Self-regulation, psychopathology, and gender in a group of university students

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20127073

Mini-dissertation (article format) submitted in partial fulfilment of the requirements for the degree of Master of Arts (Clinical Psychology) at the North-West University, Potchefstroom Campus

Supervisor: Prof. K.F.H. Botha

Potchefstroom

October 2010

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Acknowledgements

- To my supervisor, Prof. Botha: Thank you for all the support, guidance and hard work in helping me with this study. Thank you for your expertise and for always keeping our appointments.
- To my mother, Wilma Breytenbach, for all her hard work. Thank you for helping me with the statistics, always supporting and encouraging me and doing more than is expected from you. Thank you also for teaching me a love for reading and learning, through which I have discovered my love for psychology and working with people.
- To my father, Jaco Breytenbach, for editing my dissertation. Thank you for helping me to develop all the skills I need, and providing the opportunities to be successful. Thank you also for working so hard and teaching me that hard work is an important quality.
- To my husband, Theunis: You are the best part of every day. Thank you for the amazing relationship that we share. Thank you for loving me each day and letting me love you in return. Thank you for sharing my dreams with me and making me part of yours. Thank you for supporting me in completing this study. I love you so much.
- Prof. C.J.H. Lessing for helping me with my references.
- Prof. H.S. Steyn for also helping with the statistics.
- To the Department of Psychology of the North-West University's Potchefstroom Campus for giving me this life changing opportunity.
- The rest of my family and friends, for showing an interest in my study and motivating me throughout my studies.
- All of the research participants for taking part in this study.

Letter of consent

I, the supervisor, hereby give consent for Anke Cloete to submit the following manuscript for purposes of a dissertation (article format): **Self-regulation, psychopathology, and gender in a group of university students.**

It may also be submitted to Journal of Psychology in Africa for publication.

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Prof. K.F.H. Botha

Supervisor

Summary

Keywords: self-regulation, psychopathology, gender, students, mindfulness

Self-regulation is a psychological skill that helps individuals to flexibly plan, execute and monitor their own behaviour. The key self-regulation processes include goal establishment, planning, the striving towards a goal and the revision thereof. Although it is clear that poor self-regulation is associated with psychopathology, the role gender plays is not well understood. Some differences between men and women suggest that gender may be a possible factor in self-regulation and the development of specific forms of psychopathology. The aim of this study was therefore to determine the relationship between self-regulation, psychopathology and gender amongst a group of university students.

Participants consisted of an availability sample of 384 (284 female and 100 male) students at the NWU's Potchefstroom Campus. Self-Regulation was measured with the Shortened Self-Regulation Questionnaire (SSRQ) of Carey, Neal and Collins (2004). In this study, the factor structure proposed by Potgieter and Botha (2009), based on a factor analysis of the SSRQ in the South-African context, was used. Psychopathology was measured with the General Health Questionnaire (GHQ) of Goldberg and Hiller (1979) as well as with a self-compiled Alcohol and Eating Risk Questionnaire (AERQ). Data were captured and analysed using SAS.

The two gender groups did not differ clearly regarding either self-regulation or psychopathology. This supports other studies that found no gender differences in specific self-regulation contexts, but contradicts a number of studies which indicate gender differences related to psychopathology.

Interesting tendencies were noted regarding the association between self-regulation and psychopathology, independently for male and female students. Decision making and learning from mistakes, was found to be an important self-regulatory skill for both gender groups in this study, but with practical significance for male students only. For male students, differences in self-regulation were found regarding lower and higher risk for alcohol-related problems in contrast to female students, where differences were found only regarding risk for eating-related problems. It is more acceptable for males to misuse alcohol than it is for females in many societies, and this might explain why self-regulation is important for men regarding alcohol use. Current cultural values, attitudes, and practices and social norms, with particular emphasis on the sexualisation and objectification of women and their bodies, contribute to eating disorders and body image distress in females across their life span and specifically in college women. Thus, self-regulation becomes more important for females, as they are more vulnerable to eating-related problems.

It was concluded that there is an important relationship between self-regulation and psychopathology, and in this study this relationship was found to be somehow different for male and female students. The results of this study have great implications both for further research and for clinical practice.

Opsomming

Sleutelwoorde: self-regulering, psigopatologie, geslag, studente, SSRQ, GHQ

Self-regulering is ‘n psigologiese vaardigheid wat individue help om hulle eie gedrag op buigsame wyse te beplan, uit te voer en te monitor. Die kernprosesse van self-regulering sluit doelwitformulering, beplanning, die strewe na ‘n doelwit en die aanpassing daarvan, in. Alhoewel dit duidelik is dat swak self-regulering met psigopatologie gepaardgaan, is die rol wat geslag hierin speel nog nie duidelik nie. Sommige verskille tussen mans en vrouens suggereer dat geslag moontlik ‘n faktor in self-regulering en die ontwikkeling van sekere vorms van psigopatologie is. Die doel van hierdie studie was dus om die verhouding tussen self-regulering, psigopatologie en geslag onder ‘n groep universiteitstudente te bepaal.

Deelnemers het bestaan uit ‘n beskikbaarheidsteekproef van 384 studente (284 dames en 100 mans) aan die Potchefstroomkampus van die NWU. Self-regulering is gemeet met die “Shortened Self-Regulation Questionnaire” (SSRQ) van Carey, Neal en Collins (2004). In hierdie studie word die voorgestelde faktorstruktuur van Potgieter en Botha (2009), gebaseer op ‘n faktoranalise van die SSRQ in die Suid-Afrikaanse konteks, gebruik. Psigopatologie is gemeet met die “General Health Questionnaire” (GHQ) van Goldberg en Hiller (1979), sowel as ‘n selfopgestelde vraelys oor alkohol- en eetrisiko ("Alcohol and Eating Risk Questionnaire" - AERQ). Data is met behulp van SAS vasgelê en ontleed.

Die twee geslagsgroepe het nie duidelik ten opsigte van of self-regulering of psigopatologie verskil nie. Hierdie bevinding ondersteun ander studies wat ook geen geslagsverskille in spesifieke self-reguleringskontekste gevind het nie, maar is teenstrydig met studies wat geslagsverskille met betrekking tot psigopatologie suggereer. Interessante tendense, onafhanklik vir mans- en damestudente, is in verband met die verhouding tussen

self-regulering en psigopatologie waargeneem. Besluitneming en om uit foute te leer is vir beide geslagsgroepe as belangrike self-reguleringsvaardighede gevind, maar met praktiese betekenisvolheid net vir manstudente.

Verskille in self-regulering met betrekking tot laer en hoër risiko vir alkoholverwante probleme is vir manstudente gevind in teenstelling met damestudente, waar verskille slegs met betrekking tot eetgedrag gevind is. Dit is in baie gemeenskappe meer aanvaarbaar vir mans om alkohol te misbruik as wat dit vir dames is, wat moontlik kan verduidelik waarom self-regulering met betrekking tot alkoholgebruik so belangrik vir mans is. Huidige kulturele waardes, houdings, praktyke en sosiale norme met ‘n beklemtoning van die seksualisering en objektivering van die vroulike liggaam, dra regdeur hulle lewens by vroue, en veral onder damestudente, by tot eetversteurings en stres oor liggaamsbeeld. Self-regulering word vir dames dus baie belangrik omdat hulle meer kwesbaar is vir eetverwante probleme.

Daar is tot die gevolgtrekking gekom dat daar ‘n belangrike verhouding tussen selfregulering en psigopatologie is, en dat hierdie verhouding ietwat verskillend vir mans- en damestudente is. Die resultate van hierdie studie het belangrike implikasies vir sowel verdere navorsing as vir kliniese praktyk.

Preface

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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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Self-regulation, psychopathology, and gender in a group of university students

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Abstract

Self-regulation, psychopathology and gender in a group of university students

Keywords: self-regulation, psychopathology, gender, students, mindful awareness, mindfulness, SSRQ, GHQ

Objective: To explore the relation between self-regulation, psychopathology and gender amongst a group of South African university students (N=384). *Method:* Self-regulation was measured with the Shortened Self-Regulation Questionnaire (SSRQ), and psychopathology with the General Health Questionnaire (GHQ) as well as with a self-compiled Alcohol and Eating Risk Questionnaire (AERQ). *Results:* A negative association was found between self-regulation and psychopathology, but significantly stronger for male students. Self-regulation was found to be more important to males regarding alcohol use and to females regarding eating behaviour. *Conclusions:* Gender differences in the relationship between self-regulation and psychopathology are probably due to differences in the tendency to rely on self or others, as well as to differences in socio-cultural and control mechanisms regarding alcohol and eating behaviour.

The concept self-regulation has been defined and described by numerous researchers over the past three decades. According to Diaz and Fruhauf (1991, p.184) self-regulation is the "non-automatic ability to plan, execute and monitor behaviour in a flexible manner". More recently, self-regulation has specifically been associated with success in reaching one's goals. In this regard, Zimmerman (2000, p.14) defines it as "self generated thoughts, emotions and actions that are planned and periodically modified so as to reach personal goals", while Luszczynska, Diehl, Gutiérrez-Doňa, Kuusinen and Schwarzer (2004, p.555) refer to it as "any effort by an individual to alter his/her own responses, overriding impulses, and substituting them with another response that leads the person's behaviour towards a selected aim". The key self-regulation processes, according to Vancouver and Day (2005), include goal establishment, planning, the striving towards a goal and the revision thereof.

It is clear that self-regulation fits Bandura's view (2001, p.2) of human beings as agents: "agency enables people to play a part in their self-development, adaptation, and self-renewal within changing contexts". Thus, an individual with good self-regulation qualities has the ability not only to change their own behaviour and responses effectively (Peterson & Seligman, 2004), but also to perform proactively and anticipatorily (Bandura, 2001). Kuhl, Kazén and Koole (2006) perceive self-regulation as an intrapersonal process with a strong capability to adapt. In addition, Sokol and Müller (2007) emphasize the fact that self-regulation is vital for autonomous and adaptive psychological functioning. Self-regulation is therefore perceived as an important construct in positive psychology, and is included as a character strength in the classification of the Virtues in Action (Park & Peterson, 2006).

In contrast, from a pathogenic perspective, poor self-regulation may put the individual at risk of developing psychological problems or disorders over the long-term. For example, setting unrealistic goals, poor self-efficacy, a lack of monitoring progress towards a goal, or discrepancies between the real and idealized self, may lead to depression or anxiety (Endler &

Kocovski, 2000). Neal and Carey (2004) indicate a relationship between poor self-regulation and alcohol abuse. Shalev and Sulkowksi (2009) suggest that poor self-regulation may play a specific role in a range of impulsive and compulsive related disorders, for example obsessive–compulsive disorder, body dysmorphic disorder, impulse control disorders, eating disorders, substance abuse disorders, and autism spectrum disorders. According to Vohs and Baumeister (2004) all personal and social problems, on individual as well as community level, such as substance dependence, eating disorders, crime and violence, and emotional problems, may be associated with poor self-regulation.

Although it is clear that poor self-regulation is associated with psychopathology, the role gender plays is not well understood. Kurman (2001), for example, refers to a number of studies that show contradictory findings regarding gender, self-regulation and psychopathology. Some differences between men and women, however, suggest that gender may be a possible factor in self-regulation and the development of specific forms of psychopathology. Nolen-Hoeksema and Corte (2004), for example, indicate that men have a higher probability to abuse alcohol than women, possibly suggesting poorer self-control. Meyer, Leung, Waller, Perkins, Paice, and Mitchell (2005) indicate that the function of bulimia in men is to decrease anger, while for women it is to prevent anger, suggesting a gender difference in the goal of bulimic behaviour.

Regarding self-regulation during distress, Nolen-Hoeksema and Corte (2004) indicate that women are more likely than men to focus passively on the symptoms, possible causes and consequences of distress and are therefore more prone to develop depression. This is confirmed by Claes, Vertommen, Smits and Bijttebier (2009), who found that women tend to be motivated more than men by behavioural inhibition, characterized by sensitivity to, and avoidance of, behaviour that may lead to negative or painful outcomes. From another angle, Rootman, Kirsten and Wissing (2003) found that men cope with stress in an individualistic

way, in contrast to women who more often rely on interpersonal relationships, also that men focus more on problem solving and show lower expression of affect than women. All these findings suggest gender differences in self-regulation during times of perceived distress.

A target group where research on the possible relationship between self-regulation, psychopathology and the role of gender could be especially relevant is university students. The reason is that they are exposed to multiple stressors, for example the need to perform well academically, survive independently from their parents and manage their finances effectively (Misra, McKean, West & Russo, 2000). The result of ineffective stress management, and by implication poor self-regulation, can lead to poor academic performance, substance abuse (Colby, Colby & Raymond, 2008) and eating disorders (Trautmann, Worthy & Lokken, 2007) in university students. Hustad, Carey, Carey and Maisto (2009) found that lower self-regulation ability functions as a risk factor in university students for experiencing alcohol related consequences in certain domains like academic, interpersonal, health and legal issues. Although a variety of support systems and models for the improvement of welfare and the prevention of risk behaviour in university students exist (compare Winterbach, 2007), none of these focuses primarily on self-regulation as a psychological strength.

Thus, although research has already been done on the relationship between self-regulation and psychopathology, questions regarding the role of gender, especially in university students as a specific study population, still remain unanswered. Exploring this could possibly contribute to the development of gender specific guidelines in the promotion of effective self-regulation as a psychological strength in student populations. The aim of this study is therefore to determine the relation between psychopathology, self-regulation and gender amongst a group of university students.

Method

Participants

Data for this study were collected as part of a larger project, namely: "The nature, dynamics and application of Self-Regulation in South-African health contexts" in the subject group of Psychology at the North-West University (NWU). The participants consisted of an availability sample of 384 (284 female and 100 male) students at the NWU's Potchefstroom Campus. All participants had psychology as a third year subject, most were Afrikaans speaking, and their average age was 20.68 years. They were informed about the study in one of their classes, after which consent forms and measures were completed. Participation was absolutely voluntarily, and a small number of students decided not to participate. No incentives, academic or financial, were provided to participants.

Measures

Self-regulation was measured with the Shortened Self-Regulation Questionnaire (SSRQ) (Carey, Neal, & Collins, 2004) and consisted of 31 items with seven subtests. The SSRQ is designed to determine a person's average ability to regulate his or her behaviour to achieve a desired goal. In this study, the factor structure proposed by Potgieter and Botha (2009), based on a factor analysis of the SSRQ in the South-African context, was used. These seven factors, with item examples, are (1) *Monitoring*: "When I am trying to change something, I pay attention to how I am doing" (2) *Decision making*: "When it comes to deciding about a change, I feel overwhelmed by the choices" (3) *Learning from mistakes*: "I usually only have to make a mistake once in order to learn from it" (4). *Perseverance*: "I have trouble following through with things once I've made up my mind to do something" (5). *Self-evaluation*: "I set personal standards, and try to live up to them" (6) *Creativity*: "As soon as I see a problem or challenge, I start looking for possible solutions" and (7) *Mindful awareness*: "I don't notice the effects of my actions until it's too late" (Potgieter & Botha, 2009).

Psychopathology was measured with the General Health Questionnaire (GHQ) (Goldberg & Hiller, 1979) as well as a self-compiled Alcohol and Eating Risk Questionnaire (AERQ). The GHQ focuses on the limitations in normal functioning and the inability to perform normal, healthy functions. It is a 28 item measuring instrument for clinical and preclinical assessment of some forms of psychopathology. The five subtests are: *Somatic symptoms* (SS), *Anxiety and Insomnia* (AI), *Social dysfunction* (SD), *Depressive symptoms* (DS) and a *Total score*. The GHQ shows high reliability and validity coefficients in a variety of South African contexts (Spangenberg & Pieterse, 1995).

Cronbach alpha coefficients for all subtests of the SSRQ and GHQ, calculated separately for the male and female students, yielded values between 0.60 and 0.85. The only exception was the subscale self-evaluation on the SSRQ for female students, with a value of 0.50. Taking into account MSA values, percentage variances explained, as well as values of communalities, construct validity was assured by means of factor analyses which were conducted on all the subtests of both measuring instruments for the male and female students separately in this study.

The AERQ explores the risk for alcohol- and eating-related problems and was included because of its relevance to student populations (Colby et al., 2008) and also because these are not specifically measured in the GHQ. Students had to indicate how frequently they use more than two alcoholic drinks daily, and secondly, how often they make use of any of the following methods to lose weight: starving, purging, appetite suppressors, laxatives, diuretics and/or excessive training. The criteria for alcohol-related risk were based on the World Health Organisation's indication that more than two drinks daily might put individuals in a higher risk group for alcohol-related problems (World Health Organisation, 2006), while the criteria for eating-related problems were based on the Diagnostic and Statistical Manual of Mental Disorder IV-TR (DSM IV-TR) criteria for eating disorders (American Psychiatric

Association, 2000). Responses were rated on a scale from 1 to 4 (with 1 = never, 2 = seldom, 3 = sometimes and 4 = often). Thereafter two independent groups were identified by assigning participants who had responded with 1 or 2 in a lower risk group (group 1) and participants who responded with 3 or 4 in a higher risk group (group 2) for alcohol- and eating-related problems, respectively. In the case of the AERQ it was not possible to determine reliability or validity statistically, due to the structure of this scale and that no data reduction method like factor analysis could be used. However, content validity was assured by presenting the specific questions to peers in this field of expertise (Nunnally & Bernstein, 1994).

Data analysis

Data were captured and analysed by the North-West University's Statistical Consultation Services at the Potchefstroom Campus using SAS (SAS Institute Inc., 2005). Cronbach alpha reliability coefficients were computed for each measuring instrument's subtest (Nunally & Bernstein, 1994). Confirmatory factor analyses were done to confirm construct validity of subtests. To determine whether a factor analysis may be appropriate, Kaiser's measure of sample adequacy (MSA), which gives an indication of the inter correlations among variables, were computed (Tabachnick & Fidell, 2001) for each confirmatory factor. Guidelines according to Hair, Andersen, Tatham and Black (1998) were used to assure that the MSAs were appropriate. Phi-coefficients were calculated to determine if there were any relationship between gender and risk for alcohol- and eating related problems. Pearson's correlation coefficients were calculated to determine if linear relationships existed. As a result of the fact that no random sampling was done, interpretation of comparisons between group means were done according to Cohen's effect sizes, d (Cohen, 1988). Effect sizes indicate practical significance – that is the extent to which a difference is large enough to have an effect in practice (Steyn, 2009). Likewise, interpretations of the

practical significance of associations were done using the phi-coefficient and Pearson correlation coefficient as effect sizes. Thus no inferential statistics were interpreted, although p-values are reported as if random sampling was assumed.

The following guidelines were used for d-values regarding differences between means: small effect: d = |0.2|; medium effect (noticeable with the naked eye): d = |0.5|; large effect (practically significant): d ≥ |0.8|. Guidelines for interpreting the phi-coefficient are as follows: Φ = |0.1| (small effect); Φ = |0.3| (medium effect, noticeable with the naked eye) and Φ ≥ |0.5| (large effect or practically significant) (Cohen, 1988). Guidelines for practical interpretation of the strength of correlation coefficients, r, according to Cohen (1988), are the same as those for the phi-coefficient.

Results

Table 1 shows that there are no differences of any practical value between the males and females of this study regarding any of the means of the subtests of the SSRQ or the GHQ.

<Insert table 1 approximately here>

Comparing the gender groups regarding risk for alcohol-related problems (not shown in a table), 23% (23 of 100) of males, and 15% (43 of 283) of females were placed in the higher risk group, while for eating-related problems, the respective figures were 9% (9 of 100) for males, and once again 15% (43 of 283) for females. Phi-coefficients of 0.09 and 0.08, respectively for alcohol- and eating-related problems, however, indicate no practical differences between the two gender groups.

Table 2 shows that negative correlations with medium or practical significant effects were found throughout between self-regulation and psychopathology for the males. Although

multiple negative correlations with medium effect were found between self-regulation and psychopathology for the females, none of these were practically significant.

<Insert table 2 approximately here>

For males, effectively learning from mistakes is associated practically significantly with less anxiety/insomnia, lower social dysfunction, less depressive symptoms and a lower GHQ total score. Better decision making is associated practically significantly with lower social dysfunction, less depressive symptoms, and a lower GHQ total score. In addition, medium effect associations were found for both male and female students between a substantial number of SSRQ and GHQ subtests. Regarding risk for alcohol- and eating problems (Tables 3 and 4), clear differences emerged regarding within gender comparisons. For male students, differences with medium effects were found regarding self-regulation and risk for alcohol-related problems (Table 3), but not for eating-related problems (not shown in a table). In contrast, for female students, differences with medium effects were found regarding self-regulation and risk for eating-related problems (Table 4), but not for alcohol-related problems (not shown in a table).

<Insert table 3 approximately here>

Table 3 shows that male students who have a higher risk for alcohol-related problems (group 2) obtained lower scores in decision making, perseverance and mindful awareness than those with a lower risk (group 1). All three differences were of medium effect size.

<Insert table 4 approximately here>

As is seen in Table 4 female students who have a higher risk for eating-related problems (group 2) obtained lower scores in learning from mistakes, perseverance, and mindful awareness than those with a lower risk (group 1). Similar to the male students, all three differences were of medium effect size.

Discussion

The first important finding of this study was that the two gender groups in this study did not differ clearly regarding either self-regulation or psychopathology. This supports other studies that found no gender differences in specific (career and academic) self-regulation contexts (Kiener, 2006; Hong, Peng & Rowell, 2009).

According to Posner, Rothbart, Sheese, and Tang (2007) self-regulation is a natural function of brain networks, designed to control the influx of information from the environment through orienting, in order to avoid conflicting responses in behaviour. This indicates that self-regulation is a universal skill people use in order to function effectively. Therefore it is not so surprising that males and females did not differ significantly regarding their self-regulatory skills. Because the development of self-regulation is embedded in a cultural context that gives priority to a specific model, processes of self-regulation are assumed to differ cross-culturally and are therefore similar amongst the members of the same culture (Jackson, Mackenzie & Hobfoll, 2000). Most participants in this study were Afrikaans speaking and all of them were psychology students in a similar age group and developmental phase, therefore, their culture is much alike. Differences in self-regulation amongst males and females might only play a role either earlier or later in life.

This study does not clearly support gender differences regarding psychopathology, in contrast to a number of other studies (Nolen-Hoeksema & Corte, 2004; Mufson, 2006;

Hankin & Abramson, 2001). This could once again be explained by the fact that this study consisted of a homogenous, availability sample which lacks variety in culture, level of education and age with the possibility that gender differences may only appear at an earlier or later developmental phase. Another reason could be choice of measuring instruments in this study, a possibility that requires investigation in future research.

Interesting tendencies were noted regarding the association between self-regulation and psychopathology, independently for male and female students. Learning from mistakes negatively correlated (with large effect) with four GHQ subtests for male students. It also correlated negatively with the same GHQ subtests for female students, but with medium effect only. Learning from mistakes also correlated negatively (with medium effect), with somatic symptoms for males. Hallinan (2009) refer to a number of reasons why people make mistakes, including task saturation, overconfidence, blaming, stereotyping, etc. Learning from mistakes implies that a person has been able to make a successful adjustment to behaviour that caused a discrepancy between a goal and current state. Rothman, Baldwin and Hertel (2004) indicate that a fundamental aspect of any effort to adopt a new pattern of behaviour is the ability to override, inhibit or alter a prior pattern of behaviour. This is only possible when possessing a sufficient degree of self-regulation strength, conceptualised as a limited, but renewable, cognitive resource. The mechanism of learning from mistakes may be equal to a response shift or recalibration (Sharpe & Curran, 2006), which refers to a change in an individual's internal standards, values or conceptualisations that occurs when faced with a difficult situation. In situations like adjusting behaviour in response to prior mistakes, this is important as it aids the individual in prioritisings a new set of goals. This finding confirms the importance of learning from mistakes as a self-regulatory skill, for both gender groups, specifically with practical significance for male students.

Decision making correlated negatively (practically significantly) with three of the GHQ subtests for male students. For 2 of these, social dysfunction and GHQ total, the pattern was similar, but with less strength (medium effect) for females. For depression, though, a correlation (large effect) was found for male students only, thus clearly suggesting a gender difference in pattern and strength. This confirms the finding by Cella, Dymond and Cooper (2010) that depressed male patients show impaired decision making behaviour in static and dynamic environments. Decision making can be linked to control and problem solving. The self-regulated decision maker is a person who sets adaptive goals and takes appropriate measures to achieve such goals – a process that involves generating, evaluating, selecting, and learning from goal-directed choices while simultaneously managing the limitations, biases, and personal tendencies that may otherwise interfere with the attainment of adaptive goals (Miller & Byrnes, 2001). Individuals cannot effectively adapt to their environment until they establish a sense of control over their psychological processes and behaviour (Miller & Byrnes, 2001). This sense of control is precipitated by changes in one's understanding of effective and ineffective forms of decision making. These changes, in turn, promote the implementation of strategies to overcome factors that lead to errors in decision making. Decision making, like learning from mistakes, was found to be an important self-regulatory skill for both gender groups in this study, specifically with practical significance for male students.

Perseverance, self-evaluation, mindful awareness, monitoring and creativity also correlated negatively with a number of GHQ subtests, in similar ways for male and female students, all with medium effect. This also emphasizes the importance of these self-regulatory skills, but in this case, in contrast to learning from mistakes and decision making, no clear gender differences were found. Why then does self-regulation, specifically learning from mistakes and decision making, appear to be more important to male students than to female

students in this study? One possibility might be that female students, in contrast to male students, have other resources available to prevent some forms of psychopathology. Chen and Shi (2008) state that perceived social support is able to help improve the mental health of college students, and found that male students have lower perceived social support than female students. This confirms the findings by Rootman et al. (2003) that men tend more to cope with stress in an individualistic manner, whereas women tend to obtain strength and control through interpersonal relationships. Thus, if self-regulation is regarded as an individualistic skill, then by implication males depend more on self-regulation, and those with poor self-regulation skills may be more prone to certain forms of psychopathology than females with poor self-regulation skills.

A number of researchers indicate that self-regulation, however, is more than just self-reliance. According to Eisenberg and Ota Wang (2003) effortful regulation has been positively associated not only with social competence but also with sympathy and pro-social behaviour. The same authors also refer to the regulation of inter- and intrapersonal relationships, interactions, and adjustment at the levels of the individual, organization, and larger society as important factors in pro-social behaviour. Jackson et al. (2000) refer to communal regulation as the process through which individuals self-regulate their actions within a network of socially mediated factors, such as family, organizational, and group-based needs, goals, and desires. In this regard, it may be wrong to assume that self-regulation is an individualistic skill males tend to rely on more often than females. It could, however , also be that self-regulation, as measured by the SSRQ in this study, does not reflect the ability or effort to obtain and maintain social support. Looking at the items of the SSRQ, this may be a valid assumption which supports the possibility that male students in this study indeed are more self-reliant. This emphasis on self-reliance, specifically regarding learning form mistakes and decision making, in contrast to the female students in this study, may however

prevent males from relying on others when necessary. Future research should explore this possible gender difference more comprehensively.

Another interesting difference is the fact that for male students differences in self-regulation were found regarding risk for alcohol-related problems in contrast to female students, where differences were found in self-regulation only regarding risk for eating-related problems. Although all these differences were of medium effect, the dissimilarity in pattern needs to be explored further, as it might suggest important gender differences regarding self-regulation in alcohol and eating behaviour.

For male students, those with lower risk for alcohol-related problems show better decision making, perseverance and mindful awareness. This finding supports other studies, for example Magar, Phillips and Hosie (2008) who found a link between poor self-regulation and alcohol induced problem behaviours, and Hustad et al. (2009) who found that individuals with lower self-regulatory capacities will prefer activities that provide immediate gratification, and would be more likely to initiate alcohol consumption and be less likely to maintain moderate use and avoid negative consequences. For female students, learning from mistakes, perseverance and mindful awareness are higher in those who show lower risk for eating-related problems. This confirms Svaldi, Brand and Tuschen-Caffier's (2010) finding that females with binge eating disorder make risky decisions significantly more often than their healthy controls, and Lavender, Jardin and Anderson's (2009) finding that highly mindful individuals experienced less distress in response to unwanted thoughts and emotions and may therefore be less likely to rely on disordered eating behaviours as maladaptive coping strategies.

Why then, does self-regulation appear to be more important for males regarding alcohol-related problems, and for females regarding eating-related problems? According to Collins and McNair (2002) it is more acceptable, in many societies, for males to misuse

alcohol than it is for females, whereas women's drinking patterns are more strongly influenced by the cultural norms and practices of the ethnic groups they belong to. Thus, one could argue that alcohol provides a stronger challenge to the self-regulatory skills of male students, for example, to be mindful about the risks of both accessibility and acceptability, and to persevere in decisions regarding limiting the amount or frequency of intake. This challenge, however, often appears one step to far for male students, as they show higher levels of alcohol abuse (Trockel, 2004).

In contrast, current cultural values, attitudes, and practices, and social norms with particular emphasis on the sexualisation and objectification of women and their bodies contribute to eating disorders and body image distress in females across their life span (Maine, 2009) and specifically in college women (Wang, 2007). Rootman et al. (2003) found that men possess greater physical self-esteem than women, indicating that men are generally less harshly judged on physical appearance, and that there is a social bias that favours a thinner appearance in women. Wang et al. (2008) found in men, but not in women, food stimulation with inhibition significantly decreased activation in amygdala, hippocampus, insula, orbitofrontal cortex, and striatum, which are regions involved in emotional regulation, conditioning, and motivation. The finding by Rootman et al. (2003) regarding a lack of response to inhibition in women are consistent with behavioural studies showing significantly higher scores in disinhibition, the tendency to overeat in response to food stimuli when presented with palatable food or under emotional distress, in women than in men.

Thus, just as alcohol provides male students with a stronger challenge regarding self-regulation, the same is true for female students regarding eating behaviour.

Conclusion

The aim of this study was to determine the relation between psychopathology, self-regulation and gender amongst a group of university students. It was found that, when compared directly, no clear gender differences emerged regarding either self-regulation or psychopathology. As expected, a negative association between effective self-regulation and psychopathology for both gender groups was confirmed in this study. However, this association was significantly stronger for males than for females. This was explained by the fact that women tend to make more use of social support whereas males seem to be more self-reliant, and that the SSRQ possibly reflects this self-reliance more than the social component of self-regulation.

It was also found that self-regulation seems to be more important to males regarding alcohol use and to females regarding eating behaviour. As it is more acceptable, in many societies, for males to misuse alcohol it seems as if alcohol provides a stronger challenge to the self-regulatory skills of male students. In contrast, physical appearance and eating behaviour provides a stronger challenge to female students' self-regulation, due to biased sociocultural values, attitudes, and practices that favour a thinner appearance in women, as well as due to a higher tendency in disinhibiting controlled eating in women than in men.

In general, it can be concluded that there is an important relationship between self-regulation and psychopathology, and that in this study this relationship was found to be somehow different for male and female students.

Recommendations

The results of this study have great implications both for further research and for clinical practice. Regarding the lack of differences in self-regulation and psychopathology between the two gender groups, further research with a random sample of more diverse participants, with different measuring instruments, could be done to further explore gender differences (or similarities) regarding self-regulation and psychopathology in a South African context. It is also recommended to confirm the possibility that self-regulation is more important to males because they are less able to make use of social support than females and to what extent the SSRQ may be a limitation as it more clearly reflects the self-reliance aspect of self-regulation.

Knowing that in this study decision making, perseverance and mindful awareness were important self-regulation skills for male students regarding alcohol use, it may be valuable to pay special attention to these skills in alcohol prevention and treatment programmes. For the same reason, learning from mistakes, perseverance and mindful awareness may be emphasized in the prevention and treatment of eating disorders in female students.

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Tables

Table 1

Descriptive statistics and effect sizes on the subtests of the SSRQ and the GHQ for differences between males and females

Subtest	Gender	n	mean	Std	p-value (when random sampling is assumed)	d-value
Monitoring	M	100	14.26	2.61	0.68	0.05
	F	283	14.13	2.84		
Decision making	M	100	16.75	3.32	0.27	0.11
	F	283	16.31	3.87		
Learning from mistakes	M	100	14.83	3.40	0.97	0.00
	F	283	14.84	3.07		
Perseverance	M	100	18.88	3.43	0.46	0.08
	F	283	18.58	3.60		
Self-evaluation	M	100	11.63	1.95	0.15	0.16
	F	283	11.95	1.83		
Creativity	M	100	11.16	1.86	0.64	0.05
	F	283	11.26	1.91		
Mindful awareness	M	100	14.26	2.95	0.65	0.05
	F	283	14.11	2.79		
SS	M	100	1.47	1.91	0.04*	0.23
	F	284	1.94	2.06		
AI	M	100	2.09	2.15	0.43	0.08
	F	284	2.29	2.23		
SD	M	100	1.28	1.75	0.67	0.05
	F	284	1.36	1.68		
DS	M	100	0.74	1.41	0.96	0.00
	F	284	0.74	1.52		
Total score	M	100	5.59	5.91	0.27	0.13
	F	284	6.34	2.83		

Note- M = male; F = female, std = standard deviation

* Statistically significant at 0.05 level according to t-test results for independent groups

Table 2

Pearson correlation coefficients between the subtests of the SSRQ and GHQ for males and females in the study population

Group	n	Subtest	SS	AI	SD	DS	Total
Male	100	Monitoring	-0.24	-0.30$^{\Delta}$	-0.30$^{\Delta}$	-0.30$^{\Delta}$	-0.31$^{\Delta}$
		Decision making	-0.24	-0.44$^{\Delta}$	-0.53$^{\Delta\Delta}$	-0.50$^{\Delta\Delta}$	-0.51$^{\Delta\Delta}$
		Learning from mistakes	-0.30$^{\Delta}$	-0.50$^{\Delta\Delta}$	-0.56$^{\Delta\Delta}$	-0.50$^{\Delta\Delta}$	-0.53$^{\Delta\Delta}$
		Perseverance	-0.18	-0.37$^{\Delta}$	-0.32$^{\Delta}$	-0.32$^{\Delta}$	-0.37$^{\Delta}$
		Self-evaluation	-0.05	-0.16	-0.30$^{\Delta}$	-0.16	-0.20
		Creativity	-0.13	-0.10	-0.30$^{\Delta}$	-0.30$^{\Delta}$	-0.22
		Mindful awareness	-0.13	-0.37$^{\Delta}$	-0.31$^{\Delta}$	-0.30$^{\Delta}$	-0.33$^{\Delta}$
Female	284	Monitoring	-0.15	-0.19	-0.35$^{\Delta}$	-0.24	-0.30$^{\Delta}$
		Decision making	-0.24	-0.24	-0.34$^{\Delta}$	-0.24	-0.34$^{\Delta}$
		Learning from mistakes	-0.22	-0.30$^{\Delta}$	-0.38$^{\Delta}$	-0.35$^{\Delta}$	-0.38$^{\Delta}$
		Perseverance	-0.19	-0.20	-0.36$^{\Delta}$	-0.30$^{\Delta}$	-0.32$^{\Delta}$
		Self-evaluation	-0.30$^{\Delta}$	-0.30$^{\Delta}$	-0.37$^{\Delta}$	-0.30$^{\Delta}$	-0.38$^{\Delta}$
		Creativity	-0.11	-0.14	-0.30$^{\Delta}$	-0.21	-0.22
		Mindful awareness	-0.22	-0.32 $^{\Delta}$	-0.30$^{\Delta}$	-0.30$^{\Delta}$	-0.36$^{\Delta}$

$^{\Delta}$ Medium effect in practice

$^{\Delta\Delta}$ Large effect in practice and also practically significant

Table 3

Descriptive statistics and effect sizes on the SSRQ for groups of males with a lower risk and a higher risk for alcohol problems

Subtest	Group	n	mean	std	p-value (when random sampling is assumed)	d-value
Monitoring	1	77	14.42	2.74	0.21	0.25
	2	23	13.74	2.05		
Decision making	1	77	17.12	3.50	0.01**	0.50 $^{\Delta}$
	2	23	15.52	2.29		
Learning from mistakes	1	77	15.16	3.43	0.07	0.42
	2	23	13.74	3.12		
Perseverance	1	77	19.39	3.31	0.01**	0.66 $^{\Delta}$
	2	23	17.17	3.34		
Self-evaluation	1	77	11.83	2.00	0.04*	0.43
	2	23	10.96	1.64		
Creativity	1	77	11.21	2.03	0.53	0.10
	2	23	11.00	1.13		
Mindful awareness	1	77	14.72	2.97	0.00**	0.67 $^{\Delta}$
	2	23	12.74	2.34		

Note- 1 = lower risk; 2 = higher risk, std = standard deviation

* Statistically significant at 0.05 level according to t-test results for independent groups

** Statistically significant at 0.01 level according to t-test results for independent groups

$^{\Delta}$ Medium effect in practice

Table 4

Descriptive statistics and effect sizes on the SSRQ for groups of females with a lower risk and with a higher risk for eating problems

Subtest	Group	n	mean	std	p-value (when random sampling is assumed)	d-value
Monitoring	1	240	14.18	2.82	0.45	0.12
	2	42	13.81	2.98		
Decision making	1	240	16.56	3.76	0.02*	0.38
	2	42	14.95	4.20		
Learning from mistakes	1	240	15.09	2.94	0.01**	0.50$^{\Delta}$
	2	42	13.48	3.45		
Perseverance	1	240	18.85	3.44	0.01**	0.50 $^{\Delta}$
	2	42	16.99	4.16		
Self-evaluation	1	240	12.05	1.80	0.07	0.30
	2	42	11.45	1.95		
Creativity	1	240	11.35	1.84	0.13	0.25
	2	42	10.79	2.24		
Mindful awareness	1	240	14.31	2.82	0.00**	0.50 $^{\Delta}$
	2	42	13.05	2.32		

Note- 1 = lower risk; 2 = higher risk; std = standard deviation

Note - Difference in total number of participants namely 282 (240 + 42) instead of 284 due to missing values.

* Statistically significant at 0.05 level according to t-test results for independent groups

** Statistically significant at 0.01 level according to t-test results for independent groups

$^{\Delta}$ Medium effect in practice