enables the individuals to determine any discrepancy between their goals and current progress so that the necessary adjustments can be made and the resources needed to diminish the discrepancy can be allocated (Editorial, 2012).

In spite of highlighting certain aspects of self-regulation as significant predictors of these participants' mental health, the model also clearly indicates that the sub-constructs of self-regulation are significantly related to each other. Due to the strong inter-correlation between these self-regulation sub-constructs, it can be argued that the presence of all the sub-constructs should be considered when focusing on the role that the self-regulation process plays in teachers' well-being. The contributions of goal focus, self-efficacy and monitoring change to participants' well-being should, therefore, not be seen in isolation, but be interpreted as also representing the collective contribution of the other sub-constructs in the process of self-regulation. This is especially important given that the other self-regulation sub-constructs also showed statistically significant correlations with all the subscales of the MHC-SF and GHQ. The results from the current study do seem to indicate, however, that goal focus, monitoring change and self-efficacy have a unique contribution over and above that of the other self-regulation sub-constructs included in the model. It can, therefore, be said that the teachers' ability to set goals, their belief in their own capabilities to achieve it and their ability to keep themselves on track by monitoring their own progress are most predictive of the presence of mental well-being.

Conclusion

The aim of this study was to determine the role of self-regulation in the well-being of a cohort of Black South African teachers. Self-regulation as a holistic, multifaceted concept, as well as five identified facets of self-regulation, was investigated to gain insight into their roles in well-being in this traditionally more collectivistic population group. It was interesting to note that although the group as a whole reported to be experiencing very high levels of stress, their levels of stress did not correlate with their self-regulating abilities. It can, therefore, be suggested that an individual's inherent ability to self-regulate stands independently from the individual's context. Recent research has, however, also indicated that high-stress environments may require of a person to exert self-regulation more substantially (Wa Chan & Wen Wan, 2012). Future research would assist in understanding how self-regulation abilities are impacted when implemented in a high-stress environment over a long period of time.

The results indicated that self-regulation significantly predicted mental well-being. As have been found in international studies, self-regulation seems to take the role of a protective factor within high-stress contexts such as teaching. This is substantiated by the fact that the group with higher reported levels of self-regulation reported experiencing lower levels of mental illness symptoms, and significantly higher levels of mental health than the group that reported low levels of self-regulation. It can, therefore, be suggested that self-regulation as multifaceted concept may be beneficial to the enhancement of well-being within this cohort of participants. Considering the role of the self-regulation sub-constructs in well-being, all the sub-constructs correlated positively with mental health and negatively with mental illness symptoms. Moreover, there are certain aspects of self-regulation that emanated from this study as stronger predictors of

the presence of well-being than others. Although all the sub-constructs of self-regulation had strong correlations to each other, indicating their collective contributions to self-regulation, the participants' self-efficacy beliefs, ability to monitor their own behaviour and ability to set goals were most predictive of their levels of mental health.

Considering the impact of culture and collectivism, however, the results from the current study suggest that self-regulation plays a similar role in a collectivistic culture as reported for the individualistic culture. Furthermore, self-regulation seems to contribute to a collectivistic group's well-being as it does for the individualistic groups, although the way in which it contributes may differ (Klassen, 2004). The results from the current study seems to be in accordance with the argument by Bandura (1997) that individuals from a collectivistic culture may still differ in their individual responses to situations, and adjust their own behaviour to adapt in order to adjust successfully (Bandura, 1997; Klassen, 2004). However, future studies that measure the cultural orientation the population group will be able to provide a more clear indication of the role of self-regulation within both the collectivistic and individualistic cultures.

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Table 1

Descriptive statistics of the study population and the t-test values for the difference between the first and third tertile

Variable	Total group			Group 1		Group 2		t-tests		
	N	Mean	SD	Mean	SD	Mean	SD	Effect size	p-values	α
TSI_T	199	77.66	12.86	77.44	12.17	77.04	12.73	0.03	0.856	0.91
TSI_General	199	3.91	0.69	3.92	0.66	3.88	0.69	0.05	0.749	0.84
TSI_Learner	199	3.96	0.72	3.93	0.73	3.93	0.71	0.01	0.954	0.82
GHQ_T	200	8.26	6.50	10.69	6.28	6.21	5.97	0.71	<0.001	0.89
GHQ_SS	200	2.51	2.17	2.75	2.19	2.22	2.08	0.24	0.152	0.78
GHQ_AS	200	2.63	2.43	3.75	2.39	1.78	2.15	0.82	<0.001	0.85
GHQ_SD	200	2.01	2.12	2.60	2.07	1.59	2.05	0.49	0.005	0.80
GHQ_DS	200	1.11	1.86	1.58	2.17	0.61	1.29	0.45	0.002	0.83
MHC_T	200	48.30	10.94	45.17	11.98	53.41	8.39	0.69	<0.001	0.72
MHC_EWB	200	10.14	3.01	9.56	3.13	10.84	3.09	0.41	0.019	0.83
MHC_SWB	200	14.91	5.32	13.98	5.69	16.89	4.56	0.51	0.001	0.80
MHC_PWB	200	23.24	4.99	21.60	5.66	25.67	3.43	0.72	<0.001	0.84
SSRQ_Total 8	200	3.72	0.46	3.19	0.28	4.18	0.26	3.51	<0.001	0.86
Mindfulness	200	3.67	0.71	2.98	0.64	4.25	0.37	1.98	<0.001	0.80
Self-efficacy	200	3.95	0.52	3.56	0.53	4.32	0.35	1.42	<0.001	0.74
Monitoring change	200	3.74	0.66	3.35	0.64	4.10	0.55	1.17	<0.001	0.68
Goal focus	200	3.46	0.64	2.84	0.51	3.92	0.45	2.11	<0.001	0.72
IntLoC	200	3.83	0.68	3.34	0.77	4.25	0.46	1.19	<0.001	0.63

* $d \geq 0.2$ (small); ** $d \geq 0.5$ (medium); *** $d \geq 0.8$ (large)

Note: Group 1 = Tertile 1; Group 2 = Tertile 3; SD = standard deviation, α = Cronbach's Alpha; TSI_Total = Teacher Stress Inventory Total Score, TSI_Gen = Teacher Stress Inventory General Mean, TSI_Learner_Mean = Teacher Stress Inventory – Learner Mean, GHQ-T = General Health Questionnaire – Total Score, GHQ_SS = General Health Questionnaire – Somatic Symptoms subscale, GHQ_AS = General Health Questionnaire – Anxiety and Insomnia subscale, GHQ_SD = General Health Questionnaire – Social Dysfunction subscale, GHQ_DS = General Health Questionnaire – Depression Symptoms subscale, MHC_EWB = Mental Health Continuum – Emotional Well-being subscale, MHC_SWB = Mental Health Continuum – Social Well-being subscale, MHC_PWB = Mental Health Continuum – Psychological Well-being subscale, MHC = Mental Health Continuum- Total Scale Score. Mindfulness = Mindfulness subscale, Self-eff = Self efficacy subscale, Monitoring change = Monitoring change subscale, Goal focus = Goal focus subscale, IntLoC = Internal locus of control, SSRQ_Total 8 = Short Self-Regulation Questionnaire total score

Table 2

Spearman correlation coefficients

	TSI	GHQ_T	MHC_TOT	SSRQ_TOT	Mindfulness	Selfeff	Monitoring change	Goal focus	IntLoC
TSI	1								
GHQ_T	.207**	1							
MHC_TOT	-.012	-.330**	1						
SSRQ_TOT	-.042	-.304**	.352**	1					
Mindfulness	-.011	-.223**	.206**	.830**	1				
Selfeff	0.0003	-.163*	.397**	.661**	.402**	1			
Monitoring change	-.063	-.166*	.297**	.576**	.329**	.370**	1		
Goal focus	-.138	-.307**	.228**	.736**	.528**	.290**	.386**	1	
IntLoC	.028	-.244**	.238**	.607**	.341**	.425**	.372**	.367**	1

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

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

Note: SD = standard deviation, TSI_T = Teacher Stress Inventory – Total Score, GHQ-T = General Health Questionnaire – Total Score, MHC_TOT= Mental Health Continuum- Total Scale Score, Mindfulness = Mindfulness subscale, Self-eff = Self efficacy subscale, Monitoring change = Monitoring change subscale, Goal focus = Goal focus subscale, IntLoC = Internal locus of control, SSRQ_TOT = Short Self-Regulation Questionnaire total score.

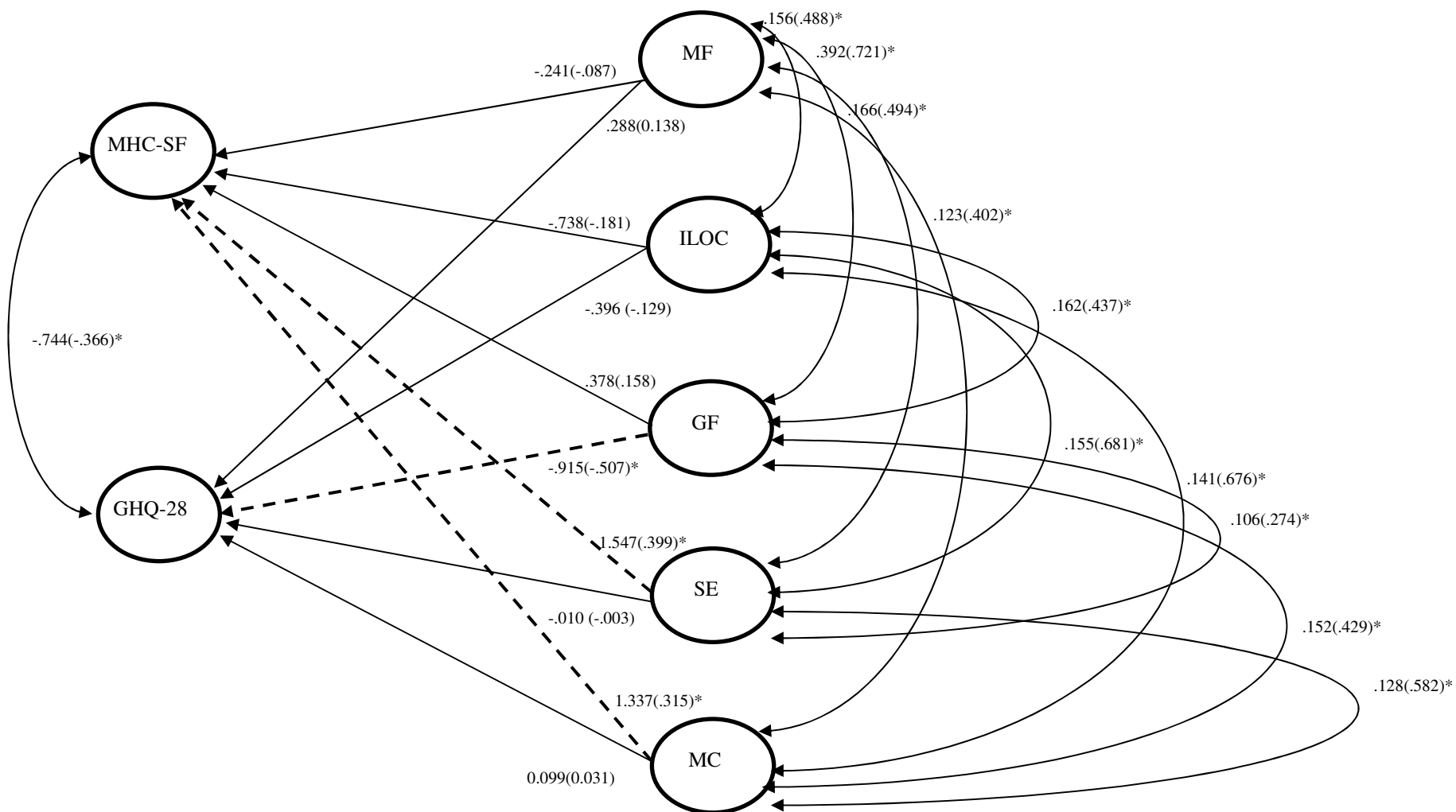
Table 3

Goodness of fit indices for structural model

	CMIN/DF	CFI	RMSEA
Full model	1.869	0.798	0.066
Reduced model	2.193	0.795	0.077

Note: CMIN = Minimum Sample Discrepancy, DF = Degrees of Freedom, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation

Figure 1.
Model relating self-regulation and mental well-being in Black South African participants



Note: Significant paths are indicated by dashed lines. GHQ-28 = General Health Questionnaire Total Scale Score. MHC-SF= Mental Health Continuum- Total Scale Score; MF = Mindfulness subscale, SE = Self efficacy subscale, MC = Monitoring change subscale, GF = Goal focus subscale, ILOC = Internal locus of control.
*p<0.05

Chapter 4

A longitudinal perspective on the progression of self-regulation and mental well-being in a high-stress work context: The SABPA study

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4.2. Manuscript

**A LONGITUDINAL PERSPECTIVE ON THE PROGRESSION OF SELF-
REGULATION AND MENTAL WELL-BEING IN A HIGH-STRESS WORK
CONTEXT: THE SABPA STUDY**

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Abstract

A LONGITUDINAL PERSPECTIVE ON THE PROGRESSION OF SELF-REGULATION AND MENTAL WELL-BEING IN A HIGH-STRESS WORK CONTEXT: THE SABPA STUDY

Key words: Self-regulation, well-being, stress, work, longitudinal, Black teachers, South Africa

The aim of this study was to determine the natural progression of self-regulation (SR) within a highly stressful context over three years. It also aimed to determine how long-term changes in SR within the context of high-stress working conditions are associated with changes in stress and mental well-being. The quantitative study made use of a longitudinal design. This study utilised the same protocol during the initial and follow-up assessments in 2008 and 2011. The results from 2008 and 2011 for the whole group were compared. Thereafter the group was divided into tertiles according to their SSRQ scores in 2008. The descriptive statistics indicated that the group as a whole reported significantly higher levels of self-regulation. They also reported significantly lower levels of stress and mental illness symptoms in 2011. The statistics further indicated that the participants from the first tertile experienced the biggest improvements in their SR and mental health levels, although they still had to surpass the SR and mental health levels that the participants from the third tertile reported in 2011. Structural Equation Modelling (SEM) was used to determine the predictive value of longitudinal changes in SR on the participants' well-being. The results indicated that the changes in SR are predictive of changes in mental health levels.

A LONGITUDINAL PERSPECTIVE ON THE PROGRESSION OF SELF-REGULATION AND MENTAL WELL-BEING IN A HIGH-STRESS WORK CONTEXT: THE SABPA STUDY

Self-regulation (SR) is a multi-faceted process during which individuals aim to control their own thoughts, emotions, actions and impulses in order to override their initial response to external and internal stimuli (Baumeister, Gailliot, DeWall & Oaten, 2006; Peterson & Seligman, 2004). This ongoing process facilitates socially desirable and adaptive behaviour through individuals' continuous evaluation and adjustment of their behaviour (Terry & Leary, 2011), and has been associated with numerous positive outcomes, including good interpersonal relationships, effective coping and adjustment, high job performance and general well-being (Gailliot, Plant, Butz & Baumeister, 2007; Hofer, Busch & Kärtner, 2011; Porath & Bateman, 2006; Terry & Leary, 2011).

The working environment is one where individuals are regularly required to apply self-regulatory behaviour and principles. Employees are required to meet specific and sometimes strenuous job descriptions, and to do so while maintaining their general health and mental well-being. In order to achieve this, they need to utilise SR to regulate their behaviour, thoughts and emotions and align their performance with the set standard, especially in stressful working conditions (Wa Chan & Wen Wan, 2012).

The teaching profession is a prime example of such a stressful working environment (Kasperdeen, 2012). Teachers face many challenges on a daily basis, ranging from learner misbehaviour, administrative problems and poor working conditions, to becoming involved in addressing social conditions (e.g. poverty and parental neglect) that are affecting their learners

(Coetzee, Jansen & Muller, 2008; Kasperdeen, 2012). The South African teaching environment is no exception. Local teachers have been found to experience high levels of stress associated with factors such as inclusive education, unmotivated and undisciplined learners, budget constraints, time demands as well as heavy workloads that impair their ability to achieve their own standards of teaching (Ngidi & Sibaya, 2002; Peltzer, Shisana, Zuma, Van Wyk & Zungu-Dirwayi, 2009; Steyn & Kamper, 2006). More specifically, Black teachers working in previously disadvantaged schools report unsatisfactory working conditions due to overcrowded classrooms and insufficient resources, facilities, poor financial management, learner misbehaviour and a lack of training (Motseke, 2013; Steyn & Kamper, 2006). Given the numerous challenges and stressors that impede teachers' goal achievement and well-being, it can be argued that individuals in this profession need to constantly apply effective self-regulatory behaviour in order to remain successful and stay healthy.

The effectiveness of self-regulation is known to depend to a large extent on inner self-regulatory resources, also referred to as *energy* or *strength* (Converse & DeShon, 2009, p1319), which are available when self-regulatory action is required. Some researchers have found that these resources are finite and that they become depleted through use (Baumeister et al., 2006; Converse & DeShon, 2009). They argue that, due to so-called 'ego-depletion' (Baumeister et al., 2006, p1774), individuals become less successful at self-regulatory tasks with each consecutive task as they will be less interested in or capable of performing volitional actions (Baumeister et al., 2006; Converse & DeShon, 2009; Ryan & Deci, 2008). Thus within the context of a highly stressful working environment, individuals may find that they have to draw so much on their self-regulatory resources to manage their work stress that they have fewer resources available to perform subsequent self-regulatory tasks (Wa Chan & Wen Wan, 2012). In contrast to the

depletion theory, various researchers have highlighted the capacity of individuals to maintain, or even increase, their self-regulatory resources. Ryan and Deci (2008) have for instance found that self-regulatory acts that are intrinsically motivated require fewer resources and are carried out by the individuals more harmoniously and efficiently. Referring to the energy available for self-regulatory purposes as vitality, these authors found that individuals who were self-directed maintained or even improved their vitality after completion of self-regulatory tasks (Ryan & Deci, 2008). Even in cases where ego depletion has been found to occur, Tyler and Burns (2008) found that SR resources can be replenished. Furthermore, it has been found that the capacity for SR can be improved through various self-control exercises (Hagger, Wood, Stiff & Chatzisavatis, 2010; Tyler & Burns, 2008). Individuals may therefore be able to increase their inner resources and self-regulatory strength over time, thereby reducing their vulnerability to ego depletion (Baumeister et al., 2006; De Witte, Bruyneel & Geyskens, 2009; Gailliot et al., 2007; Oaten & Cheng, 2007). However, it should be noted that all these improvements in self-regulatory strength were due to specific interventions and training exercises.

A major limitation noted in the current literature is that the majority of the research conducted on SR thus far has focused on changes in self-regulatory ability within a relatively short time frame (Converse & DeShon, 2009; Muraven & Baumeister, 2000). To our knowledge a very limited number of studies have focused on the natural progression of self-regulation extending over longer periods of time. It has been suggested by Converse and DeShon (2009) that individuals' SR abilities may improve due to natural adaptation processes which allow individuals to become accustomed to the exertion levels required, but that further research is necessary to understand how the effectiveness of SR changes over time. Furthermore, few longitudinal studies could be found that focused on the natural progression of self-regulation in

the context of a highly stressful working context such as the teaching environment, where individuals are constantly drawing on their self-regulation resources, and how these changes in self-regulation are reflected in the individuals' psychological well-being.

The goals of the study are therefore as follow:

1. To determine the natural progression of self-regulation within a highly stressful work situation over a period of three years.
2. To determine how long-term changes in the SR of individuals finding themselves in high-stress working conditions are associated with changes in stress and mental well-being.

Method

Design

The study used a longitudinal design with a purposively selected study population, which formed part of the Sympathetic Activity and Ambulatory Blood Pressure in Africans (SABPA) project.

Participants

Black South African teachers (N=200: 101 men, 99 women) aged between 25 and 65 years from the North-West Province of South Africa participated in the baseline phase of the SABPA project in 2008, after being screened according to the exclusion criteria (pregnancy; lactation; temperature $>37^{\circ}\text{C}$; vaccinated or donated blood within previous three months; users of alpha and beta blockers) pertaining to the broader SABPA project. Of the original 200 participants, a total of 173 teachers (88 men, 85 women) took part in data collection for the follow-up study in 2011.

Procedure

The same protocol was followed during the initial and follow-up assessments to ensure the trustworthiness of data in this longitudinal design study. Data collection took place from February to May of 2008 and 2011 respectively. During both phases the participants received details of the SAPBA project's aims and objectives in their home language, and they gave written consent for their participation. During each of these phases the participants were involved in data collection for two days, and spent one night at the North-West University's Metabolic Unit research facility. Participants completed the psychosocial battery of questionnaires with the assistance of trained field workers during the first day of their involvement. During the second day, they were involved in the collection of physiological data as part of the broader SAPBA project. For the purposes of this study, only the psychological data were utilised.

Measures

The following measures were used in the study:

Short Self-Regulation Questionnaire (SSRQ) (Carey, Neal & Collins, 2004)

The Short Self-Regulation Questionnaire (SSRQ) is a 31-item version of the Self-Regulation Questionnaire designed by Brown, Miller and Lawendowski (1999) to assess self-regulation capacity. The SSRQ has recently been validated for use in an African context (Vosloo, Potgieter & Temane, 2013), and measures participants' use of five sub-constructs of the SR process through a five-point Likert-type response format ranging from "strongly disagree" to "strongly agree". The Cronbach Alpha coefficients for the current study were 0.86 (SSRQ total

scale score), 0.80 (Mindfulness), 0.74 (Self-efficacy), 0.68 (Monitoring Control), 0.72 (Goal Focus) and 0.63 (Internal Locus of Control).

Teacher Stress Inventory (TSI) (Boyle, Borg, Falzon & Baglion, 1995)

The Teacher Stress Inventory (TSI) is a 20-item self-report scale that measures teachers' occupational stress (Boyle et al., 1995). The TSI has also been validated for use within the South African context (Boshoff, Potgieter, Ellis & Malan, 2011). Two factors, namely General circumstance-related stress and Learner-related stress were indicated through factor analysis to best represent the aspects of occupational stress associated with the South African teaching environment. This instrument uses a five-point Likert-type response format and the response options range from no stress to extreme stress. The Cronbach Alpha coefficients among the current participant group were 0.91(TSI total scale score), 0.84 (TSI General), and 0.82 (TSI Learner).

General Health Questionnaire (GHQ-28) (Goldberg & Hillier, 1979)

The General Health Questionnaire (GHQ) is a 28-item, self-administered scale that enquires about the experience of symptoms across four domains, namely Somatic Symptoms (SS), Anxiety and Insomnia (AS), Social Dysfunction (SD) and Severe Depression (DS). The response options to the different items range from "Not at all" to "Much more than usual". Originally developed to screen and identify individuals at risk for developing psychiatric disorders (Willmott, Boardman, Henshaw & Jones, 2004), the scale is often used as a measure of psychological well-being (Nagyova et al., 2000). The GHQ scoring method (0,0,1,1), with a potential minimum of 0 and a maximum of 28, was used in this study. The GHQ-28 yielded

reasonable reliability estimates (ranging from 0.77 to 0.86 for its subscales, and 0.91 for its total scale score) in a sample of Black individuals from a general South African population (Wissing & Van Eeden, 2002). Cronbach Alpha coefficients for the current study were 0.89 (GHQ Total scale), 0.74 (GHQ-SS and GHQ-AS), 0.55 (GHQ-SD) and 0.75 (GHQ-DS).

Mental Health Continuum – Short Form (MHC-SF) (Keyes, 2006)

The Mental Health Continuum – Short Form (MHC-SF) is a 14-item, self-report questionnaire that measures positive mental health. Considered more than just the absence of mental illness, mental health has recently been conceptualised as a combination of the presence of both positive emotions and positive functioning (Keyes, 2002; Lamers, Westerhof, Bohlmeijer, Ten Klooster & Keyes, 2011). The 14 items of the MHC-SF represent the three dimensions of well-being according to Keyes's conceptualisation, namely emotional (EWB), social (SWB) and psychological (PWB) well-being. This instrument uses a 6-point Likert-type response format, with response options ranging from "never" to "every day". Individuals can be identified as flourishing (i.e. experiencing complete mental health), languishing (i.e. experiencing incomplete mental health), or as moderately mentally healthy (Keyes, 2002). The MHC-SF has been validated for use within the South African context (Keyes et al., 2008). Cronbach Alpha coefficients for the current group were 0.72 (MHC-SF Total scale), 0.82 (MHC-SF EWB), 0.79 (MHC-SF SWB) and 0.84 (MHC-SF PWB), which attested to the scale's internal consistency. The results from the MHC-SF were used in conjunction with the GHQ-28 to obtain a comprehensive view of the participants' mental well-being.

Ethical aspects

The North-West University's Ethics Committee granted ethical approval (NWU-00036-07-S6) for the SABPA study. Written consent was obtained during both phases of the SABPA study from the participants after they had been thoroughly briefed on the different aspects of the research project and had the opportunity to ask questions. Confidentiality was ensured by assigning each participant a specific participant number. Trained fieldworkers, supervised by registered psychologists, facilitated the collection of the psychological data in a consistent and well-structured environment. The participants received feedback regarding their psychological results during information sessions hosted by the researchers after initial data analyses had been completed.

Data analysis

The descriptive and inferential statistics were calculated with the SPSS program (version 20). Dependent t-tests and Pearson correlations were used to determine the changes that took place within the timeframe of three years with regard to the participants' SR and well-being. The practical significance of the differences was determined through the use of effect sizes (Cohen's d). According to Berben, Sereika and Engberg (2012) an effect size of $d = 0.8$ is considered to be large, $d = 0.5$ is considered to be medium and $d = 0.2$ is considered to be small.

After comparing results from 2008 and 2011 for the group as a whole, the participant group was then divided into tertiles according to their scores on the Short Self-Regulation Questionnaire (SSRQ) as measured in 2008. The SR and well-being of the participants from the first tertile (low SSRQ total scale score in 2008) and the third tertile (high SSRQ total scale score in 2008) were then compared with the results from the follow-up assessment in 2011. These two

groups will henceforth be referred to as Group 1 (low SR) and Group 2 (high SR). The structure of the relationships among the changes in SSRQ, TSI, GHQ-28 and MHC-SF was determined through Structural Equation Modelling (SEM) with the use of the AMOS application in the SPSS statistical software package (McQuitty & Wolf, 2013). The CMIN/DF (Chi-square statistic divided by its degrees of freedom), Root Mean Square Error of Approximation (RMSEA) and Comparative Fit Index (CFI) were used as measures of the absolute, parsimonious and incremental classes of fit indices (Hooper, Coughlan & Mullen, 2008; McQuitty & Wolf, 2013).

Results

Descriptive statistics

The results for the whole group (Table 1) indicate that the SSRQ total scale score showed a statistically significant increase ($p < 0.001$) with a medium effect ($d = 0.51$) from 3.72 (SD = 0.46) in 2008 to 3.99 (SD = 0.49) in 2011. The Goal Focus (GF) subscale showed a significant increase ($p < 0.001$) with large effect ($d = 1.17$) from 3.46 (SD = 0.64) in 2008 to 4.37 (SD = 0.76) in 2011. The Monitoring Change (MC) subscale score also yielded a significant increase ($p < 0.001$) with a medium effect ($d = 0.31$) from 3.74 (SD = 0.66) in 2008 to 3.96 (SD = 0.66).

During the three-year interval, this group of teachers' overall stress levels, as reflected by TSI total scale score decreased significantly ($p < 0.001$) with a medium effect ($d = 0.54$) from 77.66 (SD = 12.86) in 2008 to 69.47 (SD = 15.62) in 2011. This change in teacher stress was also reflected in the TSI subscale scores, with both showing statistically significant ($p < 0.001$) decreases with a medium effect from 2008 to 2011.

With regard to this group of teachers' self-reported well-being, the GHQ total scale score, the anxiety and insomnia (GHQ-AS) as well as the somatic symptoms (GHQ-SS) subscales

yielded decreases of varying significance with small effect in practice. In light of the above it was interesting to see that, although the trend was towards a slight increase in the participants' well-being as reflected by changes in the MHC-SF total and subscale scores between 2008 and 2011, none of these changes were statistically or practically significant.

Table 2 gives the intra-group comparisons for the low (Group 1) and high (Group 2) self-regulation groups from 2008 and 2011. The SSRQ total scale score for Group 1 showed a significant increase ($p < 0.001$) with a large effect ($d = 0.86$), while a smaller increase ($d = 0.21$) was observed for Group 2. The SSRQ subscale scores revealed that the GF subscale increased significantly ($p < 0.001$) with a large effect ($d = 1.30$ and 1.11 respectively) for Groups 1 and 2. The most significant increases in the remaining subscales was observed in Group 1, with most notably a significant increase ($p < 0.001$) of medium effect ($d = 0.62$) in the SE subscale score. The rest of the subscales for both groups showed increases of small practical significance, with d -values ranging between 0.27 and 0.42 .

The TSI total scale scores of both Groups 1 and 2 decreased significantly ($p < 0.001$) from 2008 to 2011 with a medium practical significance ($d = 0.52$ and 0.54 for Groups 1 and 2 respectively). These changes were also reflected in the TSI subscale scores, which revealed statistically significant decreases ($p < 0.001$) of small to medium practical significance ($d = 0.36$ to 0.44) for both groups between 2008 and 2011.

According to the GHQ-28 total scale score and subscales scores, the slight decrease observed in the scores for both groups from 2008 to 2011 were neither statistically nor practically significant.

In spite of a trend toward higher self-reported levels of mental health observed in increased MHC-SF scores in both groups, none of these increases from 2008 to 2011 were of

either statistical or practical significance. However, closer inspection of the MHC-SF results indicated that Group 1 showed the biggest improvement in their mental health levels over the three years. Fifty-two per cent of the participants in this group reported to be flourishing, in comparison to 39% in 2008. Including the number of participants who reported experiencing moderate mental health instead of languishing from 2008 to 2011, it equates to a general increase of 26% in the mental health levels for Group 1. The results of Group 2 indicate that 9% of the participants reported an improvement and 19% indicated a decrease in their mental health levels. Despite the decrease, however, 67% of Group 2 still reported to be flourishing. Therefore, although the results of Group 1 improved the most, the mental health levels reported by Group 2 were still the highest. Figure 1 provides a graphic presentation of the results.

Table 3 indicates how the changes in SR over the three-year period correlates with the changes observed in the participants' self-reported levels of stress and mental well-being. The results for the group as a whole indicate a positive correlation ($p < 0.01$) between increases in the SSRQ and MHC-SF total scale scores. There is also a significant correlation ($p < 0.01$) between the observed increases in the MHC-SF and decreases in the GHQ-28 total scale scores. No significant correlations were found between the changes in the TSI total scale score and any of the health indicators (GHQ-28 and MHC-SF) or the SSRQ total scale scores.

Structural Equation Modelling (SEM)

Structural Equation Modelling (SEM) was used to determine the predictive value of changes in SR on the changes in the participants' well-being. Different structural models were conceptualised in order to determine which model represents the best fit to the data. Due to the absence of statistically significant correlations between the TSI and mental health measures

(GHQ-28 and MHC-SF) and self-regulation (SSRQ), the TSI was omitted from this analysis. The fit indices of the reduced model (Figure 2) were indicative of an acceptable fit. All regression weights for the measurement model were statistically significant. Regression weights for the structural model in Figure 2 are indicated on the different paths with the standardised regression coefficients indicated in brackets. The statistically significant paths are indicated by an asterisk.

The measures of fit, representative of the various fit indices, are given in Table 4. The CMIN/DF ratio yielded a value of 1.735. This is indicative of a good fit as it is lower than the value of 2 as recommended by McQuitty & Wolf (2013). The CFI value was 0.871, which is lower than the recommended value of 0.95, but still proves to be acceptable. The RMSEA value of 0.061 is indicative of a good fit (Hooper et al., 2008). The model, as depicted in Figure 1, indicates that changes in self-regulation have a direct and statistically significant positive effect on the changes of mental health levels ($\beta = 0.488$). As reflected in Table 3, the model also showed a direct and statistically significant negative relationship between the changes in mental health levels (MHC-SF) and mental illness symptoms (GHQ-28) ($r = -0.497$). It is noteworthy that no relationship was found between changes in self-regulation and changes in mental illness symptoms. The implications of these results will be explored in the discussion section.

Discussion

The natural progression of self-regulation

The first aim of the study was to determine the natural progression of SR within the highly stressful teaching context over a period of three years. The results indicate that the group as a whole reported a significant improvement in their SR scores over a period of three years. A

further breakdown of the results into Group 1 and Group 2 clearly indicate that, although the SR scores of both Group 1 and Group 2 had improved over the course of three years, Group 1 reported the most significant improvements. The observed overall improvement in SR seems to confirm the findings of Hagger et al., (2010), Oaten and Cheng (2007) and Tyler and Burns (2008), who found improvement in SR to be possible for individuals functioning within a variety of contexts. In addition, as the current study focused on the natural progression of SR and no interventions were implemented, the findings seem to confirm the proposal by Converse and DeShon (2009) that SR may improve due to a natural adaptation process.

A number of theories could be put forward as possible explanations of the process by which individuals are able to improve their SR scores. According to Cognitive Control Theory (CCT), which has been shown to involve similar psychological processes and overlapping neurobiological networks as SR (Koole, Jostmann & Baumann, 2012), cognitive systems are able to execute demanding tasks with increasing effectiveness by gradually adjusting their perceptual selection, response biasing and maintenance of contextual information (DeWitte et al., 2009). By making use of similar processes to deal with subsequent situations, a person is able to respond more effectively to the self-regulatory demands (De Witte et al., 2009). When a subsequent demand is dissimilar to the previous demand, however, the control processes required for the first task are still active and could interfere with the quick recruitment of new control processes required for a new task, resulting in a depletion effect (De Witte et al., 2009).

In addition to the CCT, the Adaptation-level theory (Converse & DeShon, 2009; Helson, 1964) proposes that prior experience lets individuals develop internal norms or adaptive levels that serve as internal reference points for current behaviour (Converse & DeShon, 2009). In conjunction with the concept of learned industriousness (Eisenberger, 1992) it explains how

individuals are able to learn about the level of effort required in a specific situation and how adaptation to high self-regulatory efforts on initial tasks may result in SR remaining stable or even improving (Converse & DeShon, 2009).

Considering the above theories, observed increases in our participants' SR scores could be ascribed to their ability to adjust to the self-regulatory tasks presented to them by their challenging environment. The participants had to face the same challenging working environment for three years, with similar control processes required, which could conceivably not only have reversed the SR depletion effect, but given them the opportunity to become accustomed to the required effort levels, and in doing so, adapt.

Further insight into the natural progression of SR is provided by the changes observed in the sub-components of SR over the three-year period. The most significant improvements in the SR sub-components for the group as a whole were seen in the GF subscale, defined as the ability to set goals and keep to them (TerDoest et al., 2006; Vosloo et al., 2013), as well as in the MC subscale, which refers to the participants' ability to monitor their own progress in reaching their set goals (Vosloo et al., 2013). The results for Groups 1 and 2 indicate that, although all the SR subscale scores improved in both groups, the GF subscale showed the most significant improvements. In addition, the SE subscale, which measures the participants' judgment of their own abilities to execute tasks successfully (Beefink et al., 2012; Reicks et al., 2004), improved more significantly for Group 1 than for Group 2. Similarly, the MF subscale also improved more significantly for Group 1 than for Group 2. The concept of mindfulness refers to a non-judgmental, open and receptive awareness of the event that is taking place at the present moment (Özyeşil, 2012). The SOC (selection, optimisation and compensation) theory (Baltes & Baltes,

1990) may provide insight into the process by which these sub-components of SR could have improved over three years.

Firstly, individuals *select or prioritise* goals or tasks for which resources are available and which are in accordance with their personal needs or environmental demands. In doing so, they focus on goals that are conducive to their development (Phillips & Kunter, 2013). The results from the current study show that both groups were significantly more focused on their set goals, it is a possibility that they were focusing their efforts on goals that were worth their energy and not expending much energy on goals that were unrealistic or unrewarding.

Secondly, through the process of *optimisation*, individuals acquire and refine their strategies to achieve the selected tasks (Phillips & Kunter, 2013). This includes practice, attainment of new skills, learning from other successful individuals or scheduling the required time and energy (Phillips & Kunter, 2013). The time between baseline and follow-up assessments would have allowed for these participants to optimise their strategies for goal achievement through practice, and the acquisition of skills, for instance by observing others. Given the increase in SE scores, it seems that participants especially from Group 1 grew more confident in their own abilities to deal with their daily challenges, also referred to as self-efficacy (Beefink et al., 2012; Reicks et al., 2004).

Thirdly, individuals can use alternative means to *compensate* for lost or dwindling resources in order to maintain the desired level of functioning (Phillips & Kunter, 2013). Individuals can do this by altering the allocation of their effort to important areas in their lives while decreasing effort in less important areas (Phillips & Kunter, 2013). Given the increase in the MC subscale for the group as a whole, it seems plausible that the participants of the current study became more effective in monitoring their own progress, and discerned over time where

their efforts would be most effective or rewarding and rather focused on that, instead of wasting it on outcomes that would be neither satisfactory nor gratifying.

The increase in the MF subscale, especially for Group 1, indicates that the participants had grown more aware of their own experiences. According to Grossman, Niemann, Schmidt & Walach (2004), the increased awareness could contribute to more accurate perceptions of the participants' responses to different stimuli, which in turn allowed additional information to be gathered that enhanced the action taken. As a result, the participants may have experienced a greater sense of control. It can be suggested that the increase in MF contributed to the utilisation of more effective selection, optimisation and compensation (SOC) strategies. The effective and coordinated utilisation of these SOC strategies has been shown to allow optimal allocation of individuals' personal resources, ensuring successful adjustment to work environments and work demands (Phillips & Kunter, 2013).

Association between changes in SR and changes in stress and well-being

The second aim of the study was to determine how long-term changes in SR are associated with changes in stress and mental well-being within the context of high-stress working conditions.

The descriptive statistics (Table 1) suggested a positive association between changes in the participants' SR scores and changes in their mental health levels. The correlation analysis confirmed this association as it further indicated that changes in SR over the three-year period correlated positively with changes in mental health levels, as measured by the MHC-SF. The results illustrate that the improvement of Group 1's SR scores is of large practical significance and that their mental health also improved the most. In comparison, the improvement of Group

2's SR scores is of a small practical significance and their mental health levels did not improve to the same extent as those of Group 1.

There was a significant correlation between the increase in mental health levels (MHC-SF) and the decrease in mental illness symptoms (GHQ-28) of the participants over the three-year period. Against expectations, however, changes in SR showed no association with the participants' stress levels or mental illness symptoms. These results therefore seem to suggest that, while changes in SR are significantly associated with changes in mental health levels, these changes showed no discernable and direct association with changes in either stress or mental illness symptoms.

In addition to the correlation analysis, a path analysis was conducted to provide more insight into the predictive value of changes in self-regulation for the changes in stress and mental well-being levels. The SEM results indicate that changes in SR are highly predictive of changes in mental health levels, but not of changes in mental illness symptoms. The model further indicates that changes in mental health levels and mental illness symptoms are significantly related to each other.

The two-continua model on mental health and mental illness by Keyes (2002) provides an insight as to how the changes in SR can affect mental health and mental illness. The two-continua model places mental health and mental illness in two separate continua. This makes it possible to understand how mental health is not just the absence of mental illness and vice versa, but that mental health can still be experienced even in the presence of mental illness (Keyes et al., 2008; Lamers et al., 2011). According to this model, the measures of mental health correlate with, but are distinct from, the mental illness measures. The results from the current study seem to suggest that changes in SR are associated with changes in the measures used to determine

mental health, but not those measuring mental illness. However, given that the results indicated a negative correlation between mental illness and mental health, which is in line with prior findings by Keyes (2002; 2007), it seems plausible that SR may have an indirect effect on the presence of mental illness symptoms.

Conclusion

The results indicate that the participants' self-reported self-regulation levels improved over the three-year period and that they were experiencing their working environment to be less stressful. A number of theories have been incorporated to provide an explanation for the results.

The improvement in the participants' self-regulatory abilities can be ascribed to a number of processes. An in-depth exploration into these processes would fall outside the scope of this study; however, the psychological perspective on stress could be a possibility for future exploration. According to this perspective, the emphasis is placed on the importance of how life events are perceived and evaluated (Clark, Bond & Hecker, 2007) and how this perception and appraisal of life events contribute most to the development of stress-induced pathology (Koolhaas, De Boer & Buwalda, 2006). The significant improvement in the participants' SR, especially the Self-Efficacy component, gives reason to deduce the possibility that the teachers' perception of themselves and their own self-regulating abilities have changed. It has possibly also changed their perception of their ability to deal their daily challenges, to the extent that they feel more empowered to deal with the stressors associated with the teaching environment. This may provide answers as to why all the participants reported significant decreases in their stress levels as it seems doubtful that changes in the educational context and improvements in the participants' working environment over the three years were responsible for the decreases. However, given that this study made only use of quantitative data, future studies would benefit

from incorporating qualitative data to gain a more in-depth understanding of participants' perception of their ability to self-regulate, and the role thereof in their well-being.

It is interesting to note that it was those participants who initially reported the lowest SR scores whose SR and well-being levels improved the most over the three years. The participants who initially reported the highest SR scores did experience improvement in their SR and well-being, although to a lesser extent. However, their SR and well-being levels were still surpassed by those of Group 1. We would like to suggest that it is possible for self-regulating abilities to improve naturally over time and that individuals with lower self-regulating abilities will show the biggest improvements. In addition, it seems that self-regulation does reach a plateau, after which the abilities are maintained and any further improvements are minimal. Furthermore, it can be expected that mental health levels will improve in accordance with the improvement in SR.

Limitations and recommendations for future research

It is important to note the limitations of and future direction for the study. The current study was purely a quantitative study. Qualitative data would provide more insight into the participants' lived experiences of their environment and their own abilities to self-regulate. It is suggested that further studies should use a multi-method approach in order to investigate the development of self-regulation over a long period of time as well as the participants' experience of their work environment. Additionally, a larger participant group may yield results that illustrate the underlying associations more clearly. Furthermore, due to the specific population group, the results may not be representative for other populations, and it is recommended that future studies investigate the natural progression of SR and its association with mental well-being in other populations.

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Table 1

Descriptive statistics for all the measures for the combined group

Measure	2008			2011			Effect size	p-value	α
	N	Mean	SD	N	Mean	SD			
SSRQ Total	200	3.72	0.46	173	3.99	0.49	0.51 ^{**}	p<0.001	.86
Mindfulness	200	3.67	0.71	173	3.72	0.71	0.06	0.422	.80
Self-efficacy	200	3.95	0.52	173	4.04	0.42	0.15	0.055	.74
Monitoring change	200	3.74	0.66	173	3.96	0.66	0.31 [*]	0.001	.68
Goal focus	200	3.46	0.64	173	4.37	0.76	1.17 ^{***}	p<0.001	.72
Internal locus of control	200	3.83	0.68	173	3.90	0.55	0.06	0.385	.63
TSI Total	199	77.66	12.86	173	69.47	15.62	0.54 ^{**}	p<0.001	.91
TSI Learner Mean	199	3.96	0.72	173	3.55	0.88	0.48 [*]	p<0.001	.84
TSI General Mean	199	3.91	0.69	173	3.60	0.82	0.40 [*]	p<0.001	.82
GHQ Total	200	8.26	6.50	173	6.78	6.58	0.22 [*]	0.008	.89
GHQ SS	200	2.50	2.17	173	2.10	2.22	0.18 [*]	0.032	.74
GHQ AS	200	2.63	2.43	173	2.04	2.30	0.21 [*]	0.015	.74
GHQ SD	200	2.01	2.12	173	1.73	1.97	0.14	0.130	.55
GHQ DS	200	1.11	1.86	173	0.92	1.61	0.10	0.164	.75
MHC Total	200	48.30	10.94	173	48.99	9.17	0.10	0.155	.72
MHC EWB	200	10.14	3.01	173	10.39	2.71	0.08	0.363	.82
MHC SWB	200	14.91	5.32	173	14.89	4.87	0.03	0.691	.79
MHC PWB	200	23.24	4.99	173	23.68	4.45	0.03	0.081	.84

*d $\geq$ 0.2 (small); **d $\geq$ 0.5 (medium); ***d $\geq$ 0.8 (large)

Note: SD = standard deviation, α = Cronbach's Alpha, TSI_Total = Teacher Stress Inventory Total Score, TSI_Gen = Teacher Stress Inventory General Mean, TSI_Learner_Mean = Teacher Stress Inventory – Learner Mean, GHQ-T = General Health Questionnaire – Total Score, GHQ_SS = General Health Questionnaire – Somatic Symptoms subscale, GHQ_AS = General Health Questionnaire – Anxiety and Insomnia subscale, GHQ_SD = General Health Questionnaire – Social Dysfunction subscale, GHQ_DS = General Health Questionnaire – Depression Symptoms subscale, MHC_EWB = Mental Health Continuum – Emotional Well-being subscale, MHC_SWB = Mental Health Continuum – Social Well-being subscale, MHC_PWB = Mental Health Continuum – Psychological Well-being subscale, MHC = Mental Health Continuum- Total Scale Score. Mindfulness = Mindfulness subscale, Self-eff = Self efficacy subscale, Monitoring change = Monitoring change subscale, Goal focus = Goal focus subscale, IntLoC = Internal locus of control, SSRQ_Total = Short Self-Regulation Questionnaire total score

Table 2
Intra-group comparison of Groups 1 and 2 from 2008 and 2011

Measure	Group 1								Group 2							
	2008			2011			Effect size	p-value	2008			2011			Effect size	p-value
	N	Mean	SD	N	Mean	SD			N	Mean	SD	N	Mean	SD		
SSRQ_T	53	3.20	0.26	53	3.65	0.52	0.86***	p<0.0001	61	4.17	0.22	61	4.25	0.384	0.21*	0.107
MF	53	2.99	0.60	53	3.32	0.82	0.40*	0.007	61	4.23	0.36	61	4.08	0.55	0.29*	0.022
SE	53	3.57	0.53	53	3.90	0.50	0.62**	p<0.001	61	4.31	0.359	61	4.20	0.36	0.34*	0.027
MC	53	3.33	0.59	53	3.65	0.73	0.42*	0.014	61	4.08	0.55	61	4.22	0.53	0.27*	0.14
GF	53	2.89	0.47	53	3.84	0.73	1.30***	p<0.001	61	3.90	0.46	61	4.67	0.69	1.11***	p<0.001
ILOC	53	3.38	0.67	53	3.62	0.60	0.36*	0.014	61	4.27	0.46	61	4.11	0.49	0.32*	0.029
TSI T	53	78.31	10.79	53	70.51	15.11	0.52**	0.001	61	77.08	13.09	61	68.57	15.73	0.54**	p<0.001
TSI Learner Mean	53	3.99	0.61	53	3.61	0.89	0.44**	0.003	61	3.91	0.73	61	3.52	0.90	0.43**	p<0.001
TSI Gen Mean	53	3.94	0.63	53	3.66	0.80	0.36*	0.001	61	3.90	0.70	61	3.54	0.82	0.44**	p<0.001
GHQ T	53	10.16	6.40	53	9.09	6.80	0.16	0.308	61	6.47	6.06	61	5.54	6.45	0.14	0.298
GHQ SS	53	2.61	2.22	53	2.43	2.22	0.08	0.567	61	2.26	2.06	61	1.86	2.30	0.17	0.262
GHQ AS	53	3.56	2.47	53	2.81	2.43	0.30*	0.083	61	1.85	2.19	61	1.67	2.28	0.08	0.612
GHQ SD	53	2.55	2.13	53	2.39	2.11	0.07	0.670	61	1.67	2.15	61	1.38	1.90	0.14	0.329
GHQ DS	53	1.43	2.12	53	1.45	1.99	0.01	0.942	61	0.66	1.32	61	0.61	1.01	0.03	0.797
MHC T	53	45.04	12.13	53	47.16	10.28	0.18	0.166	61	52.53	8.40	61	51.82	8.26	0.08	0.471
MHC EWB	53	9.69	3.00	53	10.12	3.11	0.11	0.533	61	10.75	3.02	61	10.81	2.62	0.02	0.884
MHC SWB	53	13.68	5.95	53	14.62	4.97	0.16	0.248	61	16.16	4.61	61	15.99	4.79	0.10	0.436
MHC PWB	53	21.63	5.63	53	22.49	5.37	0.15	0.276	61	25.31	3.51	61	25.03	3.64	0.08	0.537

* $d \geq 0.2$ (small); ** $d \geq 0.5$ (medium); *** $d \geq 0.8$ (large)

Note: Group 1 = Tertile 1; Group 2 = Tertile 3; SD = standard deviation, α = Cronbach's Alpha; TSI_Total = Teacher Stress Inventory Total Score, TSI_Gen = Teacher Stress Inventory General Mean, TSI_Learner_Mean = Teacher Stress Inventory – Learner Mean, GHQ-T = General Health Questionnaire – Total Score, GHQ_SS = General Health Questionnaire – Somatic Symptoms subscale, GHQ_AS = General Health Questionnaire – Anxiety and Insomnia subscale, GHQ_SD = General Health Questionnaire – Social Dysfunction subscale, GHQ_DS = General Health Questionnaire – Depression Symptoms subscale, MHC_EWB = Mental Health Continuum – Emotional Well-being subscale, MHC_SWB = Mental Health Continuum – Social Well-being subscale, MHC_PWB = Mental Health Continuum – Psychological Well-being subscale, MHC = Mental Health Continuum- Total Scale Score. Mindfulness = Mindfulness subscale, Self-eff = Self efficacy subscale, Monitoring change = Monitoring change subscale, Goal focus = Goal focus subscale, IntLoC = Internal locus of control, SSRQ_Total = Short Self-Regulation Questionnaire total score

Table 3

Spearman correlation coefficients illustrating correlations between changes in measurements

	SSRQ_TOT	TSI	GHQ_T	MHC_TOT
SSRQ_TOT	1			
TSI	0.004	1		
GHQ_T	-0.140	0.074	1	
MHC_TOT	0.303**	0.066	-0.236**	1

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

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

Note: SSRQ_TOT = Short Self-Regulation Questionnaire Total Score Increase; TSI = Teacher Stress Inventory Total Score Increase; GHQ-T = General Health Questionnaire – Total Score Increase; MHC= Mental Health Continuum- Total Scale Score Increase

Table 4

Goodness of fit indices for structural model

	CMIN/DF	CFI	RMSEA
Initial model	1.363	0.784	0.075
Reduced model	1.735	0.871	0.061

Note: CMIN = Minimum Sample Discrepancy, DF = Degrees of Freedom, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation

FIGURES

Figure 1

Changes in mental health levels in Group 1 and Group 2

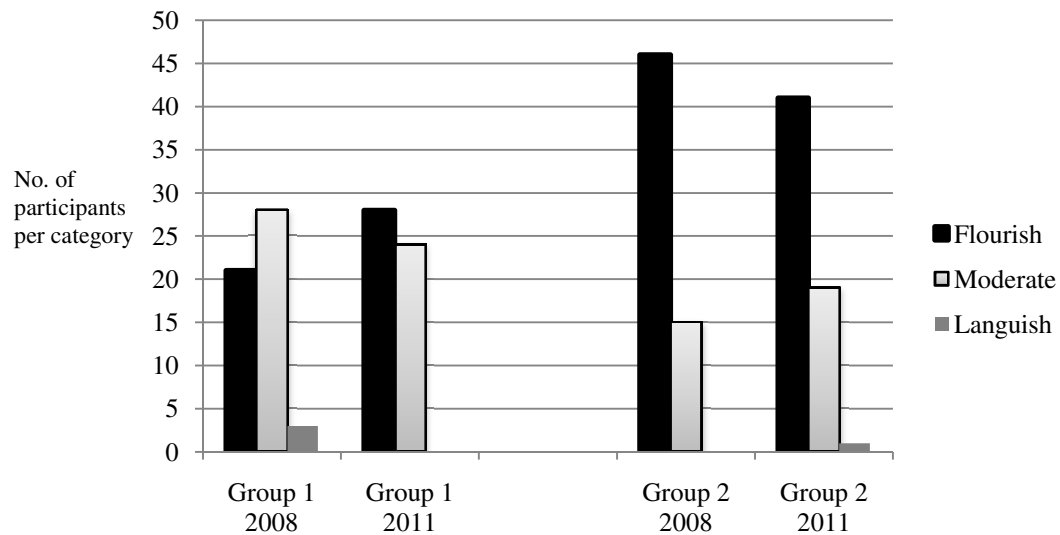
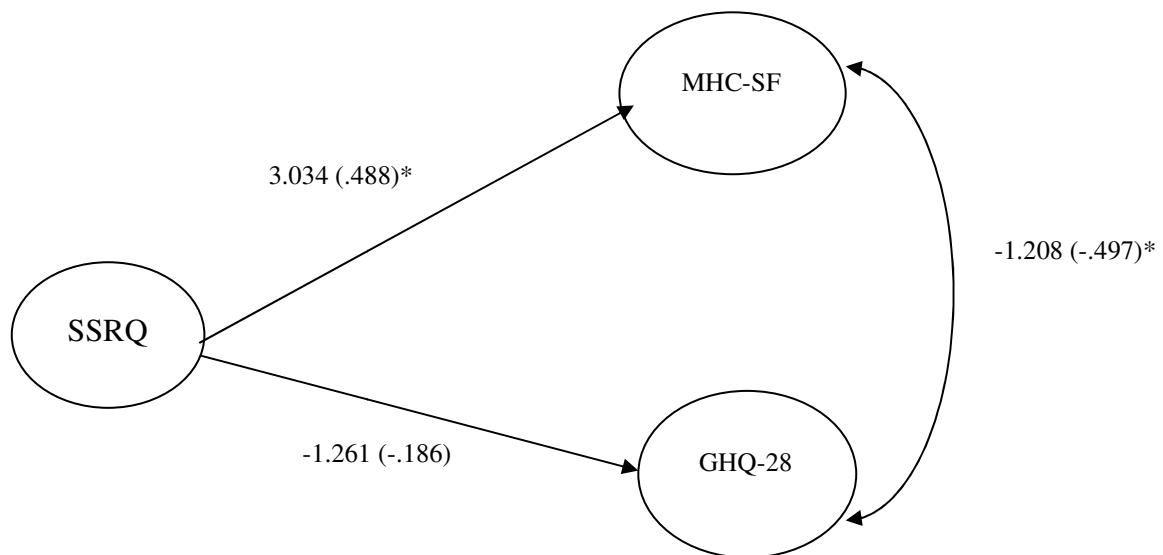


Figure 2

Model relating changes in self-regulation and changes in well-being



Note: GHQ-28 = General Health Questionnaire Total Scale Score; MHC= Mental Health Continuum- Total Scale Score; SSRQ = Short Self-Regulation Questionnaire total score

*p<0.05

**p<0.01

Chapter 5: Conclusions, Limitations and Recommendations

Conclusions

The aim of this study was threefold. It firstly aimed to investigate the stress and well-being profile of a cohort of Black South African teachers, and the association that exists between these variables. Secondly, it aimed to determine the role of self-regulation in the teachers' well-being. Thirdly, it aimed to determine the natural progression of self-regulation in a highly stressful situation, and the association between changes in self-regulation and changes in well-being over a three-year period. Each of these aims was addressed in separate chapters of this manuscript, which have been presented as research articles to be submitted for publication. The main results and conclusions as they pertain to the specific aims will be briefly presented.

Chapter 2 / Article 1: Occupational stress and mental well-being in a cohort of Black South African teachers: The SABPA study

The aim of Chapter 2 was to investigate the levels of occupational stress and mental well-being in a cohort of Black South African teachers, as well as the association that exists between these variables. The participant group as a whole reported that they were experiencing the teaching occupation as very stressful. They furthermore reported symptoms indicative of mental illness to an extent that would warrant psychiatric intervention. The results indicated that these teachers' stress levels and self-reported symptoms of mental illness were in fact significantly higher in comparison to those of the general population (Ballou, 2012; Hanif, Tariq & Nadeem, 2011; Wissing & Van Eeden, 2002). As might be expected, significant correlation between participants' stress levels and the prevalence of mental illness symptoms were found. These results are in line with the abundant literature that shows the high levels of stress experienced by

teachers both locally and internationally, and that links chronic stress with psychopathology (Ballou, 2012; Bellingrath et al., 2009; Mahan et al., 2010; Sun et al. 2007).

Against expectations, however, these participants also reported to be experiencing relatively high levels of mental health in comparison to general populations cited in local and international studies (Keyes, 2002; Keyes et al., 2008). The majority of the group reported moderate mental health or flourishing, while only a small percentage reported to be languishing.

With regard to the association between these variables, no significant correlations were found between participants' stress levels and their levels of mental health. Path analysis confirmed that these teachers' stress levels significantly predicted their experience of mental illness symptoms, but not their self-reported mental health levels.

The absence of significant correlations between the teachers' stress levels and self-reported mental well-being merited further investigation. One possible explanation for these findings could be the influence of cultural factors. Previous studies have indicated that racial groups differ significantly in their vulnerability to developing specific conditions (Jackson et al., 2010, Keyes, 2009). Research by Keyes (2007; 2009) has indicated that, although Blacks are more likely to experience poorer physical health in comparison to Whites, they are more likely to report better rates of mental health than Whites (Keyes, 2009; Keyes, 2007). The possibility exists that factors related to culture and ethnicity, such as genetic disposition, socio-economic position, life-style behaviours and psychosocial exposures (Agyemang et al., 2007; Deuster, Kim-Dorner, Remaley & Poth, 2011) may have influenced the results. It should also be considered that Black South Africans are more likely to adhere to a collectivistic worldview (Niemann, 2006), which could involve a stronger focus on the group's social needs rather than their individual needs. It is therefore possible that participants' responses to self-report

questionnaires could have been influenced by what they view as being socially acceptable or in line with the group's social norms (Niemann, 2006). Although it would be erroneous to assume that all participants adhered to a traditionally collectivistic world view, it is possible that the high levels of stress, symptomatology *and* mental health levels reported by these participants may in part be due to over-reporting as a result of acquiescence.

A more likely explanation could be found in considering the definition of well-being. The WHO (2004) clearly states that well-being is more than just the absence of disease, but rather the ability of individuals to cope with stress, to contribute to the community, to work productively and to realise their potential (World Health Organisation, 2004). The two-continua model of Keyes (2002) illustrates how mental health and illness, although related, exist on separate continua, making it possible for an individual to maintain relatively high levels of mental health despite adverse circumstances, and even the existence of pathology.

A final explanation could be that these results are suggestive of the teachers' resiliency. Defined as the ability to withstand, cope with, or even adapt to stress while maintaining mental health (Herrman et al., 2011; Schetter & Dolbier, 2011), resilience is often linked to the existence and use of resources and protective factors within the individual and the environment. Our results therefore suggested the possible presence of protective factors that would enable these teachers to maintain their mental health despite working in a very stressful environment.

Chapter 3 / Article 2: Self-regulation and mental well-being in a cohort of Black South African teachers: The SABPA study

The aim of Chapter 3 was to investigate the role of self-regulation, as a potential protective factor, in maintaining the well-being of this group of teachers. It also aimed to

determine the association between the subcomponents of the self-regulation process and the teachers' self-reported levels of mental well-being.

In order to investigate the role of self-regulation on the teachers' well-being, the whole group was divided into tertiles based on their self-regulation scores. Results for the participants from the first tertile (i.e. Group 1: low self-reported levels of self-regulation) and third tertile (i.e. Group 2: high self-reported levels of self-regulation) were thereafter compared. Both groups reported to be experiencing similar levels of work-related stress, and the results therefore lent themselves to the exploration of the association between self-regulation and well-being within a highly stressful work context.

Descriptive statistics indicated that although Group 1 and Group 2 did not differ significantly with regard to their self-reported stress levels, they did differ significantly with regard to their well-being. Overall, Group 2 reported significantly higher levels of mental health and lower levels of mental illness symptoms in comparison to Group 1, despite sharing the same stressful working conditions. It was interesting to note that there was no correlation between self-regulation and the participants' stress levels, suggesting that the inherent ability to self-regulate is independent of challenges emanating from the environmental context.

These results were interpreted as an indication of the possible role that self-regulation plays as a protective factor in the promotion of mental well-being and prevention of mental illness. Protective factors are described as “critical intervening processes” (Layous, Chancellor & Lyubomirsky, 2014; p4) that help explain why, despite sharing the same risk factors, individuals differ in the development of mental illness. This interpretation would be on a par with the findings of international studies (Baumeister & Vohs, 2007; Perry, 2010; Peterson & Seligman,

2004), which strongly suggest that self-regulation, as a multi-faceted concept, has a protective role in the promotion of mental well-being and prevention of the development of mental illness.

The second part of Chapter 3 incorporated correlations and path analysis to provide insight into the way in which different sub-constructs of self-regulation contributed to the participants' well-being. In a recent South African study (Vosloo et al., 2013) in which the psychometric properties of the Short Self-regulation Questionnaire were investigated, the following five sub-constructs were identified: Mindfulness, Internal Locus of Control, Self-efficacy, Goal Focus and Monitoring Change. The latter three were indicated by our results to be the most significant predictors of the teachers' well-being. These sub-constructs have been illustrated by numerous studies to contribute to individuals' well-being in various ways (Maas, Hietbrink, Rinck & Keijsers, 2013; Steyn & Mynhardt, 2008; TerDoest et al., 2006). The results from the current study also showed that all these sub-constructs were significantly related to each other, emphasising their combined contribution to well-being. Although certain aspects of self-regulation therefore seemed to make a more pronounced contribution to well-being, it remains necessary to consider the collective contribution of all of the sub-components, in other words the self-regulatory process as a whole, to well-being.

The results indicated that self-regulation is significantly associated with this group of participants' well-being. Most literature on self-regulation and its contribution to individual well-being have originated from Western, and therefore more individualistic, cultural groups (Klassen, 2004). As discussed in Chapter 2, Black South Africans have traditionally been associated with a collectivistic cultural orientation and world view (Niemann, 2006). The current study's results seem to suggest that, just as self-regulation has been found to contribute to well-being in individualistic groups, it could also play a prominent role in the well-being of cultural

groups that have traditionally been regarded as adhering to a more collectivistic world view. Although the way in which self-regulation contributes to individual well-being may differ between cultures (Klassen, 2004), the results from the current study seem to be in agreement with Bandura's (1997) argument that individuals from a traditionally collectivistic culture rely strongly on the use of self-regulation in forming individual responses to situations while adapting and adjusting successfully to the environment (Bandura, 1997; Klassen, 2004).

Chapter 4 / Article 3: A longitudinal perspective on the progression of self-regulation and mental well-being in a high-stress work context: The SABPA study

Chapter 4 explored the natural progression of self-regulation within the highly stressful teaching context over a period of three years. It furthermore aimed to determine how long-term changes in the self-regulation of individuals finding themselves in high-stress working conditions are associated with changes in their self-reported levels of stress and mental well-being.

This three-year longitudinal study used the same protocol during the initial and follow-up assessments. The results from the group as a whole as well as from Groups 1 and 2 (see Chapter 3) were used.

The results from the participant group as a whole indicated that there was a significant improvement in their self-regulation scores over the three years. On closer inspection, it was clear that certain sub-constructs of the self-regulation process improved more significantly than others. The results from the sub-groups indicated that the group that initially reported the lowest self-regulation scores (Group 1), showed a more significant improvement in their self-regulation scores than the group who initially reported the highest self-regulation scores (Group 2). It was

interesting to note, in addition to the general improvement in self-regulation scores, that all the participants reported significantly lower stress levels. Group 1 specifically experienced significantly lower levels of mental illness symptoms over time, and reported the biggest improvements in their mental health levels. However, the mental health levels of Group 2 were still higher during follow-up assessment than those of Group 1.

Several theories were put forward as possible explanations for the process which made these improvements in self-regulation scores possible. The Cognitive Control Theory (CCT) suggests that cognitive systems are able to execute demanding tasks with increasing effectiveness by gradually adjusting their perceptual selection, response biasing and maintenance of contextual information. As time progresses, an individual would respond more effectively to self-regulatory demands by making use of similar processes to deal with subsequent situations (De Witte et al., 2009; Koole, Jostman & Baumann, 2012). In addition to the CCT, the Adaptation-Level theory (Converse & DeShon, 2009; Helson, 1964), together with the concept of learned industriousness (Eisenberger, 1992), provides another possible explanation for these participants' apparent ability to adapt to the stress, and the associated self-regulatory tasks presented to them. These two theories explain how individuals are able to develop internal reference points based on prior experience, and therefore learn about the level of effort required in specific situations. It seems plausible that the participants in the current study gradually became more accustomed to the effort levels required as time progressed. In doing so, they may have been able to adapt their self-regulatory effort levels to those that are required in a high-stress work situation.

In addition to the general improvement in self-regulation scores, the improvement in self-regulation sub-constructs, such as Goal Focus, Monitoring Change, Self-Efficacy and Mindfulness were prominent over the three-year period.

The SOC (selection, optimisation and compensation) theory (Baltes & Baltes, 1990) may provide some insight into the process by which the some of the sub-constructs of self-regulation may have improved. Firstly, individuals' *selection* or prioritisation of goals that are in accordance with their personal needs, environmental demands and available resources, allow them to focus on goals that are conducive to their development (Philips & Kunter, 2013). Results from the SSRQ's Goal Focus subscale indicated that participants in the current study were significantly more focused on their goals, possibly focusing on goals worthy of their effort. Secondly, according to the SOC theory, individuals acquire and refine their strategies to achieve their goals through a process called *optimisation*, which includes attainment of new skills, practicing or learning from others. It seems that, the participants from Group 1 in particular were able to optimise their strategies for goal achievement, and seemingly grew more confident in their abilities to deal with their daily challenges, as reflected by the significant improvement in their scores on the Self-Efficacy sub-construct. Thirdly, according to the SOC theory, individuals can maintain the desired level of functioning by *compensating* for lost or dwindling resources (Philips & Kunter, 2013). The increases observed in the Mindfulness and Monitoring Change sub-construct suggest participants' improved awareness of their own experiences, an increased focus on the effective monitoring of their own progress, and redirection of their efforts to rewarding outcomes instead of wasting them on unsatisfactory outcomes.

The study further aimed to determine how long-term changes in self-regulation are associated with changes in self-reported levels of stress and mental well-being within the context

of a highly stressful working environment. The results indicated a positive association between changes in the participants' self-regulation scores and changes in their mental well-being levels. The positive changes in the self-regulation and mental health levels of Group 1 in particular were of large practical significance, while similar, though less significant, changes were reported by Group 2. The results further indicated that changes in self-regulation did not show any direct association with changes in self-reported levels of stress or mental illness symptoms. Path analysis confirmed that the improvements in the participants' self-regulation were highly predictive of their mental health levels, but not so for changes in the levels of mental illness symptoms reported by them. Changes in mental health levels, however, correlated significantly with changes in their mental illness symptoms.

Keyes' (2002) two-continua model of mental health and illness provides a possible explanation for the observed changes in self-regulation, and its association with mental health and illness. According to the model, measures of mental health correlate with, but are distinct from, the mental illness measures (Keyes, 2007). Mental health and mental illness therefore exist on separate continua, as mental health is considered more than the absence of mental illness, and vice versa. In the current study the changes in self-regulation seemed to be associated only with the presence of mental health, but not the indicators of mental illness. Given the negative correlation between mental health and mental illness, however, it is possible that self-regulation may have had an indirect effect on the presence of mental illness symptoms through its facilitation of mental health.

A variety of complex processes might have contributed to the improvements observed in these participants' self-regulation scores over the three-year period. Although an in-depth exploration of what these processes involve would fall outside of the scope of this study, the

psychological perspective on stress could be put forward as a potentially effective avenue for future exploration in this regard. Rather than emphasising the nature of the stressor, it focuses on the perception and appraisal of the life events and its contribution to individual well-being (Clark, Bond & Hecker, 2007; Koolhaas et al., 2006). Given the significant improvement observed in the participants' self-regulation in general, and specifically the improvements observed in the Self-Efficacy sub-component of self-regulation, it is probable that the teachers' perceptions of themselves and their own abilities to self-regulate and effectively deal with their daily challenges and stressors changed. This in turn may have led to the teachers perceiving their context differently, to the extent that they viewed it as less stressful. As it is improbable that changes in the educational circumstances and improvements in teachers' working conditions over the three years were responsible for the significant decreases observed in their stress levels; a more likely explanation would in our view be the changes in the participants' perception of themselves and their working environments. This possibility is, however, mentioned with caution, as this study only used quantitative data. Future studies incorporating qualitative data would be very useful in gaining a more in-depth understanding of teachers' perceptions of their ability to self-regulate, and the role of this ability in their well-being.

A final consideration is that, although the participant group as a whole showed improvement, the most significant improvements in self-regulation and well-being over the three years were evident for Group 1, whose members initially reported the lowest self-regulation scores. At follow-up, the self-regulation and well-being levels of Group 2 were, however, still higher than that of Group 1. The results from Chapter 4 therefore suggest that it is possible for an individual's self-regulating ability to improve naturally over time in a high-stress work situation, and perhaps more so for those individuals whose self-regulating ability was lower to begin with.

Furthermore, it seems that improved self-regulation is a significant predictor of improvements in mental health. The smaller improvements seen in Group 2 raise the intriguing question of whether self-regulating ability would eventually reach a peak, after which these abilities are maintained and any further improvements are minimal.

Limitations

Evaluation of the current study shows that a number of specific limitations should be noted. The first limitation was that the study used a very specific population group. The results should therefore only be seen as representative of this participant group and should not be generalised to other population groups.

Secondly, the study only made use of self-report measures which, as has been argued, could have been strongly influenced by cultural factors. This study did not include a specific measure of whether the participants adhered to a collectivistic or individualistic cultural approach. These results should therefore be considered as an early indication of the role of self-regulation within a traditionally collectivistic group, to be confirmed and substantiated in further cross-cultural research.

A further limitation of the study was that it took the form of a purely quantitative study. Qualitative data might have provided more insight into the participants' lived experiences of their working environment, their mental well-being and their levels of self-regulation, especially regarding the changes experienced over the course of three years.

Lastly, the limited number of participants who took part in the study may have given a limited view of the underlying associations between self-regulation, stress and well-being. This

may especially have had an effect on the results of articles 2 and 3, in which the total group was subdivided into smaller subgroups.

Recommendations

The following recommendations can be made based on the experience gained from the research project and the results of this study. The recommendations are presented firstly for the educational context and secondly for future research.

Recommendations for the educational context

The results of the current study indicated not only the extreme stress experienced by teachers in their working environment, but also the potentially protective role of self-regulation as a psychological strength in helping teachers to maintain their psychological well-being. The results of this study could therefore be used to inform future interventions aimed at improving teacher well-being. The possibility exists that, if teacher well-being is improved, the benefits will not be limited just to the teaching staff, but may spread to their pupils in the form of motivated and dedicated teaching.

Recommendations for future research

Further research on participants from the general population and different ethnic groups is needed to gain further insight into the role of self-regulation in well-being. The inclusion of a wider and more representative population group will lead to an increased understanding of the natural progression of self-regulation over time, and its role in maintaining psychological well-being.

Future studies may also benefit from making use of varying measures and data gathering methods to eliminate possible cultural influences on self-report measures. Furthermore, the influence of culture on participants' responses needs to be investigated further to determine its effect on participants' response patterns.

A further suggestion is that, rather than a one-sided approach incorporating only quantitative measures, a mixed or multiple method approach be used in future studies to gain detailed insight into the teachers' short- and long-term experience of their working environment. It will also provide insight into teachers' perceptions of their levels of stress, well-being and self-regulation, as well as changes that occur in these variables over time. Although an in-depth exploration of what these processes entail falls outside of the scope of this study, the psychological perspective on stress could be put forward as a potentially effective avenue for future exploration in this regard.

Future studies may also benefit from utilising a larger participant group, which may yield results that will more clearly illustrate the underlying association between self-regulation, stress and well-being.

Lastly, the lesser improvements in self-regulation seen in Group 2 raises the intriguing question of whether self-regulating ability would eventually reach a peak, after which the level of these abilities is maintained but any further improvements are minimal. Further studies could explore the concept of optimal self-regulation and the maintenance thereof in enhancing mental well-being.

Contributions of the study

The contribution of this study was to provide a holistic insight into the stress and well-being levels of a group of Black South African teachers. It also provided insight into the underlying associations between stress and well-being in this group, and illustrated that the teachers, despite stressful working conditions, achieved and maintained well-being. The findings confirmed the possibility of protective factors that can act as buffers against the harmful effects of stress.

Furthermore, the findings are in agreement with international literature, which indicates the beneficial effects of self-regulation as a multi-faceted construct of individuals' well-being. The results illustrated how certain sub-constructs of self-regulation made a stronger contribution to participants' well-being than others.

Although the study population cannot be said with any certainty to be collectivistic in their cultural orientation, especially given that the teaching profession requires a tertiary qualification obtained within a Western context, the results do provide insight into the role of self-regulation within a group traditionally viewed as adhering to collectivistic cultural norms, an area within which few research studies could be found.

Lastly, and perhaps most importantly, the study gave a rare three-year overview of the natural progression of self-regulation over a long period of time. It furthermore provided insight into the way in which changes in self-regulation could be predictive of changes in mental well-being. No other longitudinal research studies could be found that illustrated the underlying associations between changes in self-regulation, stress and well-being over the course of time.

In closing

Everything can be taken from a man but one thing: the last of the human freedoms—to choose one's attitude in any given set of circumstances, to choose one's own way.

~ Viktor E. Frankl, Man's Search for Meaning

This study has taught me the value of human spirit and resilience. I am grateful to the teachers for taking part in this research project and sharing their experiences, and in doing so, educating me and hopefully my colleagues, in ways in which strengths can be utilised to overcome difficulties. It is my hope that this knowledge will be beneficial in designing effective and sustainable interventions to help people from all walks of life improve their quality of life and thrive.

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