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Association between Depression and Perceived Parental Traits

Results from a nationally representative South African Survey

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April 2011

University of Cape Town

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Submitted to the University of Cape Town in partial fulfilment of the requirements for the degree Master of Public Health with specialization in Epidemiology and Biostatistics

Declaration

I, Catherine Filippa Srubisky, hereby declare that the work on which this dissertation is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

Signature _____

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ABSTRACT

***Background**:* With a growing burden of disease and disability stemming from mental disorders in South Africa, additional research into this area may be justified, with specific reference to depression. The effects of parental influences have been explored in the literature as a relevant and valid risk factor in the development and presence of depression. The literature has suggested two main underlying themes of parental styles that included parental overprotection and care. The concept of overprotection has been associated with depression. This thesis explored these constructs in their association with depression whilst highlighting the influence of control. Furthermore the influences of parental depression were also included.

Methods: The South African Stress and Health Survey (SASH) was used to access data in a South African context on demographic and mental health measures. This survey was a nationally representative study which was conducted as part of the World Health Initiative. These mental constructs were assessed using the Composite Diagnostic World Health Organization (WHO) Composite International Diagnostic Interview Version 3.0 (CIDI).
The sample base included 4351 participants. The outcome variable of depression (Major Depressive Disorder) was assessed using the DSM-IV classification system and used the lifetime version. The independent variables (parental characteristics) were the self-reported perception of the participants regarding their childhood experiences of their parents' characteristics and were based on the modified version of the Parental Bonding Instrument (PBI) as used in the CIDI. These included (maternal and paternal) strictness, monitoring, inhibition as well as affection & love and care. The additional characteristic of parental depression was also included as a potential risk factor.

Results: 10% of participants were classified with depression and 55% were female. The majority of results yielded non-significant OR's with only paternal affection and paternal depression being consistently significant. Parental depression had an unadjusted OR of 1.94 (CI: 1.19, 3.15, *p=0.009*); an adjusted OR (excluding anxiety) 1.99 (CI: 1.20, 3.28, *p=0.008*) and an adjusted OR (including anxiety) of 1.76 (CI: 0.97, 3.21, *p=0.062*). Parental affection has an unadjusted OR of 0.40, (CI: 0.22, 0.75, *p=0.005)*; an adjusted OR for all variables (excluding anxiety) of 0.34 (CI: 0.19, 0.62, *p=0.001*) and adjusted 0.35 (CI: 0.18, 0.68, *p=0.002*). Parental strictness, monitoring and inhibition did not achieve significant results. Gender was significant in accounting for depression with males having an unadjusted OR of 0.55 (CI95%: 0.38, 0.81, *p*=0.002) and an adjusted (including anxiety) of 28% (CI95%: 58%, 9%, *p*=0.015) odds of not having depression.

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Conclusions: Maternal strictness, although a risk factor, was not significantly associated with depression. None of the presumed overprotection factors were significant in association with depression. Only parental affection and depression were significant in their associations with depression which both contradicted and supported previous research. None of the demographics functioned to change the risks dramatically, except for anxiety which may have functioned as more than merely a risk factor. These results may suggest that further research is required in order to improve screening; management and treatment as well as prevention of depression in the general population. Although the positive influence of paternal affection as well as the risk of paternal depression produced strong OR's, a more accurate picture of the relationship between parental characteristics in terms of parental overprotection and care and depression is needed. These endeavours may increase understanding the context of depression in family life more coherently, especially within the culturally diverse and potentially traumatic contextual factors of a South African population.

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1. INTRODUCTION

Due to the persistent and increasingly disabling consequences of poor mental health, continued research in this area remains of prime significance (Prince, *et al.,* 2007; Stein & Seedat, 2007). In a community study conducted by Hammen, Brennan & Keenan-Miller (2008) "one-third of youth met criteria for major depressive disorder" (p.1189). Within a South African context the sheer prevalence of depression in itself, warrants the need for mental health research (Stein & Seedat, 2007; Tomlinson *et al.*, 2009). Although there have been many approaches in conceptualizing the risks factors associated with depression; this report has focused on the risks presented by parental qualities and styles. This has been with specific reference to two main areas of parenting including overprotection / care and parental depression.

The association between both parenting styles and factors (over-protection / care and depression) and an outcome of depression in children has been supported and explored in the literature (Biggam & Power, 1996; Brennan, *et al.*, 2003; Chiariello & Orvasche, 1995; Darling & Steinberg, 1993; Ge *et al.*, 1996; Heaven & Caroche, 2006; Parker, 1981; Patton *et al.*, 2001; Williams *et al.*, 2009; Wood *et al.*, 2003). These general parental traits have been grouped in accordance with general styles which have included authoritarian and authoritative parenting styles (Lamborn *et al.*, 1991). Within these broad categories lie the specific factors of parenting traits which influence childhood experiences. The specific constructs / risk factors applied in this research (i.e. control and care) have been taken from the main themes of parental overprotection and care as well as the overall parenting styles including authoritative and authoritarian parenting styles.

The literature has supported the link between the theme of control (expressed through the authoritarian styles and overprotection) and an outcome of depression in children that could extend into adulthood (Chiariello & Orvasche, 1995; Ge et. al., Heaven & Ciarrochi, 2006; Parker, 1981, 1983; Patton *et al.*, 2001; 1996; Roe & Siegelman, 1963; Williams *et al.*, 2009). Furthermore the concept of parental care (expressed through authoritative parenting as well as parental care) has been associated with being protective against depression and psychopathological outcomes in children (Chiariello & Orvasche, 1995; Ge *et al.*, 1996; Heaven & Ciarrochi, 2006; Parker, 1981, 1983; Patton *et al.*, 2001; Roe & Siegelman, 1963; Williams *et al.*, 2009; Wood *et al.*, 2003).

Parental control has often been linked with childhood depression, although it has been presented in the literature in numerous variations including overprotection; overinvolvement, psychological

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control, restrictiveness as well as 'overly critical' (Brennan *et al.*, 2003; Enns *et al.*, 2002; Stein *et al.*, 2000). One mechanism that has been suggested to explain this link includes that the child's experience of parental over-control may lead to the lack of development of the child's emotional autonomy (Gray & Steinberg, 1999). It does however appear evident from the literature that the effects of control do not occur in isolation of other parenting qualities which suggests that parental control should therefore be explored within a range of other parenting traits as well as environmental, individual or social characteristics (Brennan *et al.*, 2003; Darling & Steinberg, 1993; Finkelstein *et al.*, 2001; Gray & Steinberg, 1999; Parker, 1983; Ungar, 2009; Williams *et al.*, 1990; Wood, 2003).

Parental psychopathology, with specific reference to parental depression has been highlighted as a significant factor in accounting for depression in children (Brennan *et al.*, 2002; Downy & Coyne, 1990; Gelfand & Teti, 1990; Lieb *et al.*, 2002; Lovejoy *et al.*, 2000; Patton *et al.*, 2001; Weissman *et al.*, 1997). Although this literature has drawn a strong link between maternal depression and the outcome of depression in offspring (Downey & Coyne, 1990); the influences from both parents have been shown to be potentially significant as one parent may be able to function as a buffer for the alternate parent's psychopathology (Brennan *et al.*, 2002; Enns *et al.*, 2002; Patton *et al.*, 2001).

A strong gender differential in the investigations of depression must however be pointed out. Women have been found to have a much higher prevalence of depression relative to men where the effects of maternal influences on childhood / offspring depression, appear to outweigh the effects of the paternal influences (Heider *et al.* 2006; Rapmund & Moore, 2000; Tomlinson et al, 2009). This finding however may have been skewed by socially constructed gender roles as well as the possibility that women in depression have been explored to a much greater extent than have their male counterparts and thus may have given the inaccurate impression that females or mothers have had a stronger influence on childhood / offspring depression (Brownhill *et al.*, 2005; Downy & Coyne, 1990).

Exploring these mental health associations in a South African context provides a meaningful and needed base of information, especially considering the history of prejudice for many South Africans as well as the effects that trauma and discrimination may have had. The SASH data set provides nationally representative data collected during a significant time period in South Africa's history.

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This was a period in which South Africa developed its infancy democracy in a post Apartheid legislation era.

In order to assess these concepts as above, this report used a South African nationally representative dataset to explore the associations between depression (DSM-IV defined Major Depressive Disorder – MDD) and a proxy measure of (1) parental overprotection (represented by strictness, inhibition and monitoring) ; (2) MDD and a proxy measure of parental care (represented by affection & love as well as care). The last association (3) explored was between MDD and parental depression. All these associations were considered within a context of (adjusted for) demographic and socioeconomic variables.

The main purpose or aim of this study was to better comprehend the risk factors associated with depression in terms of parental influences and more specifically to better understand the associations between depression and the parental styles of control and care as well as parental depression.

The specific objectives of this report were to:

1. Describe the association between parental overprotection and MDD (within the context of care and depression)
2. Describe the association between parental care and MDD (within the context of overprotection and depression)
3. Describe the association between parental depression and MDD (within the context of overprotection and care)
4. Explore the gender differences associated with depression in terms of parental care and overprotection
5. Briefly explore the possible effects anxiety may have on these above associations

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2. LITERATURE REVIEW

2.1. Search Strategy

The Pubmed, PsychARTICLES and PsychINFO databases were used to search for relevant material using the term 'depression' with one or more of the following concepts (in varying combinations): 'parenting', 'parenting styles', 'parenting qualities', 'control', 'maternal control' and 'maternal depression', 'paternal depression' and 'authoritative parenting', 'authoritarian parenting' as well as 'overprotection and care'. Titles then abstracts were assessed and included if deemed applicable and appropriate. Additionally, articles were found using the reference lists of articles already included.

2.2. Significance of Mental Health in terms of Burden of Disease (BOD)

Our health is threatened in South Africa by an increasing burden of disease (BOD). With a growing prevalence of non-communicable diseases, the effect of mood disorders becomes significantly more pertinent. Unipolar depressive disorders ranked 3rd in the top ten causes of disability adjusted life years (DALYs) for high income countries taking up 5.6% of DALYs and 7th for low-income countries with 3.1% of DALYs in 2001 (Lopez *et al.*, 2006). In 2005, the worldwide percentage of DALYs attributable to neuropsychiatric conditions was 13.5% where the proportion of DALYs for non-communicable disease was 27.5% (Prince *et al.*, 2007). Neuropsychiatric disorders accounted for approximately 14% of the global burden of disease and more specifically represented 28% of the DALYs contributed to by non-communicable diseases in 2005 of which unipolar depression accounted for 10% (Prince *et al.*, 2007; Tomlinson *et al.*, 2009).

According to Stein & Seedat (2007) psychiatric disorders have been established as one of the most "prevalent, burdensome, and costly of all medical disorders" (Stein & Seedat, 2007, pp.573). With the understanding that these statistics are only likely to increase in years to come, emphasis on the burden associated with mental health is of prime significance (Prince *et al.* 2007). With these statistics and the World Health Organization's proposition that there is "no health without mental health" (Prince *et al.*, 2007), rigorous investigation into mental health has been and may continue to be a vital component in developing and improving health in all communities.

In South Africa, the 9.8% lifetime prevalence of mood disorders adds to the justification that mental health research is a necessary area of investigation within a South African context, with specific focus on mood disorders (Stein *et al.*, 2008; Tomlinson *et al.*, 2009). Increasing research investigations in this area would be able to provide accurate and meaningful data that could enable practitioners, policy makers and lay persons to more fully understand, manage and prevent mental

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illness (Stein *et al.*, 2008; Tomlinson *et al.*, 2009). The risk factors that result in or exacerbate the development of mood disorders may be determined through such research practices, thereby creating a basis on which not only treatment strategies but also preventative methods may be formulated.

2.3. Parenting Traits and Styles

As Hammen *et al.*, (2008) suggested, the "sheer prevalence (of depression) suggests that there are multiple pathways to depression, with considerable heterogeneity in etiology, course, and treatment/prevention implications" (Hammen, Brennan & Keenan-Miller, 2008, 1189). With comparatively less focus on the underlying biological causes for the increasing rates of depression, more consideration has been paid to socialization processes (Finkelstein *et al.*, 2001). These have included parent-child relationships.

Modern-day research pertaining to parenting styles has expanded on the influential work of Diana Baumrind (Bornstein & Bornstein, 2007; Lamborn *et al.*, 1991; Milevsky, Schlechter, Netter & Keehan, 2007). Baumrind's original three group classification has been expanded into four categories of parenting styles. The original three group classification followed that of authoritative parenting which represented a combined style of elevated levels of control and responsiveness (Bornstein & Bornstein, 2007) with "patterns of warmth, non-punitive discipline, and consistency" (Milevsky *et al.*, 2007, 40). This style represents parents who are warm whilst firm and applied an adaptive and functional form of control (Williams *et al.*, 2009). This style of parenting comprised parental behaviour that was accepting, used non-punitive disciplinary methods and was consistent (Gray & Steinberg, 1999).

Authoritarian parenting represented elevated levels of control relative to deflated levels of responsiveness (Bornstein & Bornstein, 2007) which, overall was "marked by patterns of low warmth, harsh discipline, and inconsistency" (Milevsky *et al.*, 2007, 40). In other words, authoritarian parenting represents elevated restrictiveness relative to diminished warmth (Williams *et al.*, 2009). The last style was permissive parenting which initially represented "low levels of supervision" (Milevsky *et al.*, 2007, 40). This last category however was expanded to include two distinct parenting styles (Lamborn *et al.*, 1991; Milevsky *et al.*, 2007) which incorporated permissive parenting (entailing decreased control relative to increased responsiveness) as well as neglectful parenting (representing the diminished control and responsiveness) (Bornstein & Bornstein, 2007, p2)

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Authoritative parenting has been associated with "the presence of several adaptive behaviours in children, in comparison to authoritarian styles" (Milevsky, et al, 2007, 40). Authoritative parenting has been considered most conducive to raising well-adjusted and psychologically robust children (Ge *et al.*, 1996; Williams *et al.*, 2009). Authoritarian parenting however, which exemplifies hostility and punitive control, has most often been associated with dysfunction and psychopathology in offspring (Ge *et al.*, 1996; Williams *et al.*, 2009). More specifically, an outcome of depression in offspring has been associated with parenting practices or the perception of parenting practices (Biggam & Power, 1998; Gerlsma, Emmelkamp & Arrindell, 1990; Heaven *et al.*, 2006) where, for example, Milevsky *et al.*, 2007, in their recent study, found that authoritative parenting was associated with lower levels of depression in adolescence.

"our findings add to the literature on parenting styles in childhood and functioning in mid- to later life by providing evidence that remembered authoritative parenting is linked with more positive adult outcomes compared with recalled authoritarian and uninvolved parenting behaviours. (Rothrauff *et al.*, 2009, 142).

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2.3.1. Fundamental Principles: control versus warmth

The fundamental principle underlying this classification system follows two broad dimensions of parenting which include control / demandingness and support / responsiveness (Biggam & Power, 1996; Bornstein & Bornstein, 2007; Finkelstein *et al.*, 2001; Parker, 1981, 1983; Roe & Siegelman, 1963). Bornstein & Bornstein (2007) explain that control or demandingness represents how parents engender maturity, discipline and regulation through their parenting. Responsiveness represents how parents promote the child's "individuality, self-regulation and self assertion" (ibid., p.2).

These constructs of control relative to care have been associated with an outcome of psychopathology in offspring (Biggam & Power, 1996; Brennan *et al.*, 2003; Darling & Steinberg, 1993; Parker, 1981; Patton *et al.*, 2001; Williams *et al.*, 2009; Wood *et al.*, 2003). Furthermore, studies have found an association between an outcome of psychopathology in offspring as adults and perceived parenting styles (including control versus support) (Rothrauff *et al.*, 2009).

2.3.1.1. Support, warmth and care versus control, over-protection, demandingness

Parental care or warmth has been associated with affection, empathy and closeness whilst control has been associated with over-protection, intrusion and encouraging dependency on parents (Biggam & Power, 1996). These qualities (i.e. the experience of affection, empathy, closeness,

overprotection and intrusion) may also be described as interpersonal resources (Stuart *et al.*, 1990) and may function as both protective and detrimental factors in the development of depression.

The research has shown however that the factor most significantly associated with an outcome of psychopathology in children has been parental care or rather the lack of care (Brennan *et al.*, 2003; Enns *et al.*, 2002; Patton *et al.*, 2001; Rey, 1995). Children's perception of decreased care was associated with an increased risk for depression whilst the perception of being protected by one's caregiver was protective against depression (Brennan *et al.*, 2003; Parker, 1981; Stein *et al.*, 2000). Significantly, Rey (1995) found that although none of the four parenting styles were significantly associated with an outcome of depression in offspring, the only significant variable associated with depression was maternal care.

Parental care or the lack thereof has accounted for depression even more strongly after having adjusted for parental control (Patton *et al.*, 2001). This may have implied that if parental control elicited an effect in accounting for depression, this risk was only valid within the context of a lack of parental care.

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2.3.1.2. Control

Although the association between parental support and a positive outcome in offspring is known; the "findings related to parenting control are inconsistent" (Finkelstein *et al.*, 2001, 156). Finkelstein *et al.* (2001) suggest that the operationalization of control may be held, in part, accountable for this. Control has been, for example, variably defined, labelled or associated with permissiveness / strictness; overprotection; demandingness; psychological control / autonomy and firm / lax control (Finkelstein *et al.*, 2001). Control may therefore be understood or interpreted as intrusiveness, increasing dependence or decreasing the capacity for autonomy (Parker, 1983; Yahav, 2006) or as the regulation of behaviour (Finkelstein *et al.*, 2001).

A theoretical distinction between psychological and behavioural control has been proposed (Barber *et al.*, 2002)**.** Psychological control provokes a lack of the development of emotional autonomy in the child and has been consistently associated with depressive symptoms. Behavioural control, conversely, may engender an environment with a greater sense of behavioural leniency which has in turn been associated with externalizing problems (Gray & Steinberg, 1999). Establishing adaptive control enables boundaries to be set (i.e. firm control or behaviour regulation) relative to the

intrusive and punitive methods as applied in restrictiveness (Williams *et al.*, 2009). Psychological control may therefore elicit more restrictiveness relative to behavioural control.

Specific to depression, **control** has regularly featured in the literature as being associated with the development of **depression** (Barbar, 1996; Brennan *et al.*, 2003; Gray & Steinberg, 1999; Stein *et al.*, 2000; Ungar, 2009;) and as Rapmund & Moore (2000) discussed in their qualitative analyses of depression in women, the theme of control was present throughout all their participants' results. The literature has presented many versions of the concept of control that have included maternal over protection (Enns *et al.*, 2002; Stein *et al.*, 2000) parental psychological control and overinvolvement (Brennan *et al.*, 2003) restrictiveness and firm control (Williams *et al.*, 2009) as well as increased criticisms (Stein *et al.*, 2000) all of which have been associated with depression.

Defining control in terms of "rule setting and insistence on following rules" (Finkelstein *et al.*, 2001, 156) has however been associated with a positive psychological outcome in contexts where the externalizing behaviour of offspring was in need of increased behaviour regulation. Alternatively, when control is defined in terms of psychological control which entails the concealed approach of parents which functions to undermine and intrude upon the offspring's emotional and psychological development, an association with depression has been found (Barber, 1996; Finkelstein *et al.*, 2001). Wood, *et al.* (2003) defined parental control as being an "excessive regulation of children's activities and routines, autocratic parental decision-making, overprotection or instruction to children on how to think or feel" (Wood *et al.*, 2003, pp.135). Control interpreted in this negative and maladaptive parental style has been associated with internalizing tendencies (Van Leeuwen *et al.*, 2004) and the lack of emotional autonomy (Gray & Steinberg, 1999) in off spring.

The link between control and depression may be due to a number of causal mechanisms that have included a wide range of possibilities. One of these includes the child's capacity for emotional expression and freedom. An environment which has disenabled the child to express themselves or their emotions may be conducive to the child developing emotional adjustment problems which increases the potential for mood disorders (Gray & Steinberg, 1999). In other words, a family context facilitated by parents who use a warm and caring whilst firm approach may be able to create an environment that encourages the child to express their emotions and therefore provides them with the opportunity to develop adaptive and functional mental health capacities. Alternatively, parental styles that use control techniques may produce an environment which ultimately promotes

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the development of maladaptive and dysfunctional emotional patterns in children. These patterns consequently increase the potential for mood disorders.

2.3.1.2.1. Control in context

Control however may be better conceptualized within the context of other parenting qualities as throughout the literature of the concepts taken from the underlying themes suggest that there are multiple contributing factors (Brennan *et al.*, 2003; Gray & Steinberg, 1999; Parker, 1983; Ungar, 2009; Williams *et al.*, 1990; Wood, 2003). Furthermore control may be better conceptualized within the context of other valid risk factors not specific to additional parental qualities but also referring to cultural, social or even gender variations (Darling & Steinberg, 1993; Finkelstein *et al.*, 2001; Ungar, 2009). Furthermore, greater parental care rather than less overprotection was associated with lower vulnerability for depressive symptoms" (Rothrauff *et al.*, 2009, 139), however, as previously referred to, the operationalization of control may have only accessed behaviour control and not psychological control.

Understood however within the context of high parental warmth and affection, the influence of increased control has been associated with lower levels of depression (Finkelstein *et al.*, 2001). Nonetheless, the relationship between control (regulation of behaviour) and depression remains inconsistent (ibid.). Figure 1 displays a possible causal mechanism differentiating between authoritative and authoritarian parenting and how the concept of control can be highlighted from the underlying themes of parental care and overprotection[1].

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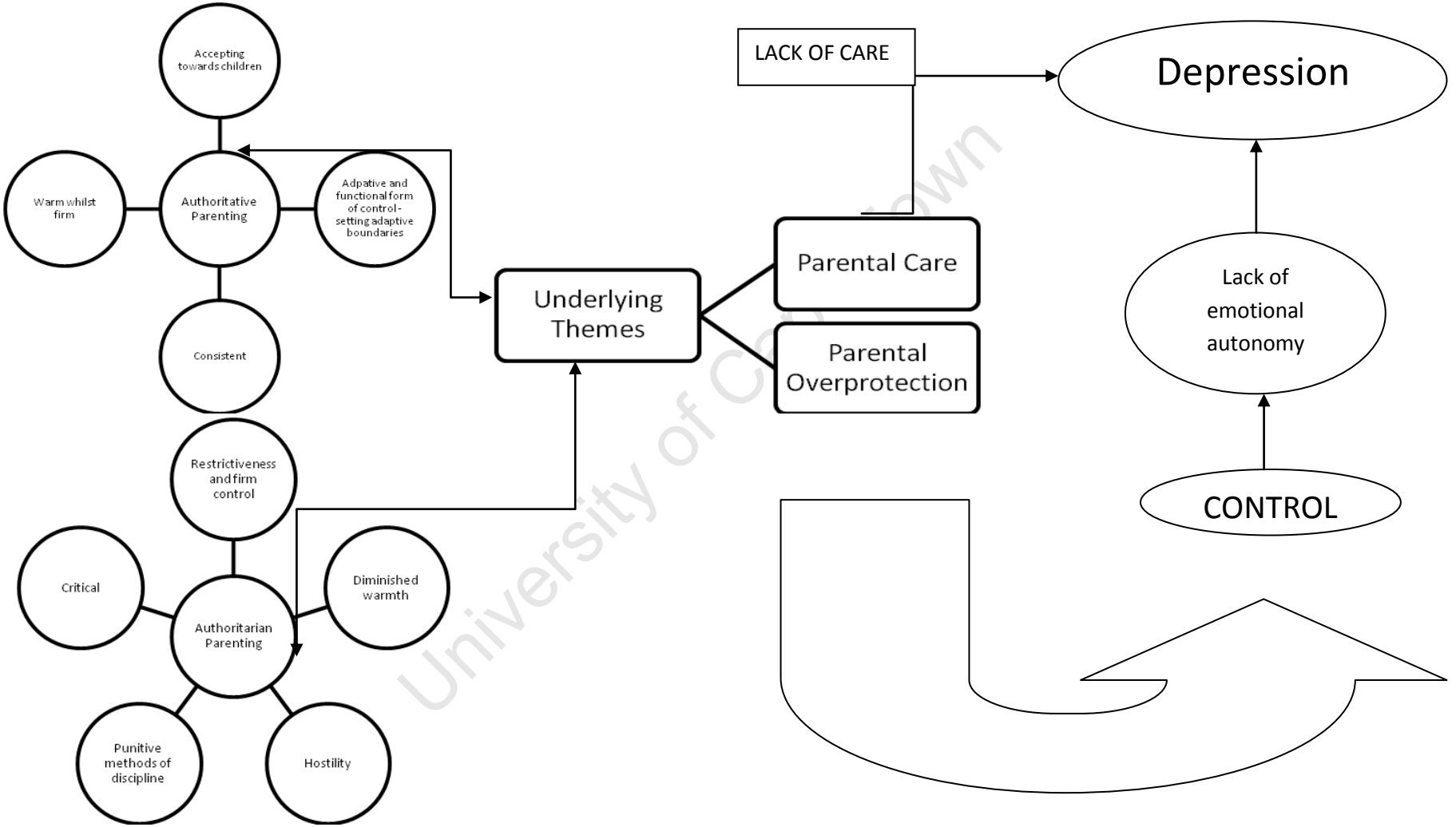
[1] Please note this diagram is an overly simplistic model demonstrating only how control resonates through the constructs of the authoritarian parenting styles, the underlying theme of overprotection and how control may relate to depression. This model has excluded various contributory and contextual factors as displaying all possible risk factors and their interactive relationships is beyond the scope of this graphic representation.

Figure 1: Flow Diagram of Possible Causal Mechanism For Depression Highlighting Control



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The context of parenting: culture / ethnicity, gender, individual perception and developmental stage

Even though the literature referred to above suggest that there is an association between parenting styles and psychopathological outcomes in offspring, the context of culture, ethnicity, parent's or child's gender and even individual perception may change the associations (Bornstein and Bornstein, 2007; Finkelstein *et al.*, 2001; Rothrauff *et al.*, 2009). For instance, Rothrauff *et al.*, (2009) found that the advantages of authoritative parenting seemed more positively associated with men relative to women. Furthermore, authoritative parenting has been associated with increased benefits for white middle class offspring relative to children from different ethnic backgrounds and socie-economic status (Bornstein and Bornstein, 2007). A possible reason for this difference may be that for families who reside in safe environments, the provision of freedom and flexibility is experienced as positive parenting and associated with positive psychological outcomes in children. However, for families who reside in more at risk environments, an increased level of parental control may be experienced as protective and thus relatively more positive than other parenting styles (Bornstein and Bornstein, 2007). As Finkelstein *et al.* (2001) suggested, "firm maternal control" (p.164) may be more associated with positive outcomes in offspring when experienced within a context of particular circumstances where such measures of control are experienced as protective and functional relative to being psychologically intrusive. Lastly, development stage of the offspring may additionally influence or mediate the association between parenting styles and control and an outcome of depression or other psychopathology in children (Finkelstein, 2001; Milevsky *et al.*, 2007)

Maternal versus paternal parenting – is there a difference?

As Milevsky *et al.* (2007) suggested many studies have not separated the potentially significant difference in effects between maternal and paternal parental practices on psychopathology in offspring. Offspring adjustment and psychological functioning may be a function of either maternal or paternal-specific parenting styles. Most studies have however focused more exclusive on maternal influences without acknowledging paternal influences (ibid). As Milevsky *et al.*, (2007) have proposed that "fathers seem to serve a different function in parenting than do mothers" (p.45). Milevsky found that authoritative mothering relative to permissive mothering was associated with more detrimental outcomes in children. The same pattern however was less apparent in terms of paternal parenting. The implication therefore may suggest that permissive mothering may be more detrimental than permissive fathering. Milevsky *et al.* (2007) further suggested that the role of fathers may be more playful and thus more suited and accessible through permissive parenting

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although such comments should be regarded as speculative (ibid). Other studies have similarly found that it is the parenting behaviour of fathers relative to mother's which has been associated with offspring depression (Avison and McAlpine, 1992 in Finkelstein *et al.*, 2001 p.166; Baron and MacGillivray, 1989 in Finkelstein *et al.*, 2001, p.166).

2.3.2. Parental Psychopathology – parental depression

The association of parental styles with psychopathological outcomes in children has not only included the influence of parenting skills or other socio-cultural factors, but also parental psychopathology as well. The literature further suggests that parental influences have an acute impact on childhood development with the potential to continue into adulthood (Chiariello & Orvasche, 1995; Ge et. al., 1996; Heaven & Ciarrochi, 2006; Patton *et al.*, 2001). Adult psychopathology has been used to discuss how adverse parental experiences have negatively affected outcomes in children (Patton *et al.*, 2001). Hammen & Brennan (2003) stated that studies "of the offspring of clinically depressed parents show that having a depressed parent is one of the strongest predictors of depression in youth" (Hammen & Brennan, 2003, p.253). However, as with the association between parenting styles per se and psychological outcomes in children, the association between parental psycholopathology and offspring psycholopathology may be more complex that first thought. Other factors that have been investigated have included maternal depression (which has garnered the most research); gender and timing of exposure.

2.3.2.1. Maternal Depression

Maternal depression has been well established as a form of adult psychopathology which appears to profoundly influence the development of depression in offspring (Hammen, Brennan & Keenan-Miller, 2008; Brennan *et al.*, 2002; Downy & Coyne, 1990; Gelfand & Teti, 1990; Lieb *et al.*, 2002; Lovejoy *et al.*, 2000; Beardslee *et al.*, 1998; Weissman *et al.*, 1997; Phares & Compas, 1992 in Ohannessian *et al.*, 2005).

Although this literature acknowledges the relatively significant and strong association between maternal and childhood depression, as Downy & Coyne (1990) have suggested, this association may not be as straightforward as proposed as it may not be inevitable that all children of depressed mothers become depressed.

The association between psychopathology in childhood and maternal depression may be better interpreted within the context of both the family and societal contexts. Individuals living with depression more often than not have lived in an environment of adverse conditions which may

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include co-existing personality disorders, ineffective parenting skills, tendency to marry partners who also suffer from psychopathology, as well as a history of family psycho-social problems (Downy & Coyne, 1990). These adverse conditions may have in fact preceded or co-existed (or even continue to exist in conjunction) with depression (ibid.). These authors have therefore proposed that consideration of a wider scope of risk factors is essential when assessing the aetiology of depression as stemming from a parental source. Furthermore, parental depression has been associated with various adverse parenting qualities which included "unresponsiveness, inattentiveness, intrusiveness, inept discipline and negative perceptions of children" (Gelfand & Teti, 1990, pp.329). It may perhaps be these qualities that are in fact a more direct risk for the development of depression in children as opposed to depression in parents per se.

The timing of the exposure of maternal depression to offspring may similarly be of significance in the development of depression in offspring. The assumption being that the earlier the exposure of maternal depression, the greater the disruption of functional and normative development for offspring (Hammen & Brennan, 2003). Although much of the literature has explored the effect of parenting styles during childhood, studies have also focused on the effect of parenting styles in adolescence (Milevsky et al, 2007).

Similarly, Hammen & Brennan (2003) have suggested that not only is the timing of exposure in terms of developmental progression in offspring significant, so is the severity of depression as well as duration of the maternal depression and possible a combination of all above mentioned factors. There is of course the consideration of a genetic factor – if the mother is prone to depression, it may stand to reason that the offspring are at a greater genetic risk for depression themselves.

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Gender and timing

Maternal depressive symptoms were more associated with psychopathology in female offspring relative to male offspring (Ohannessian *et al.*, 2005).

The ability of children however to know and understand their own emotional experiences may influence the manner in which they are able to communicate such experiences (Blumberg and Izard, 1985 in Forehand, et al. 1988). This then suggests that even if children are in fact experiencing depression, this may not be expressed or communicated in a manner in which others may identify depression as it is defined for adults (Forehand, *et al.*, 1988). Depression in children may in fact be expressed as anger rather than sadness (ibid.).

This alludes to possible methodological concerns as Forehand, et al., (1988) did not find a relation between maternal and adolescent depression by using either self-report measures or behavioural ratings. They suggested that based on the possible inability of adolescents or children to accurate identify and name their experience of depression implies that depression may be evident in the self-report measures. Other methodological issues include "lack of longitunidcal studies, use of clinical samples that may be atypical in severity and with limited generalizbility and relatively small sample sizes, precluding the ability to disentangle the overlapping issues of severity, chronicity and timing" (Hammen & Brennan, 2003, p.254).

Another contextual factor in the association between maternal depression and depression in offspring, as Tan and Rey (2005) have suggested, is that depression mothers may perceive their children as difficult and that their children's disposition or temperament, is in fact the root cause of their distress. Interesting, however, these authors found that the fathers of these children did not share the same sentiments as the mothers. This finding first makes reference to the direction of causality – it may well be that apparently 'difficult' children instigate the development of depression in their parents. Furthermore, as Ohannessian *et al.*(2005) suggested, it may well be the family conflict and maternal depression that is the cause of depression in offspring.

2.3.2.2. Differences between paternal and maternal depression

Even though much of the literature on parental depression has focused its attention on maternal depression, the impact that paternal psychopathology has on outcomes in offspring, should not be excluded as there may well be differential effects between paternal and maternal depression on their children (Phares & Compas, 1992). Furthermore, although the association between maternal depression and general psychopathology in offspring has been well researched, there have been conflicting results on the potential differences between maternal and paternal influences on the development of psychopathologies in childhood and adolescences.

Patton *et al.* (2001) have suggested that no differences were evident between maternal and paternal influences whereas Enns *et al.* (2002) suggested that indeed there were differences. These differences followed that the maternal influences were more strongly associated with the development of depression relative to paternal care. For example Pederson (1994) in Phares & Compas (1992) found that adolescent depression and anxiety was more strongly associated with paternal care relative to maternal care being more strongly associated with with adolescent delinquency. Brennan *et al.*, (2002) have suggested that the effects of paternal psychopathology

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during child-rearing may function as a moderator effect on the already established influences of maternal depression. Paternal influences would then have the potential to mollify or alleviate some of the negative effects of maternal psychopathology (ibid.). The relationship between the child and parent may be partially disrupted when only one parent presents with pathology and the other is able to provide buffering effects. If however neither parent (or caregiver) were able to provide sufficiently supportive and nurturing environments or appropriate bonding opportunities for their children, the likelihood of the child developing a pathology becomes more likely (Brennan *et al.*, 2002).

Childhood psychopathologies however, may not have only originated due to pathologies of the mother or lack of protective skills of the father (or even the combined lack of parental skills), but may have stemmed from the inherent qualities of the child or the interaction between the child's temperament and parenting qualities (Williams *et al.*, 2009). This theory suggests that children may be born with a certain propensity for attachment and through this temperament may elicit a certain response from the parent. In turn, these parental responses would be similarly dependent upon the personality traits of the individual parent. Ultimately, the child will demonstrate particular innate characteristics that influence their relationship with their parent(s). Similarly, however, the relationship between parents and their children will be influenced by not only the child and / or parent's own unique attributes, but also through the interaction between all contributing factors (Williams *et al.*, 2009).

Figure 2 below demonstrates the possible association between parental characteristics that could function as protective or risk factors and how these contribute towards an insecure attachment as well as how the underlying themes of parental care and overprotection may contribute towards the development of depression. This diagram however does not demonstrate the reciprocal nature of these relationships or the potential of the child's temperament and personality to influence the parents. These additional possibilities may be represented by two-way arrows that show causality from the child towards the parent[2].

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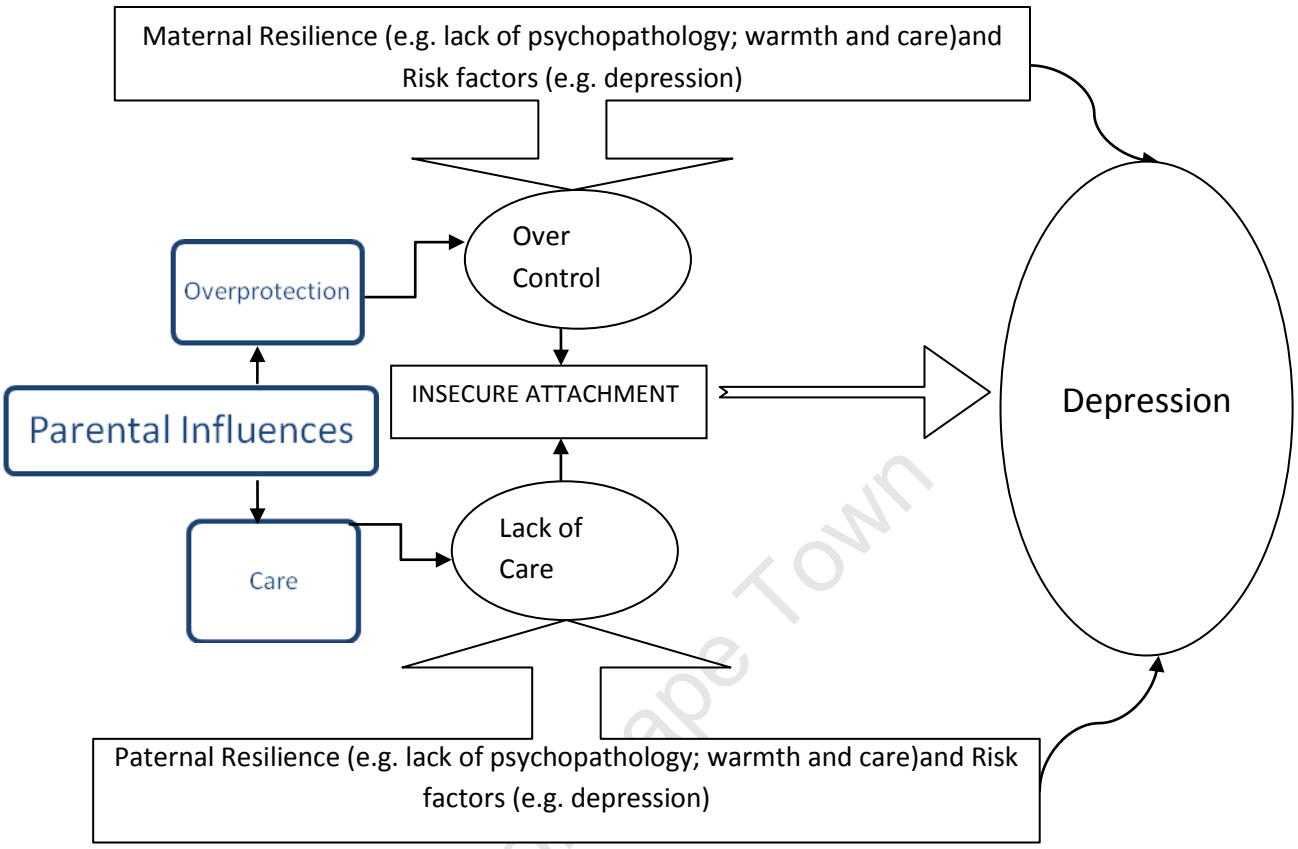
[2] Please note Figure 2 is intended to function as a simplified diagram to demonstrate in a basic and fundamental format the relation and direct of influence of these constructs. The author of this report notes that the context of parental influences and depression is more complex that depicted in this diagram.

Figure 2: Flow Diagram of Possible Causal Mechanism for Depression highlighting Position of Insecure Attachment



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2.3.3. Gender Effects in Depression

A significant gender effect has been found in two areas: in the general outcome of depression where females appear to report higher rates of depression relative to men but also in that maternal influences seem to have a greater impact during childhood development for psychopathology relative to the paternal counterparts (Heider *et al.* 2006; Tomlinson *et al.*, 2009;). Children seem to be more susceptible to the detrimental influences of maternal psychopathology than with paternal psychopathology (Rapmund & Moore, 2000). Paternal influences in the development of depression however, have not been explored to the same extent as have maternal influences which may have created the impression that maternal influences are more significant in accounting for depression in children (Downy & Coyne, 1990).

This gender difference may be due to many factors which include the possibility that it has been socially constructed as more acceptable for women to report and seek treatment for depression as opposed to men (Brownhill *et al.*, 2005). Based on these constructed social roles, gender differences in depression may follow that men may experience the same frequency of depression; however the

symptoms of depression are expressed differently in accordance with the prescribed social and gender norms (ibid.). In other words, the male version of depression may be regulated by the particular cultural or societal norms of masculinity which may entail, for example, acting out through behaviours that tend to be aggressive and destructive, violent or concealing underlying emotions. Alternatively the symptoms of depression may be overlooked in men relative to women, in whom symptoms of depression seem (to the observer) as more obvious and even expected (ibid.). In other words, observers may expect depression in women yet not in men (ibid.).

Then there is also the consideration of the gender difference in male and female offspring (Ohannessian *et al.*, 2005). For instance, depending on the particular social, political or cultural context, female offspring may be raised and supported to focus more on relationships relative to their male counterparts (ibid.) Ohannessian *et al.* (2005) suggest that male offspring may be sheltered from potential family conflict through rewarding them for emotionally withdrawing. However, even in light of these sentiments, Ohannessian *et al.* (2005) found that paternal depression was constantly positively associated with adolescent depression and did not find a difference in the gender of the offspring and parental psycholopathology.

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2.3.4. The South African Context

Some aetiology research of depression has been conducted in South Africa in order to confirm or refute international findings or to expand on such claims, however it has been suggested that additional research is necessary (Stein *et al.*, 2008). The SASH dataset provides a meaningful and timeous opportunity for exploring mental health based on the social-political milieu within which the data for this survey was collected. The data was collected consequent to the time when South Africa's infant democracy came into effect which had followed a history of socio-political violence and legislative subjugation. This context has provided valuable information in understanding the mental health of South African citizens through a nationally representative study.

2.3.5. Contexts of parent's psychopathology

There are many contributing factors involved in the development of psychopathologies in childhood. These may potentially originate from all or any family members as well as the interaction between these contributory factors (Darling & Steinberg, 1993; Ungar, 2009; Williams *et al.*, 2009; Wood *et al.*, 2003). It may then stand to reason that the protective factors may also take on any form (individual family member, socio-cultural factors; parenting traits) stemming from the child's environment. The maternal – child or even the paternal – child relationship could function as a

protective factor for the maladaptive influences of the alternate parent – child relationship. In other words, the maternal contributions may protect against the detrimental effects of the paternal influences and the paternal influences may protect against the destructive maternal factors.

Furthermore, considering the significant impact that maternal pathology has had on the psychological development of children may suggest that the protective effects of the paternal or alternate caregiver may be equally as significant. The father or alternate parent could potentially shield the child from the possible detrimental influences of maternal depression, over control or lack of care. These protective qualities may be expressed in terms of high care and warmth, decreased depressive symptomotology and low in excessive control.

Parental styles however do not operate in isolation (Gray & Steinberg, 1999; Unger, 2009). These contextual factors may include the societal or environmental influences such as neighbourhood violence, living in an impoverished community or even living in a rural / urban setting as well as the political milieu. Contexts may also include more direct influences such as family socioeconomic status, marital status, family structure (nuclear family or extended family) or cultural variations. The context in which the family was residing was significant as Ungar (2009) suggested that over protective parenting in an environment which was low risk and relatively safe may have more negative than positive consequences. Alternatively however over protective parenting in an environment which was high risk may be considered as advantageous. Effective and appropriate parenting needs to be considered within the environment as well as socio-political context and be adaptive to variations (Fonagy, 2001). The literature has suggested that parental contributions may not be sufficient in accounting for the developmental process of childhood depression as more significant contributing factors could lie within the child's temperament or the interaction thereof with parenting qualities (Williams *et al.*, 1990) or even that demographic identities such as gender and cultural factors may contribute more significance than acknowledged (Finkelstein *et al.*, 2001)

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2.3.5.1. Demographic Influences and Contextual Factors

The literature has suggested that other factors may be significant contributors in accounting for depression in children. These have included cultural backgrounds (Darling & Steinberg, 1993; Muris *et al.*, 2006;) temperament (Williams *et al.*, 1990), age and divorce status (Stein *et al.*, 2008) as well as the changes over time between the interactional effects of parental influences, environmental factors and even child temperaments (Darling & Steinberg, 1993; Williams *et al.*, 1990). The association between socioeconomic status and depression has been long established (Patel &

Kleinman, 2003). Similarly the risk for depression consequent to unemployment has also been considered as a significant contributing factor (Montgomery *et al.*, 1999). Education, or rather lower levels of education have also been associated with depression in the literature (Patel & Kleinman, 2003).

In conclusion, this literature review has intended to demonstrate why depression warranted additional research with specific reference to the growing burden of disease of depression in South Africa. Furthermore, parental influences were suggested as a set of plausible risk factors for depression through considering the different parenting styles (authoritarian and authoritative) and the underlying themes of parental care and parental overprotection and how these umbrella constructs contain various specific concepts that relate to childhood depression and resilience. These included control and care with the influences of control being highlighted as a potential main cause within the context of other parental factors. Additional parental factors may also include parental depression, although more specifically as stemming from maternal influences with the suggestion that the father may function as a buffer should he not suffer from any maladaptive behaviours or psychopathology. Furthermore, the importance of contextual factors warranted consideration in investigating depression as parental influences in isolation may not be sufficient in accounting for depression. These contextual factors had a wide range however may have included various demographic, cultural, societal or even political factors. Lastly the significance of the SASH has been highlighted considering the need for research in mental health in South Africa as well as the need to explore mental health consequent to a history of prejudice and trauma experienced in South Africa.

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3. METHODS

3.1. Characteristics and Participants

The South African Stress and Health (SASH) survey was a unique and significant investigation carried out within a South African context (Haro *et al.*, 2006; Kessler & Üstün, 2004; Stein *et al.*, 2008; Tomlinson *et al.*, 2009; Williams *et al.*, 2004). The reasons being that (1) the SASH was the first nationally representative survey to have been conducted in a South African context for psychiatric disorders thus contributing much needed epidemiological data on psychiatric disorders in South Africa. (2) The SASH was conducted during a significant political and social period in South Africa's history. Data was collected from January 2002 until June 2004 – a period that represented a post-apartheid, newly acquired democratic constitution. (3) The SASH was a World Health Initiative that aimed to provide a more substantial body of knowledge from a South African perspective that was able to share methods and compare results in a global context thus contributing to a world-wide base of knowledge. This information may then have been able to add to a global understanding of community as well as individual level social and economic-patterns of health and ill-health. Additionally, the sample base was a community and not clinical sample base which improves the generalizability of the results (4) The World Health Organization Composite International Diagnostic Interview version 3.0 (WHO CIDI) was used as the measurement instrument for SASH which was a comprehensive and extensive instrument used for collecting data on not only psychiatric disorders, but demographic statistics and psycho-social estimates. The WHO CIDI has numerous strengths including good reliability and validity results, considers the prevalence of psychiatric disorders and allows measurement of severity of these disorders. Furthermore, the CIDI's classification systems was structured based on the DSM-IV and ICD-10 classification systems (Haro *et al.*, 2006; Kessler & Üstün, 2004; Stein *et al.*, 2008; Tomlinson *et al.*, 2009; Williams *et al.*, 2004).

For this current report, the information taken from the SASH dataset includes 3036 participants' data (out of the original 4351 participants) (Stein *et al.*, 2008). These participants were aged between 18 and 92 years, included Black, White, Coloured and Asian / Indian population groups, resided in rural and urban areas (including hostel-dwellers), had varying education and income levels. Interviews were available in 7 different languages including English, Afrikaans, Zulu, Xhosa, Northern and Southern Sotho and Tswana. The WHO CIDI 3.0 was administered using trained lay-persons. These interviewers were trained together during the course of one week. The interviews lasted approximately between 2 - 3 ½ hours. Each participant was required to provide their

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informed consent in order to participate. Certain interviews, based on the extended duration, may have been conducted over the course of more than one session (Stein *et al.*, 2008).

3.2. Sampling Methods

The SASH was a face-to-face survey consisting exclusively of South African citizens. Both residential and hostel-dwellers were included although those participants belonging to the military and / or to institutions were excluded (Stein *et al.*, 2008, pp.112). The inclusion of hostel-dwellers was used to "maximise the coverage of young working men" (Stein *et al.*, 2008). A three level probability sampling procedure was applied. The first stage followed a primary area selection which was based on guidelines from the South African Census of Enumeration Areas (EAs) as well as similar structures as found in the UK and USA. Sample sizes for this stage were proportionate to the corresponding population size (Stein *et al.*, 2008; Tomlinson *et al.*, 2009).

The next sampling phase was based on a randomly selected process which incorporated residential units from each primary area as selected from stage 1 (Stein *et al.*, 2008). These residential units included both households and hostels. Sample selection here used methods based on equality. The last or third stage selected a random interviewee from each of the stage 2 residential units all of which were of equal size. This last stage involved using the Kish procedure which ensured that individual respondents were selected objectively and at random (Stein *et al.*, 2008). If the selected individual interviewee refused participation, an alternate randomly selected substitute would have been drawn from the EA listing for that particular area (i.e. another residential unit and subsequent randomly selected individual would have been included). Initially 5089 individuals were selected however with an 87.1% response rate 4433 completed interviews were attained of which 4351 were included for the final analysis as based on quality controlled exclusions (85.5% were retained out of the 87.1% response rate) (Stein *et al.*, 2008; Tomlinson *et al.*, 2009).

3.3. Measurement Instrument (WHO CIDI)

The measurement instrument used in the SASH survey was the fully structured World Health Organization (WHO) Composite International Diagnostic Interview (CIDI) version 3.0 administered by trained lay persons. The CIDI was initially developed as a measure of psychiatric disorders which structured its classification system in accordance with the DSM-IV and ICD-10 systems. This

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instrument has been validated as a reliable and trusted measure of psychiatric disorders (Haro *et al.*, 2004; Kessler & Üstün, 2004; Romera *et al.*, 2002, Tacchini, 1994; Wittchen, 1994). Not only was the CIDI designed to measure psychiatric data in an accurate, meaningful and transactional format, but has also been found to be a reliable and valid measure of mood disorders and has also been found to be a valid and reliable measure of data from a culturally diverse population (Haro, *et al.*, 2004; Kessler & Üstün, 2004; Romera *et al.*, 2002; Tacchini *et al.*, 1994; Wittchen, 1994; www.hcp.med.harvard.edu/wmhcidi/index.php). The application of the CIDI in South African context was therefore appropriate in order to validly record data from a culturally and historically diverse population in South Africa. Researchers and theorists have suggested that understanding the cultural and social contexts of psychopathological outcomes was of prime importance as consideration of these contributing and dynamic influences played a vital role in understanding the pathology with specific reference to the context of parenting styles and mood disorders in both parents and their children (Darling & Steinberg, 1993; Ungar, 2009). Lastly, the section of the CIDI which measured childhood influences used a modified version of the Parental Bonding Instrument (PBI) which had received good validity and reliability reports thus further contributing to the authenticity and generalizability of the results from the CIDI (Wilhelm & Parker, 1990; Wilhelm *et al.*, 2005).

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3.4. Measurement Variables

3.4.1. DSM-IV Defined Major Depressive Disorder (MDD)[3] – Outcome variable

Depression has not only been described as a significant health burden but has also been described as a rapidly increasing health risk (http://www.who.int/mental_health/management/depression/definition/en/). With the WHO sentiments of '*there can be no health without mental health*' (Prince *et al.*, 2007), investigating depression may be considered a top priority in health research. Similarly in a South African context, with a prevalence of lifetime depression in South Africa (during the period for 2002 until 2004) being as high as 9.7% and considering that 90% of those individuals who had reported depression had global impairment (Tomlinson *et al.*, 2009) and with few epidemiologic studies which can describe and expand more efficiently on this area (Stein *et al.*, 2008; Tomlinson *et al.*, 2009) conducting

[3] The DSM-IV version of MDD has been used in this report. Table 1 and 2 in the Appendix display the criteria for Major Depressive Episode and Major Depressive Disorder (recurrent) quoted directly from the DSM-IV (4th Ed.).

research into depression seems a valid endeavour. Furthermore, following South Africa's history of prejudice, violence and legislative discrimination the effects of mental anguish have been a significant and necessary area of inquiry and concern (Hirschowitz & Orkin, 1997; Ngcobo & Pillay, 2008;). A substantial proportion of South Africans have suffered and most likely have continued to suffer from at least one type of mental ailment, the proportion of which has been estimated as high as 38% (ibid.).

Using the lifetime version of Major Depressive Disorder seemed an appropriate choice as based on the potential for childhood experiences to have an impact on one's adult life (Chiariello & Orvasche, 1995; Heaven & Ciarrochi, 2006; Ge et. al., 1996; Patton *et al.*, 2001; Poulton *et al.*, 2002; Smith *et al.*, 1998;). The focus of this report was whether childhood influences may have been a valid method of understanding and explaining depression in adulthood (18 years and older)[4]. The use of 12-month or 30-day versions of depression may have restricted the analysis to the particular year or month of depression and may have therefore excluded the influences that childhood experiences may have on adult experiences. Furthermore, MDD- lifetime also demonstrated the highest prevalence, relative to both 12-month and 30-day (Table 1) depression which may have contributed to increasing the statistical power of the analysis by increasing the sample size.

Table 1: Prevalence of Major Depression Disorder (lifetime, 12 months & 30 days)

	MDD LIFETIME	MDD 12 months	MDD 30 days
YES	9.91	4.71	1.67
NO	90.09	95.29	98.33

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3.4.2. Five perceived parenting traits (PPT's) – independent variables

The premise of this report was that parental control experienced by children may have functioned as a meaningful risk factor in the development of childhood depression. The concept of control in parenting styles and its association with depression has been explored in the literature (Barbar, 1996; Biggam & Power, 1996; Brennan *et al.*, 2003; Gray & Steinberg, 1999; Rapmund & Moore, 2000; Stein *et al.*, 2000; Ungar, 2009; Van Leeuwen *et al.*, 2004; Wood *et al.*, 2003). The influence of control on the development and progression of depression was however far more complex than simply stating that only control may have instigated depression and that rather parental control within the context of other parenting qualities was more appropriate.

[4] This report did not seek to explore the 'age of onset' of depression and incorporated the assumption that depression may occur throughout the participant's lifetime and whether parental influences could significantly and sufficiently account for the experience of depression throughout this life-course.

The literature suggested that there were two broad parenting styles that contributed towards a psychopathological outcome. These included parental overprotection (control) and parental care (Biggam & Power, 1996; Parker, 1981, 1983; Roe & Siegelman, 1963). The variables measured in the CIDI that were assumed to have best estimated these parental qualities included love & affection, closeness and inhibition, monitoring and strictness. These variables in the CIDI formed part of the section which measured childhood experiences which used the modified version of the Parental Bonding Instrument (PBI). The Parental Bonding Instrument was intended to assess participants in terms of their experience of parental care and overprotection (Parker, 1990). The assumption made in this report was that strictness, monitoring and inhibition represented the construct of overprotection (control) and affection & love and closeness represented the overall theme of care. These measures were also the perception of the participants of their childhoods and not the direct measures of the parents themselves.

Table 2 below shows these variables as well as the items that represented each variable which were presented in the interview. Each question pertains to a particular parenting trait which, for the purpose of being concise, has been renamed by its most representative theme. For example, the question "how much effort did she/ he put into watching over you and making sure you had a good upbringing" was represented in this report as "monitoring". Affection & love represented the perception of the participant as to how much love and affection they received from their mother and father whilst growing up. Similarly, closeness represented how emotionally close the participant perceived they were with their mother / father during their childhood. Monitoring referred to the extent to which the participant's mother and father watched over them during childhood to ensure they had a good upbringing. Strictness related how strict the mother / father was with her / his rules during childhood and inhibition referred to whether the participant perceived their parents as having prevented them from doing things that their similar aged cohorts were doing at a similar time during childhood.

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Table 2: List of Constructs and SASH ITEM / QUESTION

PPT Construct	SASH ITEM / QUESTION
Affection & love	How much love and affection did she give you?
Closeness	How emotionally close were you with her while you were growing up – very close, somewhat close not very close, or not at all?
Depression	During the years you were growing up, did (man who raised R) ever have periods lasting 2 weeks or more where he was sad or depressed most of the time?
Monitoring	How much effort did she put into watching over you and making sure you had a good upbringing?

Inhibition	How much did she stop you from doing the things that other kids your age were allowed to do?
Strictness	How strict was she with her rules for you?

3.4.3. Parental Depression

Parental depression has received a significant and substantial body of support from past literature (Brennan *et al.*, 2002; Lieb *et al.*, 2002; Weissman *et al.*, 1997) which implied that an investigation of risk factors for depression could not have excluded parental depression as a potential risk factor. The tendency in the literature has been to place a far greater emphasis on maternal depression and its consequences relative to the effects of the father (Rapmund & Moore, 2000). Although this may have some validity, as Downy & Coyne (1990) have suggested, there could be additional contextual factors that are ultimately better suited in explaining this association. Other research has suggested however that depression experienced by either parent has developmental and adjustment consequences for their children (Downey & Coyne, 1990; Lieb, *et al.*, 2002). Parental depression as used in this report was the participant's perception of whether or not either of their parents experienced depression during the participant's childhood and was defined by assessing whether the mother or father had had periods lasting two or more weeks of sadness or depression.

3.4.4. Demographic Variables

The South Africa population has endured a history of trauma and discrimination that has included both racial, gender, political and social prejudices (Hirschowitz & Orkin, 1997; Stein *et al.*, 2008) however without sufficient data, the true effects and implications of this history may not be fully acknowledged, understood or resolved (Williams *et al.*, 2004). In order to more fully comprehend these more often than not traumatic effects and patterns of social-political and economic inequalities in health, racial categories[5] have been included with the intention that such description may have elucidated these patterns. Furthermore, although a vast amount of research has been conducted regarding mood disorders and its association with parental styles, these associations have not been fully explored in such a nationally representative design within a South African context. The SASH dataset has provided a methodologically sound opportunity for exploring mental health and potential underlying patterns of inequality in accordance with racial divides and prejudice where

[5] This report does however acknowledge the debate and sensitive nature of using racial categories where the suggestion is that the continued use of such categories only functions to maintain and extend these patterns of inequality.

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the patterns of mental ill health have corresponded with racial divides (Ngcobo & Pillay, 2008; Williams *et al.*, 2004).

Financial demographics as well as employment status have both been associated with depression in past literature (Downey & Coyne, 1990; Montgomery, *et al.,* 1999; Ngcobo & Pillay, 2008; Rodriguez *et al.*, 2001; Stankunas *et al.*, 2006;). Some theorists have argued that in fact the direction of this association followed that depression was the causal factor in creating unemployment or financial disadvantage however Montgomery *et al.* (1999) have suggested that in fact unemployment predated depression even in individuals without a history of poor psychological functioning.

Female gender has had an extensive association with depression where even in the recent investigation from the SASH dataset, females relative to males were at a considerably higher risk for depression (Ngcobo & Pillay, 2008; Tomlinson *et al.*, 2009; Stein *et al.*, 2008). Education level (Patel & Kleinman, 2003) and marital status (Ross & Mirowsky, 1989) have been associated with depression. The literature has suggested that education would function as a protective factor against depression where the higher the education status, the smaller the risk of depression (Patel & Kleinman, 2003), similarly, marital status was interpreted as a proxy measure of social support where a lack of social support has been associated with depression as a risk factor. Other demographic variables included the standard measures of age and education.

The demographic variables were assessed as categorical variables. Age was represented through four categories including 18 – 24yrs, 25 – 44 yrs, 45 – 64 yrs and 65+. Racial categories included black, white, coloured and Asian/ Indian. Education was coded in terms of five groups including none, grade 1 – 7, grade 8 – 11, grade 12 and grade 13+. Family income was used as a proxy measure for financial resources. Although the participants' income ranged between R0 and R3mil/yr, only four categories were included in order to make the analysis more succinct. These categories were as follows: R0 – R9999; R10000 – R49999, R50000 – R99999 and ≥ R100000[6].

3.5. Statistical Analysis

[6] The sample was weighted much more heavily for a family income level below the R10000 mark and thus the highest category cut off was deemed reasonable at R100000.

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All statistical analyses were carried out using the statistical software package STATA® version 10. The Microsoft word program "excel" was additionally used to generate two graphs.

3.5.1. Missing Data (refer Appendix C)

There appeared no underlying patterns for missing data thus suggesting that any missing data was based on chance as there appeared no difference in the patterns of distribution for the missing data or the original dataset for all measured variables. For this reason, the missing data was removed from the dataset.

3.5.2. Data Management

The data entry points were captured and coded, data entry was carried out in South Africa where upon the raw results were cleaned by the University of Michigan, Harvard University (Williams *et al.*, 2004). Family income was re-coded into four categories which was intended to simplify the analysis and consequent interpretation as well as assist in improving the power by increasing the sample size for each analysis. Parental variables were re-coded into binary responses (1/0) as opposed to the format they were originally presented in during the interview. In other words, for affection, monitoring, inhibition and strictness, the response options provided for participants included "a lot – some – a little – not at all – don't know – refused". For close the options included "very – somewhat – not very – not at all – don't know and refused". A positive response was represented by the first positive option response only – i.e. "a lot" and "very" represented a positive response (1) whilst the remaining responses (including don't know and refused to answer) represented a negative response (0).

Parental depression followed the same process as for the five perceived parental traits and was regrouped into the format of a binary response (1/0) where the options in the CIDI included "yes – no – don't know – refused to answer". A positive response (1) was only represented by "yes" whereas the remaining options of no –don't know – refused to answer were grouped as a negative response (0).

The reason for recoding these response variables in a binary format was to firstly help in increasing the sample size as well as attempting to make the analysis and interpretation simpler. Having used

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as many as 5 – 6 parental variables, the sample size was decreased quite dramatically for each variable, consequently by combining the responses into only two groups would have resulted in increasing the sample size for each group / analysis and subsequently the power of the statistical tests.

In order to manage the complex survey design, the responses were weighted for individual-level results in order to adjust for "differential probabilities of selection within households, differential non-response and residual discrepancies" (Stein *et al.*, 2008, pp.113). In order to apply the appropriate weight an outline of the corresponding geographical and demographic samples were used (weights represented the corresponding population proportions) (Stein *et al.*, 2008). This was managed by using the set of survey commands available in STATA®. These commands enabled the user to incorporate any complex design that has been used in the data collection. For the SASH, the design was incorporated for using cluster sampling and for each sampling stage the probability weights were applied and incorporated into the STATA® SVY programming.

The original dataset included 4351 participants, however based on the independent variables selected and the removal of missing data, the remaining data sample for analysis included 3036 observations. The data was assessed for bivariate and multivariate analysis using descriptive statistics and logistic regression.

Generally, non-parametric tests were applied based on the nature of the data which was non-normally distributed. These statistical analyses for descriptive statistics included tabulations and Chi^2 tests of association (testing two categorical variables). All p-values were assessed within a 95% confidence interval. Linear relations were tested using Pearson Chi^2 tests as the correlations were between non-parametric (non-normally distributed data). Additionally histograms in STATA® were generated and Microsoft Excel was used to generate two graphs.

For the multivariate analyses, in order to predict the risk of depression (a binary outcome) from a number of independent variables (i.e. whether the independent binary variables were in fact able to predict significant risk for depression) regression analysis was used. The logistic version of regression was used as the outcome variable was binary. Factorial logistic regression was used as a number of the independent variables had more than one level (education, family income, age and race). Lastly a model building process was also used in order to determine the best fit of independent variables to explain a change in depression.

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For the factorial logistic regression, crude models were created for each independent variable in order to assess the validity of an association with individual single variables and depression (i.e. age and depression or maternal strictness and depression). These produced unadjusted odds ratios for each of the single variable models. A second batch of models were constructed which adjusted for the demographic variables in order to ascertain any variation in risk between the influence of demographics alone or demographics and PPT's. This also alluded to the possibility of whether the inclusion of additional variables changed the direction of the risk for depression. In other words, the risk for depression produced by a particular variable may have changed within the context of other variables (either demographic or all variables).

The third stage of this process was to create a model which adjusted for all variables and therefore included all demographics and PPTs in order to assess the impact of each variable within the context of all other variables. The last model (fourth version) similarly adjusted for all variables however additionally included anxiety. The reason for producing these four types of models was to ascertain any potential differences in how the variables were confounded or may have functioned as confounders themselves. By only including anxiety in one of the models, the impact of anxiety was made apparent. (Please refer Table 8 for all these results.)

The model building process (please refer Appendix D) included four basic models: two sets which included anxiety and two which did not as well as 2 models which forced maternal strictness and two sets which did not force any variables into the process. This process had to be carried out without the SVY set of commands as the logistic function in model building process does not operate within the SVY set of commands in STATA®.

The first stage of the model building process was to find the single variable model (model with only one independent variable included) which generated the lowest AIC (Akaike's Information Criterion). Once this model had been selected, the next stage of comparing two nested models continued. Here the likelihood ratio test was conducted and the model which had the largest reduction in AIC was considered the best fitted model. This process then progressed to selecting additional variables until the inclusion of an additional variable no longer improved the AIC.

For this model building process all variables were included, although anxiety was only included for two versions (one which forced maternal strictness into the model from the start of the process and

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one which did not force any variable). The intention of this report was to assess the impact that maternal control had on depression. The variable used by proxy to represent control – maternal strictness – was consequently forced into this model building process in order to ostensibly test this proposition (please refer the Appendix D for further details).

4. RESULTS

4.1. Demographics Characteristics

10% of participants were classified with MDD. Approximately 55% were females relative to 45% males. Family income ranged between R0 per year and > R100000 per year. The vast majority (49%) of participants earned < R10000 per year. Approximately ⅓ of this sample group earned between R10000 and R50 000 per year with only 21% earning above R100 000 per year. 61% of participants lived in an urban setting relative to the 39% who lived in a rural setting. 74% participants were black, 12% were coloured, 10% were white and 4% were Asian / Indian. Just under 50% participants were aged 25 – 44 years with only approximately 6% participants aged 65+ years. Just over half of the participants were married (52%) relative to the 48% who were unmarried. 68% participants were unemployed with only 32% employed. 35% participants had grade 8 – 12 education[7] level, 7% had no education; 19% had grade 1 – 7, 23% had grade 12 or Matric and 17% with tertiary level education.

4.2. Distributions

4.2.1. Distribution of Major Depressive Disorder by demographics

Participants with MDD had 32% males relative to 68% females (Table 3). For those without MDD, 46.43% were male relative to 53.57% female. For the racial / ethnic groups, marital status, family income and employment status the patterns of distributions for both MDD and no MDD as well as the overall patterns were relatively similar. This may suggest that in fact there may be no significant association between these demographic variables and MDD. Age categories did show some variation as did education level, although only for certain levels. For those with MDD, there were 15% participants aged 18 – 24; 53% aged 25 – 44years; 29% were aged 45 – 64 years and 4% were aged 65+ years. For those without MDD, 21% were 18 – 24 yrs; 48% were 25 – 44 yrs, 25% were 45 – 64 yrs and 6% were 65+ yrs. The overall patterns resembled the proportions for participants without MDD. Education level showed that the largest difference was for grades 1 – 7. 29% of participants with MDD had grade 1 – 7% whereas for those participants without MDD only 18% had grades 1 – 7. Although only slightly varied, this discrepancy may hint towards an association between education level and depression.

[7] Education (as referred to under the discussion for missing variables) had a decreased number of observations with 2994 (missing variables) relative to 3036 observations used for this analysis.

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Table 3: Distribution (%) of MDD by demographics

	MDD – NO	MDD – YES	OVERALL DEMOGRAPHICS %
GENDER			
Male	46	32	**45**
Female	54	68	**55**
RACE / ETHNICITY			
Black	74	73	**74**
Coloured	12	13	**12**
White	10	10	**10**
Asian / Indian	4	5.	**4**
AGE CATEGORIES			
18 – 24 years	21	15	**21**
25 - 44 years	48	53	**48**
45 - 64 years	25	29	**25**
65+ years	6	4	**6**
EDUCATION LEVEL			
None	7	5	**7**
Grade 1 – 7	18	29	**19**
Grade 8 – 11	35	32	**35**
Grade 12	23	22	**23**
Grade 13+	16	13	**16**
MARITAL STATUS			
Married	52	51	**52**
Unmarried	48	49	**48**
EMPLOYMENT STATUS			
Employed	33	31	**33**
Unemployed	67	70	**68**
FAMILY INCOME			
R0 – R9999	49	55	**49**
R10000 - R49999	20	18	**20**
R50000 - R99999	11	9	**11**
≥ 100000	21	18	**21**

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4.2.2. Distribution of demographics by MDD

Similar to the distribution patterns generated for participants with and without MDD, the patterns for the demographic variables similarly followed the overall distribution pattern of 80% versus 20% (Table 4-5). The vast majority of participants did not have MDD (±80%) relative to ±20% who did. For example, the female population was represented by 12% with MDD relative to the 88% who did not have MDD. Males however had 7% with MDD relative to the 93% without MDD. This pattern was repeated for all demographic variables. The demographic with the largest percentage of MDD relative to the other demographics, was education grade 1 – 7 with 15% relative to the 85% who did not have MDD. In terms of the distribution patterns within the demographic variables, there did not seem any differentiating patterns, although perhaps for education grades 1 - 7.

Table 4: Distribution of demographics by MDD %

	Gender		Education Level					Age Category				Employment Status	
	Females	Males	None	1-7	8-11	12	13+	18-24	25-44	45-64	65+	Employed	Not employed
MDD YES	12	7	6	15	9	9	8	7	11	11	6	9	10
MDD NO	88	93	94	85	91	91	92	93	89	89	94	91	90
TOTALS	55	45	7	19	35	23	16	21	48	25	6	33	68

Table 5: Distribution of demographics by MDD % - CONTINUED

	Marital Status		Family Income				Racial / Ethnic categories			
	Married	Unmarried	R0-R9999	R10000-R49999	R50000-R99999	>=100000	Black	Coloured	White	Asian/Indian
MDD YES	10	10	11	9	9	8	10	10	9	14
MDD NO	90	90	89	91	91	91	90	90	91	86
TOTALS	52	48	49	20	11	21	74	12	10	4

4.2.3. Distribution of PPT's and Parental Depression by MDD

The distribution pattern for the PPT's was relatively similar as with the demographic variables (Table 6). For most of the PPT's the pattern seemed similar between those with the PPT relative to those without, except with paternal affection. For those participants who perceived that their fathers did *not* demonstrate their affection and love during their childhood, had the highest percentage of MDD, as compared to the other demographic variables, with 21% relative to the 79% of participants who did not have MDD and did not perceive paternal affection & love. This difference was only evident for the absence of paternal affection, as with the presence of paternal affection; the usual pattern of 10% with MDD relative to 90% without MDD was evident.

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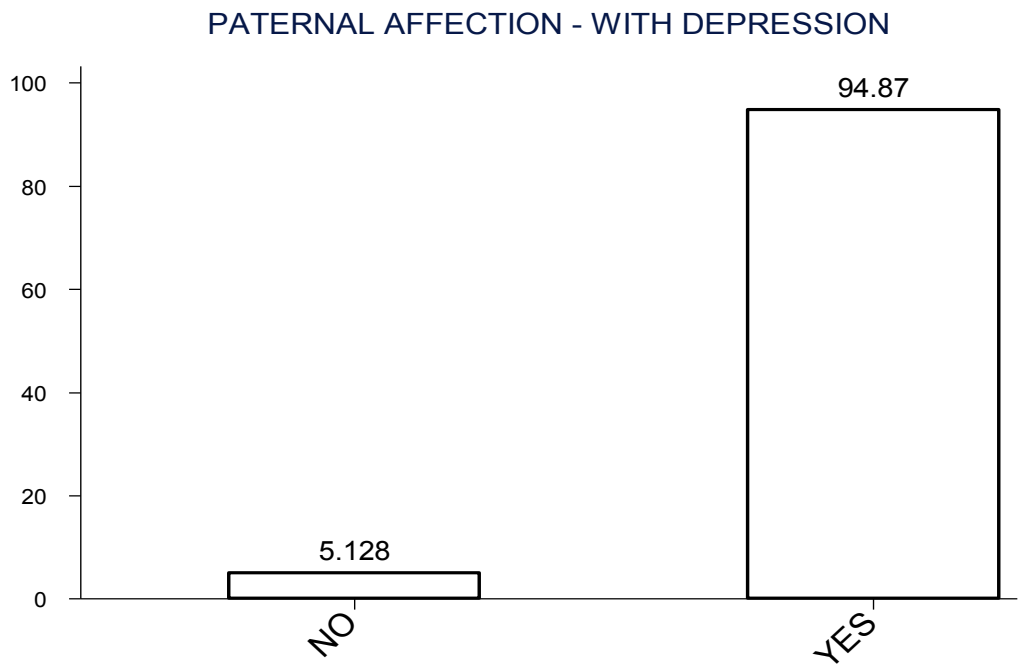
Figure 3: Distribution of Paternal Affection in Depressed Participants



The only other PPT which seemed to indicate any difference was depression (both maternal and paternal). For participants who perceived their mothers as having depression, 14.33% had MDD relative to the 85.67% who did not. For participants who considered their fathers as having depression, 19.89% had MDD relative to 83.11% who did not have MDD.

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Table 6: Distribution of PPT's by MDD (%)

	MATERNAL											
	Affection		**Close**		**Depression**		**Monitoring**		**Inhibition**		**Strictness**	
	Y	N	**Y**	**N**	**Y**	**N**	**Y**	**N**	**Y**	**N**	**Y**	**N**
MDD YES	10	13	10	10	14	10	10	10	11	9	10	9
MDD NO	90	87	90	90	86	90	90	90	90	91	90	91
Total present / Not present	**91**	**9**	**83**	**17**	**6**	**94**	**87**	**13**	**51**	**50**	**67**	**33**
	PATERNAL											
	Affection		**Close**		**Depression**		**Monitoring**		**Inhibition**		**Strictness**	
	Y	**N**	**Y**	**N**	**Y**	**N**	Y	N	**Y**	**N**	**Y**	**N**
MDD YES	10	21	10	10	17	10	10	10	11	9	10	9
MDD NO	90	79	90	90	83	91	90	91	89	91	90	91
Total present / Not present	**98**	**2**	**61**	**39**	**6**	**95**	**71**	**30**	**50**	**50**	**70**	**30**

Figure 4: Distribution of Maternal Depression in Depressed Participants

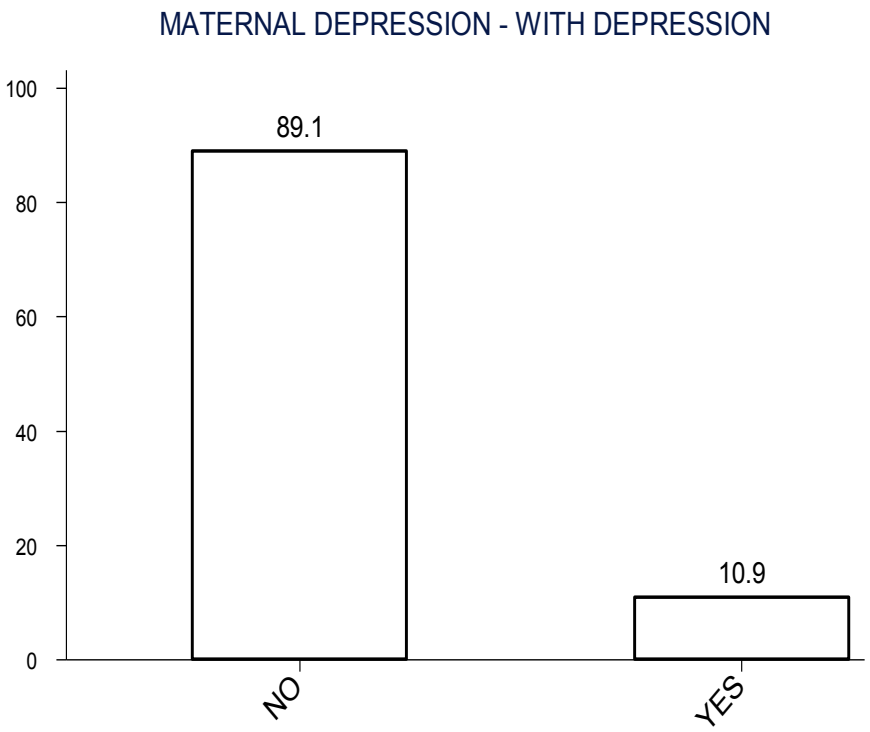
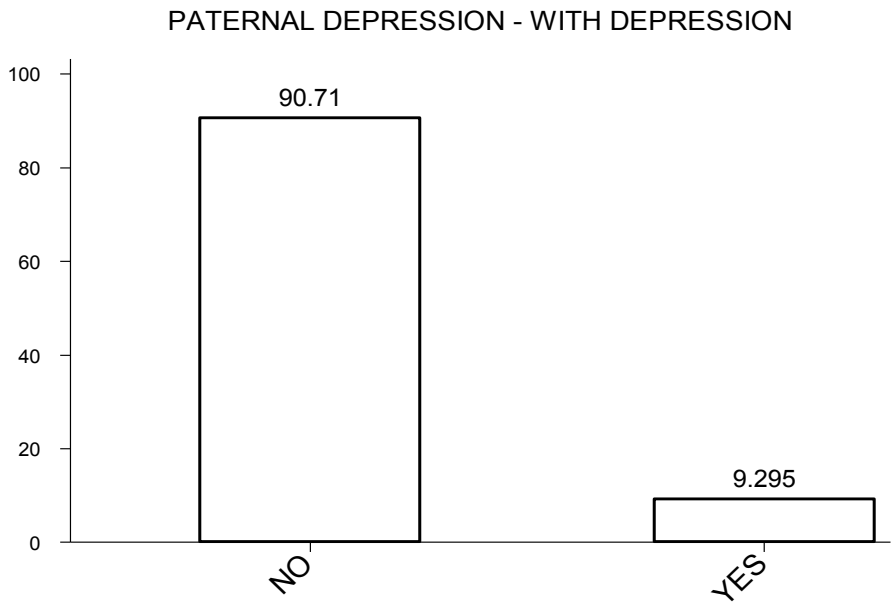


Figure 5: Distribution of Paternal Depression in Depressed Participants



For the remaining PPT's (maternal affection, closeness, inhibition, monitoring and strictness as well as paternal closeness, inhibition, monitoring and strictness) the general distributions resembled a similar pattern as with the demographics however instead of the 20% versus 80% distribution, a 10% versus 90% pattern was shown. For these variables, the differences between those participants with and without the particular trait seemed unapparent.

4.2.4. Overall Distributions of Perceived Parental Traits and Depression

Of the overall distributions paternal affection stands out with the largest difference with 98% of participants who perceived paternal affection & love relative to the 2% who did not (Table 5). The only other patterns which displayed a potentially marked difference were for paternal and maternal depression. For mothers 6% were perceived as having depression relative to 94% who were perceived as not. Similarly for the father, 6% were perceived as with depression relative to the 95% who were perceived as not.

Most noteworthy, inhibition showed relatively no differences between those who perceived their parents as inhibiting their behaviour or not inhibiting their behaviour. This is based on the ratio which was 50%:50% for fathers and 51%:50% for mothers.

The remaining overall distributions demonstrated the same patterns with generally 70% of PPTs present relative to the 30% PPTs absent.

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4.3. Bivariate Analyses

4.3.1. Associations and Correlations

The only significant associations with MDD (**Table 7 and Table 8**) were between age categories (*p=0.01*), education (*p=0.006*), paternal affection (*p=0.004*) and paternal depression (*p=0.008*) which was also demonstrated in the distributions above.

Table 7: Association between Demographics and MDD (Pearson's Chi2)

GENDER	0.002
RACE / ETHNICITY	0.682
AGE CATEGORIES	0.01
EDUCATION LEVEL	0.006
MARITAL STATUS	0.779
EMPLOYMENT STATUS	0.623
FAMILY INCOME	0.326

Table 8: Association between PPT's and MDD (Pearson's Chi2)

Maternal Affection	0.089	**Paternal Affection**	0.004
Maternal Close	0.739	**Paternal Close**	0.669
Maternal Depression	0.061	**Paternal Depression**	0.008
Maternal Monitoring	0.834	**Paternal Monitoring**	0.736
Maternal Inhibition	0.383	**Paternal Inhibition**	0.373
Maternal Strictness	0.367	**Paternal Strictness**	0.431

4.4. Multivariate Analyses

4.4.1. Influence of demographics

Racial / ethnic categories were not significant in explaining the experience of depression in the single-variable analysis as well as in the adjusted models (Table 9). Marriage was consistently not significant in any versions of the adjusted models. Family income (Table 9), although not significant in any version of the models, showed a clear and distinct pattern indicating that the high levels of income were certainly protective against having depression relative to having / earning less than R10000/year. The difference in the magnitude of the OR's between the financial categories did not seem to increase dramatically. The risk for depression in earning more than R100,000.00 per year was only 0.76 (0.52, 1.12, *p*=0.150) relative to 0.78 (0.53-1.17p=0.226). Similarly for the various adjustments, this OR did not seem to vary greatly. 21% odds of not having depression if you earn R10,000 – R49,999 per year relative to earning less than R10,000 per year whilst adjusting for all other variables as well as anxiety. Interestingly, earning between R50,000 – R99,999 per year was the most protective earning bracket, relative to earning less than R10000/year and compared to earning more than R100000/year.

Age categories showed that overall (Table 9), it was not significant in explaining depression (OR: 1.09, CI 95%: 0.96; 1.24, *p*=0.160), however assessing the levels of age, participants aged 25 – 44 yrs relative to participants aged 18 – 24 yrs had an OR 1.64 (CI 95% 1.16 – 2.31, *p*=0.006) as well as 45 – 64 yrs with an OR 1.2 (CI 95%: 1.25 – 2.3) *p*=0.001. Being in the category 65+ was protective with an OR 0.89 (CI: 95% 0.43 – 1.84, *p*=0.741) although was not statistically significant. This pattern remained consistent throughout the adjusted models with only small variations.

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Although the pattern for employment indicated that being employed was protective against depression, these results were not statistically significant even when adjusted for demographics, all variables as well as all variables including anxiety. Only one level of education (grade 1 – 7) was statistically significant whilst the underlying pattern indicated that all levels of education relative to having no education was a risk for depression (Table 9).

As expected, there was a gender discrepancy and a strong association between gender and depression as males had an OR 0.55 (CI95%: 0.38, 0.81, *p*=0.002) relative to females for depression (without adjusting for other variables). This OR remained relatively the same even when adjusting for the other variables although the most variation occurred when adjusting for anxiety where males had a 28% (CI95%: 58%, 9%, *p*=0.015) odds of not having depression relative to females.

Anxiety showed a strong ability to account for the development of depression even when adjusting for all other variables. As a crude model, the presence of anxiety had 8.67 OR (CI: 5.33, 14.10, *p=0.000*), when adjusting for demographic variables. This OR decreased to 8.07 (CI: 4.8, 13.56, p=0.000) and remained statistically significant, thus indicating that demographics do in fact account for some of variation in depression. When adjusting for all variables including the PPT's again anxiety was significant and demonstrated a high risk (OR: 7.69, CI: 4.51, 13.09, *p*=0.00), although again, the PPT's did account for some variation in depression.

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4.4.2. Influence of PPT's

Out of all the PPT's the only traits that showed any statistical significance was paternal affection and paternal depression. Paternal depression showed a risk factor whereas paternal affection was protective factor. If you perceived your father to be depressed, you had 1.94 (CI: 1.19, 3.15) odds of having depression which was statistically significant (*p=0.009*). Adjusting for the demographic variables, perceived paternal depression increased in risk (OR: 1.99 CI: 1.20, 3.28, p=0.008), thus indicating that demographics, relative to this parenting trait, were not able to explain a great deal of variation in depression. When including the other PPT's, no change was seen. Adjusting for participant's anxiety decreased some of the risk of paternal depression (OR: 1.76, CI: 0.97, 3.21, p=0.062). This statistic however was not significant at the 5% CI level. By increasing the margin for change, this statistic may be considered significant however this may indicate that the role of anxiety in this process was far more complex.

Paternal affection was protective and significant at all levels of adjustment, although with each additional adjustment, the OR did decrease in risk although not by a large amount (Table 8). The crude risk indicated that paternal affection had 60% odds of not having depression relative to no paternal affection; the model of parental affection adjusted for demographics had 63% odds of not having depression relative to no parental affection. Parental affection adjusted for demographics and PPTs had 66% odds of not having depression relative to no paternal affection and lastly parental affection adjusted for all variables including anxiety had 65% odds of not having depression relative to paternal affection.

Parental strictness, monitoring and inhibition were risk factors although no results were significant for any of the models (Table 9). Furthermore, maternal strictness was neither selected into the model building process as a significant variable in predicting depression, as when maternal strictness was forced into the model, it remained non significant, but also did not affect or change the variables selected into the model for the best fit for depression (please refer Appendix D).

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Table 9: OR's for Demographic and Perceived Parental Traits and Major Depressive Disorder

		Models 1[a]		Models 2[b]		Models 3[c]		Models 4[d]	
	Total N	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Race/Ethnicity									
Black – 1	2,227	1.00 (Reference)		1.00		1.00		1.00	
Coloured – 2	432	1.07 (0.76; 1.52)	0.685	1.08 (0.74; 1.59)	0.676	1.03 (0.69; 1.53)	0.883	0.93 (0.62; 1.40)	0.728
White – 3	262	0.96 (0.44; 2.09)	0.916	1.33 (0.56; 3.15)	0.515	1.25 (0.52; 2.97)	0.612	1.15 (0.49; 2.72)	0.748
Asian Indian - 4	115	1.54 (0.75; 3.13)	0.234	1.67 (0.84; 3.31)	0.141	1.69 (0.82; 3.50)	0.152	1.65 (0.8; 3.42)	0.172
Marriage									
Not Married – 0	1,472	1.00		1.00		1.00		1.00	
Married – 1	1,564	0.97 (0.75; 1.24)	0.779	0.79 (0.60; 1.03)	0.082	0.78 (0.6; 1.03)	0.076	0.80 (0.61; 1.06)	0.123
Age Categories									
18 – 24 (1)	596	1.00		1.00		1.00		1.00	
25 – 44 (2)	1508	1.64 (1.16; 2.31)	0.006	1.68 (1.18; 2.39)	0.005	1.73 (1.23; 2.43)	0.002	1.54 (1.11; 2.14)	0.010
45 – 64 (3)	745	1.7 (1.25; 2.3)	0.001	1.55 (1.09; 2.20)	0.015	1.63 (1.14; 2.33)	0.008	1.38 (0.98; 1.93)	0.064
65+ (4)	187	0.89 (0.43; 1.84)	0.741	0.79 (0.36; 1.70)	0.537	0.81 (0.36; 1.81)	0.607	0.66 (0.28; 1.52)	0.322
Finance									
1R0 – R9999		1.00		1.00		1.00		1.00	
2 R10000 – R49999		0.78 (0.53; 1.17)	0.226	0.83 (0.54; 1.29)	0.404	0.84 (0.54; 1.3)	0.421	0.79 (0.52; 1.2)	0.254
3 R50000 – R99999		0.77 (0.46; 1.27)	0.295	0.78 (0.49; 1.25)	0.299	0.8 (0.48; 1.21)	0.239	0.67 (0.40; 1.10)	0.113
4 ≥ R100000		0.76 (0.52; 1.12)	0.150	0.78 (0.53; 1.15)	0.203	0.76 (0.51; 1.13)	0.173	0.77 (0.52; 1.14)	0.189
Employment									
Not Employed – 0	2,073	1.00		1.00		1.00		1.00	
Employed – 1	963	0.90 (0.59; 1.37)	0.624	0.96 (0.65; 1.42)	0.846	0.97 (0.51; 1.13)	0.872	0.998 (0.68; 1.47)	0.990
Education									
None (1)	235	1.00		1.00		1.00		1.00	
Grade 1 – 7 (2)	627	2.56 (1.21; 5.37)	0.014	2.29 (1.08; 4.84)	0.031	2.34 (1.12; 4.89)	0.025	2.18 (1.01; 4.71)	0.046
Grade 8 – 11 (3)	1026	1.51 (0.76; 2.97)	0.232	1.34 (0.66; 2.73)	0.406	1.33 (0.66; 2.67)	0.418	1.29 (0.61; 2.72)	0.502
Grade 12 (4)	642	1.52 (0.71; 3.22)	0.274	1.39 (0.62; 3.1)	0.417	1.37 (0.63; 2.99)	0.424	1.43 (0.63; 3.24)	0.392
Grade 13+ (5)	464	1.29 (0.57; 2.91)	0.531	1.16 (0.48; 2.79)	0.736	1.18 (0.49; 2.84)	0.716	1.26 (0.51; 3.10)	0.617
Gender									
Female – 0	1,829	1.00		1.00		1.00		1.00	
Male – 1	1,207	0.55 (0.38; 0.8)	0.002	0.57 (0.39; 0.84)	0.004	0.58 (0.40; 0.84)	0.004	0.62 (0.42; 0.91)	0.015
Anxiety (GAD[e]) lifetime									
No – 0	2912	1.00		1.00		--	--	1.00	
Yes – 1	124	8.67 (5.33; 14.10)	0.000	8.07 (4.8; 13.56)	0.000	--	--	7.69 (4.51; 13.09)	0.000
Paternal Depression									

No – 0	2,875	1.00		1.00		1.00		1.00	
Yes – 1	161	1.94 (1.19; 3.15)	0.009	1.99 (1.20; 3.28)	0.008	1.99 (1.16; 3.41)	0.014	1.76 (0.97; 3.2)	0.062
Maternal Depression									
No – 0	2,854	1.00		1.00		1.00		1.00	
Yes – 1	182	1.57 (0.98; 2.54)	0.063	1.51 (0.92; 2.50)	0.104	1.23 (0.73; 2.06)	0.439	1.05 (0.58; 1.88)	0.877
Paternal Affection									
No – 0	70	1.00		1.00		1.00		1.00	
Yes – 1	2,966	0.40 (0.22; 0.75)	0.005	0.37 (0.19; 0.71)	0.004	0.34 (0.19; 0.62)	0.001	0.35 (0.18; 0.68)	0.002
Maternal Affection									
No – 0	265	1.00		1.00		1.00		1.00	
Yes – 1	2,771	0.7 (0.46; 1.06)	0.090	0.74 (0.47; 1.17)	0.191	0.69 (0.40; 1.17)	0.163	0.64 (0.39; 1.06)	0.084
Paternal Monitoring									
No – 0	872	1.00		1.00		1.00		1.00	
Yes – 1	2,164	1.06 (0.75; 1.49)	0.736	1.05 (0.72; 1.54)	0.786	1.11 (0.69; 1.78)	0.678	1.09 (0.67; 1.77)	0.735
Maternal monitoring									
No – 0	393	1.00		1.00		1.00		1.00	
Yes – 1	2,643	1.04 (0.7; 1.56)	0.834	1.13 (0.76; 1.69)	0.542	1.43 (0.85; 2.38)	0.172	1.46 (0.87; 2.44)	0.145
Maternal Close									
No – 0	521	1.00		1.00		1.00		1.00	
Yes – 1	2,515	0.93 (0.61; 1.42)	0.739	0.89 (0.58; 1.37)	0.583	0.94 (0.59; 1.50)	0.806	0.98 (0.63; 1.52)	0.911
Paternal Close									
No – 0	1,168	1.00		1.00		1.00		1.00	
Yes – 1	1,868	0.94 (0.72; 1.24)	0.669	0.93 (0.7; 1.23)	0.593	0.92 (0.65; 1.30)	0.633	0.96 (0.67; 1.38)	0.813
Maternal Inhibition									
No – 0	1,478	1.00		1.00		1.00		1.00	
Yes – 1	1,558	1.16 (0.83; 1.62)	0.384	1.17 (0.82; 1.68)	0.377	1.04 (0.67; 1.6)	0.870	0.97 (0.63; 1.50)	0.888
Paternal Inhibition									
No – 0	1,491	1.00		1.00		1.00		1.00	
Yes – 1	1,545	1.16 (0.83; 1.63)	0.374	1.19 (0.84; 1.69)	0.327	1.12 (0.75; 1.68)	0.566	1.16 (0.78; 1.72)	0.468
Maternal Strict									
No – 0	965	1.00		1.00		1.00		1.00	
Yes – 1	2,071	1.18 (0.82; 1.69)	0.367	1.18 (0.82; 1.70)	0.370	1.13 (0.77; 1.65)	0.529	1.16 (0.79; 1.71)	0.448
Paternal Strict									
No – 0	881	1.00		1.00		1.00		1.00	
Yes – 1	2,155	1.17 (0.79; 1.72)	0.431	1.17 (0.81; 1.7)	0.402	1.09 (0.73; 1.62)	0.680	1.06 (0.68; 1.65)	0.786

[a] Model 1 – Crude model – unadjusted – single variable models
[b] Model 2 – Adjusted for demographics
[c] Model 3 – Adjusted for all variables (demographics and PPT's)
[d] Model 4 – Adjusted for all variables (demographics and PPT's) as well as GAD
[e] GAD = General Anxiety Disorder

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4.4.3. Gender as a confounder

Considering that gender had a strong and consistent association with depression and has been considered a confounding variable, these OR's were assessed under each level (tables 9 and 10; also refer tables 22 and 23 in the Appendix E).

4.4.3.1. Female effect

As with the overall OR's for females this same pattern emerged (Table 10) which showed that only paternal depression and paternal affection were significant. No demographic variables were

significant (refer Table 22 in Appendix E). This pattern differed however for paternal depression in that adjusting for anxiety increased the risk for depression (OR: 2.02, CI: 1.11, 3.67, *p*=0.022) if the participant perceived their father was depressed. Adjusting for anxiety increased the risk for paternal depression in females and was statistically significant (OR: 2.02, CI: 1.11, 3.67, *p=0.022*).

Paternal affection was still significant in females and was protective against the development of depression (OR: 0.30 (CI: 0.14, 0.62, *p=0.002*) and remained the same even after having adjusted for anxiety (OR: 0.31 (CI: 0.14, 0.68, *p=0.004*).

Table 10: OR's for Perceived Parental Traits and Major Depressive Disorder FOR FEMALES

		Without Anxiety[1]		With anxiety[2]	
Risk Variables	N	OR (95% CI)	P-value	OR (95% CI)	P-value
Paternal Depression	1829				
No – 0	1732	1.00		1.00	
Yes – 1	97	1.91 (1.10; 3.32)	0.022	2.02 (1.11; 3.67)	0.022
Maternal Depression	1829				
No – 0	1713	1.00		1.00	
Yes – 1	116	1.39 (0.78; 2.51)	0.261	1.07 (0.55; 2.08)	0.850
Paternal Affection	1829				
No – 0	45	1.00		1.00	
Yes – 1	1784	0.3 (0.14; 0.62)	0.002	0.31 (0.14; 0.68)	0.004
Maternal Affection	1829				
No – 0	164	1.00		1.00	
Yes – 1	1665	0.61 (0.32; 1.17)	0.132	0.56 (0.3; 1.04)	0.066
Paternal Monitoring	1829				
No – 0	529	1.00		1.00	
Yes – 1	1300	1.23 (0.72; 2.10)	0.434	1.22 (0.7; 2.12)	0.481
Maternal monitoring	1829				
No – 0	232	1.00		1.00	
Yes – 1	1597	1.60 (0.85; 2.99)	0.144	1.72 (0.92; 3.21)	0.090
Maternal Close	1829				
No – 0	280	1.00		1.00	
Yes – 1	1549	1.12 (0.66; 1.9)	0.679	1.14 (0.7; 1.86)	0.605
Paternal Close	1829				
No – 0	734	1.00		1.00	
Yes – 1	1095	0.83 (0.57; 1.2)	0.309	0.88 (0.61; 1.28)	0.509
Maternal Inhibition	1829				
No – 0	875	1.00		1.00	
Yes – 1	954	1.04 (0.63; 1.74)	0.866	0.99 (0.58; 1.68)	0.965
Paternal Inhibition	1829				
No – 0	900	1.00		1.00	
Yes – 1	929	1.22 (0.71; 2.10)	0.473	1.21 (0.69; 2.11)	0.501
Maternal Strict	1829				
No – 0	555	1.00		1.00	
Yes – 1	1274	1.15 (0.73; 1.81)	0.547	1.18 (0.73; 1.89)	0.498

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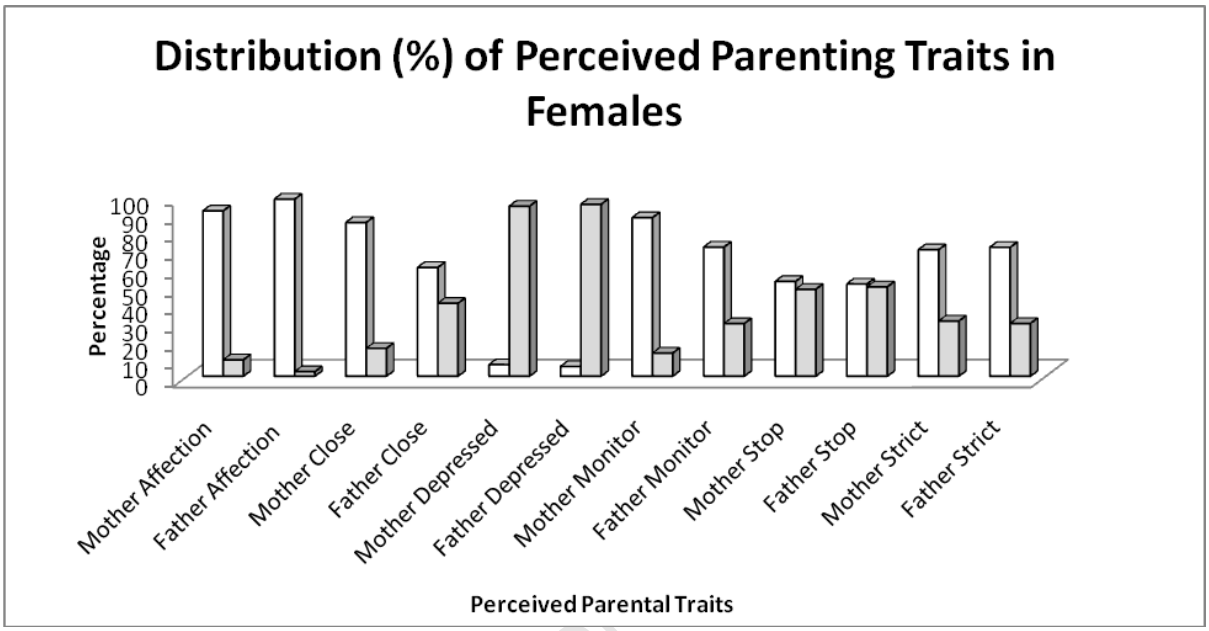
Paternal Strict	1829				
No – 0	531	1.00		1.00	
Yes – 1	1298	0.84 (0.55; 1.29)	0.427	0.85 (0.54; 1.34)	0.468

[1] Adjusted for all variables
[2] Adjusted for all variables

Figure 6: Distributions of PPT's in Females



4.4.3.2. Male effect

Significantly, there were ***no*** significant OR's for males (refer Table 11 below and Table 23 in Appendix E). There were however interesting underlying patterns. For example males who perceived their father's as strict, had 1.93 odds of having depression, even after having adjusted for all other PPT's and demographics. Adjusted for anxiety, this risk remained high, although reduced. This OR was the only OR vaguely close to being significant *p=0.09* (CI: 0.09, 4.15).

Table 11: OR's for Perceived Parental Traits and Major Depressive Disorder FOR MALES

		Without Anxiety[1]		With Anxiety[2]	
Risk Variables	N	OR (95% CI)	P-value	OR (95% CI)	P-value
Paternal Depression	1207				
No – 0	1143	1.00		1.00	
Yes – 1	64	2.05 (0.78; 5.35)	0.141	1.25 (0.46; 3.43)	0.658
Maternal Depression	1207				
No – 0	1141	1.00		1.00	
Yes – 1	66	0.79 (0.3; 2.12)	0.641	0.87 (0.35; 2.16)	0.756
Paternal Affection	1207				

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No – 0	25	1.00		1.00	
Yes – 1	1182	0.46 (0.13; 1.64)	0.227	0.47 (0.14; 1.59)	0.218
Maternal Affection	1207				
No - 0	101	1.00		1.00	
Yes – 1	1106	0.77 (0.30; 1.97)	0.577	0.79 (0.31; 2.01)	0.619
Paternal Monitoring	1207				
No - 0	343	1.00		1.00	
Yes – 1	865	0.90 (0.45; 1.82)	0.766	0.89 (0.43; 1.83)	0.748
Maternal monitoring	1207				
No - 0	161	1.00		1.00	
Yes – 1	1046	1.003 (0.49; 2.05)	0.993	0.92 (0.44; 1.92)	0.817
Maternal Close	1207				
No - 0	241	1.00		1.00	
Yes – 1	966	0.75 (0.35; 1.63)	0.463	0.80 (0.35; 1.84)	0.599
Paternal Close	1207				
No - 0	434	1.00		1.00	
Yes – 1	773	1.23 (0.62; 2.43)	0.555	1.14 (0.57; 2.31)	0.704
Maternal Inhibtion	1207				
No - 0	603	1.00		1.00	
Yes – 1	604	1.12 (0.59; 2.12)	0.733	1.02 (0.55; 1.89)	0.954
Paternal Inhibtion	1207				
No - 0	591	1.00		1.00	
Yes – 1	616	0.94 (0.49; 1.79)	0.845	1.03 (0.55; 1.92)	0.935
Maternal Strict	1207				
No - 0	410	1.00		1.00	
Yes – 1	797	1.02 (0.54; 1.95)	0.946	1.09 (0.58; 2.06)	0.782
Paternal Strict	1207				
No - 0	350	1.00		1.00	
Yes – 1	857	1.93 (0.9; 4.15)	0.090	1.76 (0.8; 3.88)	0.160

[1] Adjusted for all variables
[2] Adjusted for all variables

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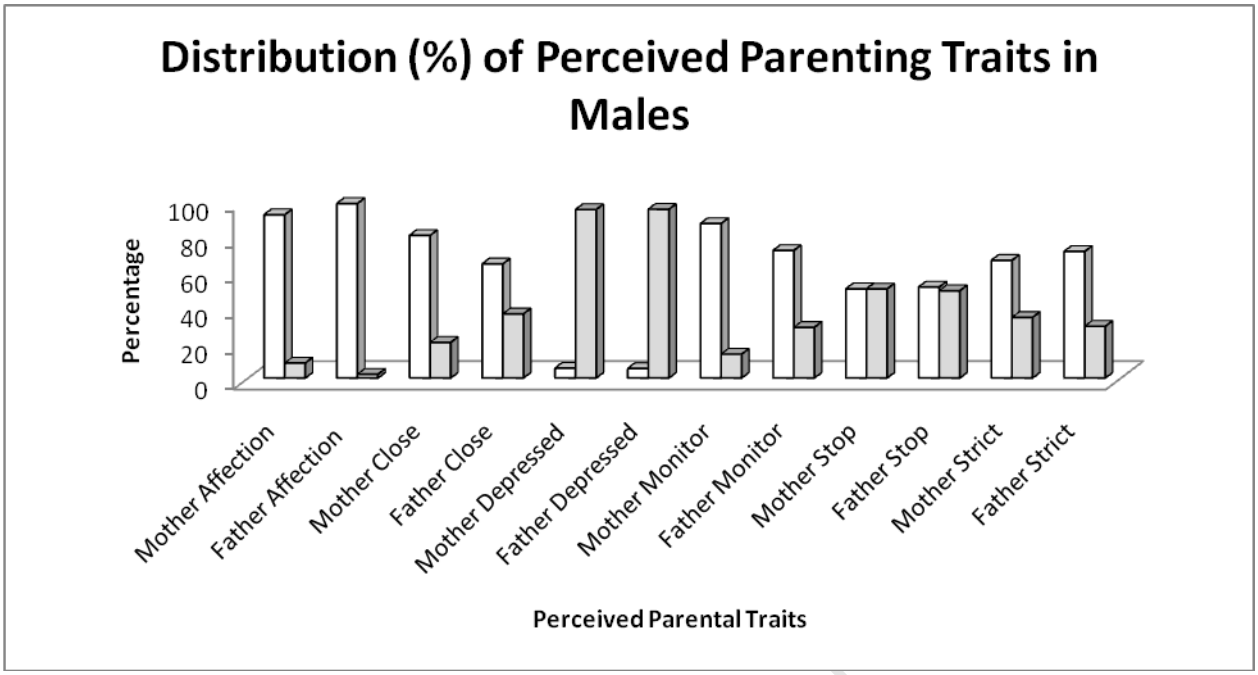
Figure 7: Distribution of PPT's in Males



4.5. The Model Building Process

Even through the model building process, the significance of paternal qualities was demonstrated. For all models, paternal affection was selected as well as paternal monitoring and paternal depression. Gender was also consistently significant in all models and was usually the first to be selected, even when anxiety was included. Although maternal depression was included in all models, this variable was never statistically significant. Gender, anxiety, paternal affection and paternal depression were all significant in all models. Additionally what was interesting was the featuring of the demographic variables of education, age and family income. These variables were selected into some of the models, however were not consistently significant. All four models were significant although most of the variables in each were not significant themselves (please refer Appendix D).

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5. DISCUSSION

5.1. Summary

Three main themes were generated through this report and represented the three main associations. These include:

- parental care and childhood depression
- parental overprotection and childhood depression
- parental depression and childhood depression

As discussed in the literature review, overprotection has been used in this report to represent an umbrella concept which may include particular styles or qualities of parenting such as control and overt discipline. This concept was intended to be representative of Baumrind's authoritarian parenting style. Similarly, parental care has been constructed to be generally representative of Baumrind's authoritative style and the underlying theme of parental care. Depression (usually discussed as maternal) has been widely reported and documented as a risk factor for childhood depression and could therefore not be excluded. Additionally, a sub-theme of the differences between maternal and paternal influences emerged through these results as well.

One of the most interesting and noteworthy results of this report was that maternal depression did not feature consistently or at times significantly in accounting for depression relative to paternal depression and the remaining PPT's. This finding contradicts the vast majority of the literature which supported the effects that maternal depression had on children, yet in this report the most predominant influence has been that of the paternal qualities. Furthermore, the parental quality which seemed to best explain the presence of depression was in fact paternal affection which was protective against depression. Although these results both support and contradict past literature, they should be interpreted within the specific context and design of this report (the limitations have been discussed towards the end of this paper).

One of the main premises of this report was that (in accordance with the literature) maternal influences, especially strictness or the broader concept of over protection, would be a strong and significant factor in explaining the presence of depression. The expectation being that the maternal qualities of over protection would predominate in being a risk factor for depression where there was

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the possibility that paternal influences may function as a protective factor. The results however have demonstrated that control did not feature as a significant risk for depression, even having adjusted for parental care. Furthermore, the paternal effects seemed to be more significant than the maternal factors in that the parental qualities of the father seemed to have been more significant in accounting for depression than that of the mother. Lastly, affection proved in this report to be significant and strong in explaining depression relative to other parental qualities including parental depression.

5.2. Parental Overprotection

The main objective of this investigation was to confirm the association between maternal overprotection (as represented by maternal strictness, monitoring and inhibition) and the presence of depression in children. This was not confirmed or qualified through these results in any way or form. Throughout the analysis strictness, monitoring and inhibition were not but once significant in accounting for depression, either by mothers or by fathers.

For strictness, monitoring and inhibition, most of these OR's were moderate to weak in strength and none were significant even after adjusting for all variables including anxiety. The largest risk was found for maternal monitoring (OR: 1.43, CI: 0.85;2.38, *p=0.172)* which was adjusted for all variables as well as when adjusted for all variables including anxiety (OR: 1.46, CI:0.87;2.44, *p= 0.145*). All other risks were bordering on or close to a null value where the highest strength was for paternal inhibition with 1.19 (CI: 0.84;1.69, *p=0.327*). Furthermore, there was no consistent pattern throughout the various stages of adjustment for these variables. Even though there were numerous increases and decreases in risk, such variations may be considered as negligible due to their small and amounts and random patterns. Additionally, the model building process only selected paternal monitoring into the model, even when forcing maternal strictness into the model (please refer Appendix D). Furthermore, although paternal monitoring was selected into all 4 models, none of these OR's were significant. By forcing maternal strictness into the model process did not affect the remaining variables. Paternal affection and paternal depression remained significant.

A possible explanation could be that these variables were not true representations of the constructs of overprotection and could therefore not have explained the presence of depression accurately. Another possible explanation could be that these variables were in fact accurate representations of over-protection and simply did not explain depression significantly. Another possibility may have

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been that even though these factors were accurate representations of a particular parenting style, they did not actually represent over protection which has been associated with depression in the literature. In other words, the factors were accurate in measuring strictness, monitoring and inhibition however these constructs did not in fact represent overprotection as discussed in the literature. Another possibility that these results were not significant may be due to a statistical possibility in that for each category of PPT the sample base was relatively small and reduced the power of the analysis. Perhaps with a more appropriately sized sample base, a more significant pattern could emerge, however the strength of these OR's may attest to the possibility that in fact these constructs are not truly associated with explaining depression.

Another possible explanation may have been that the control assumed to have been measured through these variables was in fact behavioural control and not psychological control and therefore was not a risk factor for depression. Strictness was in reference to the rules applied by the parents for the child. This may in effect not refer to control in its strictest form as intended by the past literature and therefore did not represent the control generally associated with depression.

From a social or community perspective, another explanation may in the form of cultural or community differences in the way in which these measurements were interpreted by the participants of the SASH survey. There was a possibility that in South Africa's rich and diverse cultural climate overprotection may not have been viewed in the same manner as it was in other countries from which the vast literature had originated. A South African context may have implied that, even though the questionnaire was translated into various and appropriate languages, South Africans interpreted the meanings differently relative to what has been previously and extensively researched from other communities. Variations may also exist within the different communities within the South African setting which may also contribute towards skewing the results as certain groups have favoured particular parenting qualities in explaining depression over and above other parental qualities. For example, strictness may in fact have been interpreted as a protective factor in certain communities.

These cultural differences have not been accurately or extensively considered in this report as such investigations were beyond the scope of this research. Although these social differences may have added their weight in producing inconsistent and confusing results, the actual OR's were in fact risks and not protective. Furthermore, when maternal strictness was adjusted for the remaining PPT's,

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its OR did in fact decrease thus perhaps suggesting the remaining variables of parental qualities were in fact better suited in accounting for the presence of depression.

5.3. Parental Care

As discussed in the literature review, Baumrind's parental style of authoritarian parenting has been widely associated with functional and well adapted children. Research suggested that the parenting style and behaviour most often associated with functional childhood development was parental care. The results from this current report confirmed this finding. In fact this finding proved to be the predominant factor in accounting for depression in the SASH dataset. What was interesting however, was that parental care, which proved most significant and strong in explaining the presence of depression, originated from the father and not from the mother. This was to say that statistically paternal care was consistently significant in accounting for the presence of depression relative to both maternal care as well as depression stemming from either parent.

In this report, parental care was measured by proxy through the constructs of 'closeness' and 'affection & love'. In the model building process, paternal affection was consistently selected and significant in all four models thus demonstrating the potentially meaningful influence this variable may have on depression even within the context of other parenting qualities (please refer Appendix D). Paternal closeness however was not selected into any of the models. Furthermore, for all versions of the adjusted regression models (Table 8), closeness (from either parent) did not yield significant results and was not particularly strong although the pattern did demonstrate a protective effect against depression. For affection however, quite the opposite was true. For each of the versions of the regression models, affection from the father was significant and relatively strong as ranging from the crude model 0.40 (CI: 0.22; 0.75, *p=0.005*) to demographic adjusted model 0.37 (CI: 0.19; 0.71, *p=0.004*) to adjusted for all variables model 0.34 (CI: 0.19; 0.62, *p=0.001*) and even adjusted for all variables including anxiety model 0.35 (CI: 0.18; 0.68, *p=0.002*). All risks were relatively strong and significant.

This pattern was also one of the few that demonstrated a relatively clear, consistent and easily interpreted progression through the various models of adjustment. On the other hand, the patterns of adjustment from each model of the remaining variables (including strictness, inhibition and monitoring), were not consistent and yielded small, practically negligible changes in risk – most likely explained as 'noise'.

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It was perhaps relatively odd that the construct of affection & love would be interpreted somewhat differently to how closeness may have been understood as seen in the difference in significance values for these OR's. Although both were considered as protective against depression, closeness was not significant and was neither particularly strong in its effect. These two concepts may seem relatively similarly or at the very least were expected to have had a similar effect in explaining depression. Both concepts were considered to be equally representative of the overarching theme of parental care yet it was plausible that the difference in significance and strength of these variables may have attested to the slight nuances in interpretation for similar yet qualitatively varied constructs. Perhaps the participants regarded closeness as referring to the separate concept of familiarity between parent and child as opposed to feeling cared for. In other words, closeness represented how similar the participants understood themselves to be with their parents.

Perhaps the difference in interpretation attested to a 'real' difference in that affection & love was far more valid in explaining depression than was parental care. Should these results have represented the actual truth, this may be interpreted as having suggested that one could potentially experience and receive affection and love from one's parent without feeling close to them and still enjoy the benefits of being protected against depression. This difference may then warrant further investigation in order to better understand the subtleties of the affectionate and loving bond between parent and child that functions to protect against childhood maladjustments and in so doing attempt to understand the actual mechanism of what the child experiences that functions as a protective and even preventative factor in the development of depression.

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5.4. Parental Depression

The literature has very clearly and consistently stated that parental depression has been a potent risk factor for the development of depression in children. The results of this report confirm these findings with perhaps one distinct difference. The literature has usually shown that maternal depression has demonstrated a profound effect on depression in children, however in this report, it has rather been the results referring to the father that have proven most significant and strong. Even though maternal depression was consistently selected into all four of the models in the model building process, this variable was never statistically significant (please refer Appendix D). Paternal depression however was consistently selected and significant in all four models (although perhaps not at exactly the 95% confidence level).

Maternal depression was not significant when adjusting for all variables in the regression analysis with an unadjusted OR of 1.23 (CI: 0.73; 2.06, *p=0.439*) or when adjusting for all variables and anxiety 1.05 (CI: 0.58; 1.88, *p=0.877*). Adjusting for anxiety seemed to account for depression more than maternal depression, although this exact mechanism requires additional research.

Paternal depression relative to all the measured PPTs was not only strong but also significant not only in the model building process (please refer Appendix D), but also in the regression analysis (OR: 1.99, (CI: 1.16; 3.41, *p=0.014*). This pattern confirmed the literature in the sense that depression functioned as a strong risk factor for the presence of depression in children. The existing literature comprised a comprehensive supply of theory and explanations as to why depression from a parent would be such a strong and significant risk factor – a discussion of which was truly beyond the space of this report. The main objective however has been to compare how parental depression functions in the context of other potential risk factors. This report has confirmed the literature demonstrating that indeed parental depression, even within the context of other parenting factors, was a consistent and significant risk for the presence of depression in children.

5.5. Differences in paternal and maternal effects

As suggested from the literature, maternal depression and pathological behaviours appeared to be a main instigator in producing or aggravating pathologies in children. The general consensus being that maternal depression had been widely reported and investigated as a strong and valid risk factor for depression. The literature has suggested that in terms of valid risk factors for depression, the main influence of parental depression would stem from the mother whilst the father's contributions may be viewed as secondary factors that function to buffer the effects of the mother (if the father did not have any psychopathologies) or to exacerbate the effects of the maternal depression (should the father have psychopathologies).

The reason why these results have been unexpected was that the maternal influences were not significant or particularly strong in explaining the presence of depression. This was not in line with what the literature has suggested. This report has rather demonstrated both support and contradiction of the past literature in that the effects of maternal depression have been non-significant (contradiction) whereas this report confirms the protective influence of the father through paternal affection.

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Furthermore, the strength of the OR for paternal depression (OR: 1.99, (CI: 1.16; 3.41, *p=0.014*) unadjusted for anxiety and 1.76 (CI: 0.97; 3.2, *p=0.062*) adjusted for anxiety) appeared greater than for maternal depression (OR: 1.23, (CI: 0.73; 2.06, *p=0.439)* unadjusted for anxiety and 1.05 (CI: 0.58; 1.88, *p=0.877*) adjusted for anxiety). The increased strength in effect was also found for affection where the father's influences (OR: 0.34* (CI: 0.19; 0.62, *p=0.001)*) seemed greater than maternal effects (OR: 0.69* (CI: 0.40; 1.17, *p=0.163*)). A potential explanation may have been that for this particular sample group the results represented the actual effects in that the father had a more profound influence on the participants than did their mothers with regard to depression. Perhaps fathers were viewed as the more stable and comforting parental figure and therefore provided more comfort and protection than the mothers. Consequently, when the father's were depressed, the children may not have had a reliable source to buffer this effect.

Alternatively, the social constructions of a father (husband or male role) relative to that of a mother (wife or female role) may have accounted for these varying perceptions of the participants in that children may have viewed father's depression as more devastating as males were not supposed to express vulnerabilities or sadness relative to females from whom these characteristics may have been acceptable. This potential difference in social / gender roles could have been linked to the gender bias in the epidemiology of depression where the rates of depression in women appeared to be much higher and more profound relative to the rates in men.

Another possible explanation may have been that it was more acceptable for women to seek professional advice and treatment for mental ailments relative to men. This may then have entailed that women who were depressed sought help which in effect reduced the negative consequences of their psychopathologies. For men however who may not have even admitted to suffering from depression, it may not have been likely that they would seek treatment. This may have implied that their pathology at best remained constant and at worst increased. The negative impact on children may then have increased thus explaining the increased risk of paternal depression.

These differences however may have also been explained through a gender effect of the participants' themselves in that there were differences between how female participants responded relative to their male counterparts with regard to their interpretation of parental effects (for a more detailed discussion please refer *Gender Effects* below).

* Unadjusted for anxiety

* Unadjusted for anxiety

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Another possible explanation may be based on how the families in the sample base were structured. Family structure however was not measured as an additional variable and therefore it may have potentially skewed the results. Families in this sample group may have been structured in a non-nuclear manner in which the father or mother was absent, inconsistent or unavailable. Furthermore, the caregivers of these participants may not have been the biological mothers or fathers and may have been substitute caregivers. These results may have been indicative of non-nuclear family structures which may have an alternative set of theories explaining attachment and parental influences for depression. This may suggest that the usual understanding of maternal depression cannot be applied to this context.

Perhaps if one assumed that the mother was the main caregiver with an absentee father, the children may have favoured and idealised the father and thus perceived the father's input as more meaningful and more comforting than their mothers input. In other words, the mother's care or depression was taken for granted whereas the father's input was considered as rare and idealized and thus valued over the mother's qualities.

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5.6. Gender Effects

Gender was consistent and significant throughout the report in accounting for the presence of depression both in terms of the regression analysis as well as the model building process (please refer Appendix D). Gender was selected into the model building process even within the context of anxiety and proved to be consistently significant and strong (refer Appendix D). Overall females had a 45% (CI: 62%; 20%, *p=0.002*) probability of having depression relative to males. This ratio was consistent when adjusting for demographics as well as all the PPT's. This may have indicated that gender had a strong independent association with depression and its influences cannot be readily explained by the PPT's. Even adjusting for anxiety, the risk did not change by much which followed that females had a 38% (CI: 58%; 8%, *p=0.015*) probability of having depression relative to males.

The association between gender and depression has previously been alluded to in the explanation for variation between maternal and paternal qualities. The explanation followed the social constructions of gender roles in that females may have been viewed as more likely to suffer from depression relative to men. Depression in females may then have been recognised, diagnosed and treated with increased frequency as compared to men. This has been a persistent and global

phenomenon and therefore it was necessary to 'factor' out this (more than likely) confounding factor. Please refer tables 16 – 17 for a full set of these results.

5.6.1. Gender Effect: Affection

For both males and females the pattern between maternal and paternal influences was similar in that both were protective yet the only significant risks were produced for females and their father's affection. For females, paternal affection reflected the results in the main body of this report in that paternal affection was a strong and significant factor in explaining the presence of depression in females (0.30 (CI:0.14;0.62, *p=0.002*)) even after adjusting for anxiety the risk was not changed by much (0.31 (CI:0.14;0.68, *p=0.004*)). This may have indicated that for females, the presence of anxiety did not diminish the protective effects of paternal affection on depression. In males however the effect of paternal affection was not significant.

All other risks were not significant. The father's influence for affection in both males and females was stronger than for mother's affection in both males and females, however overall for females, the strength of the risk for both mothers and fathers was stronger than for males. Please refer table below.

Table 12: Gender Effect for Affection & Love

	Without anxiety	With anxiety
	Males	
Father:	0.46 p = 0.227	0.47 p = 0.218
Mother:	0.77 p = 0.577	0.79 p = 0.619
	Females	
Father:	0.3 p = 0.002	0.31 p = 0.004
Mother:	0.61 p = 0.132	0.56 p = 0.066

Reasons for this could be that for females, the impact of paternal affection may have been more profound and meaningful than for males – however this could be a situation of the male-defined role in society which may possibly have dictated that males should be less emotional and emotionally affected than females. This finding may be representative of the underlying cultural and gender norms that existed in South Africa at the time of the survey.

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5.6.2. Gender Effect: Strictness

Table 13: Gender Effect for Strictness

	Without anxiety	With anxiety
	Males	
Father:	1.93 p = 0.090	1.76 p = 0.160
Mother:	1.02 p = 0.946	1.09 p = 0.782
	Females	
Father:	0.84 p = 0.427	0.85 p = 0.468
Mother:	1.15 p = 0.547	1.18 p = 0.498

The strongest risk was for paternal strictness for males however after adjusting for anxiety; this risk for depression was greatly reduced. This may have implied that anxiety relative to parental strictness could account for depression in a more accurate manner – perhaps overly strict parents encouraged their children to be anxious which in turn may have initiated a depressive response. All results however for parental strictness were not significant. Interestingly, paternal strictness was protective for females, although a strong risk factor for males for depression.

Once again this may attest to gender differences as females may have viewed a strict father as protective whereas sons viewed strict fathers as detrimental. Maternal strictness did not generate particularly strong risks in either males or females; however in males the strength of risk for strict mothers was almost null relative to the impact of mother's strictness in females. It was interesting as fathers who were strict had a much stronger effect on sons than did their mothers. For daughters, however, strict fathers were protective relative to strict mothers who functioned as a risk for depression.

This could possibly be due to the variations in gender roles in a given society where sons and daughter react and respond differently to parental influences. Furthermore, as previously mentioned, strictness actually referred to the stringency of the rules and not necessarily for controlling one's identity. This could then mean that males found this tendency from their father's as negative whereas for females they interpreted this quality from their fathers as protective. As Ungar (2001) suggested that perhaps for females, this protectiveness was necessary within

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particular contexts whereas males did not interpret these same contexts as requiring protection. A common thread however, as has been repeated throughout this report, was that the influences of the father seemed to have a stronger effect than the influences of the mother. The actual reasons and underlying causes for these differences warrant additional investigation.

5.6.3. Gender Effect: Inhibition

Table 14: Gender Effect for Inhibition

	Without anxiety	With anxiety
	Males	
Father:	0.94 p = 0.845	1.03 p=0.935
Mother:	1.12 p = 0.733	1.02 p = 0.954
	Females	
Father:	1.22 p=0.473	1.21 p=0.501
Mother:	1.04 p=0.866	0.99 p=0.965

There did not appear to be any consistent pattern forming for inhibition both from the perspective of males relative to females, as well as for paternal versus maternal effects. Paternal inhibition for males was protective, however after adjusting for anxiety changed to be a risk factor (albeit practically null). For males, maternal inhibition had a small risk and was reduced even further after adjusting for anxiety. For females, paternal inhibition had a slightly stronger risk, although remaining non significant and was not reduced after adjusting for anxiety. For maternal inhibition the risk was practically null. This inconsistent pattern may underlie the possibility that parental inhibition does not have a significant or strong effect or association on the development of depression, either for males or females (although the strongest risk was between fathers and daughters). Additional research may be necessary to find plausible explanations for this pattern.

5.6.4. Gender Effect: Closeness

Table 15: Gender Effect for Closeness

	Without anxiety	With anxiety

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	Males	
Father:	1.23 p = 0.555	1.14 p = 0.704
Mother:	0.75 p = 0.463	0.80 p = 0.599
	Females	
Father:	0.83 p = 0.309	1.14 p = 0.605
Mother:	1.12 p = 0.679	0.88 p = 0.509

Interestingly before adjusting for anxiety, the difference in results between males and females seemed to be the inverse pattern between maternal and paternal closeness. For males, father's closeness was a risk whereas for females father's closeness was protective. This seemed to represent a similar pattern as found with strictness. For males, mother's closeness was protective whereas for females mother's closeness was a risk factor. Interestingly however after adjusting for anxiety, the pattern was changed to be the same between males and females. No risks were significant. This pattern may once again allude to how parent's gender roles were perceived in this sample group. The relationships between similar gender parent-child dyads yielded a risk factor for depression, however father-daughter or mother-son associations were protective, except when adjusting for anxiety. Anxiety seemed to have accounted for the risk in males and for the protectiveness in females.

Another possible explanation could have been regarding issues of dependency. Perhaps females (or males) that are 'too' close or dependent on their mothers (or fathers) and had an unhealthy attachment or bond with their mothers / fathers actually proved to be harmful and may therefore have been associated with depression.

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5.6.5. Gender Effect: Depression

Table 16: Gender Effect for Depression

	Without anxiety	With anxiety
	Males	
Father:	2.05 p = 0.141	1.25 p = 0.658
Mother:	0.79 p = 0.641	0.87 p = 0.756
	Females	

Father:	1.91 p = 0.022	2.02 p = 0.022
Mother:	1.39 p = 0.261	1.07 p = 0.850

One of the most interesting findings regarding the variations between males and females was in the varying effects between maternal depression in males relative to females. For females the effect of maternal depression produced a relatively moderate risk however this effect was reduced quite substantially after adjusting for anxiety. Yet for males, the effect of maternal depression was protective against depression. Interestingly, this effect of protectiveness was reduced after adjusting for anxiety. Possible reasons for this anomaly could be a sign of the underlying gender roles in society in South Africa. Perhaps male children believed that they needed to be strong and take care of their mothers who were suffering from depression and therefore had an opposite reaction which denounced their own emotional suffering. After taking out the effect of anxiety, this effect was reduced thus perhaps confirming that male children of depressed mothers were actually anxious or even depressed, but could not show these qualities as they perceived their roles as having to be supportive for their mothers. Another possible explanation could have been that males, in accordance with their roles as needing to be strong, independent and emotionally solid, may not have expressed their sadness or emotions accordingly. The strongest risk however (although again not significant) was for males and paternal depression. This may have accounted for the socially constructed gender roles in that male children could not bear to see their fathers as emotionally vulnerable and therefore were at an extremely high risk for depression.

For females the pattern was representative of the literature, however again only the paternal influences produced significant results relative to the maternal influences. For paternal depression, the only significant values were generated for female participants.

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5.7. Anxiety Effects

The interpretation of anxiety should be taken within the context that anxiety has been generally considered as a co-morbid condition to depression and may therefore function as more than merely a risk factor. Anxiety may also have functioned as a confounding factor that obscured the results however anxiety may also have resulted in explaining away the effect of depression as this effect may have been due to the presence of anxiety. The specific reasons for the exact effect of anxiety may be confusing however cognisance should be made to the potential effects of anxiety. Having stated as much, this report found that anxiety both increased and decreased risk and at times had

no effect. In general anxiety had a mixed effect on the results which suggests that an additional and more comprehensive explanation regarding the effect of anxiety not only as a co-morbid condition, but also as an independent risk factor for depression is needed. Interestingly, the inclusion of anxiety in the regression analysis did not alter the significance levels of the risks, it only served to increase or decrease the risk. In the model building process, anxiety was strong and significant, although did not alter the variables selected for the process which did not include anxiety.

Significantly, anxiety had relatively no impact on affection from either the mother or father and did not differ in terms of males or females. This may have implied that the strength of affection in explaining depression was not affected by anxiety and that affection was a relatively independent factor for depression compared to anxiety.

For strictness, anxiety both decreased and increased risk for males however had no effect for females. This may have indicated that for males, anxiety played a role in accounting for depression within the context of parental strictness. Further research may be needed in order to understand these variations more clearly.

Inhibition had a similar pattern for anxiety where for males; the risk for depression in terms of parental inhibition was both increased and decreased whereas for females the risk remained relatively the same. Similarly for parental closeness, anxiety seemed to have an inconsistent pattern for both males and females. Anxiety may warrant closer investigation to clarify and better understand these results.

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5.8. Demographics

Significantly, the demographic variables did not generate significant risks, except for age categories and education – however only certain levels of these variables were significant. The majority of demographics were risk factors for depression except for being married (relative to not being married) with 0.78 (0.6; 1.03, *p=0.076*); being 65+ years compared to 18 – 24 years with 0.81 (0.36; 1.81, *p=0.607*). All the family income levels compared to earning R0 were protective against depression where the greater the income the greater the protectiveness: earning R10, 000 – R49, 000 had 0.84 (0.54; 1.3, *p=0.421*); earning R50, 000 – R99, 999 had 0.8 (0.48; 1.21) p=0.239) and ≥ earning R100, 000 had 0.76 (0.51; 1.13, *p=0.173*). Although these results were not significant, it may

be interesting to note that even with such a vast increase in earnings, the protectiveness did not increase dramatically. These results however do warrant additional investigation.

6. STRENGTHS AND LIMITATIONS

One of the greatest strengths of this report was in the actual SASH survey which was a nationally representative survey design which incorporated data from across a wide, randomly selected cross section of the South African population. The SASH used the CIDI which has been supported as a valid measure of not only mental disorders but also for having the capacity for measuring mental disorders within a culturally diverse population. Furthermore the data was generated from a general population and not a clinical population contributing towards the generalizability of the results.

There were however limitations in this report. The vast majority of the results generated through this analysis were non-significant. This may well attest to the possibility that the associations drawn were not relevant and were based rather on chance. Other possibilities may be that the inclusion of 11 constructs (5 maternal, 5 paternal as well as parental depression) as well as demographics decreased the sample size for each analysis. Dividing the sample base to assess each parenting quality affected the number of participants specific to each trait which may have produced confidence intervals that were too widely centred around the OR and reduced the power of analysis.

Another limitation may have included that the constructs selected from the CIDI may not have been applied and interpreted in the manner in which they were originally intended. The main premise of this report was to investigate whether parental control (with specific interest in maternal influences) would be a strong predictor of depression. The concept of control however was assessed in this report by proxy measures. Strictness was intended to be the main representative of control however the influences of both monitoring and inhibition were also deemed as having contributed towards a general construct of parental control. This may not have been an accurate representation of control which entails that the content validity was poor[8].

[8] Not by way of the intended measurement instrument but through the application of the author of this report.

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Furthermore, as suggested in the literature review there may be two types of control. Strictness, as used in this report, may have actually referred to behavioural control and not psychological control which has been associated with depression and psychopathological outcomes (Gray & Steinberg, 1999). This may imply that the content validity was further weakened as the control assessed in this report was not the control associated with depression as depicted in the literature.

The CIDI used a modified version of the Parental Bonding Instrument (PBI). The use of the PBI would indeed have been a strength as this instrument, in its unadjusted format, has been widely considered a valid and reliable measurement tool and considering the general validity of the CIDI, the strength of the PBI may be assumed, although not tested per se, to have good reliability and validity. Nonetheless, the items in this report were selected from this modified version of the PBI in the CIDI and may not have been fully representative of the complete set of items originally intended to represent the parental constructs of care and overprotection thus having further reduced content validity.

Another possible limitation could have included that family structure was not considered as a potential contributing factor in this report. Families may have included single parents or non-biological care-givers in which case the description of parental traits may not have represented the family accurately. This may have contributed towards the lack of power and significance as in fact critical information was lacking as to who the mother or father actually was in the household and how the participants would have related to these relationships (e.g. absent fathers or mothers and single parent households).

No other possible risk factors for depression were considered as only the influence of parents was considered as the main risk in this report. Other influences not measured in this report may have included ill-health, other psychological disorders (e.g. PTSD, anxiety disorders), trauma, violence; abuse (experiencing abuse or being the abuser), drug abuse and alcohol abuse.

Additionally, the nature of the study design may be considered as a limitation in that the participants were interviewed at a moment-in-time design (cross sectional study). This entailed that participants recalled their responses which have been based on their memory. This introduces recall bias. Furthermore, the cross sectional nature does not allow for interpretations of causality as the temporality of the data and results cannot be determined (i.e. one cannot determine whether depression preceded parental qualities or whether parental qualities preceded depression. The

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relationship between depression and parental qualities may follow that depression may elicit the parental qualities (Parker; 1981) or whether depression may have influenced the perception of parental characteristics or whether children's temperaments leaned towards a depressive nature which elicited parental traits that therefore tended to be more overprotective than caring (Williams *et al.*, 1990).

The assessment of participants regarding their parents may have been influenced by their current mood (at time of interview) or even current relationship with their parents and was the participant's perception of their parent's behaviour which was a subjective measure. This assessment may have been influenced by numerous additional factors not considered in this report, such as the personality of the participant.

Participants may also have found the nature of these questions relatively sensitive as perhaps they attempted to provide a more favourable representation of their parents. This may have been due to a number of reasons, again not considered in this report.

Although the CIDI has been found to be a valid measure in differentiating between cultural differences, the potential of cultural differences specific to this study and a South African context were not considered in this report. Potential differences were excluded from this report in how, for example, various communities included in this report perceived and understood depression as well as what 'good parenting' actually represented for various cultural and social backgrounds. This lack of information may have contributed towards reducing the validity.

The risk factors for depression may have had a wider range than the suggestions provided in this report. By excluding these potential risk factors, an accurate trajectory of depression may not be plausible. This report, for example, did not include a measure of temperament (Williams *et al.*, 1990) or substance abuse (Havenaar *et al.*, 2008) as possible risk factors for depression.

Furthermore, certain studies have suggested that although adverse parenting has shown to be a risk factor for psychiatric disorders, this association has been non-disorder specific (Enns, *et al.*, 2002; Heider, *et al.*, 2006) which may have resulted in skewing any associations this report found with depression.

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7. POLICY IMPLICATIONS

Although additional research is required, the policy implications could include modifying and enhancing community interventions both through schools as well as the general community. These interventions may benefit from incorporating the role that parenting habits and qualities have on their children's depressive symptoms and experiences. By incorporating parents into community intervention programs may not only function as additional sources of resilience against depression, but also as a form of screening. Biggam & Power (1998) have suggested that parental relationships may serve as a warning sign that development problems may arise, therefore incorporating parents into intervention programs may serve as an innovative screening mechanism. Much more research is required to explore this possibility.

As evidenced from the Millennium Development Goals, the significance and importance of maternal health and care was essential in improving the health of all communities and included early detection, appropriate treatment, education with corresponding psychological support, increasing and improving the mother-child relations (which have been considered essential for encouraging healthy, functional and adaptive child development) as well as encouraging treatment which is culturally sensitive (Engle, 2009). Taking these sentiments into account, incorporating the role and influence of parenting as well as parental depression may provide a meaningful contribution towards improving the mental development and health of both children and parents. Furthermore, a more comprehensive understanding of the South African context of family life and development may be necessary for the healthy and functional adjustment of South African citizens that is specific to a history of violence and subjugation.

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It has also been suggested that interventions should focus on the risk factors as opposed to the treatments strategies as these interventions may be more focused (Heider *et al.*, 2006). By focusing on parental risk factors for depression, more specific attention may be focused on the growing burden of disease presented by mental health in South Africa. Community level programs may assist parents in addressing various risk factors that not only focus on parenting skills and education, but may also help to focus on additional risk factors relevant to the household although not considered in this report.

8. RESEARCH IMPLICATIONS

The results from this report have not produced conclusive evidence regarding the impact of parenting traits on children's development of depression. Additional research may be necessary to determine in a more comprehensive and accurate manner the nature of what constitutes adaptive and healthy parenting in the numerous cultural contexts in South Africa. The meaning and consequence of depression from the communities' perspective would be a significant component of such research.

Another vein of research may include the support and co-operation and acceptance by parents in relation to the mental health of their children. In other words asking how accessible parents may be towards education and workshop intervention (regarding depression), how parents respond and manage their children in treatment or attending workshops at their schools. Further research may benefit from focusing attention on South Africa's more vulnerable population (including women and the impoverished) in accessing how depression affects family dynamics in the most vulnerable communities in South Africa and what resources these communities may have in terms of family dynamics.

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9. CONCLUSION

From the underlying themes of parental characteristics in terms of parental overprotection and parental care, the most significant and strongest factors that emerged in this report were paternal affection and paternal depression. Neither the effects of the mother nor the controlling influences of either parent were significant. These results seemed to have indicated that the influence of the father outweighed the effects of the mother both in terms of depression as well as in terms of the parental traits. With regards to the parental characteristics, care (represented by affection) seemed to outweigh overprotection (represented by strictness, monitoring and inhibition) in accounting for depression. These findings may suggest that incorporating parental influences in treatment or intervention programs may be of some significance. By focusing on the influences of parents, these traits may function as not only detrimental influences but also as protective factors and thus may provide a basis for understanding the development of depression within a family context in order to improve screening, enhance prevention and management. Furthermore, the consistent and global theme of gender and depression has persisted in this report which indicates that gender remains a significant factor in discussions of depression. This may imply that research into the context of depression through gender and the intricate gender familial relationships remains a significant area of enquiry. These results suggest that research into parental influences and depression requires additional research that will elucidate these complex family dynamics.

Furthermore, the strongest indicators of risk seemed to better account for the protectiveness against depression. These statistics did not give adequate indication as to which perceived parental traits could be held liable in predicting the development of depression with the exception of paternal depression. This was a most interesting find as it has usually been the effects of the mother that have been strongly associated with the development of depression. These results seem to indicate that indeed the effects of the father are also extremely significant and pertinent in explaining and understanding the development of depression.

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10.ACKNOWLEDGEMENTS

I wish thank my supervisor, Dr. Landon Myers for his continued support and patience.
I wish to thank Antony Maltz for his unwavering belief, commitment and understanding.

I am grateful to both Dr. Landon Myers and Professor Dan Stein as well as to the entire SASH team for providing this opportunity to explore depression within a South African context.

The SASH was funded through various sources.

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APPENDIX

Appendix A - Definition for Major Depressive Episode

Table 17: Criteria for Major Depressive Episode[9]

A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure. **Note:** Do not include symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations.

(1) depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful). **Note:** In children and adolescents, can be irritable mood.

(2) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others)

(3) significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. **Note:** In children, consider failure to make expected weight gains.

(4) insomnia or hypersomnia nearly every day

(5) psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)

(6) fatigue or loss of energy nearly every day

(7) feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick)

(8) diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)

(9) recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide

B. The symptoms do not meet criteria for a Mixed Episode (see p. 335).

C. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

D. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).

E. The symptoms are not better accounted for by Bereavement, i.e., after the loss of a loved one, the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.

[9] Quoted directly from American Psychiatric Association (1994) Diagnostic and statistical manual of mental disorders, Retrieved from www.PsychiatryOnline, January 13, 2010.

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Appendix B – Diagnostic Criteria for Major Depressive Disorder, Recurrent

Table 18: Diagnostic Criteria for Major Depressive Disorder, Recurrent[10]

A. Presence of two or more Major Depressive Episodes.

Note: To be considered separate episodes, there must be an interval of at least 2 consecutive months in which criteria are not met for a Major Depressive Episode.

B. The Major Depressive Episodes are not better accounted for by Schizoaffective Disorder and are not superimposed on Schizophrenia, Schizophreniform Disorder, Delusional Disorder, or Psychotic Disorder Not Otherwise Specified.

C. There has never been a Manic Episode, a Mixed Episode, or a Hypomanic Episode.

Note: This exclusion does not apply if all of the manic-like, mixed-like, or hypomanic-like episodes are substance or treatment induced or are due to the direct physiological effects of a general medical condition.

Appendix C – Missing Data

In order to assess the nature of the missing data, variables were generated in STATA® for each of variables used in the dataset which represented whether, for that particular participant there was an entry / value missing for one of more of the PPT's. This generated variable then represented the set of missing data. Tests of association were conducted thus examining whether any patterns were evident. The Chi^2 test of association was used where the generated variable representing the missing data was compared to the outcome of depression. The analysis for missing data was conducted on the original dataset (n= 4351).

Table 19 displays the distributions for the missing data set. Overall there were 1260 missing data, although the entry for education was only represented by 1192 missing data. As suggested by Howell (2004) there are several reasons why data would be missing many of which may well be due to chance or 'missing completely at random'. If the data are missing at random (MAR) this implied that the reason for the missing was not related to the value of the missing data or any other variable which would then represent an underlying pattern within the data set which could potential

[10] Quoted directly from American Psychiatric Association (1994) Diagnostic and statistical manual of mental disorders, Retrieved from www.PsychiatryOnline, January 13, 2010.

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confound and bias the results. The sentiments being that each data point of missing information has an equal probability of being missing as does each and every other missing point.
Significantly, data that was missing was dependent on the value of the missing data and not merely that the data was missing. This was the underlying reason as to why this report considered the participants responses of "refused to answer" or "don't know" as having represented a negative response (Howell, 2004).

The distributions derived from the missing information indicate that there are no patterns. This entails that there should be no difference between the missing data and the responses. The underlying reason for the missing information may then be attributable to chance. As can be seen from Table 19 the patterns in the distributions for the full dataset follow the same pattern as for the missing data on all variables. Even though approximately 29% (n=1260) of the original dataset (n=4351) (more than the suggested 5% (Howell, 2004)) had missing information on one or more PPTs, the decision was made to remove the missing data based on the identification that this data was missing by chance.

As can be seen from **Table 19**, overall there were 90.75% non-depressed responses in the missing data relative to the 90.09% non-depressed responses for the analysed dataset. For gender, the proportions seem relative similar, both comparing each depressed category with its corresponding column and also looking at differences between proportions of depressed to non-depressed participants. Race / ethnicity showed slightly larger differences in terms of black participants had 66.91% responses for non-depressed in the analysed dataset relative to the 75.97% responses for non-depressed participants for the missing dataset. For the coloured group, the analysed dataset had 10.85% responses for non-depressed – for the missing dataset, response were at a slightly less 7.37%. For the white category, the difference seemed more marked, where 9.21% of participants responded for non-depression for the analysed group, whereas only 4.7 responded for the missing group for non-depressed.

Table 19: Distributions for Missing Data and Analysed Data

	DISTRIBUTIONS (%) FOR MISSING DATA FOR 1 or MORE PPT's (TOTAL N = 1260[1])			DISTRIBUTIONS (%) FOR ANALYSED DATASET (TOTAL N = 3036[2])		
	Not Depressed	Depressed	TOTAL	Not Depressed	Depressed	TOTALS
TOTAL	**91**	**9**	**100**	**90**	**10**	**100**
GENDER						
Male	41	3	45	42	3	45
Female	49	6	55	48	7	55
RACE / ETHNICITY						

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Black	76	8	84	67	7	74
Coloured	7	0.8	8	11	1	12
White	5	0.43	5	9	0.95	10
Asian / Indian	3	0.12	3	3	0.51	4
AGE CATEGORIES						
18 – 24 years	26	3	29	19	1	21
25 - 44 years	44	4	48	43	5	48
45 - 64 years	17	2	19	23	3	25
65+ years	4	0.33	4	5	0.35	6
MARITAL STATUS						
Married	40	6	43	47	5	52
Unmarried	51	4	57	43	5	48
EMPLOYMENT STATUS						
Employed	22	3	26	29	4	32
Unemployed	68	6	74	61	7	68
FAMILY INCOME						
R0 – R9999	44	5	48	44	5	49
R10000 - R49999	16	0.91	17	18	2	120
R50000 - R99999	10	1	11	10	0.91	10
≥ 100000	21	3	23	19	2	21
	TOTAL N for Education Level = 1192			**TOTAL N for Education Level = 2994**		
TOTAL	**91**	**9**	**100**	**90**	**10**	**100**
EDUCATION LEVEL						
None	6	0.53	7	7	0.45	7
Grade 1 – 7	17	2	20	17	3	19
Grade 8 – 11	32	4	36	31	3	35
Grade 12	23	2	25	21	2	23
Grade 13+	12	1	13	15	1	16
	[1]Except for Education Level N = 1192 (missing dataset on 1 or more PPT's)			**[2]Except for Education Level N = 2994 (analysed dataset)**		

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Furthermore, the second statistical test carried out on the missing data was to test any possible associations between the missing variables and MDD. Table 20 below displays these results. In terms of missing values, none of the demographics with missing information for one or more PPT had a significant association with MDD thus confirming again that any missing data was most likely due to chance.

Table 20: Associations of Missing Data with MDD (for demographic variables)

	Test of Association between MISSING FOR 1 or MORE PPT's and MDD (Chi2) N=1260[2]
GENDER	0.078
RACE / ETHNICITY	0.645
AGE CATEGORIES	0.597
EDUCATION LEVEL	0.534
MARITAL STATUS	0.348
EMPLOYMENT STATUS	0.058
FAMILY INCOME	0.288

[1] Except for Education Level N= 2994
[2] Except for Education Level N=1192

Appendix D - Model building

Model building was applied to find the best model fit. Here two basic models were constructed but had versions with anxiety and without anxiety. The inclusion of maternal strictness did not seem to have an influence on the variables as for both models (with and without mother strict) the same variables were included. Additionally the value of the risks were not changed greatly either. The inclusion / exclusion of anxiety however did alter the inclusion of family income. The inclusion of GAD generally increased the risk for all variables, except for paternal monitoring and paternal affection (both of which stayed the same) included family income, education the risks for each level stayed the same , increased or decreased risk, and gender the risk was decreased.

For the model which included anxiety, the best model included the following variables: anxiety, gender, education, paternal affection, paternal depression, age, family income, paternal monitoring and mother depression. The only variables however which were statistically significant in this model were GAD, gender and paternal affection. The overall model however was significant (*p=0.0000*). A model however without anxiety also had overall significance (*p=0.000*) and included the same variables except family income. The same process however without including anxiety included the following variables: gender, maternal depression, education, paternal affection, age category, paternal depression and father monitoring. Although certain variables were not statistically significant, the overall model was significant (*p=0.0000*).

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The effect of maternal strictness however had no effect on any variables, the only change was perhaps a 2% change in risk which either increased or decreased the risk. The effect of mother strict on GAD was nothing, GAD stayed the same, gender remained the same, education level 2 relative to level 1 increased by 2%, education level 3 relative 1 increased by 2%, education level 4 remained the same, education level 5 relative to level 1 increased by 1%, father affection decreased by 1%, father depression increased by 2%, age levels 2 – 4 relative to level 1 decreased by 1%, family income level 2 relative to level 1 decreased by 1%, family income level 3 relative to level 1 stayed the same, family income level 4 relative to level 1 also stayed the same, paternal monitoring decreased by 5% and lastly mother depression stayed the same.

Table 21: 4 Models from Model Building Process

MODEL 1A			
BEST MODEL FIT with anxiety			
Risk Variables	N	OR (95% CI)	Sig
	2994		
GAD	7.72 (4.63; 12.88)		0.000
Gender	0.61 (0.41; 0.90)		0.015
Education – 2	2.14 (0.99; 4.65)		0.053
Education – 3	1.35 (0.65; 2.8)		0.417
Education – 4	1.6 (0.72; 3.55)		0.243
Education – 5	1.39 (0.59; 3.26)		0.446
Father Affection	0.34 (0.17; 0.68)		0.003
Father Depression	1.68 (0.92; 3.07)		0.092
Age Category – 2	1.43 (0.996; 2.04)		0.053
Age Category – 3	1.29 (0.92; 1.8)		0.138
Age Category – 4	0.64 (0.29; 1.41)		0.257
Family Income – 2	0.78 (0.53; 1.13)		0.185
Family Income – 3	0.65 (0.36; 1.17)		0.147
Family Income – 4	0.79 (0.53; 1.18)		0.236
Father Monitoring	1.25 (0.84; 1.84)		0.265
Mother Depression	1.11 (0.64; 1.93)		0.697
F(16, 46) = 11.27 ; p=0.0000; design df=61			

MODEL 1B			
BEST MODEL FIT without anxiety			
Risk Variables	N	OR (95% CI)	Sig
	2994		
Gender	0.57 (0.39; 0.83)		0.004
Mother Depression	1.32 (0.80; 2.18)		0.271
Education – 2	2.30 (1.10; 4.83)		0.028
Education - 3	1.36 (0.70; 2.67)		0.365
Education – 4	1.47 (0.70; 3.12)		0.305
Education – 5	1.20 (0.53; 2.72)		0.652
Father Affection	0.34 (0.18; 0.64)		0.001
Age Category – 2	1.58 (1.10; 2.26)		0.013
Age Category – 3	1.49 (1.07; 2.08)		0.019
Age Category – 4	0.79 (0.37; 1.71)		0.542
Father Depression	1.91 (1.12; 3.28)		0.019
Father Monitoring	1.24 (0.85; 1.82)		0.261
F(12, 50) = 4.88; p=0.0000 design df = 61			

MODEL 2A			
BEST MODEL FIT forcing mother strict at baseline			
With Anxiety			
Risk Variables	N	OR (95% CI)	Sig
Mother Strict	1.21 (0.84; 1.74)		0.312
GAD	7.72 (4.61; 12.95)		0.000
Gender	0.61 (0.41; 0.91)		0.016
Education – 2	2.16 (0.997; 4.69)		0.051
Education – 3	1.36 (0.65; 2.83)		0.409
Education – 4	1.60 (0.72; 3.56)		0.245
Education – 5	1.40 (0.59; 3.29)		0.439
Father Affection	0.33 (0.17; 0.65)		0.002
Father Depression	1.70 (0.93; 3.11)		0.086
Age Category – 2	1.42 (0.99; 2.04)		0.057
Age Category – 3	1.28 (0.90; 1.8)		0.162
Age Category – 4	0.63 (0.28; 1.37)		0.237
Family Income – 2	0.77 (0.53; 1.13)		0.176
Family Income – 3	0.65 (0.36; 1.17)		0.146
Family Income – 4	0.79 (0.53; 1.18)		0.247
Father Monitor	1.20 (0.82; 1.76)		0.344
Mother Depression	1.11 (0.64; 1.92)		0.718
F(17, 45)=11.41, p=0.0000, design df = 61			

MODEL 2B			
BEST MODEL FIT forcing mother strict at baseline			
Without anxiety			
Risk Variables	N	OR (95% CI)	Sig
	2992		
Mother Strict	1.20 (0.84; 1.72)		0.307
Gender	0.57 (0.39; 0.83)		0.004
Education – 2	2.31 (1.10 ; 4.82)		0.027
Education – 3	1.37 (0.7; 2.67)		0.359
Education – 4	1.47 (0.7; 3.11)		0.308
Education – 5	1.20 (0.53; 2.73)		0.650
Mother Depression	1.32 (0.80; 2.16)		0.273
Father Affection	0.33 (0.18; 0.62)		0.001
Age Category – 2	1.57 (1.1; 2.26)		0.015
Age Category – 3	1.48 (1.05; 2.08)		0.026
Age Category – 4	0.77 (0.36; 1.68)		0.509
Father Depression	1.93 (1.13; 3.31)		0.017
Father Monitor	1.2 (0.82; 1.75)		0.341
F(13,49)=5.46, p=0.0000, design df 61			

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Appendix E - Gender Effect

Table 22: OR's for Demographic and Major Depressive Disorder FOR FEMALES

		Without Anxiety[1]		With anxiety[2]	
Risk Variables	N	OR (95% CI)	P-value	OR (95% CI)	P-value
Race/Ethnicity	1829				
Black – 1	1334	1.00		1.00	
Coloured – 2	266	1.04 (0.64; 1.69)	0.880	0.98 (0.61; 1.56)	0.926
White – 3	154	1.04 (0.40; 2.7)	0.928	1.003 (0.38; 2.64)	0.995
Asian Indian - 4	75	1.74 (0.72; 4.23)	0.213	1.64 (0.69; 3.87)	0.255
Marriage	1829				
Not Married – 0	872	1.00		1.00	
Married – 1	957	0.76 (0.56; 1.02)	0.065	0.77 (0.57; 1.05)	0.102
Age Categories	1829				

18 – 24 (1)	342	1.00		1.00	
25 – 44 (2)	900	1.59 (0.89; 2.83)	0.115	1.41 (0.81; 2.44)	0.220
45 – 64 (3)	463	1.39 (0.75; 2.59)	0.292	1.14 (0.65; 1.99)	0.649
65+ (4)	124	0.74 (0.27; 2.02)	0.549	0.58 (0.20; 1.66)	0.302
Finance	1829				
1R0 – R9999	972	1.00		1.00	
2R10000 – R49999	332	0.96 (0.53; 1.77)	0.903	0.91 (0.50; 1.67)	0.762
3R50000 – R99999	192	0.73 (0.42; 1.27)	0.263	0.69 (0.39; 1.20)	0.184
4≥ R100000	333	1.02 (0.63; 1.65)	0.947	1.05 (0.65; 1.72)	0.833
Employment					
Not Employed – 0	1405	1.00		1.00	
Employed – 1	424	0.83 (0.50; 1.35)	0.440	0.88 (0.52; 1.47)	0.608
Education	1806				
None (1)	141	1.00		1.00	
Grade 1 – 7 (2)	403	2.09 (0.97; 4.50)	0.059	1.86 (0.85; 4.08)	0.117
Grade 8 – 11 (3)	655	1.14 (0.5; 2.61)	0.749	1.02 (0.43; 2.41)	0.960
Grade 12 (4)	349	1.05 (0.4; 2.81)	0.917	1.04 (0.38; 2.79)	0.944
Grade 13+ (5)	258	1.19 (0.42; 3.39)	0.744	1.13 (0.41; 3.16)	0.810
Anxiety – lifetime	1829				
No – 0	1732	--	--	1.00	
Yes – 1	97	--	--	7.21 (4.02; 12.91)	0.000

[1] Adjusted for all variables
[2] Adjusted for all variables

Table 23: OR's for Demographic and Major Depressive Disorder FOR MALES

		Without Anxiety1		With Anxiety2	
Risk Variables	N	OR (95% CI)	P-value	OR (95% CI)	P-value
Race/Ethnicity	1207				
Black – 1	893	1.00		1.00	
Coloured – 2	166	1.02 (0.36; 2.86)	0.975	0.85 (0.29; 2.53)	0.769
White – 3	108	1.78 (0.63; 5.02)	0.273	1.55 (0.29; 2.53)	0.395
Asian Indian - 4	40	1.49 (0.4; 5.65)	0.548	1.58 (0.43; 5.83)	0.487
Marriage	1207				
Not Married – 0	600	1.00		1.00	
Married – 1	607	0.75 (0.39; 1.44)	0.384	0.8 (0.4; 1.6)	0.512
Age Categories	1207				
18 – 24 (1)	254	1.00		1.00	
25 – 44 (2)	608	2.00 (0.85; 4.72)	0.113	1.80 (0.77; 4.23)	0.173
45 – 64 (3)	282	2.25 (0.95; 5.33)	0.066	1.94 (0.82; 4.6)	0.131
65+ (4)	63	0.9 (0.25; 3.22)	0.866	0.67 (0.16; 2.77)	0.575
Finance	1297				
1R0 – R9999	578	1.00		1.00	
2R10000 – R49999	257	0.65 (0.30; 1.38)	0.253	0.60 (0.27; 1.35)	0.213
3R50000 – R99999	123	0.77 (0.31; 1.93)	0.571	0.57 (0.19; 1.69)	0.302
4≥ R100000	249	0.35 (0.14; 0.88)	0.026	0.35 (0.14; 0.87)	0.024
Employment	1207				
Not Employed – 0	668	1.00		1.00	
Employed – 1	539	1.11 (0.63; 1.95)	0.709	1.09 (0.63; 1.89)	0.766
Education	1188				
None (1)	94	1.00		1.00	
Grade 1 – 7 (2)	224	3.11 (0.71; 13.68)	0.130	3.08 (0.61; 15.61)	0.171
Grade 8 – 11 (3)	371	1.83 (0.42; 8)	0.419	1.97 (0.39; 9.96)	0.404
Grade 12 (4)	293	2.33 (0.51; 10.74)	0.272	2.58 (0.49; 13.65)	0.259
Grade 13+ (5)	206	1.34 (0.27; 6.63)	0.713	1.64 (0.29; 9.29)	0.573
Anxiety	1207				
No – 0	1180	--	--	1.00	
Yes – 1	27	--	--	9.84 (2.94; 32.94)	0.000

[1] Adjusted for all variables

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[2] Adjusted for all variables