Separation-Individuation and its Effect on Diabetes Management and Diabetes Control in Young Women with Type 1 Diabetes

Submitted by

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Abstract

Insulin dependent diabetes mellitus, or Type 1 Diabetes, is a potentially life-threatening chronic illness which places affected individuals at increased risk of heart disease, stroke, kidney failure, blindness, and amputation. The incidence of Type 1 Diabetes has increased in countries world wide including Australia. During adolescence and young adulthood diabetes management and control have been found to deteriorate placing the young person at risk of diabetes related complications. This deterioration in diabetes management and control among adolescents and young adults has been suggested to be related to the many developmental changes taking place in this period. In particular, the process of separation-individuation referred to in different developmental theories could be relevant to how a young person manage a chronic illness such as Type 1 Diabetes. However, very little empirical research has been conducted in regard to separation-individuation and most research to date has been done in the US with college students. The generalizability of the results from these studies to other populations of adolescents and young adults is unknown.

The primary aim of the present study was to examine factors thought important to the separation-individuation process in a sample of young Australian women and to investigate how having a chronic illness such as Type 1 Diabetes might influence this developmental process. A further aim was to explore factors expected to be important to diabetes management during young adulthood.

The sample consisted of young adult women with and without a diagnosis of Type 1 Diabetes aged between 18 and 25 years. Participants were recruited from Victoria University (n = 64) and diabetes clinics at the Western Hospital and Royal

Melbourne Hospital (n = 42) in the Melbourne metropolitan area. All participants completed a number of questionnaires related to depressive symptoms, current attachment to mother, peer attachment, and separation-individuation. Young women with diabetes also completed questionnaires related to their diabetes management, acceptance of having diabetes, and past parental involvement. Depending on diabetes status the questionnaires were completed either after university lectures/tutorials or before appointments at the diabetes clinics.

Two proposed models (Model 1: Factors Influencing Separation-Individuation in Young Adult Women; Model 2: Factors Influencing Diabetes Management in Young Adult Women) were tested using hierarchical multiple regression analysis. Further regression analyses were conducted to test for possible mediated pathways in the two models. Results of the multivariate analyses indicated that perceived maternal care, depressive symptoms in the young person, and attachment to peers significantly contributed to the variance in separation-individuation. The effect of maternal care on separation-individuation was mediated through depressive symptoms of the young person and attachment to peers. The proposed regression model of diabetes management in young women did not fit the data however depressive symptoms and acceptance of having diabetes had significant bivariate correlations with diabetes management. The results of this research were compared and contrasted to other relevant research studies in the field. The lack of support for some hypotheses was discussed in the context of the limitations of the present study and recommendations were made for future research.

Declaration of Authenticity

I, Hege Kristine Andreassen, declare that the Doctor of Psychology (Clinical Psychology) thesis entitled Separation-Individuation and its Effect on Diabetes Management and Diabetes Control in Young Women with Type 1 Diabetes is no more than 40,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references, and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this is my own work.

Signature:

Date:

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Table of Contents

List of Tables

List of Figures

1 Literature Review

1.1 Introduction

Insulin dependent diabetes mellitus, or Type 1 Diabetes, is a potentially life-threatening chronic illness which places affected individuals at increased risk of heart disease, stroke, kidney failure, blindness, and amputation (Australian Institute of Health and Welfare, 2006). The Australian Institute of Health and Welfare (2006) reported that in 2004 there were 24.6 new cases per 100 000 of Type 1 Diabetes among zero to 14 year olds and a further 12.3 new cases per 100 000 among 15 to 39 year olds. Over recent years the incidence of Type 1 Diabetes in Australian children aged zero to 14 years has been increasing (Haynes, Bower, Bulsara, Jones, & Davis, 2004; Taplin et al., 2005). A UK study also reported an increase in the incidence of Type 1 Diabetes in children but among young adults aged 15 to 29 year old the incidence had been the same over the last 15 years (Feltbower, McKinney, Parslow, Stephenson, & Bodansky, 2003). Haynes et al. (2004) suggested that the increased incidence of Type 1 Diabetes reported in children might be the result of greater exposure to different environmental factors in individuals who are already genetically susceptible to Type 1 Diabetes. The authors did not specify the different environmental risk factors. The onset of Type 1 Diabetes usually occurs during childhood and early adolescence and the peak onset is between the ages of 12 and 14 years (Shillitoe & Christie, 1990) with girls being diagnosed on average one and a half years earlier than boys (Drash & Berlin, 1985).

Adolescence and young adulthood have been found to be high risk periods in terms of diabetes management (Bryden, Dunger, Mayou, Peveler, & Neil, 2003; Bryden et al., 2001; Dashiff & Bartolucci, 2002; Wills et al., 2003). This is the case despite the fact that many young individuals manage and cope well with the demands of a chronic

illness such as Type 1 Diabetes (Wills et al., 2003). It has been suggested that the decline in metabolic control evident in adolescence is related to the many developmental changes taking place in this period including physiological changes (Camron, 2006), emotional changes (Graber, Brooks-Gunn, & Petersen, 1996), and changes in responsibility regarding behaviour in general and diabetes specific behaviour (Edgar & Skinner, 2003). The continued difficulties experienced by young adults managing Type 1 Diabetes occurs in a context of life changes such as finishing school, getting a job, becoming self-supporting (Anderson & Wolpert, 2004), and include declining and poor attendance at diabetes clinics (Jacobson, Adler, Derby, Anderson, & Wolfsdorf, 1991; Kipps et al., 2002) and serious diabetes complications (Bryden et al., 2003). However, research about diabetes management and factors influencing diabetes management in young people in the age group 18 to 25 years is lacking. Young people in this age group are considered as adults and thus have been included in studies examining adults of all ages. As a result there is limited identification of factors unique to this developmental period. Of particular relevance to this period is increasing autonomy.

It is assumed that during the developmental period of late adolescence and young adulthood a young person has to develop independence from parents and/or other caregivers (Lopez, Campbell, & Watkins, 1986, 1988; Moore, 1987). Research published over the past 20 years on developmental processes during adolescence and young adulthood also include the notion of connectedness and separation when participating in relationships with caregivers and friends (Quintana & Kerr, 1993). Further examination of the developmental tasks taking place during adolescence and young adulthood could provide a better understanding of how vulnerable groups, such as young people with a chronic illness, resolve these tasks. In particular, the process of

separation-individuation referred to in different developmental theories could be relevant to how a young person manage a chronic illness such as Type 1 Diabetes. However, very little empirical research has been conducted in regard to separation-individuation. Moreover, most research to date has been done in the US with college students as participants and so findings might not be generalizable to other populations of adolescents and young adults.

Developmental processes taking place during adolescence and young adulthood have often been ignored in the research literature on diabetes management and control in young people. However, it seems important to consider developmental factors when examining diabetes management and control in adolescents and young adults because of the increased risk of a decline in diabetes management and control during this developmental period (Bryden et al., 2003; Wills et al., 2003). Normal developmental processes may complicate the challenges faced by the young person in adopting more responsibility for their management of Type 1 Diabetes at this time (Anderson & Wolpert, 2004; Betts, Jefferson, & Swift, 2002).

1.2 Developmental Stages of Adolescence and Young Adulthood

The cumulative nature of development means that it is important to be familiar with the previous developmental stages before considering particular developmental aspects of adolescence and young adulthood. While many authors have published texts describing development from infancy to childhood and adolescence, Erikson's (1963, 1968, 1980) seminal work outlines development throughout the lifespan from infancy to old age. A brief summary of different aspects of normal development from infancy to young adulthood based on his work is provided below.

1.2.1 Infancy.

According to Erikson (1968, 1980) a fundamental developmental task for the infant in the first year of life is to establish basic trust in the world via the attachment relationship they develop with their primary caregiver. The basic trust an infant develops in his/her outer and inner world provides the foundation of the infant's identity (Erikson, 1963).

1.2.2 Toddlerhood.

In the second year of life, with increasing biological maturity, important developmental tasks in regard to mobility and language are achieved. These achievements allow for the first stage of separation-individuation and the associated emergence of self-concept or identity allowing for development of a sense of autonomy (Erikson, 1963, 1968, 1980; Mahler, Pine, & Bergman, 1975). Erikson suggested that a balance between negotiation and cooperation with limit setting in the parent-child relationship fosters the development of autonomy in the child.

1.2.3 Preschool.

A stronger sense of self develops during the preschool years (Erikson, 1968, 1980). The preschool child is more able to express his/her desires and is gradually becoming more capable of thinking about and planning his/her actions. Fantasy also plays a big part in the pre-school child's life (Erikson, 1968, 1980). In this period there is an increased social interaction with other adults and children outside the immediate family. According to Piaget (2001) children of this age are in the pre-operational stage of development, a period characterised by intuitive reasoning, egocentricity, and

magical thinking. Magrab (1985) suggested that preschool children often see illness as a punishment for bad behaviour.

1.2.4 School-Age (Latency).

For the school aged child industry and mastery of skills and tasks becomes prominent (Erikson, 1968, 1980; Magrab, 1985) and moral attitudes and values are established. Through the development of peer relationships and relationships with people of different ages the child is prepared to be a member of a community and be part of social groups (Barker, 1993).

1.2.5 Adolescence.

Adolescence has been defined as occurring between the ages of 10 to 19 years (World Health Organization, 2006). During this period of development major changes take place (Meeus & de Wied, 2007) including physical and hormonal changes (Archibald, Graber, & Brooks-Gunn, 2003), behavioural and relationship changes, and changes in cognitive abilities (Rodgers & Bard, 2003). In addition to coping with these changes the young person also has to adjust to other people's responses to these changes (for example their changing appearance) (Archibald et al., 2003).

During the adolescent years the young person starts to establish social maturity, commences sexual relationships, and starts making choices regarding career, family beliefs, and values which all contribute to the development of their identity (Erikson, 1968, 1980). Increased autonomy has been suggested to be a central part of adolescent development (Dashiff & Bartolucci, 2002; Tanner, 2005) with the second phase of

separation-individuation thought to start during the adolescent years and continue into young adulthood (Blos, 1979).

1.2.6 Young Adulthood.

Arnett (2000, 2001) proposed the term "emerging adulthood" to describe the developmental period between the ages of 18 to 25 years which is characterised by frequent change and exploration in the areas of life such as work, living arrangements, interpersonal relationships, education, and worldviews. In the young adults' relationships with their parents the change from dependent to independent status that has commenced during adolescence continues during the developmental period of young adulthood (Arnett, 2001; Tanner, 2005).

As the young person's autonomy increases, behaviour that might have previously been regulated by others (e.g. parents) is now increasingly regulated by the young person (Tanner, 2005). At the same time, risky behaviours such as unprotected sex, substance use (including binge drinking), and dangerous driving are behaviours that start during adolescent years and peak during young adulthood (Arnett, 2000).

As highlighted above in the brief synopsis of Erikson's developmental tasks, the infant moves from complete dependence on an adult caregiver, develops trust through their attachment to their caregiver, and gradually, with increasing age, achieves increasing autonomy and hence a growth in self-confidence. From preschool and throughout childhood there is an expansion of social interaction beyond the family and peer relationships become increasingly important by adolescence. The rapid development of cognitive abilities and mastery of tasks occur at the same time as an increase in social skills takes place.

Of course, many factors may lead to a departure from the normal developmental trajectory and affect the achievement of the various developmental tasks. In particular the presence of a chronic illness such as Type 1 Diabetes during childhood may have important implications for development.

1.3 Type 1 Diabetes

Diabetes Mellitus is a disease resulting from a deficiency or a complete lack of insulin (Drash & Berlin, 1985; Knip, 2005). There are two main types of diabetes: insulin-dependent diabetes mellitus, or Type 1 Diabetes, and non-insulin-dependent diabetes mellitus, or Type 2 Diabetes. In the present dissertation only Type 1 Diabetes will be considered.

In Type 1 Diabetes a complete insulin deficiency takes place as a result of destruction of the beta cells (Drash & Berlin, 1985; Knip, 2005) resulting in blood glucose levels above the normal range (Shillitoe & Christie, 1990). The normal range of blood glucose levels are considered to be between 4.3 and 6.1% (Bryden et al., 2001) and both the American Diabetes Association (2007) and Diabetes Australia (2006) recommend a glycosylated hemoglobin of less than seven percent for patients diagnosed with diabetes. Hypoglycaemia occurs when the blood glucose values become too low (Hermanns, Kubiak, Kulzer, & Haak, 2003). Patients diagnosed with Type 1 Diabetes are at higher risk of developing coronary heart disease, stroke, retinopathy, nephropathy, and neuropathy (Australian Institute of Health and Welfare, 2008) if glycosylated haemoglobin levels become too high. Based on the most recent available data on incidence rates it was estimated that in 2004-05 approximately 700 000 people in Australia had diabetes (3.6% of the population) and of these an estimated 10 to 15% had Type 1 Diabetes (Australian Institute of Health and Welfare, 2008).

1.4 Management of Type 1 Diabetes

As Type 1 Diabetes is a chronic illness the goal of treatment is focused around management of the illness rather than curing the illness. The objectives of management include relief of symptoms, improved quality of life, and prevention of acute and chronic complications (Shillitoe & Christie, 1990) which require an individual to follow a complicated medical regimen (Dashiff, Bartolucci, Wallander, & Abdullatif, 2005). Typically the regimen would include self-care behaviours such as following a specific diet, exercise, testing blood glucose levels, and administering insulin injections (Drash & Berlin, 1985).

Individuals with a diagnosis of Type 1 Diabetes are prescribed insulin which is most often self administered (with the exception of young children and older adults) (Shillitoe & Christie, 1990). Patients with Type 1 Diabetes are required to self monitor their blood glucose levels as accurate knowledge of glycemic level is necessary to make decisions regarding changes to medication and diet (Shillitoe & Christie, 1990).

Managing diet is important as obesity has been found to be a characteristic of Type 1 Diabetes (Shillitoe & Christie, 1990). Weight gain has been identified as one possible consequence of insulin therapy and a few factors have been found to be related to this increase in weight: improved glycemic control can result in caloric retention; excess caloric intake; decreased caloric expenditure; and sedentary lifestyles (Daly, 2007). Consistency and regular adherence to a diet is required in order for a diet to have any effect. If weight loss is a desired outcome then adhering to a diet must generally be accompanied by an increase in exercise (Shillitoe & Christie, 1990).

Smoking and consumption of alcohol and other drugs increase the risk of complications such as cardiovascular disease (Thompson & Greene, 1997). Long term effects of alcohol consumption also include weight gain and worsening metabolic

control. Excessive drinking has been found to be related to diabetic ketoacidosis (DKA) and hypoglycaemia in adolescents and young adults (Thompson & Greene, 1997). Henriksen, Prahl, Røder, and Svendsen (2007) defined DKA as "the consequence of absolute or relative insulin deficiency and concomitant elevation of counter-regulatory hormones resulting in hyperglycemia, metabolic acidosis, ketosis, and varying degrees of dehydration" (p. 113).

1.4.1 Management of Type 1 Diabetes during Adolescence and Young Adulthood.

Compared to childhood and adulthood there are greater problems in diabetes management during adolescence and young adulthood (Hanna, Juarez, Lenss, & Guthrie, 2003; Wills et al., 2003) with deterioration in metabolic control being associated with increasing age during adolescence (Helgeson, Siminerio, Scobar, & Becker, 2009). The increase in serious complications that have been found from late adolescence and young adulthood into adulthood (Bryden et al., 2003) are associated with the management problems in this period. Aspects of diabetes management that have been found to be problematic during the adolescent years (ages 11 to 18 years) are the introduction of intensive therapy (either multiple insulin injections or insulin pump therapy) (Davidson, Penney, Muller, & Grey, 2004), adherence to treatment regimen (Anderson, Auslander, Jung, Miller, & Santiago, 1990), and the need for the young person to become increasingly responsible for their diabetes management (Edgar & Skinner, 2003).

As a child with Type 1 Diabetes grows older and becomes more mature, he or she is expected to be responsible for some of the procedures involved in their treatment regimen (Standen, 1990) and eventually take complete responsibility for the

management of their diabetes. The literature suggests that factors such as developmental stage and cognitive development of the child will impact on the decision of when the child can be expected to take on this responsibility. Chronological age is not necessarily a reliable indicator of children being able to understand the treatment regimen related to successful management of the chronic illness (Follansbee, 1989; Standen, 1990). Shillitoe and Christie (1990) suggested that children are capable of self-injections of insulin from the age of nine years, however, it is not until the child reaches the age of approximately 12 years that they are able to understand the relationship between different self-care behaviours such as dietary intake, exercise, insulin dosage, and blood glucose concentration.

Studies have demonstrated that there is an increase in the responsibility that children and adolescents assume for their own treatment regimen as they grow older (e.g. Anderson et al., 1990; Lewin et al., 2006) with an associated decrease in parental responsibility (Palmer et al., 2009). In a study of children and adolescents aged six to 21 years (Anderson et al., 1990), although it was found that older participants assumed greater responsibility, as age increased both mother and child reported more frequently that no one took responsibility for the treatment. Furthermore, older participants were more likely to report lower levels of adherence to treatment and have poorer metabolic control. The authors suggested that in some mother-child dyads there might be inadequate communication about when the young person was expected to take over responsibility for their diabetes management (Anderson et al., 1990).

Results from a longitudinal study on the effects of family environment on metabolic control suggest that parental monitoring in the mid-adolescent years and into young adulthood is important for optimal diabetic control (Luyckx & Seiffge-Krenke, 2009). In this longitudinal study across the developmental periods of adolescence and

young adulthood three trajectories of metabolic control were evident: optimal control, moderate control, and deteriorating control. Adolescents and young adults in the moderate and deteriorating control trajectories reported poorer organisation and family structure from mid-adolescence onwards compared to young people in the optimal trajectory. The authors suggested that if there were clear rules and organisation within a family then the young person seemed to be more likely to have optimal metabolic control during adolescence and young adulthood (Luyckx & Seiffge-Krenke, 2009).

Regular medical monitoring continues to be required into adulthood but among young adults poor attendance at diabetes clinics makes screening for diabetes related complications difficult (Wills et al., 2003). Poor continuity of care between services for children/adolescents with Type 1 Diabetes and adult services (Magrab, 1985), a perception that there is often a poor understanding of the lifestyle of young adults, and services that are often not tailored to suit working people (Bundy, 2003) have been factors suggested to be associated with poor attendance at diabetes clinics.

Individual characteristics that have been found to have an impact on diabetes management in both the adolescent and young adult years include: age, developmental stage (Wills et al., 2003), duration of illness (Pereira, Berg-Cross, Almeida, & Machado, 2008), and psychopathology in the young person (Leonard, Jang, Savik, Plumbo, & Christensen, 2002; Mayou, Peveler, Davies, Mann, & Fairburn, 1991). Studies examining these factors are considered below.

Numerous studies have examined psychopathology in adolescents and young adults and its relation to diabetes management (Bundy, 2003; Law, Kelly, Huey, & Summerbell, 2002; Mayou et al., 1991; Northam, Matthews, Anderson, Cameron, & Werther, 2005). An increase in psychopathology during adolescence in general has been demonstrated (Australian Bureau of Statistics, 2004-05; Turk, Graham, & Verhulst,

2007) and research has suggested that there is stability of both behavioural and emotional difficulties from adolescence into young adulthood (Ferdinand & Verhulst, 1995). Across countries prevalence rates of mental illness among adolescents have been reported to be between 15 and 20% (Dogra, Parkin, Gale, & Frake, 2009).

Young women have been reported to be at greater risk of developing anxiety and depression with the rate of depression among female adolescents being twice as high as among male adolescents (Turk et al., 2007). Having diabetes (either Type 1 or Type 2) has been linked to an increase in depressive symptoms and a greater likelihood of meeting criteria for major depressive disorder in children (Grey, Whittemore, & Tamborlane, 2002), adolescents (Northam et al., 2005), and adults (Popkin, Callies, Lentz, & Colon, 1988). In an Australian study, adolescents (aged 11 to 18 years) with Type 1 Diabetes were twice as likely as adolescents in the general community to have symptoms that met criteria for a DSM-IV diagnosis of a mood, anxiety, eating, or behavioural disorder (Northam et al., 2005). Adolescents/young adults aged 17 to 25 years with Type 1 Diabetes were found to have a prevalence of mental illness 40% higher than that of the general population (Bryden et al., 2003).

It has consistently been found that higher glycated hemoglobin (HbA1c), or poor metabolic control, is associated with anxiety (Law et al., 2002) and depression (Bryden et al., 2001; McGrady, Laffel, Drotar, Repaske, & Hood, 2009). Patients (aged 18 to 64 years) with Type 1 Diabetes who had symptoms of depression were found to report more reasons not to comply with the recommended medical regimen, expressed these reasons more frequently compared to patients with Type 1 Diabetes without depressive symptoms, and engaged in poorer overall self care behaviours (Kyrios, Nankervis, Reddy, & Sorbello, 2006). The authors suggested that lower levels of behavioural activation in depressed patients could be an explanation for why they engaged in fewer

self-care behaviours (Kyrios et al., 2006). Support for this claim has been found in a sample of adolescents with Type 1 Diabetes where depressive symptoms were related to lower frequency of blood glucose monitoring (McGrady et al., 2009). Moreover, it has been suggested that patients with Type 1 Diabetes who are also depressed may find it more difficult to ask for support from significant others which again can influence diabetes management and diabetic control (Ciechanowski, Katon, & Russo, 2005).

Duration of illness has been found to be related to treatment adherence and metabolic control. Young people (aged 10 to 18 years) who had Type 1 Diabetes for a longer period of time had poorer metabolic control (Pereira et al., 2008). However, illness duration is often not included as a factor in the literature and so how illness duration is related to diabetes management is poorly understood.

Recognition of the management difficulties that occur in adolescents and young adults must take into account not only the duration of the illness but what has happened in the years prior to adolescence. Diagnosis of a chronic illness during childhood may lead to a departure from the normal developmental trajectory, affecting the achievement of the various developmental tasks and consequently how the adolescent copes with management of their diabetes.

1.4.2 The Effect of a Chronic Illness on Developmental Tasks.

A number of authors have discussed how a chronic illness such as Type 1 Diabetes might affect normal developmental processes (e.g. Barker, 1993; Magrab, 1985; Standen, 1990). Magrab (1985) described important psychosocial developmental factors and cognitive skills and looked at these in relation to children with a chronic illness. She argued that an important part of psychosocial development is the socialisation process which can be significantly affected and altered by a chronic illness

such as Type 1 Diabetes. Hughes (1976) suggested that eight basic emotional needs are challenged as a result of the course of a chronic illness. These emotional needs include: love and affection; security; acceptance as an individual; self-respect; achievement; recognition; independence; authority and discipline. The impact of a chronic illness on the various emotional needs will vary according to the stage of development and the nature of the chronic illness. An important issue therefore is not just the type of chronic illness but also the age at which it has been diagnosed and the developmental tasks associated with that age and subsequent ages (see section 1.2).

When an infant has been diagnosed with a chronic illness the parents may experience feelings of anger, guilt, and shame which can interfere with the establishment of trust and attachment (Magrab, 1985). If a diagnosis is made during infancy or in the toddler years a disruption in home life routines is likely to take place (Anderson & Brackett, 2000). The primary caregiver is required to perform invasive medical procedures (for example injections) on the infant or toddler which can have an impact on the development of a trusting relationship between the infant and primary caregiver. The literature further suggests that a diagnosis of Type 1 Diabetes in the first two years of life can be complicated emotionally compared to when a diagnosis is made later in life because of the intense grief experienced by the parents. This more emotional reaction has been attributed to the parents having recently celebrated the birth of their child who they had expected to be healthy and perfect. Another factor thought to be important in the increased grief is that at the time of diagnosis infants are often critically ill which in turn may require care in an intensive care unit. The experience of having a critically ill child who needs care in an intensive care unit can add to the trauma of receiving a diagnosis as it highlights the seriousness of the chronic illness and their child's vulnerability (Anderson & Brackett, 2000).

The presence of a chronic illness in a toddler or a preschooler may have a number of effects on normal developmental tasks. The normal striving towards independence that occurs in the second year of life may be inhibited if parental anxieties lead to a discouragement of exploration and the development of an over-reliance on the parent (Anderson & Brackett, 2000). During the toddler years the child is expected to start to separate from their parents and develop a sense of being a separate person. The child also develops a sense of being able to master his or her environment and engage in social relationships. Because of the need to adhere to the treatment regimen and their fears for their child's well-being parents may overprotect their child and so interfere with the toddler's wish to explore and master their environment. As a way of striving for some autonomy the toddler may refuse to comply and cooperate with the different treatment requirements (Anderson & Brackett, 2000).

In the preschool years the development of a primitive conscience has occurred, so that some preschool children see illness as a punishment for bad behaviour (Magrab, 1985) and this may impact their developing self esteem. The child may further see himself or herself as being vulnerable and not as able as healthy children (Barker, 1993). At this time some understanding of their chronic illness and the practical consequences of having a chronic illness must be incorporated into their emerging self-concept (Barker, 1993). The pre-school years may be the first time that children realise that they are different from their peers because of eating restrictions and monitoring of blood glucose levels (Anderson & Brackett, 2000).

During the school age years, as their cognitive abilities develop, children have a greater understanding of illness and can utilise the knowledge they have about an illness, the body, and the treatment of an illness (Magrab, 1985). The school environment also fosters the development of peer relationships which is an important

preparation for membership in social groups and participation in the community (Barker, 1993). Studies have found that children with Type 1 Diabetes have more absences from school compared to siblings and same aged peers (McCarthy, Lindgren, Mengeling, Tsalikian, & Engvall, 2002). Barker (1993) suggested that frequent absences from school can result in the child with a chronic illness being disadvantaged in that they become isolated from their peer group.

Throughout childhood having a chronic illness may have a negative effect if the child sees him or herself as being different, as vulnerable, and not as able as healthy children. The attitude of parents, teachers, and other adult figures in the child's life who can foster in the child a sense of being valued and respected by others even in the presence of a chronic illness has been identified as an important protective factor (Barker, 1993).

Similar to young persons without a chronic illness, adolescents and young persons with a chronic illness such as Type 1 Diabetes have been found to exhibit increased autonomous behaviour during this developmental period (Dashiff & Bartolucci, 2002; Pacaud et al., 2007). However, the rate and circumstances under which increased autonomy takes place in young persons with a chronic illness may be different to that of young persons without a chronic illness. As noted previously, it has been suggested that children and adolescents with a chronic illness may be overprotected by their parents as a result of parental anxiety (Barker, 1993; Standen, 1990). A possible consequence of this for the young person may be difficulties in developing autonomy and being able to appropriately separate from parents as would be expected during the adolescent and young adult years.

Young people with a chronic illness are expected to comply with their medical treatment regimen. Studies have reported a relationship between pubertal status and

treatment adherence: as age increase and higher pubertal status is reached treatment adherence declines (e.g. Dashiff et al., 2005). During the developmental periods of adolescence and young adulthood the young person might rebel against a medical treatment regimen that has been suggested by adults and as a result the young person engages in behaviour that can jeopardise their health (Dunger, Acerini, & Ahmed, 2005; Magrab, 1985). Risk-taking behaviours are characteristic of this period of development but these behaviours can affect the young person's motivation to adhere to their treatment (Dunger et al., 2005) and the increase in autonomy that occurs in this period may mean that the young person no longer wants a high level of support from their parents (Magrab, 1985).

As described above having a chronic illness can have a major effect on developmental tasks from infancy to adulthood. In addition to mastering the normal developmental tasks the young person with Type 1 Diabetes also has to work out the meaning of having a chronic illness and the effects of this on their life and how they think of themself as a person.

1.5 Acceptance of Having Diabetes

Acceptance of having diabetes (also called psychological adjustment to diabetes in the literature) is another factor that has been considered in relation to diabetes management and metabolic control. Dunn, Smartt, Beeney and Turtle (1986) developed a measure of emotional adjustment for patients with diabetes where items were designed to measure the patient's emotional attitude and responses to diabetes, diabetes treatment, the effect of diabetes on lifestyle, and the impact of diabetes on the patient's

view of the future (Dunn et al., 1986; Welch, Dunn, & Beeney, 1994; Welch, Smith, & Walkey, 1992).

1.5.1 Acceptance of Having Diabetes and Diabetes Management.

Acceptance of having diabetes has been found to be related to diabetes management and control. Young people taking part in a study investigating the effects of a training program for diabetes management (adolescents and young adults, no age specified) reported being overwhelmed, angry, and afraid in the beginning of the program in relation to their treatment regimen and possible diabetes related complications (Dupius, 1980). Fears about telling people they knew about their diabetes were also expressed. After being in the program for approximately two months patients became more flexible in relation to their treatment regimen, were more accepting of having diabetes, and felt more in control of their illness (Dupius, 1980).

In a more recent study investigating young women's experience of living with Type 1 Diabetes it was found that young women thought having diabetes put restrictions on them and what they could do compared to young women without diabetes (Kay, Davies, Gamsu, & Jarman, 2009). Themes of feeling vulnerable as a result of having diabetes were also evident together with fears of what the future might hold in terms of developing diabetes related complications and starting a family. The women reported that they did not feel understood by people who did not have diabetes and having diabetes impacted on their relationships as they worried about how others perceived them. There was some indication that at times the women used denial or blocked out painful feelings as a means of coping with having diabetes (Kay et al., 2009). No measure of metabolic control or treatment adherence was included in these studies.

Among adolescents and young adults (aged 18 to 22 years and 14 to 20 years) with Type 1 Diabetes elevated scores on a measure of adjustment and coping with diabetes were related to poor diabetes management including not complying with the diabetes treatment and poor metabolic control (Hanson et al., 1989; Wysocki, Hough, Ward, & Green, 1992). In a study conducted by Wysocki et al. (1992) adjustment to diabetes included the degree of denial of the illness and resistance to making the changes to their behaviour required for the management of their diabetes. Participants who indicated retrospectively that they had poor adjustment to their diagnosis of diabetes at the age of 13 to 17 years had poorer diabetes management and health-related behaviours at the age of 18 to 22 years (Wysocki et al., 1992). These results suggest that, for young adults, being able to accept the diagnosis of Type 1 Diabetes and incorporate this as one aspect of their self concept and who they are as a person may be beneficial for treatment adherence and metabolic control.

1.5.2 Acceptance of Having Diabetes and Psychopathology.

Psychopathology and wellbeing are factors that have been found to be important in relation to acceptance of having diabetes. Gender differences have been reported with female adolescents and young adults found to worry more about their diabetes and have poorer adjustment to diabetes than males and as a result at potentially greater risk of depression (Grey, Boland, Yu, Sullivan-Bolayi, & Tamborlane, 1998). Female adolescents, young adults, and older adults have been found to be more likely to meet criteria for clinical depression than males (Eiser, Riazi, Eiser, Hammersley, & Tooke, 2001; Enzlin, Mathieu, & Demyttenaere, 2002). Adolescent females have also been found to be more likely to perceive diabetes as having a greater impact on their daily life than males and this perception was related to a higher incidence of symptoms of

depression and anxiety (Skinner, John, & Hampson, 2000). No direct relationship between emotional adjustment to diabetes or depression and glycemic control were found in a study of adults with Type 1 Diabetes (aged 18 to 76 years) which may mean that depressive symptoms and emotional adjustment to diabetes have an indirect impact on glycemic control through adherence to treatment regimen (Enzlin et al., 2002).

1.5.3 Acceptance of Having Diabetes and Illness Duration.

Illness duration has also been found to be related to acceptance of having diabetes. Diabetes related guilt (e.g. feeling responsible for having diabetes, feeling guilty for burdening people with one's needs as a result of having diabetes) is associated with older age and longer illness duration, particularly in the presence of diabetes related complications (mean age of participants 48 years, age range not reported) (Dunn et al., 1986). One possible explanation of the increased diabetes related guilt is that it is associated with perceiving oneself as adhering poorly to the treatment regimen. In young people aged 10 to 20 years behaviours such as avoiding things and places that reminded them of having diabetes, frequently losing one's temper, and blaming others were associated with poor adherence to treatment regimen (Hanson et al., 1989). These behaviours were more evident in older participants than in younger participants and in patients with longer illness duration (Hanson et al., 1989).

In younger adolescents (10 to 15 years) longer illness duration has been found to be related to lower rates of maternal responsibility for diabetes management and poorer adherence and metabolic control (Wiebe et al., 2005). Research investigating the impact of illness duration in young persons aged 18 to 25 years is lacking so that it is not clear what impact illness duration has on diabetes management for this age group. A related

area that has received limited research attention is how factors within the family affect young women's management of their diabetes.

1.6 Family Factors and Diabetes Management

The onset and diagnosis of a chronic illness such as Type 1 Diabetes in childhood or adolescence impacts on the young person and his or her family in many ways including cognitively, behaviourally, emotionally, and financially (Anderson & Brackett, 2000; Massie, 1985; Patterson & Garwick, 1998). Cognitively the family has to learn about diabetes and how it is managed. Behaviourally the family has to incorporate the treatment regimen into their day-to-day life which for many families may mean a change in their routines and way of living. The family also experiences emotions related to the diagnosis such as anger, loss, guilt, blame, helplessness, and grief (Patterson & Garwick, 1998). When a child is diagnosed with Type 1 Diabetes the management and care for the child is quickly transferred from the health professionals to the family (Anderson & Brackett, 2000). In the literature many family factors (e.g. family conflict, communication styles within the family, parenting) have been suggested to be important in relation to diabetes management. The past parent-child relationship and the young person's development of autonomy seem particularly pertinent to considerations of diabetes management in adolescence and young adulthood. The young person's perception of parental involvement in the diabetes treatment regimen would also be expected to be important to the parent-child relationship and increased autonomy in the young person.

1.6.1 Chronic Illness, Family Dynamics, and Developmental Tasks.

Within the diabetes literature there has been some examination of the influence of family factors on developmental tasks. Seiffge-Krenke (1997) suggested that the relationship between the young person with a chronic illness and the parent (usually the mother) is often extremely close. The need for the parent to implement intrusive regimens, such as the administration of insulin injections, can have implications for the developing parent-child relationship. In particular, representations of self and others and the boundaries between the young person's body and the parent's body may not become differentiated but rather remain diffused. The closeness of the parent-child relationship may make it harder for the young person to separate from the parent so that there may be a tendency for the young person to maintain the role of the dependent child (Seiffge-Krenke, 1997). This dependency may be related to current and/or past parental anxiety about the health of the young person which has resulted in the parent being overprotective of their child.

Overprotection as a result of parental anxiety has been suggested to be evident in the relationship between parents and their adolescents with a chronic illness where the overprotection by the parents can make the young person perceive himself or herself as being different and vulnerable (Barker, 1993). Overprotection and intrusiveness may be a result of the parent wanting to help and to make sure the young person is managing their diabetes in the best possible manner. However, this type of parenting can undermine the young person's confidence and motivation to take on the responsibility of self-management of the diabetes (Wolpert, 2002).

Parental negativity and warmth have also been considered in relation to metabolic control and diabetes management. Parental negativity, low levels of parental warmth, and a perception of parents as being critical have been found to be related to poor

metabolic control in adolescents (Lewin et al., 2006) and young adults (Gillibrand & Stevenson, 2006) and an increased likelihood of experiencing episodes of DKA in children and adolescents (Geffken et al., 2008). Based on such findings parental support has been suggested as an important possible factor to improve health outcomes in children and adolescents aged seven to 18 years (Geffken et al., 2008).

A diagnosis of a chronic illness in a child or adolescent can potentially alter parenting and the parent-child relationship because there is a necessity for the parent (usually the mother) to be closely involved in the management of the illness until the child reaches an age where self-management is appropriate. Such involvement may influence important developmental tasks such as the development of independence from the parents. As noted earlier, the parent might inadvertently become overprotective and impose restrictions that might not necessarily be warranted in light of the diagnosis of a chronic illness (Standen, 1990).

How parental overprotection and care influence the development of autonomy in young persons in general has had limited research attention. This question may be particularly important in regard to young people with Type 1 Diabetes given the suggested implications noted above for diabetes management.

1.7 The Young Person's Perception of Received Parenting

The perception a young person has of the parenting they have received has been found to be important in the development of autonomy (Feldman & Rosenthal, 1991) and is thought to be indicative of the attachment between a young person and their primary caregiver (Parker, Tupling, & Brown, 1979). There has been extensive investigation of particular aspects of parenting. Parental care has been conceptualised as

a dimension that includes affection, emotional warmth, empathy, and closeness on one end and emotional coldness, indifference, rejection, and neglect on the other end (Parker et al., 1979). The concept of parental control or overprotection has been explained as the parent being controlling and overprotective versus encouraging autonomy and independence in the child (Parker et al., 1979).

In American, Australian, and Hong Kong students aged 15 to 18 years, high levels of parental monitoring of adolescent behaviour and perceiving the family environment as demanding were associated with the adolescents expecting to become independent at a later age (Feldman & Rosenthal, 1991). Among Australian female adolescents perceptions of greater maternal control was associated with problems in the separation-individuation process (Milne & Lancaster, 2001). These results suggest that parental factors are important to the separation-individuation process and a young person's ideas of becoming independent. Moreover, too much parental protectiveness and intrusiveness may interfere with the development of independence in the young person. Whether parents of children and adolescents with a chronic illness are perceived as more controlling or overprotective is unclear as there are inconsistent findings in the literature.

Holmbeck et al. (2002) examined the degree of parental overprotection in parents of children with a chronic illness by asking both the parents and the child to rate the parents on their parenting. The results suggested that parents of children with a chronic illness were more overprotective than parents of children without a chronic illness (Holmbeck et al., 2002). It may be that parents fear what might happen if they do not take on a protective and controlling role in relation to their child's diabetes management. When parents of adolescents with Type 1 Diabetes were asked about benefits and barriers to their son or daughter assuming responsibility for their own

diabetes management, parents identified their own fear of losing control as a barrier (Hanna & Guthrie, 2000).

However, contrasting results have been reported elsewhere in the literature. In a recent study parents of children and adolescents (aged 8-18 years) with Type 1 Diabetes could not be classified as overprotective (Bourdeau, Mullins, Carpentier, Colletti, & Wolfe-Christensen, 2007). Moreover, parental overprotectiveness was not related to self-care behaviours in the young person and instead greater levels of parental stress were significantly related to the child being perceived as less engaged in self-care behaviours related to Type 1 Diabetes (Bourdeau et al., 2007). The causal direction of this relationship is not clear as parental stress might also have been because of concern about the children and adolescents not adhering to their treatment regimen. Thus, poorer adherence might explain greater levels of parental stress. While this study examined overprotectiveness in relation to diabetes self-care, metabolic control was not reported. Moreover, only the parents completed a measure about parental control and overprotection: there was no assessment of how their children perceived the parenting they received (Bourdeau et al., 2007).

Research investigating the relationship between parental involvement/guidance related to diabetes self-care behaviours in the young person and metabolic control has found that continued involvement in the adolescent years and support and guidance into the young adult years is beneficial to treatment adherence and metabolic control. Grey et al. (1998) found that in young people (aged between 13 and 20 years) who perceived their parents as maintaining guidance and support in their diabetes management had better metabolic control. This suggests that with increasing age of the young person parents need to consider the developmental needs of the young person together with the seriousness of the diabetes in order to achieve the optimal balance between parental

involvement and the young person taking on complete responsibility for the treatment regimen (Grey et al., 1998; La Greca et al., 1995). Thus, how parental involvement in the young person's diabetes management is discussed and negotiated between the parent and young person is of importance (Anderson, 2004). It is however unclear whether young adults who perceive their parents as having been involved in their diabetes management during adolescence have better diabetes management and metabolic control in young adulthood. Thus, examining the young person's perception of past parental involvement seems relevant.

A young person's perception of the parenting he or she has received is thought to be closely related to attachment between the young person and the caregiver but how this might be connected to parental involvement needs further examination. Attachment between the young person and their parent is in turn thought to be related to how a young person develops independence from their caregivers. Below is a brief overview of attachment theory and some of the research findings related to the development of autonomy and how attachment may be affected by the presence of a chronic illness.

1.8 Attachment Theory and Research

Attachment theory was developed by Bowlby (1969, 1973, 1981) and describes behaviours that are thought important for an attachment relationship to develop between an infant and his/her primary attachment figure (usually the mother). Attachment behaviours (e.g. crying and clinging) are activated mainly in situations of distress where the infant seeks proximity and contact with the primary attachment figure. Bowlby suggested that these behaviours protect the infant because they promote safety and survival and assist in the development of an enduring emotional bond between an infant and the attachment figure. Difficulties in the primary attachment relationship can affect

later psychological well-being and adjustment in a negative manner and make it difficult for a child to rely on his/her mother as a safe base. The early experiences the child has of his/her primary attachment relationship are internalised as working models of self and others as worthy or unworthy and as responsive or unresponsive. These working models guide how a person thinks, feels, and acts in later relationships (Bowlby, 1981). Empirical research has supported Bowlby's (1969) claim that as the child grows older, reaches adolescence and becomes an adult, the primary attachment figure often changes from the mother to a romantic partner (e.g. Fraley & Davis, 1997; Hazan, Gur-Yaish, & Campa, 2004). The quality of these later relationships will be influenced by the nature of the early attachments. Studies have shown that people with insecure attachment styles are more likely to experience interpersonal difficulties throughout life (e.g. Dinero, Conger, Shaver, Widaman, & Larsen-Rife, 2008; Pearce & Halford, 2008). This link between past and current attachment styles may first become evident in adolescence.

1.8.1 Attachment during Adolescence and Young Adulthood.

During adolescence attachment relationships with parents are still important, however, peer relationships take on a more prominent role throughout this developmental period. A longitudinal study over two years examining attachment patterns in adolescents and their parents found that the quality of attachment between adolescents and their parents was stable during this period (Buist, Reitz, & Dekovic, 2008). As in infancy, the secure base from which exploration can take place becomes important when the adolescent starts to explore his or her sexual needs. In particular, the parents symbolically represent a secure base from which the adolescent can explore new social situations and relationships (M. L. Cooper, Shaver, & Collins, 1998).

One way in which attachment to parents has been suggested to be different during adolescence compared to other ages (e.g. infancy) is that in addition to receiving high levels of support from parental figures, emotional autonomy reflected in the need to spend more time away from the parents and engaged in peer activities is of great importance (L. S. Brown & Wright, 2001; Schneider & Younger, 1996). Parental support can allow the young person to experience a sense of stability in spite of all the changes taking place during adolescence. Support for this view can be found in the literature on college students in America. College students with a more secure attachment to parents and peers were found to adjust better to college life (Lapsley & Edgerton, 2002; Lapsley, Rice, & Fitzgerald, 1990). In a German study of young adults a secure attachment pattern was related to the timing of age expected behaviours: young adults with a secure attachment to their parents were more likely to move out of the parental home at normative times (defined as age 21 for females and age 23 for males) compared to their peers with an insecure attachment (Seiffge-Krenke, 2006).

As has been mentioned above peer relationships become increasingly important during adolescence and have been shown to be associated with the quality of attachment to parents. A correspondence between the type and quality of attachment with parents and peers has been found among American college students aged 16 to 22 years (Armsden & Greenberg, 1987). Young people with insecure attachments to their parents have been rated by their peers as being more hostile and anxious compared to young persons with secure attachments to their parents (Kobak & Sceery, 1988). Taken together this suggests that even as peer relationships become more influential throughout the adolescent years parent-child attachment still remains important as a foundation for how the young person develops peer relationships and negotiates the process of increasing autonomy.

Attachment has also been found to be related to psychopathology. Adolescents aged 13 to 19 years who were categorised as securely attached were found to have fewer symptoms of anxiety, depression, hostility, paranoid ideation, psychoticism, somatisation, and obsessive-compulsive thoughts and behaviour (M. L. Cooper et al., 1998). Depressive symptomatology has also been found to be related to insecure attachment patterns and being less comfortable with closeness and depending on others in American college students (Lapsley, Varshney, & Aalsma, 2000; Marchand-Reilly, 2009; Riggs & Han, 2009). A study of two groups of young people aged 14 to 29 years, one clinical group recruited from mental health services and one non-clinical group, found that young people in the clinical group were significantly more likely to display ambivalent or avoidant attachment patterns than were young people in the non-clinical group (L. S. Brown & Wright, 2003). The young people in the clinical group further reported having more difficulties with being sociable (L. S. Brown & Wright, 2003). Having a chronic illness may impact on both the attachment bond between child and parent and the development of age expected behaviours.

1.8.2 Attachment and Chronic Illness.

The presence of a chronic illness in early childhood can potentially disrupt the attachment process during this developmental period (Ødegård, 2005). Ødegård suggested that parental anxiety, child anxiety, the physical effects of the illness, and the various treatment components necessary for the management of a chronic illness can have consequences for the attachment process during childhood. She further argued that as individuation and autonomy are critical aspects of the attachment process, having a chronic illness can make it more difficult for these developmental tasks to be gradually achieved during childhood development. Individuation and the development of

autonomy is a continuing process so even though Ødegård's discussion was focussed on childhood, it seems likely that any interference occurring during this period would affect these developmental processes throughout adolescence and young adulthood. Delay or disruption in these processes may in turn have implications for how young people manage their chronic illness.

In recent years researchers have started investigating the link between attachment and diabetes management. Adult patients with diabetes who had a dismissing attachment style were less likely to adhere to recommended diabetes treatment in the areas of diet, exercise, foot care, testing blood, and insulin injections (Ciechanowski et al., 2004; Turan, Osar, Turan, Ilkova, & Damci, 2003). Higher prevalence of dismissing/avoidant attachment style (35.8%) and a lower prevalence of secure attachment (44.2%) has been found in a population of individuals diagnosed with diabetes (Ciechanowski et al., 2004) compared to adults in the general population (25% dismissing/avoidant and 59% secure) (Mickelson, Kessler, & Shaver, 1997). This discrepancy in the distribution of attachment patterns might suggest that having diabetes has an impact on attachment styles. However, this study (Ciechanowski et al., 2004) included participants of all ages with both Type 1 and Type 2 Diabetes and did not report the age range of their participants or whether their age or illness duration had any effect on attachment style or diabetes management. As such, it is difficult to know how these variables might have influenced the results.

The studies reviewed above suggest that a secure attachment to a primary caregiver is an important part of the development of independent behaviours during adolescence and young adulthood (Doctors, 2000; Josselson, 1988; Tanner, 2005). As there is evidence that a diagnosis of a chronic illness can affect the way a child is parented and therefore potentially alter the attachment relationship, it is important to

consider how the parenting received may influence developmental tasks such as separation-individuation of which identity formation is an important part.

1.9 Separation-Individuation

Separation-individuation is regarded as an important developmental process in the developmental stages of adolescence and young adulthood (Josselson, 1988; Tanner, 2005) and involves developing autonomy and separating from parents (e.g. Lapsley, Rice, & Shadid, 1989; Lopez et al., 1988; Moore, 1987). Identity development is an important part of the separation-individuation process (Erikson, 1968, 1980). Blos (1979) outlined the concept of separation-individuation in his study of adolescence. Building on the first phase of separation that takes place in the second year of life (Mahler et al., 1975), Blos suggested that the second phase of separating and individuating from parents takes place during adolescence where the young person has to differentiate certain parts of the self that are still enmeshed with the parents and in this way achieve autonomy from parents. In this process the young person's sense of self is sharpened and there is a strengthening of boundaries and feelings of separateness from other people (Josselson, 1980).

The traditional psychodynamically oriented theories about adolescence and separation-individuation assume that during adolescence there is "the shedding of family dependencies, the loosening of infantile object ties in order to become a member of society at large or, simply, of the adult world" (Blos, 1979, p. 142). This description might suggest that a weakening of the parent-child relationship is necessary for the successful working through of the separation-individuation process. However, more recent theories have emphasized that close parent-adolescent relationships are critical during this period as they provide the young person with the opportunity to explore and

develop competencies outside the family while providing a secure base for such exploration (e.g. Bowlby, 1988). The young person includes parents and the multigenerational family system in the process of separation-individuation by modifying and thus preserving these relationships (Josselson, 1988; Tofani, 2007). This ongoing connection is evident when the young person brings new ideas and ways of behaving back to the parent in order for these new elements to be recognised and for the relationship to be updated (Josselson, 1988). Theories of family development (Lopez & Gover, 1993) also suggest that for the young person to manage the process of separation-individuation a change in the parent-adolescent relationship needs to take place (Allison & Sabatelli, 1988; C. R. Cooper, Grotevant, & Condon, 1983; Grotevant & Cooper, 1985, 1986; Josselson, 1988; Tofani, 2007).

Tofani (2007) suggested that through the process of separation and individuation the young person and their family are engaged in different tasks such as re-developing family boundaries and interactions which can encourage increased responsibility and self-directed behaviour in the young person. In their theory of connectedness and individuality Grotevant and Cooper (1985, 1986) suggested that rather than abandon their relationship with their parents, the relationship is changed between the adolescent and the parents to one in which there is increased equality with the parents instead of authority from the parents. They further suggested that a high degree of connectedness in the parent-adolescent relationship allows for the development of individuation (C. R. Cooper et al., 1983; Grotevant & Cooper, 1985) with higher levels of emotional connectedness to parents being related to a young person's perception of having greater influence in the parent-child relationship (Buhl, 2008).

The process of separation-individuation is thought to take place over several years with differences in the degree of achieved separation-individuation according to the age

of the young person (Youniss & Smollar, 1985). Some support for the idea that increased individuation is evident with increasing age has been found in studies examining independent behaviours and taking on of adult roles. Cohen, Kasen, Chen, Hartmark and Gordon (2003) examined the separation-individuation process in young Americans aged 17 to 27 years and sought to determine whether there was an increase in independent behaviours and the taking on of adult roles such as living independently and being financially independent according to the age of the young person. The expected age differences in terms of independent behaviours and the assumption of adult roles were found with older participants being more likely to work full-time and to have children and being less likely to live at home with their parents and to receive financial support from their family. However, large individual differences in the timing of independent behaviours and a moving between increasing and decreasing dependency was evident (P. Cohen et al., 2003).

It seems unlikely that separation-individuation is the only factor that determines when a young person engages in more independent behaviours and assuming adult roles. Even though it might be assumed that an increase in independent behaviours and taking on adult roles are related to the process of separation-individuation it does not necessarily follow that they are indicative of a more resolved separation-individuation process. An example might be when a young person decides to move out of the parental home. This decision might be dependent more on where the young person can obtain a university degree or find a job than whether or not it is representative of a more resolved separation-individuation process. However, research examining the link between the internal process of separation-individuation and the more external aspects of adult roles and behaviours is lacking.

Other factors operating at a more internal level that are thought to be important to the separation-individuation process are the young person's expectations of relationships with family and peers. German adolescents and young adults aged 10 to 20 years were found to have a greater likelihood of experiencing fewer difficulties in their separation-individuation when there was low maternal overprotection and high maternal empathy (Kruse & Walper, 2008). American college students with a secure or dismissing attachment style were found to be more likely to have a more resolved separation-individuation process compared to college students with a fearful or preoccupied attachment style (Lapsley & Edgerton, 2002). These results suggest that a young person's view of the parenting they have received and their attachment style impacts on the separation-individuation process.

Since the process of separation-individuation has been reported to be important to developmental stages from early childhood through adolescence and young adulthood, parenting practices and how young women's mothers perceived their own separation-individuation process have been thought to be influential (Charles, Frank, Jacobson, & Grossman, 2001). Daughters who perceived their mothers as being supportive of and facilitating their attempts of separating from their mothers and becoming more independent were more likely to be parented by a mother who remembered her own mother behaving in a similar manner (Charles et al., 2001). It has been suggested that such generational transmission is related to the development of a working model of separation-individuation (Diamond, Heinicke, & Mintz, 1996) which will impact on patterns of relationships, affect regulation, and internal representations of how a person sees him or herself in relation to others (Charles et al., 2001).

A healthy level of separation and individuation has been found to be related to a strong sense of self and having resources to deal with situations and transitions that arise

(Mattanah, Hancock, & Brand, 2004). Moreover, a healthy level of separation-individuation also included not feeling bad (e.g. feelings of anxiety, guilt, or expecting rejection) about the changes taking place during the process of separation-individuation (Mattanah et al., 2004). Less resolved separation-individuation on the other hand has been linked to fears of being rejected by mother and at the same being intruded upon by mother, the presence of more depressive symptoms, and lower self-esteem (Kruse & Walper, 2008).

There is only limited research on separation-individuation and most studies have included American college students as participants. There is no research that has investigated the separation-individuation process in populations of chronically ill young adults but some research has focused on aspects of the separation-individuation process such as identity development and specific types of autonomous behaviour present in young persons with Type 1 Diabetes.

1.9.1 Separation-Individuation and Type 1 Diabetes.

Studies have investigated whether there are differences in types of autonomy in adolescents and young adults with and without Type 1 Diabetes (e.g. Dashiff & Bartolucci, 2002; Pacaud et al., 2007). Dashiff and Bartolucci (2002) examined three types of autonomy: cognitive, behavioural, and emotional autonomy in adolescents (aged 12 to 15 years) who had been diagnosed with Type 1 Diabetes before puberty. Behavioural autonomy increased with pubertal stage suggesting that parents might grant their adolescents more freedom as visual indicators of pubertal change becomes more evident. Overall, patterns of cognitive, behavioural, and emotional autonomy in adolescents with Type 1 Diabetes were found to be similar to those in adolescents without a chronic illness. A limitation of this study was that the authors only compared

the scores of the different measures with other studies using the same measures. Using a matched control group might have yielded different results (Dashiff & Bartolucci, 2002). Young adults (18 to 25 years) with a diagnosis of Type 1 Diabetes have been found to be similar to young adults without a diagnosis of Type 1 Diabetes in terms of psychosocial maturation (e.g. level of education, income source, marital status, living arrangements) (Pacaud et al., 2007). Adherence to treatment regimen and metabolic control were not investigated in this study. However, it is not clear that autonomy as conceptualised in the above studies is a direct representation of separation-individuation which relates more to internal processes around the young person's self-concept and their internalised relationship with parents.

Identity development and exploration are important aspects of adolescent and young adult development and are also related to separation-individuation. The effects of having Type 1 Diabetes on these developmental tasks have been explored in young adults aged 18 to 30 with and without Type 1 Diabetes (Luyckx et al., 2008). Young adults with a diagnosis of Type 1 Diabetes were found to be mostly similar to young adults who did not have a diagnosis of Type 1 Diabetes suggesting that young adults with Type 1 Diabetes deal with identity development similarly to other young adults. However, young adults with Type 1 Diabetes were found to be less likely to examine different alternatives before making decisions and commitments (identity exploration in breadth) and less likely to evaluate how well commitments engaged in by the young person fitted with their image of self (identity exploration in depth). Thus, a diagnosis of Type 1 Diabetes might have interfered with the young person's opportunities for identity exploration (Luyckx et al., 2008; Seiffge-Krenke, 2001) which may be the result of the young person worrying about managing their diabetes (Seiffge-Krenke, 2001). The results from this recent study of the impact of Type 1 Diabetes on

developmental tasks in the young adult years suggested that there are many similarities but also some important differences.

Despite the absence of research on the separation-individuation process in young persons with a chronic illness it has been suggested that separation difficulties may occur because of a close parent-child relationship that has been influenced by a diagnosis of Type 1 Diabetes in the young person (Seiffge-Krenke, 1997). During the adolescent years the young person has to differentiate herself from others and accept her chronic illness as an aspect of her body. Seiffge-Krenke suggested that difficulties in the individuation process were indicated by a very close relationship and lack of physical separateness between mothers and their chronically ill adolescents. Such physical closeness may be demonstrated by the mother performing the diabetes management tasks for the young person even as the young person approaches adulthood and might be expected to take responsibility for their own illness management. Seiffge-Krenke (1997) gave the example of mothers who would observe their children closely and notice when an episode of hypoglycaemia approached, and thus remind their adolescent to eat a sugar drop before the adolescent himself had the opportunity to become aware of what was going on in his own body. While some differences in the process of separation-individuation among young adults with a chronic illness might be expected, importantly, examples such as the one mentioned above are likely to be evident mostly in pathological mother-child relationships (Seiffge-Krenke, 1997). However, this is difficult to know as there have been no empirical studies that have examined whether the separation-individuation process is delayed in adolescents/young adults who are diagnosed with diabetes in childhood or adolescence and whether this has any association with current diabetes management.

2 Rationale and Aims of Present Study

2.1 Rationale of Present Study

As is apparent from the above literature review there is a need to increase our understanding of the difficulties associated with diabetes management in adolescence and young adulthood. Separation and individuation involves increasing autonomous behaviour, becoming more self-reliant, separating oneself from the dependency on parents, forming an identity as a separate person, and changing perceptions of parents from one of idealisation to parents as individuals with strengths and weaknesses. Most studies that have examined the separation-individuation process have used American college students as participants (e.g. Gnaulati & Heine, 2001; Hoffman, 1984; Kenny & Donaldson, 1992; Kobak & Sceery, 1988; Lapsley & Edgerton, 2002; Rice, Cole, & Lapsley, 1990) and therefore may not be representative of other young adults living elsewhere. Adoption of 'adult roles' and age expected behaviours have been the focus of most studies that have investigated the separation-individuation process. Even though these aspects are clearly important in the separation-individuation process they may not necessarily imply a more or less resolved separation-individuation.

There have been very few Australian studies on separation-individuation and none that have examined this concept in late adolescence and young adulthood. It is not clear then in what form the separation-individuation process takes place in general among adolescents and young adults. Many of these issues around separation-individuation can be seen as critical to diabetes self-management but there have been no published studies that have examined the link between the separation-individuation process and diabetes management. In the absence of more information on separation-individuation in the general population, it is not clear whether the presence of a chronic illness affects the

process of separation-individuation in young people and also whether the degree of separation-individuation influences self-management of a chronic illness such as Type 1 Diabetes. However, it seems possible that the presence of a chronic illness may well influence this developmental process as research suggests that having a chronic illness can have a major effect on different developmental tasks from infancy to adulthood. Being diagnosed with Type 1 Diabetes during childhood has been suggested in the literature to have possible implications for the parent-child relationship, particularly the attachment relationship developed between the child and caregiver (Ødegård, 2005) and the parenting the child receives (Barker, 1993; Wolpert, 2002). The age at which a child is diagnosed with Type 1 Diabetes can affect the parenting the child later receives particularly in regard to parental care and overprotectiveness. The way the child is parented following the diagnosis may have implications for later developmental tasks including the separation-individuation process during early childhood and in adolescence and young adulthood. There has been very little research focus on how a diagnosis of Type 1 Diabetes affects developmental tasks throughout childhood and adolescence into early adulthood.

2.2 Aims of Present Study

The major aim of the present study was to examine factors that were thought to be important in diabetes management and control in young women aged 18 to 25 years with Type 1 Diabetes. In particular, the study aimed to investigate whether separation-individuation, illness duration, acceptance of having diabetes, depressive symptoms, and previous parental involvement influenced the management of Type 1 Diabetes in young women. A further aim of the present study therefore was to examine how factors such as perceptions of parenting, attachment to parents and peers, and depressive

symptoms influenced separation-individuation and whether having a diagnosis of Type 1 Diabetes made any additional contribution. To address these questions two models were developed and tested with an Australian sample of young women with and without Type 1 Diabetes.

2.3 Proposed Models

Two models were developed:

a) to explain how the factors identified above influenced separation-individuation and

b) to explain how separation-individuation and other factors influenced diabetes management in young women with Type 1 Diabetes.

2.3.1 Model 1: Factors Influencing Separation-Individuation in Young Adult Women.

The first model presented below in Figure 1 comprised factors that had been identified as influencing the separation-individuation process. The following factors were included: perceived maternal care, perceived maternal overprotection, current attachment to mother, attachment to peers, and depressive symptoms in the young person. As is suggested in the literature reviewed above, it was expected that a young person's perception of the parenting they have received (maternal care and overprotection) would be linked to their current attachment to their mother and to separation-individuation. Specifically, young women who perceived their mother to have provided high levels of care were expected to have a more secure current attachment to their mother than women who perceived their mother as having provided

low levels of care and they were also expected to have a more resolved separation-individuation process. High levels of maternal overprotection were expected to be associated with a less secure current attachment to mother and a less resolved separation-individuation process.

A secure attachment to parents has been associated with resolution of the separation-individuation process and greater independent behaviour in the young person (Kenny & Donaldson, 1992). The quality and type of attachment to a parent has been reported to correspond with a person's attachment to peers (Armsden & Greenberg, 1987) and based on studies reviewed above, current attachment relationships to both parent and peers were expected to influence separation-individuation. More secure attachment relationships with parent and peers were expected to be associated with more resolved separation-individuation. It has been reported that the resolution of the separation-individuation process can be related to different types of psychopathology including depressive symptoms (Christenson & Wilson, 1985) and also that depressive symptoms is associated with the parent attachment relationship. Thus, a less secure attachment relationship with mother was thought to be associated with more depressive symptoms and the presence of more depressive symptoms was expected to be associated with a less resolved separation-individuation. To address the question of whether a chronic illness has any further influence on separation-individuation a variable indicating whether the young person had a diagnosis of Type 1 Diabetes was also included in the model. As a diagnosis of a chronic illness has been suggested in the literature to be linked to possible delays or complications in the developmental tasks throughout childhood and adolescence it was expected that having a diagnosis of Type 1 Diabetes would be associated with a less resolved separation-individuation.

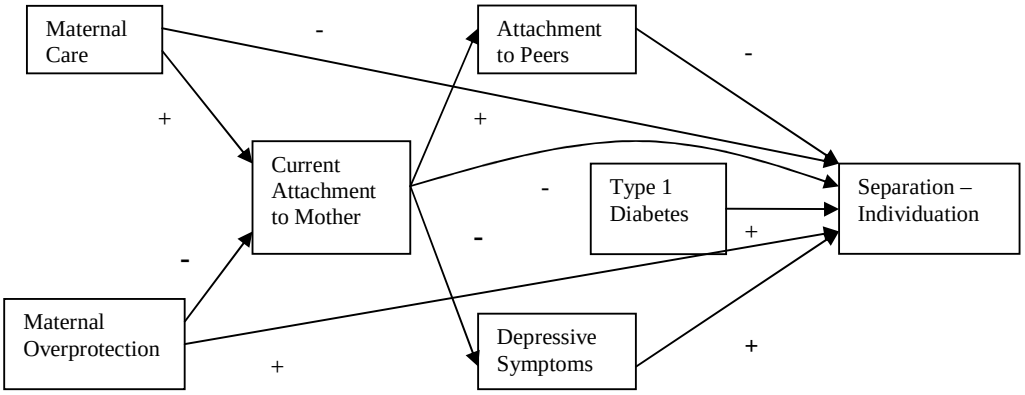

Figure 1. Model 1: Factors Influencing Separation-Individuation in Young Adult Women

2.3.1.1 Hypotheses – Model 1

In the development of Model 1 the following hypotheses were generated:

(1) Perceived maternal care will have a negative association with separation-individuation where higher level of perceived maternal care will be associated with more resolved separation-individuation (a lower score on the separation-individuation measure).

(2) Perceived maternal care will have a positive association with current attachment to mother where higher level of perceived maternal care will be associated with a more secure current attachment to mother.

(3) Perceived maternal overprotection will have a positive association with separation-individuation where higher level of perceived maternal

overprotection will be associated with less resolved separation-individuation (a higher score on separation-individuation measure).

(4) Perceived maternal overprotection will have a negative association with current attachment to mother where higher level of perceived maternal overprotection will be associated with a less secure current attachment to mother.

(5) Current attachment to mother will have a negative association with separation-individuation where a more secure attachment to mother will be associated with more resolved separation-individuation (a lower score on separation-individuation measure).

(6) Current attachment to mother will have a positive association with attachment to peers where a more secure attachment to mother will be associated with a more secure attachment to peers.

(7) Current attachment to mother will have a negative association with depressive symptoms where a more secure attachment to mother will be associated with less depressive symptoms.

(8) Attachment to peers will have a negative association with separation-individuation where more secure attachment to peers will be associated with more resolved separation-individuation (a lower score on separation-individuation measure).

(9) Depressive symptoms will have a positive association with separation-individuation where more depressive symptoms will be associated with less resolved separation-individuation (a higher score on separation-individuation measure).

(10) A diagnosis of Type 1 Diabetes will have a positive association with separation-individuation where having a diagnosis of Type 1 Diabetes will be associated with less resolved separation-individuation (higher score on separation-individuation measure).

The following hypotheses examined potential indirect pathways in Model 1:

(11) The negative association between perceived maternal care and separation-individuation will be mediated by current attachment to mother.

(12) The positive association between perceived maternal overprotection and separation-individuation will be mediated by current attachment to mother.

(13) The negative association between current attachment to mother and separation-individuation will be mediated by attachment to peers.

(14) The positive association between current attachment to mother and separation-individuation will be mediated by depressive symptoms.

2.3.2 Model 2: Factors Influencing Diabetes Management in Young Adult Women.

A second model presented in Figure 2 below was proposed to examine the influence of separation-individuation on diabetes management in young women with Type 1 Diabetes. Factors included in this model were illness duration, perception of past parent involvement in diabetes management, separation-individuation, depressive symptoms in the young person, and acceptance of having Type 1 Diabetes. Illness duration is thought to have a direct relationship with past parental involvement, acceptance of having diabetes, and diabetes management. The length of time since onset of diabetes would be expected to influence diabetes management through the reported

association with acceptance of having the illness. The close involvement of parents with children diagnosed with Type 1 Diabetes potentially influences normal developmental tasks. The young person's perception of past parental involvement in diabetes management was therefore expected to affect their current diabetes management according to their level of separation-individuation. Less resolved separation-individuation and less acceptance of having diabetes in the young person were expected to be associated with the presence of more depressive symptoms. Depressive symptoms were expected to influence the young person's diabetes management behaviours as was acceptance of having diabetes. Finally, young women who reported better diabetes management were expected to have better metabolic control as measured by glycated hemoglobin levels.

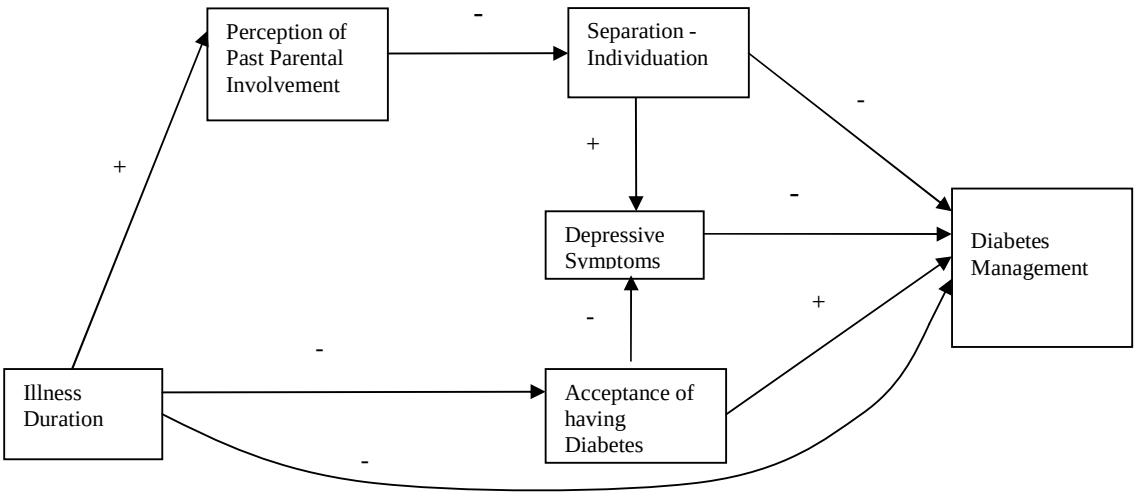

Figure 2. Model 2: Factors Influencing Diabetes Management in Young Adult Women

2.3.2.1 Hypotheses – Model 2:

In the development of Model 2 the following hypotheses were generated:

(15) Illness duration will have a negative association with acceptance of having diabetes.

(16) Illness duration will have a positive association with past parental involvement in diabetes self care behaviours.

(17) Illness duration will have a negative association with diabetes management.

(18) Depressive symptoms will have a negative association with acceptance of having diabetes.

(19) Perception of past parental involvement in diabetes management will have a negative association with separation-individuation.

(20) Separation-individuation will have a negative association with diabetes management.

(21) Separation-Individuation will have a negative association with acceptance of having diabetes.

(22) Depressive symptoms will have a negative association with diabetes management.

(23) Acceptance of having diabetes will have a positive association with diabetes management.

(24) Diabetes management will be positively associated with metabolic control.

The following hypotheses examined potential indirect pathways in Model 2:

(25) The association between illness duration and diabetes management will be mediated by acceptance of having diabetes.

(26) The association between separation-individuation and diabetes management will be mediated by depressive symptoms.

3 Method

3.1 Participants

Participants in this study were young women aged between 18 and 25 years with or without a diagnosis of Type 1 Diabetes. General exclusion criteria included having an intellectual disability, a diagnosed mental illness, or insufficient English to complete the questionnaires.

Young Women diagnosed with Type 1 Diabetes (n = 42) were recruited from the Western Hospital and the Young Person's Clinic at the Royal Melbourne Hospital. Young Women without a diagnosis of Type 1 Diabetes (n = 64) enrolled in higher education degree were recruited from Victoria University; those studying psychology and other health related disciplines were excluded as it was thought that these students would have superior knowledge about certain constructs examined via questionnaires.

3.1.1 Recruitment Sites.

Western Hospital is located in the Western suburbs of the Melbourne metropolitan area in Australia. The hospital has two main outpatient clinics related to diabetes care that provide medical care for people of all ages with Type 1 and Type 2 Diabetes. Western Hospital also provides diabetes education to patients with diabetes and their families. Young women who were seen as outpatients at the two main clinics were recruited.

Young women with a diagnosis of Type 1 Diabetes were also recruited from the Young Person's Clinic at the Royal Melbourne Hospital located in the centre of Melbourne. The Young Person's Clinic is an outpatient clinic specializing in the treatment of young patients (aged 17 to 25 years) with Type 1 Diabetes. The clinic

operates on two afternoons/evenings per calendar month in order to cater for the needs of young adults.

Young women without a diagnosis of Type 1 Diabetes were recruited from Victoria University. Victoria University was founded in 1916 but was then called Footscray Technical School. Since then many different TAFE colleges merged together and eventually in 1990 Victoria University was established. Victoria University offers short courses and qualifications in vocational and higher education. There are over 50 000 students enrolled at campuses in Melbourne, Australia, and at international sites. Of these 50 000 students, approximately 12 000 are international students. Recruitment for the present study took place at two campuses in the Western suburbs in the metropolitan area of Melbourne.

3.2 Measures

Participants were given a questionnaire booklet together with information about the study and support services they could access if needed. The participant information booklet contained information that briefly described the present study and consent forms for the participants and researchers to sign (see Appendix A for the participant information booklet for participants with Type 1 Diabetes and Appendix B for the participant information booklet for participants without Type 1 Diabetes).

3.2.1 Background Questionnaire (see Appendix C).

A questionnaire was developed specifically to collect background information for the present study and was included in the questionnaire booklet given to participants. Demographic data included age of the participant, level of education, marital status,

living arrangement, employment status, country of birth, and ethnicity. Other questions related to birth order in family, and current weight and height. Participants who had Type 1 Diabetes were also asked to provide information regarding age when diagnosed with diabetes, treatment regimen, frequency of diabetes clinic attendance, age at which they assumed full responsibility for their diabetes management, whether they have been hospitalised in relation to their diabetes, and whether they have experienced any complications as a result of their diabetes. If participants answered yes to the last two questions they were asked to provide details of the complications they had experienced and the reasons for hospitalization.

3.2.2 Separation-Individuation Process Inventory (S-IPI) (Christenson & Wilson, 1985) (see Appendix D).

The S-IPI (Christenson & Wilson, 1985) was used to assess the degree of separation-individuation. This inventory consists of 39 items that are rated on a ten point Likert scale where 1 represents “not at all characteristic” and 10 represent “very characteristic”. Total scores range from 39 to 390 with higher scores on the inventory being suggestive of a problematic or less resolved separation-individuation process. The authors suggested that a cut-off score of 190 can be used to distinguish individuals who experience difficulties with the separation-individuation process from those who do not with a score of 190 and above indicative of difficulties and possible pathology in the separation-individuation process. Examples of items are ‘When people really care for someone, they often feel worse about themselves’ and ‘I am tempted to try to control other people in order to keep them close to me’. Three items are reversed scored and the total score can be obtained by adding all the item scores (Christenson & Wilson, 1985; Fischer & Corcoran, 2007). The inventory has been reported to have adequate

psychometric properties with a Cronbach's alpha of .92 (Christenson & Wilson, 1985). In the present study this measure was found to have adequate internal consistency with a Cronbach's alpha of .94.

3.2.3 The Inventory of Parent and Peer Attachment (IPPA) (Armsden & Greenberg, 1987) (see Appendix E).

Parent and peer attachment was assessed using the IPPA (Armsden & Greenberg, 1987). This self-report measure assesses the security and importance of the attachment between individuals and their parents and peers (Armsden & Greenberg, 1987; Lopez & Gover, 1993). The IPPA consists of two scales: one scale assessing parent attachment (25 items) and a second scale assessing peer attachment (25 items) with higher scale scores indicating a more secure current attachment to parent or peers. Each scale consists of three sub-scales: Trust, Communication and Alienation. Only the total scores for the parent attachment scale and the peer attachment scale were used in the current study. Items are rated on a five point Likert scale where participants indicate the degree to which each item is true for them ranging from "almost always or always true" to "almost never or never true". Examples of items from the parent attachment scale are 'My mother accepts me as I am' and 'I get upset a lot more than my mother knows about'. Examples of items from the peer attachment scale are 'I wish I had different friends' and 'I trust my friends'. Internal reliability (Cronbach's alpha) for the two scales has been reported to be .96 for attachment to mother and .94 for attachment to peers (Beitel & Cecero, 2003). Internal reliability (Cronbach's alpha) for the two scales in the present study sample was good: $\alpha = .96$ for parent attachment and $\alpha = .94$ for peer attachment.

3.2.4 The Parental Bonding Instrument (PBI) (Parker et al., 1979) (see Appendix F).

The PBI (Parker et al., 1979) was used to assess the young women's perceptions of the parenting they received before the age of 16 years. How people perceive the parenting they received, as measured by the PBI, has been shown to be stable over a period of 20 years (Wilhelm, Niven, Parker, & Hadzi-Pavlovic, 2005). The PBI consists of 25 items divided into two sub-scales; Parental Care consisting of 12 items and Parental Overprotection consisting of 13 items with wording available for mothers and fathers (only perceptions of maternal parenting was used in the present study). A higher score on the Parental Care subscale suggests a perception of parents as being more caring. A higher score on the Parental Overprotection subscale suggests a perception of parents as being more controlling and overprotective. The items are rated on a four point Likert scale where participants indicate the degree to which each item is characteristic of their mother ranging from "very like" to "very unlike". Examples of items include 'spoke to me with a warm and friendly voice' and 'tried to control everything I did'. Adequate psychometric properties have been reported on this measure with Cronbach's alpha of .85 for the Care sub-scale and .69 for the Overprotection sub-scale (Parker et al., 1979). Internal reliability of this measure in the present study was found to be good with Cronabach's alpha of .92 for the Care sub-scale and .91 for the Overprotection sub-scale.

3.2.5 Depression Anxiety and Stress Scale (DASS) (S. H. Lovibond & P. F. Lovibond, 1995) (see Appendix G).

Depressive symptoms in the young person were assessed using the DASS (S. H. Lovibond & P. F. Lovibond, 1995). The DASS has three sub-scales; Depression,

Anxiety, and Stress with 14 items in each sub-scale. Only the Depression and Anxiety sub-scales were collected in the present study with the results from the Depression subscale being the only data used in the analyses. The items are rated on a four point Likert scale ranging from “did not apply to me at all” to “applied to me very much” according to how much the statement applied to the participant over the past week. Examples of items from the Depression sub-scale are ‘I couldn’t seem to experience any positive feeling at all’ and ‘I felt I was pretty worthless’. Examples of items from the Anxiety sub-scale are ‘I had a feeling of shakiness’ and ‘I felt I was close to panic’. Scores on the Depression subscale range from zero to 42 with higher scores indicating the presence of more depressive symptoms. The DASS has been extensively used in both research and clinical settings (e.g. Antony, Bieling, Cox, Enns, & Swinson, 1998; T. A. Brown, Chorpita, Korotitsch, & Barlow, 1997; Lovibond, 1998; Page, Hooke, & Morrison, 2007) and has been found to have adequate psychometric properties with Cronbach’s alpha of .91 for the Depression sub-scale and .81 for the Anxiety sub-scale (P. F. Lovibond & S. H. Lovibond, 1995). Internal reliability of this measure in the present study was good with $\alpha = .95$ (Depression) and $\alpha = .85$ (Anxiety).

3.2.6 Metabolic Control.

Metabolic control was assessed by glycosylated hemoglobin in whole blood (HbA1c) which is an indicator of blood glucose level over the previous three months (Dashiff & Bartolucci, 2002; Nansel et al., 2009). The normal range for HbA1c is considered to be between 4.3 – 6.1 % (Bryden et al., 2001). The American Diabetes Association and Diabetes Australia recommends a glycosylated hemoglobin of < 7% and have suggested that this should be a goal of treatment (American Diabetes Association, 2007; Diabetes Australia, 2006). Measures of HbA1c for participants with

Type 1 Diabetes were obtained from hospital records. The rating with the date closest to the date when the participants completed the questionnaire booklets was used for the present study.

3.2.7 Self-Care Inventory – Revised (SCI – R) (La Greca, 2004; Weinger, Butler, Welch, & La Greca, 2005) (see Appendix H).

Diabetes management was assessed using the SCI - R (La Greca, 2004; Weinger et al., 2005) which consists of 15 items. This questionnaire assesses an individual's perception of how well they adhere to their treatment regimen (Schilling, Grey, & Knafl, 2002). The items are rated on a five point Likert scale where the items range from "never do it" to "always do this as recommended without fail". The SCI – R provides a total score which is an indication of an individual's self-care in relation to managing their diabetes. Participants' scores on this measure were converted to a zero to 100 point scale following instructions provided by the authors (Weinger et al., 2005): subtract the minimum possible item score from the individual's averaged raw score; then multiply this number by 100; this value is then divided by the difference of the minimum possible item score subtracted from the maximum possible item score. Higher scores are suggestive of better adherence to treatment regimen. Adequate psychometric properties have been reported with a Cronbach's alpha of .87 (Weinger et al., 2005). Internal reliability of this measure in the present study was adequate with a Cronbach's alpha of .75.

3.2.8 A Measure of Psychological Adjustment to Diabetes (ATT19) (Welch et al., 1994) (see Appendix I).

Acceptance of having diabetes (psychological adjustment to diabetes) was assessed using the ATT19 (Welch et al., 1994). The original measure consisted of 39 items, however, a shortened version with 19 items was later created and was reported to be more reliable (Dunn et al., 1986; Welch et al., 1992). Items on the ATT19 are rated on a five point Likert scale ranging from "I disagree completely" to "I agree completely". Examples of items include 'If I did not have diabetes I think I would be quite a different person' and 'I believe I have adjusted well to having diabetes'. The measure gives an overall indication of an individual's psychological adjustment to diabetes and the acceptance of the diagnosis and its meaning. Scores range from 19 to 95 with a high score being suggestive of a positive attitude and greater acceptance of having Type 1 Diabetes. The measure has been found to have adequate psychometric properties with a Cronbach's alpha of .84 (as cited in Welch et al., 1994). Cronbach's alpha for this measure when used in the present study was .89.

3.2.9 The Diabetes Family Responsibility Questionnaire (DFRQ) (Anderson et al., 1990) (see Appendix J).

Perception of past parental involvement in diabetes management was assessed by the DFRQ (Anderson et al., 1990). This measure was developed to assess whether it is the parent, the child, or the parent and child that take responsibility for the tasks involved in diabetes management. The DFRQ consists of 17 items with different numbers assigned to the items depending on whether it was the parent, parent and child, or child that took or initiated most responsibility in relation to the child's diabetes management. Cronbach's alpha of .84 has been reported (Anderson et al., 1990) for the

full original scale. The original measure calculates a responsibility score based on both the child/adolescent score and on the parent score.

A modified version of this measure was used with the instructions re-worded in order to fit the purpose of the present study. Instead of asking the participants to complete items in terms of what takes place at present in their family with regard to diabetes management, the participants were asked to respond to items according to what occurred when they were in secondary school. The period of secondary schooling was chosen as this is the time when the process of separation-individuation is occurring. A further modification was that in the present study only the young women (and not the parents) completed the questionnaire. An adjustment of the scoring was made to reflect this modification so that higher scores indicated the participant's perception of greater involvement from the parents at the age of 16 years. A Cronbach's alpha of .89 was calculated for the reworded scale when used in the present study.

3.3 Procedure

Ethical clearance to conduct the study was received from Victoria University and Melbourne Health. As described above a sample of young women with Type 1 Diabetes was recruited from Western Hospital and the Young Persons' Clinic at the Royal Melbourne Hospital. Posters (see Appendix K) about the study were put up in the waiting areas at both sites. When the young women attended their medical appointments at the diabetes clinics potential participants were advised of the study by diabetes educators and were asked if they were willing to speak to the researcher about the study.

If the young women agreed to this they were advised of where the researcher could be found. After the researcher explained the study and answered any questions, the young women were invited to take part in the study and if they agreed to participate

they were required to sign a consent form. They then completed a questionnaire booklet in the presence of the researcher while waiting for their appointment.

The sample of young women without Type 1 Diabetes was recruited from Victoria University located in Melbourne, Australia. Posters (see Appendix L) advertising the study were put up at two different campuses and after contacting relevant lecturers the researcher went to lectures to briefly talk about the study and invite young women to participate. Young women who agreed to participate were required to meet with the researcher, sign the consent form, and fill in a questionnaire booklet in the presence of the researcher.

3.4 Power Analysis

In order to determine the power in relation to effect size and sample size in the case of multiple hierarchical regression guidelines provided by Cohen (1992) were followed. As there were no previous studies that have examined the same variables there was no indication of likely effect size so sample size was estimated for both medium and large effect sizes. In Model 1 (Factors Influencing Separation-Individuation in Young Adult Women) there were six predictor variables and participants with and without Type 1 Diabetes were included in this model. With a medium effect size and power of .80 an estimated 97 participants were needed in order to detect correlation coefficients at an alpha set at .05. With a large effect size and power of .80 an estimated 45 participants were needed to detect correlation coefficients at an alpha set at .05.

Five predictor variables were included in Model 2 (Factors Influencing Diabetes Management in Young Adult Women) and only participants with Type 1 Diabetes were included in this model. With a medium effect size and power set at .80 a sample size of

91 participants was needed in order to detect correlation coefficients at an alpha level set at .05. With a large effect size and power set at .80 an estimated sample size of 42 participants were needed.

3.5 Design and Statistical Analysis

A cross sectional design was used to examine factors thought to be important in separation-individuation and diabetes management in the developmental period of young adulthood. The data was analysed using SPSS for Windows version 17 (SPSS for Windows, 2008). Hierarchical multiple regression analyses were used to test the proposed models.

3.5.1 Testing Model 1: Factors Influencing Separation-Individuation in Young Adult Women.

The total sample (N = 106) was used to test Model 1 with separation-individuation as the outcome variable and the different predictor variables entered in the following order:

Step 1: Perceived Maternal Care; Perceived Maternal Overprotection.

Step 2: Current Attachment to Mother.

Step 3: Attachment to Peers; Depressive Symptoms.

Step 4: Diagnosis of Type 1 Diabetes (coded as yes/no).

In order to further test the presence of full and partial mediated pathways between the predictor variables and the outcome variable conditions for mediation according to Baron and Kenny (1986) was followed. A series of regression models were tested to examine potential mediator variables, including partial and fully mediated pathways. Baron and Kenny (1986) specify four conditions that need to be satisfied for mediation:

(1) The independent variable needs to be significantly associated with the outcome variable;

(2) The independent variable needs to be significantly associated with the mediator variable;

(3) The mediator variable needs to be significantly associated with the outcome variable while the independent variable is accounted for; and

(4) When the mediator is added to the model the relation between the independent variable and outcome variable will be reduced.

For a fully mediated pathway to be present the relation between the independent variable and the outcome variable in condition four should no longer be significant when the mediator variable is added to the model. A partial mediation occurs when the relation between the independent variable and outcome variable is still significant but this association is reduced. The relationship between the independent variable, the mediator variable, and the outcome variable is depicted below in Figure 3.

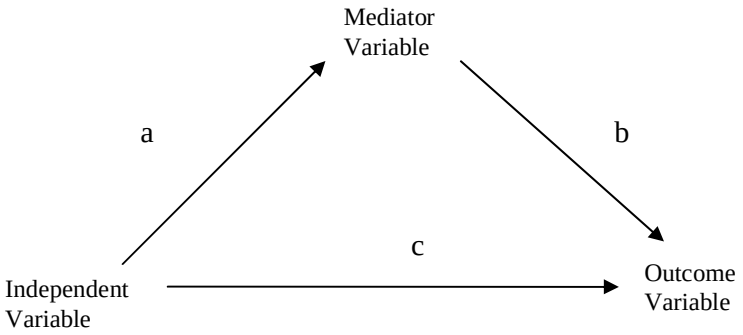

Figure 3. Diagram depicting a mediated pathway. Adapted from figure presented by Baron and Kenny (1986) p. 1176.

3.5.2 Testing Model 2: Factors Influencing Diabetes Management in Young Adult Women.

Only participants with Type 1 Diabetes (N = 42) were included in the analyses for Model 2 where the outcome variable was diabetes management and the predictor variables were entered in the following order:

Step 1: Illness Duration.

Step 2: Perception of Past Parental Involvement.

Step 3: Separation-Individuation; Depressive Symptoms; and Acceptance of Having Diabetes.

Further analyses were conducted in order to test hypotheses proposed in relation to full and partial mediated pathways between the predictor variables and the outcome variable for Model 2 according to conditions explained above.

4 Results

4.1 Preliminary Analyses

Before conducting the main analyses the data was checked for accuracy and missing values by inspecting frequency tables, histograms, and box plots. Missing data analysis was performed and missing data was found to be at a rate of less than 5 % and appeared to be missing at random. It was decided to keep cases with missing values and a pro-rata procedure was implemented to substitute for the missing values (Hair, Anderson, Tatham, & Black, 1998; Tabachnick & Fidell, 2001).

Univariate outliers were identified as cases with standardised *z* scores above 3 or below - 3 for variables in Model 1 and cases with standardised *z* scores above 2.5 or below - 2.5 for Model 2 (as there were fewer cases tested in Model 2) (Hair et al., 1998). Histograms and box plots were also investigated. Three cases were found to have extreme scores on depressive symptoms (one case in the diabetes sample, two cases in the student sample) and two cases had extreme scores for separation-individuation (both cases in the student sample). These latter two cases were found to be extreme outliers with standardised residual scores of above 3 on the dependent variable separation-individuation. After inspection of scores for these two cases on other measures included in Model 1 it was decided that they were not part of the population studied and they were excluded from further analyses (Tabachnick & Fidell, 2001) leaving 106 cases for the main analyses for Model 1. It was decided to keep the three cases with extreme scores on depressive symptoms as they appeared to be part of the population studied.

Multivariate outliers were assessed using the Mahalanobis distance statistic and one case had a value above the critical value for cases used to test Model 1. As there

was only one case with scores above the critical value it was decided to include this case in the final analyses. No multivariate outliers were identified for Model 2.

Normality of the distributions was examined via inspection of histograms, probability plots, and skewness statistics. For variables entered in Model 1 (N = 106) depressive symptoms was positively skewed. Perceived maternal care and current attachment to mother were negatively skewed. For variables entered in Model 2 (N = 42) depressive symptoms was positively skewed. As the sample size was small, skewness of some variables was expected. For positively and negatively skewed variables a square root transformation was performed as a remedy for the skewness. Analyses were done with both the original and transformed variables. The results from analyses with transformed variables were similar to the results from untransformed variables and so for ease of interpretation only the results from the analyses with untransformed variables will be reported. See Table 7 and Table 8 in appendices M and N for results of analyses for Model 1 and 2 run with transformed variables.

Multicollinearity and singularity were investigated by inspecting the intercorrelations between variables (Hair et al., 1998; Tabachnick & Fidell, 2001) entered into Model 1 (see Table 3) and Model 2 (see Table 4). Inspection of data based on suggestions by Hair et al. (1998), Tabachnick and Fidell (2001), and Field (2009) indicated that multicollinearity and singularity were not evident; there were no correlations of .90 or above between the independent variables. Furthermore, examination of other collinearity statistics (variance inflation factor and the tolerance statistic) showed that the intercorrelations were within acceptable levels.

4.2 Sample Characteristics

The total sample consisted of 106 females between the ages of 18 and 25 years both with and without Type 1 Diabetes. A sample of 42 females diagnosed with Type 1 Diabetes before the age of 15 years and without any other chronic illnesses were recruited from Western Hospital (n = 7) and the Young Person's Clinic at the Royal Melbourne Hospital (n = 35). A further sample of 66 female students aged 18 to 25 years without a diagnosis of any chronic illnesses (including Type 1 Diabetes) were recruited from Victoria University. As previously described the data from two students were excluded from analyses as they were thought not to be part of the population studied leaving a sample of 64 female students.

The mean age of participants was 21.24 years (SD = 2.22), 21.21 years (SD = 2.34) and 21.25 years (SD = 2.15) respectively for the total sample, for participants with a diagnosis of Type 1 Diabetes, and for participants without a diagnosis of Type 1 Diabetes. Of the participants with a diagnosis of Type 1 Diabetes, 76.2% were born in Australia and 23.8% were born in another country (Iraq 4.8%, Scotland 2.4%, Iran 2.4%, UK 2.4%, India 7.1%, Russia 2.4%, and Ethiopia 2.4%). Of the participants without a diagnosis of Type 1 Diabetes, 87.5% were born in Australia and 12.5% were born in another country (Serbia 1.6%, Ireland 1.6%, Zimbabwe 1.6%, Sudan 1.6%, Vietnam 1.6%, Canada 1.6%, Poland 1.6%, Philippines 1.6%, and USA 1.6%). As all participants without a diagnosis of Type 1 Diabetes were higher degree students recruited from a university they had all completed Year 12 of schooling. Of the participants with a diagnosis of Type 1 Diabetes a majority (88%) had completed Year 12 and of these 29% were studying for or had completed a tertiary degree. See Table 1 for information about ethnicity, educational level, marital status, living arrangements, and current employment status of the participants.

Table 1: *Demographic Characteristics of Participants*

Characteristic	Control Group (%) *n* = 64	Type 1 Diabetes Group (%) *n* = 42
Ethnicity		
Caucasian	52 (81.3 %)	28 (66.7 %)
Aboriginal	1 (1.6 %)	0
African	2 (3.1 %)	3 (7.1 %)
North African	4 (6.3 %)	3 (7.1 %)
East Asian	1 (1.6 %)	3 (7.1 %)
Far East Asian	3 (4.7 %)	4 (9.5 %)
Polynesian	0	1 (2.4 %)
Other (South American)	1 (1.6 %)	0
Educational level reached		
Completed Primary School	64 (100 %)	42 (100%)
Completed Secondary School	64 (100%)	37 (88.1%)
Tertiary Education (completed or currently being undertaken)	64 (100 %)	12 (28.6%)
Marital Status		
Single	44 (68.8 %)	32 (76.2%)
Married	2 (3.1 %)	3 (7.1%)
Divorced / Separated	0	0
De-Facto	6 (9.4 %)	3 (7.1%)
Dating	6 (9.4 %)	0
In a Relationship	6 (9.4 %)	4 (9.5%)

Table 1 cont.

Characteristic	Control Group (%) *n* = 64	Type 1 Diabetes Group (%) *n* = 42
Living Arrangements		
Living with Parents	44 (68.8 %)	28 (66.7%)
Living with Housemates	8 (12.5 %)	6 (14.3%)
Living with Partner	8 (12.5 %)	5 (11.9%)
Other (Living with Children)	1 (1.6 %)	0
Other (Student Accommodation)	2 (3.1 %)	1 (2.4%)
Other (Extended Family)	1 (1.6 %)	0
Employment Status		
Unemployed	24 (37.5 %)	10 (23.8%)
Part-Time Employed (> 10 hours)	9 (14.1 %)	6 (14.3%)
Part-Time Employed (< 10 hours)	28 (43.8 %)	11 (26.2%)
Full-time Employed	3 (4.7 %)	15 (35.7%)
Order in Family		
1st Born	26 (40.6 %)	15 (35.7%)
2nd Born	27 (42.2 %)	15 (35.7%)
3rd Born	8 (12.5 %)	8 (19%)
4th Born	2 (3.1 %)	4 (9.5%)
7th Born	1 (1.6 %)	0

Of the participants with a diagnosis of Type 1 Diabetes the mean duration of illness was 11.24 years (*SD* = 5.16, Range 4 to 24 years). Participants with a diagnosis of Type 1 Diabetes used either an insulin pump (28.6%) or insulin injections (71.4%) as their current management regimen. The frequency at which participants with Type 1

Diabetes attended appointments at a diabetes clinic varied from once per month to once per six months: 7.1% attended once a month; 35.7% attended once every two months; 21.4% attended once every three months; 2.4% attended once every four months; and 33.3% attended once every six months. Of the participants with Type 1 Diabetes 16.7% reported that they had been hospitalized in the last three years in relation to their diabetes. The reasons for admission to hospital included DKA, hypoglycaemia, hyperglycaemia, and changing from insulin injections to insulin pump. Complications as a result of diabetes included weight gain, microalbuminuria, Bell's palsy, necrobiosis lipoidica, kidney damage, and diabetic retinopathy. Eleven point nine percent of the young women in the Type 1 Diabetes group reported having experienced complications in the last three years.

4.3 Descriptive Statistics and Correlations

Mean, standard deviation, and sample size associated with each variable in Model 1 and Model 2 are shown in Table 2. Analyses were conducted to identify demographic factors that may be related to the two outcome variables, separation-individuation and diabetes management, and therefore would need to be included in the main set of analyses for model 1 or model 2.

4.3.1 Demographic Variables and Model 1 (Separation-Individuation).

All participants were included in the analyses to examine the effects of demographic variables on the outcome variable separation-individuation. The effects of age, marital status (participants divided into two groups: $n = 76$ who were not in a relationship, $n = 30$ who were in a relationship), living arrangement (participants

divided into two groups: *n* = 73 who were living with parents, *n* = 33 who had moved out of parental home), employment status (participants divided into two groups: *n* = 18 employed full-time, *n* = 88 unemployed or employed as part-time), and order in the family (participants divided into three groups: *n* = 41 who were first born, *n* = 42 who were second born, *n* = 22 who were third or later born) were investigated. As can be seen in Table 1 most of the participants were born in Australia and considered themselves to be Caucasian. Differences in separation-individuation scores according to country of birth or ethnicity were not examined because of the small number of participants in the different groups.

The relationship between age of the participant and separation-individuation was investigated using Pearson product-moment correlation coefficient. Age of the participant was found to have a non-significant negative correlation with separation-individuation, *r* = -.114, *n* = 106, *p* = .243. This is shown in Table 3. A series of independent-samples t-tests and one one-way analysis of variance (ANOVA) were performed and revealed that there were no differences between participants on the independent variable separation-individuation based on the demographic variables marital status, living arrangement, employment status, or order in the family.

4.3.2 Demographic Variables and Model 2 (Diabetes Management).

Only participants with a diagnosis of Type 1 Diabetes were included in the analyses to examine the effects of demographic variables on diabetes management. The effects of age of participant, age at diagnosis of Type 1 Diabetes, marital status (participants divided into two groups: *n* = 32 who were not in a relationship, *n* = 10 who were in a relationship), living arrangement (participants divided into two groups: *n* = 28 who lived in parental home, *n* = 14 who had moved out of parental home), employment

status (participants divided into two groups: *n* = 15 who were employed full-time, *n* = 27 who were unemployed or employed part-time), order in the family (participants divided into three groups: *n* = 15 who were first born, *n* = 15 who were second born, *n* = 12 who were third or later born), and treatment regimen (participants divided into two groups: *n* = 12 who had insulin pump as treatment regimen, *n* = 30 who had insulin injections as treatment regimen) were investigated. Country of birth, ethnicity, hospitalisations over the last three years, and diabetes related complications were not examined because of small numbers in the groups.

The relationships between age of the participant, age at diagnosis of Type 1 Diabetes and diabetes management were examined using Pearson product-moment correlation coefficient. Age of the participant was found to have a non-significant negative correlation with diabetes management, $r = -.113$, $n = 42$, $p = .401$, as was age at diagnosis of Type 1 Diabetes, $r = -.007$, $n = 42$, $p = .966$. A series of independent-samples t-tests and one one-way ANOVA revealed no significant differences between participants on the independent variable diabetes management based on the demographic variables marital status, living arrangement, employment status, order in the family, or treatment regimen.

4.3.3 Examinations of Variables in Model 1.

Examinations of the means for variables entered into Model 1 ($N = 106$) showed that the overall mean for separation-individuation ($M = 127.59$) was higher than the mean ($M = 120.6$) reported by the authors of the measure (Christenson & Wilson, 1985). The mean score for depressive symptoms ($M = 6.75$) was almost identical to the mean ($M = 7.19$) reported for the Australian normative data (P. F. Lovibond & S. H. Lovibond, 1995). Compared to mean scores (perceived maternal care $M = 26.8$ and

perceived maternal overprotection *M* = 13.16) from Australian normative data (Parker et al., 1979), the mean scores in the current study were identical (perceived maternal overprotection *M* = 13.16) or slightly higher (perceived maternal care *M* = 28.25). The mean scores for current attachment to mother (*M* = 95.94) and attachment to peers (*M* = 102.84) were similar to the mean (current attachment to mother *M* = 96.30, attachment to peers *M* = 102.50) reported in a previous study of undergraduate university students (Beitel & Cecero, 2003).

4.3.4 Examinations of Variables in Model 2.

Examination of the means for variables entered into Model 2 (*N* = 42) showed that the mean for separation-individuation (*M* = 125.71) was higher than that reported by Christenson and Wilson (1985), *M* = 120.6. The mean for depressive symptoms (*M* = 6.14) was similar to the mean depression score (*M* = 6.74) reported in an Australian normative study (P. F. Lovibond & S. H. Lovibond, 1995). The mean for diabetes management was also similar (*M* = 62.86) to the mean (*M* = 65) reported by Weinger et al. (2005). The mean for acceptance of having diabetes (*M* = 67.31) in the present study was higher than the mean (*M* = 61.8) reported by Enzlin et al. (2002) in a sample of women aged 18 to 76 years. Comparison of mean HbA1c level in the present study to the mean HbA1c level reported in other studies with young adults revealed that the mean HbA1c level in the present study (*M* = 7.91) was lower than the mean (*M* = 9.3) reported in a study of 17 to 25 year olds (Bryden et al., 2003). There was no published mean available for comparison for the variable perception of past parental involvement (as this measure was modified for the use in the present study).

Table 2: *Descriptive Statistics*

Variable	All Participants *M* (*SD*)	Diabetes Group *M* (*SD*)	Control Group *M* (*SD*)
Age	21.24 (2.22)	21.21 (2.34)	21.24 (2.15)
Separation-Individuation	127.59 (49.87)	125.71 (52.49)	128.83 (48.45)
Perceived Maternal Care	28.25 (7.27)	28.55 (6.05)	28.05 (8.01)
Perceived Maternal Overprotection	13.16 (8.65)	15.17 (9.19)	11.84 (8.09)
Current Attachment to Mother	95.94 (21.73)	97.55 (18.83)	94.89 (23.52)
Attachment to Peers	102.84 (14.72)	105.74 (13.87)	100.94 (15.06)
Depressive Symptoms	6.75 (8.08)	6.14 (7.88)	7.14 (8.25)
Diabetic Control (Hba1c)		7.91 (1.04)	
Diabetes Management		62.86 (12.97)	
Illness Duration		11.24 (5.16)	
Age at Diagnosis of Type 1 Diabetes		10.07 (4.19)	
Perception of Past Parental Involvement		42.24 (6.12)	
Acceptance of Having Diabetes		67.31 (12.49)	

Note. All participants $N = 106$, Diabetes Group $n = 42$, Control Group $n = 64$.

The intercorrelations among the variables are shown in Table 3 (Model 1) and Table 4 (Model 2). Age of the participants was included in the correlation analyses for Model 1 as this variable was of interest. Age of onset of diabetes and diabetic control (HbA1c level) were included in the correlation analyses for Model 2 as the relationships between these variables and the rest of the variables entered into the Model were of interest.

Guidelines suggested by Cohen (1988) have been used to interpret the size of correlation coefficients in the significant relationships between variables. Cohen considered that a small size correlation was less than .30, a medium size correlation was between .30 and .50, and a large size correlation was .50 or above.

Table 3: *Intercorrelations between Variables Entered into Model 1(Factors Influencing Separation-Individuation in Young Adult Women)*

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. Separation-Individuation	-							
2. Age of Participant	-.114	-						
3. Perceived Maternal Care	-.379**	.100	-					
4. Perceived Maternal Overprotection	.290**	.209*	-.509**	-				
5. Current Attachment to Mother	-.396**	.140	.816**	-.592**	-			
6. Attachment to Peers	-.419**	-.079	.473**	-.400**	.472**	-		
7. Depressive Symptoms	.571**	-.121	-.294**	.224*	-.405**	-.304*	-	
8. Diagnosis of Type 1 Diabetes	.031	.008	-.034	-.189	-.060	-.160	.061	-

Note. $N = 106$.

* $p < .05$, two tailed.

** $p < .01$, two-tailed.

As can be seen in Table 3 separation-individuation was found to have a large positive association with depressive symptoms, a medium negative association with perceived maternal care, current attachment to mother, and attachment to peers, and a small negative association with perceived maternal overprotection. There was a large negative correlation between perceived maternal care and perceived maternal overprotection and a large positive association with current attachment to mother. Perceived maternal care had a medium size positive correlation with attachment to peers and a small negative correlation with depressive symptoms. There were negative correlations between perceived maternal overprotection and current attachment to mother (large) and attachment to peers (medium) and a low positive association with depressive symptoms. Medium size correlations were found between current attachment to mother and attachment to peers (positive), and depressive symptoms (negative). There was a medium size negative correlation between attachment to peers and depressive symptoms. Age of the participant had a small positive correlation with perceived maternal overprotection which was in the opposite direction to what was expected. Having a diagnosis of Type 1 Diabetes was not significantly correlated with any of the other variables. All the relationships between the different variables, except for age of participant and perceived maternal overprotection, were found to be in the direction expected and predicted by the hypotheses.

Table 4: *Intercorrelations between Variables in Model 2 (Factors Influencing Diabetes Management in Young Adult Women)*

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. Diabetes Management	-							
2. Diabetic Control (Hba1c)	-.197	-						
3. Age at Diagnosis	-.007	-.048	-					
4. Illness Duration	-.083	-.100	-.873**	-				
5. Perception of Past Parental Involvement	.008	.160	.144	-.207	-			
6. Separation-Individuation	-.231	.192	-.094	.031	.070	-		
7. Depressive Symptoms	-.411**	.211	-.023	-.059	.018	.579**	-	
8. Acceptance of Having Diabetes	.415**	-.016	-.062	.047	-.163	-.437**	-.687**	-

Note. $N = 42$.

** $p < .01$, two-tailed.

As can be seen in Table 4 diabetes management was found to have medium size correlations with depressive symptoms (negative) and acceptance of having diabetes (positive) in the direction hypothesised. Contrary to predictions no significant correlations were found between diabetes management and diabetic control, illness duration, perception of past parental involvement, or separation-individuation. Contrary to predictions diabetic control did not significantly correlate with any other variables in Model 2. Illness duration, as expected, was strongly correlated with age at diagnosis of Type 1 Diabetes. Hence, these two variables were not entered into the same analysis. Contrary to predictions perception of past parental involvement did not significantly correlate with any other variables in Model 2. Separation-individuation had a large positive correlation with depressive symptoms and a negative medium size correlation with acceptance of having diabetes in the expected direction. Depressive symptoms had a large negative correlation with acceptance of having diabetes in the expected direction.

4.4 Testing Model 1: Factors Influencing Separation-Individuation in Young Adult Women

In order to test the proposed model of separation-individuation (Figure 1) a hierarchical regression analysis was performed. Hypotheses related to fully and partially mediated pathways were tested by conducting a series of regression analyses.

4.4.1 Hierarchical Regression Analysis.

Separation-individuation was entered as the outcome variable in a hierarchical regression with the independent variables entered in the following order: Perceived

maternal care, perceived maternal overprotection (Step 1); current attachment to mother (Step 2); attachment to peers, depressive symptoms (Step 3); and diagnosis of Type 1 Diabetes (Step 4).

See Table 5 for R^2 *change* statistics, *F change* statistics, unstandardised beta coefficients, standardised beta coefficients, and significance levels associated with testing of Model 1. The inclusion of perceived maternal care and overprotection in Step 1 explained 15.7% of the variance and reliably predicted a portion of the variance in separation-individuation. Examination of the standardised beta coefficients indicated as hypothesised that a high level of perceived maternal care was associated with a lower score on the separation-individuation measure indicating more resolved separation-individuation. Inspection of the standardised beta coefficients for perceived maternal overprotection indicated that this variable did not significantly add to the predictive value in separation-individuation which was contrary to proposed hypothesis.

The entry of current attachment to mother in Step 2 explained an additional 1.4% of the variance in separation-individuation and did not reliably improve prediction of the outcome variable separation-individuation over and above the variables entered in Step 1. This result was contrary to what had been predicted but might be explained by the high intercorrelation between this variable and perceived maternal care as both could be considered as reflecting attachment to mother.

Depressive symptoms and attachment to peers entered in Step 3 reliably improved prediction of separation-individuation and explained an additional 23.9% of the variance in separation-individuation. Examination of the standardised beta coefficients suggested that once these two variables were entered into the model, perceived maternal care no longer significantly predicted separation-individuation. The proposed hypotheses were supported in that a more secure attachment to peers was associated

with more resolved separation-individuation (lower score on separation-individuation measure) as was fewer depressive symptoms.

A diagnosis of Type 1 Diabetes entered in Step 4 did not reliably improve prediction of separation-individuation which was contrary to what was predicted. The full model with all variables included accounted for 41% of the variance in separation-individuation.

Part correlations were examined and squared in order to give the unique variance in the outcome variable separation-individuation explained by each independent variable. Depressive symptoms were found to account for the largest proportion of unique variance (18.1%) in the full model. Attachment to peers uniquely accounted for 3% of the variance in separation-individuation.

Table 5: *Hierarchical Regression for Model 1 (Factors Influencing Separation-Individuation in Young Adult Women)*

Predictor	*B*	SE_B	β	R^2 *change*	*F change*[a]
Step 1				.157	9.570***
Perceived Maternal Care	-2.145	.721	-.313**		
Perceived Maternal Overprotection	.755	.606	.131		
Step 2				.014	1.669
Perceived Maternal Care	-1.118	1.071	-.163		
Perceived Maternal Overprotection	.460	.646	.080		
Current Attachment to Mother	-.494	.383	-.215		
Step 3				.239	20.278***
Perceived Maternal Care	-1.114	.929	-.162		
Perceived Maternal Overprotection	.308	.558	.053		
Current Attachment to Mother	.128	.341	.056		
Attachment to Peers	-.690	.308	-.204*		
Depressive Symptoms	2.911	.527	.472***		

Table 5 (continued)

Predictor	*B*	SE_B	β	R^2 *change*	*F change*[a]
Step 4				.001	.098
Perceived Maternal Care	-1.101	.934	-.160		
Perceived Maternal Overprotection	.251	.590	.043		
Current Attachment to Mother	.114	.345	.050		
Attachment to Peers	-.711	.316	-.210*		
Depressive Symptoms	2.911	.529	.472***		
Diagnosis of Type 1 Diabetes	-2.620	8.361	-.026		

Note. $N = 106$.

[a] $df_{Step1} = 2,103$; $df_{Step2} = 1, 102$; $df_{Step3} = 2, 100$; $df_{Step4} = 1, 99$.

* $p < .05$. *** $p < .001$.

4.4.2 Mediation Analyses for Model 1.

To examine possible indirect pathways in Model 1 (Factors Influencing Separation-Individuation in Young Women) Baron and Kenny's (1986) guidelines for testing mediation models were followed. An explanation of the conditions of mediation has been outlined in the method section on pages 58 and 59.

As shown in Table 5 current attachment to mother was not significantly associated with separation-individuation after accounting for the effects of perceived maternal care and overprotection. Consequently, current attachment to mother did not meet criteria for full or partial mediation for the association between a) perceived maternal care and b) overprotection and separation-individuation. Testing of peer attachment and depressive symptoms as mediators of the effects of current attachment to mother on separation-individuation was therefore not appropriate. Thus, contrary to what was predicted, current attachment to mother did not mediate the effects of parental factors (perceived maternal care and overprotection) on separation-individuation. Also, attachment to peers and depressive symptoms did not mediate the effects of current attachment to mother on separation-individuation.

As there was a large correlation between perceived maternal care and current attachment to mother and both these measures represented two different ways of measuring attachment to mother, a series of regression analyses was conducted to test whether attachment to peers and depressive symptoms mediate the effect of perceived maternal care on the outcome variable separation-individuation.

Condition one was met with perceived maternal care being significantly associated with separation-individuation, $F(1, 104) = 17.492$, $p < .001$. Perceived maternal care was significantly related to the mediator variables attachment to peers, $F(1, 104) = 29.951$, $p < .001$ and depressive symptoms, $F(1, 104) = 9.868$, $p < .01$.

Thus, condition two for inferring mediation was met. A closer examination of the standardised beta coefficients suggested that higher perceived maternal care was associated with a more secure attachment to peers (β = .473, $p < .001$) and fewer symptoms of depression (β = -.294, $p < .01$).

The mediator variables attachment to peers and depressive symptoms were found to be associated with the outcome variable separation-individuation after the effects of the independent variable perceived maternal care was accounted for, $F(1, 103) = 9.737$, $p < .01$ and $F(1, 103) = 38.015$, $p < .001$, respectively. Thus, condition three was met. Higher perceived maternal care (β = -.234, $p < .05$ in regression analysis testing attachment to peers as mediating variable; β = -.231, $p < .01$ in regression analysis testing depressive symptoms as mediating variable), a more secure attachment to peers (β = -.309, $p < .01$), and fewer depressive symptoms (β = .503, $p < .001$) were associated with a more resolved separation-individuation process as suggested by the standardised beta coefficients.

In order to infer full mediation the association between the independent variable perceived maternal care and the outcome variable separation-individuation needed to be non-significant when the effects of the mediator variables attachment to peers and depressive symptoms are entered into the model. A significant but reduced effect was found when attachment to peers was entered into the model, $F(1, 103) = 5.576$, $p < .05$, indicating that attachment to peers partially mediated the association between perceived maternal care and separation-individuation. Similarly there was a significant but reduced effect when the variable depressive symptoms was entered, $F(1, 103) = 8.061$, $p < .01$, indicating that depressive symptoms partially mediated the association between perceived maternal care and separation-individuation. The partial mediation results were confirmed by two Sobel tests (Sobel, 1982) conducted using the calculation tool

provided by Preacher and Leonardelli (2006) with the respective *z* scores ($z = -2.71$, $p < .01$; $z = -2.80$, $p < .01$) indicating the significance of the partial mediation effects. The effects of the mediator variables attachment to peers and depressive symptoms on separation-individuation are depicted in Figure 4 and Figure 5 respectively with associated standardised beta coefficients and significance levels shown.

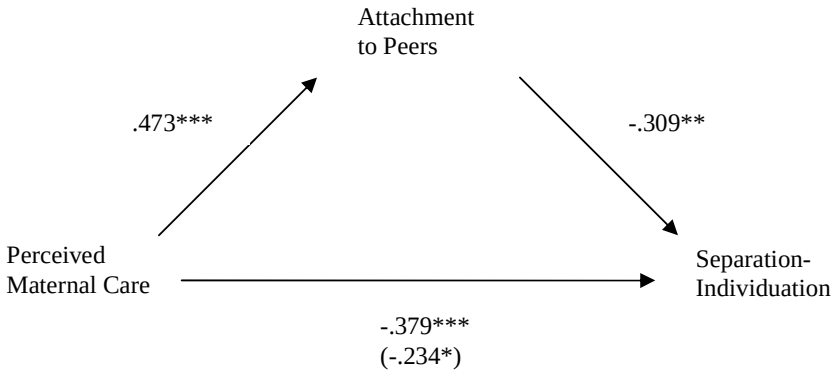

Figure 4. Attachment to Peers as a Mediator of the Association between Perceived Maternal Care and Separation-Individuation.

Note. The standardised beta weight for the direct pathway between the independent variable and the outcome variable is shown in parenthesis.

* $p < .05$; ** $p < .01$; *** $p < .001$.

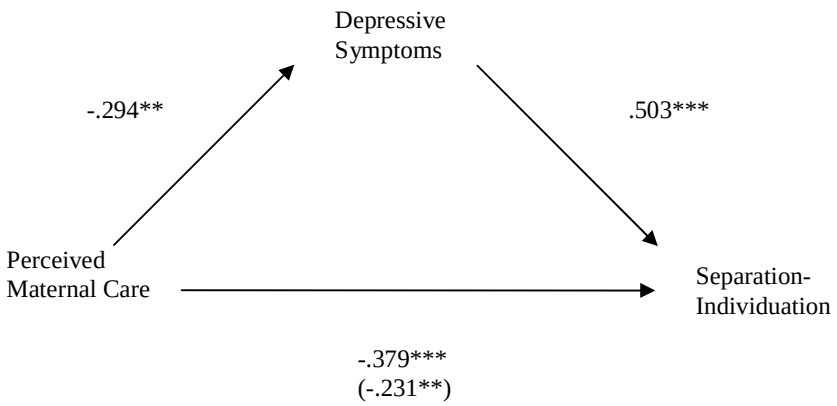

Figure 5. Depressive Symptoms as a Mediator of the Association between Perceived Maternal Care and Separation-Individuation.

Note. The standardised beta weight for the direct pathway between the independent variable and the outcome variable is shown in parenthesis.

** $p < .01$; *** $p < .001$.

A revised version of Model 1 showing direct and partial mediated pathways is shown in Figure 6 below.

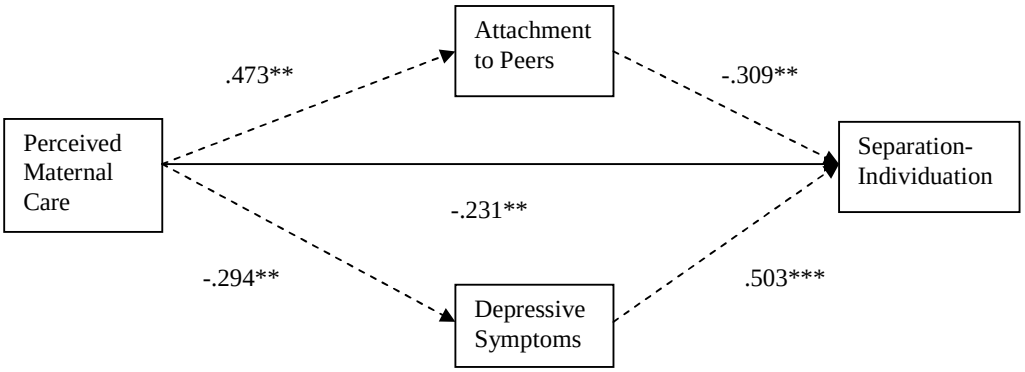

Figure 6. Revised Model 1: Factors Influencing the Separation-Individuation Process in Young Women.

Indirect Pathways ---------- ** $p < .01$; *** $p < .001$.

4.5 Testing Model 2: Factors Influencing Diabetes Management

The proposed model of diabetes management (see Figure 2) was tested using hierarchical regression analysis. Hypotheses related to fully and partially mediated pathways were tested by conducting a series of regression analyses.

4.5.1 Hierarchical Regression Analysis.

A hierarchical regression analysis was conducted to examine the extent to which the different independent variables were able to explain the variance in diabetes management. Diabetes management was entered as the outcome variable with independent variables entered in the following order: Illness duration in years (Step 1); perception of past parental involvement (Step 2); separation-individuation, depressive symptoms, and acceptance of having diabetes (Step 3).

See Table 6 for R^2 *change* statistics, *F change* statistics, unstandardised beta coefficients, standardised beta coefficients, and significance levels associated with testing of Model 2. Illness duration entered in Step 1 did not reliably predict any variance in diabetes management. Perception of past parental involvement entered in Step 2 did not reliably improve prediction of diabetes management above illness duration entered in Step 1.

The addition of separation-individuation, depressive symptoms, and acceptance of having diabetes entered in Step 3 reliably improved prediction of diabetes management and accounted for an additional 20.9% of the variance in diabetes management. The full regression model accounted for 21.6% of the variance in diabetes management.

The standardised beta coefficients were examined in order to investigate the unique contribution of each independent variable. None of the independent variables

contributed significantly on their own as none of the standardised beta coefficients were significant. These results are shown in Table 6.

Part correlations were examined and squared in order to give the unique variance in the outcome variable diabetes management explained by each independent variable. Acceptance of having diabetes accounted for the largest proportion of unique variance (4.3%) in the full model. Depressive symptoms uniquely accounted for 3.4% of the variance in diabetes management.

Table 6: *Hierarchical Regression for Model 2 (Factors Influencing Diabetes Management in Young Adult Women)*

Predictor	*B*	SE_B	β	R^2 *change*	*F change*[a]
Step 1				.007	.280
Illness Duration (in years)	-.210	.397	-.083		
Step 2				.000	.003
Illness Duration (in years)	-.215	.410	-.085		
Perception of Past Parental Involvement	-.020	.346	-.010		
Step 3				.209	3.202*
Illness Duration (in years)	-.265	.382	-.105		
Perception of Past Parental Involvement	.067	.328	.032		
Separation-Individuation	.008	.045	.033		
Depressive Symptoms	-.422	.376	-.256		
Acceptance of Having Diabetes	.274	.216	.264		

Note. $N = 42$.

[a] $df_{Step1} = 1, 40$; $df_{Step2} = 1, 39$; $df_{Step3} = 3, 36$.

* $p < .05$.

4.5.2 Mediation Analyses for Model 2.

A number of different mediating relationships were hypothesised for model 2 and were tested according to the guidelines by Baron and Kenny (1986) as discussed on pages 59 and 60.

Illness duration was not significantly associated with the outcome variable diabetes management (as can be seen in the results shown above for the hierarchical regression for Model 2). As a result, acceptance of having diabetes was not tested as a mediator variable for the effect of the independent variable illness duration on the outcome variable diabetes management. Similarly, separation-individuation was not significantly associated with the outcome variable diabetes management and as a result the variable depressive symptoms was not tested as a mediator variable for the effect of the independent variable separation-individuation on the outcome variable diabetes management.

4.6 Post Hoc Analyses for Model 1

A number of post hoc analyses were performed in order to further interpret and understand the data relevant to Model 1. Post hoc analyses pertaining to Model 1 are presented in the sections below.

4.6.1 Investigating High and Low Scores on Separation-Individuation.

Christenson and Wilson (1985) suggested a cut-off score on their measure of separation-individuation with a score of 190 and above indicative of difficulties in the separation-individuation process. They based this cut-off score on a sample of control participants (university employees) and a sample of participants diagnosed with

borderline personality disorder. Participants in the present study were divided into two groups based on this suggested cut-off score. Eighty-nine participants had a score of 189 or below and 17 participants had a score of 190 and above.

A one-way between-groups MANOVA was conducted to investigate whether participants differed on perceived maternal care, perceived maternal overprotection, current attachment to mother, attachment to peers, and depressive symptoms depending on a high or low score on the separation-individuation measure. Box's tests of equality of covariance matrices and Levene statistic for depressive symptoms were significant and as a result it was decided to report Pillai's Trace statistic. A more conservative alpha level (i.e. alpha level of .01 instead of the conventional alpha level of .05) was employed to determine the significance of the univariate F-tests (Tabachnick & Fidell, 2001).

Using Pillai's Trace statistic, there was a statistically significant difference between participants with a high or low score on the measure of separation-individuation on the combined dependent variables, V = .376, $F(5, 100) = 12.053$, $p < .001$. Separate univariate ANOVAs on the outcome variables revealed that participants with separation-individuation scores of 190 and above had a less secure current attachment to mother [$F(1, 104) = 9.387$, $p < .01$], less secure attachment to peers [$F(1, 104) = 7.120$, $p < .01$], and reported more depressive symptoms [$F(1, 104) = 61.181$, $p < .001$].

4.7 Post Hoc Analyses for Model 2

A number of post hoc analyses were performed in order to further interpret and understand the data relevant to Model 2. Post hoc analyses pertaining to Model 2 are presented in the sections below.

4.7.1 HbA1c Level and Diabetes Management.

As has been mentioned above and shown in Table 4, HbA1c level was not significantly correlated with diabetes management. However, in order to further examine the relationship between HbA1c level and diabetes management participants were divided into two groups depending on their HbA1c level: one group (low) with HbA1c level of 7 and below (n = 7) and a second group (high) with HbA1c level of 7.1 and above (n = 35). An independent-samples t-test was conducted to compare the diabetes management scores for participants with HbA1c levels of 7 and below (low) and 7.1 and above (high). There was a significant difference in scores for participants with HbA1c level of 7 and below (M = 73.09) and participants with HbA1c level of 7.1 and above (M = 60.81); $t(40) = 2.419$, $p < .05$. The magnitude of the differences in the means was moderate (eta squared = .13).

4.7.2 Investigating Diabetic Control.

Previous research has suggested that HbA1c level is related to a number of variables (e.g. depression, acceptance of having diabetes). A one-way between-groups MANOVA was performed to investigate whether a high or low HbA1c level was related to depressive symptoms, perception of past parental involvement, separation-individuation, and acceptance of having diabetes. Using Wilks's Lambda statistic, no

significant effects of HbA1c level were evident on one or more of the variables examined, $\Lambda = .796$, $F(4, 37) = 2.370$, $p = .07$. Separate univariate ANOVAs confirmed the multivariate results and revealed that the variables depressive symptoms and separation-individuation approached significance with participants with HbA1c level of 7 or above reporting more depressive symptoms and a less resolved separation-individuation process.

5 Discussion

5.1 Review of Rationale and Aims of the Study

Separation-individuation is an important developmental process which commences in early childhood and is continuous through adolescence and young adulthood. One of the aims of the present study was to examine the contribution of various factors to separation-individuation in a sample of young Australian women. Previous research on separation-individuation in adolescence and young adulthood have mostly focused on college students in America (e.g. Lapsley & Edgerton, 2002; Lapsley et al., 1989; Rice et al., 1990) and it is not known whether findings from these studies can be generalised to adolescents and young adults living elsewhere, for example in Australia. Based on the literature available on the separation-individuation process in adolescence and young adulthood the contributions of the following variables to separation-individuation were examined: perceived maternal care and overprotection; current attachment to mother; attachment to peers; and depressive symptoms. In addition to these factors the presence of a chronic illness, namely Type 1 Diabetes, was also tested as a factor in order to investigate the influence of having a diagnosis of Type 1 Diabetes on the separation-individuation process.

Diabetes management has been found to deteriorate during adolescence and into young adulthood which can have serious implications for the young person's health (Bryden et al., 2003; Bryden et al., 2001). How young women managed their Type 1 Diabetes was investigated with separation-individuation included as a factor in the model of diabetes management. Factors thought important to diabetes management in young adults have been overlooked in the literature as young adults are often included in studies together with adolescents or adults of all ages potentially ignoring specific

factors important to young adults. In the present study the effects of factors such as illness duration, perception of past parental involvement, separation-individuation, depressive symptoms, and acceptance of having diabetes on diabetes management were examined. Whether there was a relationship between diabetes management and diabetic control among young women was also tested.

5.2 Evaluating Hypotheses and Findings

A number of hypotheses were tested and the main findings suggested that depressive symptoms, attachment to peers, and perceived maternal care were important factors in the separation-individuation process in this population of young women with and without Type 1 Diabetes. The effect of perceived maternal care on separation-individuation was found to be partially mediated through depressive symptoms and attachment to peers. The presence of more depressive symptoms, a less secure attachment to peers, and perceiving mother as less caring were predictive of less resolved separation-individuation. Contrary to what was predicted perceived maternal overprotection, current attachment to mother, and having a diagnosis of Type 1 Diabetes were not significantly associated with separation-individuation. Moreover, the age of the participants did not have a significant effect on the separation-individuation process.

Preliminary analyses suggested that the presence of more depressive symptoms and less acceptance of having diabetes were related to poorer diabetes management which was in agreement with proposed hypotheses. When separation-individuation, depressive symptoms, and acceptance of having diabetes were entered together as one block in the diabetes management model (together with other factors hypothesised to be important to diabetes management) they significantly contributed to the variance in diabetes management. However, the standardised beta coefficients suggested that

uniquely these variables did not significantly contribute to diabetes management in this population of young women which was contrary to proposed hypotheses. Contrary to predictions illness duration and perception of past parental involvement did not contribute to the variance in diabetes management. Further analyses showed that young women reporting poorer adherence to treatment regimen had poorer metabolic control suggesting that these two variables were related.

The possible implications of these results will be discussed further in the sections below where the results from the analyses will be considered in relation to previous research findings in the area. Theoretical and research implications will be considered and discussed and finally limitations of the present study will be presented together with suggestions for future research in the area.

5.3 Factors Affecting the Separation-Individuation Process in Young Adult Women

The results of the main analyses testing Model 1 of separation-individuation in young adult women suggested that depressive symptoms was the most important predictor for the level of separation-individuation in young adult women with and without a diagnosis of Type 1 Diabetes. The importance of the effect of depression and depressive symptoms on the separation-individuation process in adolescence and young adulthood has been reported elsewhere (Lapsley, Aalsma, & Varshney, 2001; Lopez et al., 1986; Milne & Lancaster, 2001; Quintana & Kerr, 1993).

Lopez, Campbell, and Watkins (1986) found that depressive symptoms was negatively related to psychological separateness in young women college students suggesting that women who were less separated from their parents experienced more depressive symptoms. In Australian female adolescents aged 14 to 16 years (Milne & Lancaster, 2001) and in a sample of American college students (Lapsley et al., 2001) a

strong relationship between depression and separation-individuation was found with more depressive symptoms being related to difficulties in the separation-individuation process.

A possible explanation for how depression is linked to separation-individuation may be that early experiences in childhood have affected how the young person perceives people and relationships. Quintana and Kerr (1993) suggested that disturbances in the separation-individuation process may take place if the young person expects to experience separation anxiety, expects to be rejected by significant others, fears that one's independence will be restricted when in an interpersonal relationship, or denies the need to feel close and connected to significant others when participating in relationships. According to literature discussing attachment and psychopathology (including depression) in relation to achieving developmental tasks (e.g. separation-individuation) it has been suggested that the beliefs a person has about relationships are linked to the development of depressive symptoms (Marchand-Reilly, 2009; Quintana & Kerr, 1993).

Attachment theory provides a theoretical basis to understand these links between depressive symptoms and separation-individuation. An insecure attachment between a child and caregiver in the first year of life is likely to interfere with the separation-individuation process taking place in early childhood. The security of attachment to a caregiver and/or having a secure attachment style has been negatively associated with depressive symptoms in children (Milan, Snow, & Belay, 2009), adolescents (Lee & Hankin, 2009), and young adults (Marchand-Reilly, 2009) and it seems that these factors in turn impact on the second separation-individuation phase taking place during adolescence and into young adulthood. Longitudinal studies that can link early attachment and the first and second stages of separation-individuation are necessary to

confirm the hypothesis that depressive symptoms mediate such pathways. While the current study could not address this longer view and test the proposed pathway the findings are consistent with such a proposition.

In fact, while there was no available direct information on the experiences in early childhood the current study attempted to capture a representation of the parent-child relationship by obtaining information about the young women's perceptions of the parenting received before the age of 16 years. It has been argued that such retrospective data reflects the internalised attachment relationship (Lopez & Gover, 1993). As separation-individuation is a process starting in early childhood parental factors are thought to influence this process throughout childhood and into adolescence and young adulthood (Grotevant & Cooper, 1985, 1986; Lapsley & Edgerton, 2002; Tofani, 2007).

The two aspects of parenting considered in the current study were perceived maternal care and overprotection. In accordance with the proposed hypothesis maternal care was found to be associated with separation-individuation in young adult women. The effect of perceived maternal care on separation-individuation was further found to be mediated through depressive symptoms and attachment to peers. Perceived maternal overprotection was not associated with separation-individuation in the young person. Previous studies have also investigated these two aspects of perceived parenting in relation to separation-individuation in Australian adolescents (Milne & Lancaster, 2001) as well as in a retrospective study of how mothers and their daughters remembered their separation-individuation process in relation to their perception of own mothers' ability to cope with this separation (Charles et al., 2001).

The finding that perceived maternal care, but not perceived maternal overprotection was important to the separation-individuation process is in contrast to that reported by the previously cited study of Australian female adolescents aged 14 to

16 years in that perceived maternal overprotection, but not perceived maternal care, had an effect on separation-individuation (Milne & Lancaster, 2001). The results from the retrospective study by Charles et al. (2001) suggested that young adult women aged 22 to 30 years who perceived their mothers as enabling autonomy described their mothers as encouraging separateness and independence in a warm, encouraging, and trusting fashion which was communicated in a respectful manner where the mother appeared interested in their young adult daughter's experience of becoming more autonomous (Charles et al., 2001). Thus, aspects of perceived parenting related to care seems important to the separation-individuation process of young adult women.

Milne and Lancaster (2001) further found that current attachment to mother was significantly related to separation-individuation in adolescent females. The findings of the present study, on the other hand, found that the effect of current attachment to mother on separation-individuation disappeared once perception of past maternal care was accounted for. These discrepancies in the results may be related to changes in the separation-individuation process according to the developmental stage of the young person. Participants in the current study were older than the participants in the Milne and Lancaster study (2001) and so it might be expected that the attachment the young women had with their peers was of greater importance to the separation-individuation process.

The present study demonstrated that attachment to peers influenced separation-individuation with a secure attachment to peers being related to a more resolved separation-individuation process. Previous studies have found that peer relationships become increasingly important during adolescence and into young adulthood (L. S. Brown & Wright, 2001; Schneider & Younger, 1996) with the young person putting greater emphasis on the emotional attachment to peers rather than with parents (Hay &

Ashman, 2003). This transfer of emotional attachment from parents to peers has been suggested to be an important part of the development of individuation and autonomy in the adolescent and the young adult person (Hay & Ashman, 2003; Laible, 2007). Future research of a longitudinal design might be able to assess whether a secure attachment to peers is related to more resolved separation-individuation over time. It may be that peer relationships can foster the achievement of the developmental task of separation-individuation in a similar manner to the development of empathy, prosocial behaviour, and perspective taking as has been suggested in the literature (Hay & Ashman, 2003; Laible, 2007; Youniss, 1980).

The measure used to assess attachment in the current study may provide an explanation as to why current attachment to mother did not contribute to the model of separation-individuation. Other studies have reported that attachment is related to separation-individuation (Lapsley & Edgerton, 2002; Lapsley et al., 2000) however they used a categorical measure of attachment style rather than a dimensional measure of attachment as used in the present study. Lapsley and Edgerton (2002) suggested that during the separation-individuation process taking place in adolescence and young adulthood, the young person is revising their internal working model of attachment. This revision of internal working model of attachment is influenced by new experiences the young person has of relating to, being connected to, and separating from important people in their lives. Lapsley and Edgerton (2002) found evidence suggesting that Canadian college students' score on a measure of separation-individuation (the same measure utilised in the present study: S-IPI) was influenced by their attachment style. College students with secure or dismissing attachment styles had lower scores on the separation-individuation measure, reflecting a more resolved separation-individuation process, compared to their fearful and preoccupied counterparts who on average

reported less resolved separation-individuation. A possible explanation for the strong association between separation-individuation and attachment style in the above mentioned study was because of the many aspects assessed by the S-IPI thought important to and related to attachment including differentiating between self and others and splitting of others into “good” and “bad” (Lapsley & Edgerton, 2002). Similarities between adolescent/parent individuation typology and that of attachment styles has also been reported by Kruse and Walper (2008).

That current attachment to mother (as assessed by the IPPA) failed to independently predict separation-individuation after the effects of perceived maternal care (as measured by the PBI care subscale) was accounted for could be because of the previously noted (p. 72) high positive correlation (.816) between the IPPA and the PBI. This statistical association suggests that there is an overlap in the constructs of current attachment to mother and perceived maternal care as measured by the IPPA and the PBI respectively. The IPPA was designed to measure how a person currently perceives their relationship to their parent, particularly the level of security in this relationship, whereas the PBI was designed to asses a person’s perception of the parenting received until the age of 16 years. As attachment theory suggests that early relationship experiences with parents affect later attachment to parents it is not surprising that there is an overlap.

Some consideration of the measure utilised to assess separation-individuation in young adult women in the present study might further assist in the considerations of the present results. The S-IPI was developed by Christenson and Wilson (1985) in order to measure the presence or absence of pathology in the separation-individuation process. A sample of adult men and women with a diagnosis of borderline personality disorder as well as a sample of university employees were recruited for the purpose of identifying measurement items reflecting this developmental process (Christenson & Wilson,

1985). More recently this measure has been used in a sample of Australian female adolescent aged 14 to 16 years (Milne & Lancaster, 2001) as well as in two studies investigating the separation-individuation process in American and Canadian college students (Lapsley & Edgerton, 2002; Lapsley et al., 2000) with all studies reporting adequate psychometric properties of this measure.

Comparisons of the mean scores from the different studies reported above to the mean separation-individuation score obtained in the present study indicated that the sample of university employees participating in the study by Christenson and Wilson (1985) had a slightly lower mean score (M = 120.6) compared to the sample recruited for the present sample (M = 127.59). The higher score reported by Christenson and Wilson may reflect the higher mean age (36.7 years) of participants as it might be expected that older participants would have more resolved separation-individuation.

A more recent study of the separation-individuation process in a sample of Canadian college students with a mean age of 20.24 years (Lapsley & Edgerton, 2002) reported a mean of 125.36 on the S-IPI which was almost identical to that found in the present study. Notably, in a study by Milne and Lancaster (2001) it was found that young adolescent females aged 14 to 16 years reported a more unresolved separation-individuation process (M = 181.36) compared to the sample of young women in the present study. This is not surprising as the young women participating in the present study were older than the sample of early adolescents participating in the Milne and Lancaster study. Older adolescents/young adults might be expected to be further advanced in many of the developmental tasks of young adolescence such as sexual maturation, cognitive functioning/development, moral development and judgement, and identity formation and thus having a more resolved separation-individuation.

Even though the present study did not set out to investigate whether young women who had taken on adult roles and behaviours (e.g. moving out of the parental home, completing school/higher degree, entering marriage or cohabitating with a romantic partner, focusing on a career, and becoming parents) had more or less resolved separation-individuation, these behaviours are important to the developmental stage of young adulthood (P. Cohen et al., 2003; Kokko, Pulkkinen, & Mesiäinen, 2009; Masche, 2008). As has been mentioned previously there is a lack of studies examining the separation-individuation process in late adolescence and young adulthood and instead many empirical studies about autonomy development in adolescence and young adulthood have focused on the behavioural markers of these developmental stages but have not linked these behaviours to the process of separation-individuation (P. Cohen et al., 2003).

Preliminary analyses examining the relationship between demographic variables such as living situation and employment status and separation-individuation suggested that the internal process of separation-individuation was not related to autonomous behaviours in this sample of young adult women. There were no differences among the young women in the present study on their score of separation-individuation depending on whether they were living out of the parental home or working in full-time employment. Thus, behaviours thought to reflect autonomy may be related to other important factors. For example, the decision to move out of home does not necessarily reflect a more resolved separation-individuation process, it may instead reflect practical decisions to move closer to where one is studying or working. Nevertheless, recent research have found evidence suggesting that young people are more likely to live independently from their parents if a higher level of trust was reported between the young person and their parent (Masche, 2008). This has in turn been suggested to be

related to the young person having an internal working model supporting a secure attachment to parental figures thus allowing the young person to engage in autonomous behaviours such as living independently (Masche, 2008). Longitudinal studies examining separation-individuation and autonomous behaviour over the developmental periods of adolescence, young adulthood, and adulthood may further assist in our understanding of the relationship between separation-individuation and the time at which the young person engages in age expected autonomous behaviours and roles.

The correlation between participants' age and separation-individuation was examined in order to decide whether the effects of age needed to be controlled for in Model 1. As age was not significantly associated with separation-individuation in this sample of young women it was not entered into the hierarchical regression testing Model 1.

Developmental theories and the literature about the separation-individuation process in adolescence and young adulthood (Blos, 1979; Erikson, 1968, 1980; Josselson, 1980) suggest that separation-individuation would increase with age. However, the age range of the present sample started at the higher end of adolescence, 18 years, with the end of the range at 25 years. If the separation-individuation process commences in early adolescence it is possible that the greatest changes take place before the age of 18 years. Around the age of 18 years there is a drive for more autonomous behaviours reinforced by society in that the young person is then able to vote and get a driver's licence. While separation-individuation is not necessarily completely resolved for young people in their 20s less variation may be present. Results from a recent study investigating separation-individuation in the context of adult children's relationship to their parents (Buhl, 2008) support the finding that there is no significant association between separation-individuation and the age of the young adult.

Buhl (2008) reported that in a sample of German young adults and adults aged 21 to 47 years no increase in the participants' individuation depending on the age of the participants was evident. Similarly, in a recent study (Kruse & Walper, 2008) only small age trends were reported for the separation-individuation process in adolescents and young adults aged 10 to 20 years. Including participants of a wider age range (e.g. from early adolescence to adulthood) within a longitudinal research design would make it possible to investigate changes in the separation-individuation process over different developmental periods and increase understanding regarding the effects of age on the separation-individuation process.

As there have been relatively few studies examining the separation-individuation process, the current study needed to look at more general factors expected to influence separation-individuation before considering any potential effects of the presence of a chronic illness on this process. It was expected that having a chronic illness such as Type 1 Diabetes would be associated with a less resolved separation-individuation process.

The findings of the present study did not support this hypothesis as having a diagnosis of Type 1 Diabetes was not associated with separation-individuation and was not able to predict any of the variance in separation-individuation. Moreover, no difference in the mean score of separation-individuation was evident between young women with and without Type 1 Diabetes. The present results support the claim that there are possibly more similarities than differences between young adults with and without a diagnosis of Type 1 Diabetes in terms of achieving age appropriate developmental tasks (Dashiff & Bartolucci, 2002; Luyckx et al., 2008; Pacaud et al., 2007). However, the fact that only university students served as participants in the control group needs to be considered. In the above cited studies investigating

developmental tasks and achievements in young adults with and without a diagnosis of Type 1 Diabetes, participants for the control group were recruited from a university, different work settings (Luyckx et al., 2008), and visits to the emergency department (Pacaud et al., 2007). Including young people from different backgrounds with different educational level and socioeconomic (SES) backgrounds would be important in future studies to ensure more generalizability.

A possible explanation for the lack of a significant association between having a diagnosis of Type 1 Diabetes and separation-individuation in young adult women may be related to the age at which the diagnosis of Type 1 Diabetes occurred. As has been mentioned previously, being diagnosed with a chronic illness such as Type 1 Diabetes during the childhood years can have possible implications for the parent-child relationship (Barker, 1993; Ødegård, 2005; Wolpert, 2002) in terms of the attachment relationship between the child and caregiver (Ødegård, 2005) and the parenting received as a result of a diagnosis of Type 1 Diabetes (Barker, 1993; Wolpert, 2002). This in turn may have implications for later developmental tasks and processes including the first and second stages of the separation-individuation process.

It further seems possible that the parenting experiences of a person diagnosed with Type 1 Diabetes in early childhood will be very different compared to the parenting experiences of a young person diagnosed at a later age with differences in parental stress and anxieties throughout the life of the child and young person. The non-significant association between having a diagnosis of Type 1 Diabetes and separation-individuation found may be a result of too few participants having been diagnosed in early childhood. In the present study only six participants with Type 1 Diabetes were diagnosed in early childhood (at the age of three years or younger) which was too small a number to conduct further analyses or make any meaningful comparisons.

Effects of time of diagnosis of Type 1 Diabetes on the child and parents have been reported in the literature with mothers of children diagnosed with Type 1 Diabetes expressing elevated scores on measures of psychiatric symptoms and disorders (Northam, Anderson, Adler, Werther, & Warne, 1996; Wysocki, Huxtable, Linscheild, & Wayne, 1989). Northam et al. (1996) reported that parents of children diagnosed with Type 1 Diabetes during the primary school years reported most psychiatric symptoms followed by parents of children diagnosed during the preschool years. Parents with a child diagnosed during the adolescent years reported the least amount of psychiatric symptoms. They attributed this finding to the possibility that when a diagnosis of Type 1 Diabetes takes place in the adolescent years the parents might feet less affected by this diagnosis as they expect the young person to take responsibility in relation to the management of the illness. Moreover, in families with children diagnosed with Type 1 Diabetes between the ages of zero to four years parents responded to this by initially feeling closer to their child and reported a strengthening of the emotional bond. One year later the parents and children were found to be on the connected/enmeshed end of the scale when compared to normative data (Northam et al., 1996). Moreover, internalising behaviours have been reported to be higher in children diagnosed during preschool years compared to children diagnosed in school aged and adolescent years (Wysocki et al., 1989). These findings suggest that age at diagnosis may affect parenting children with a diagnosis of Type 1 Diabetes receive which in turn may affect separation-individuation in childhood, adolescence, and young adulthood. In further studies the inclusion of greater numbers of participants diagnosed at different ages may further add to our understanding regarding this claim.

The recruitment process for the present study and the reported incidence rates of Type 1 Diabetes in Australia explain in part the low number of participants diagnosed

with Type 1 Diabetes at an early age. It is estimated that approximately 700 000 Australians have been diagnosed with diabetes (3.6% of the population) and approximately 13% of these cases have Type 1 Diabetes (Australian Bureau of Statistics, 2006). Available Victorian statistics indicate that the lowest female incidence rates for diagnosis before the age of 15 years is in the age group zero to four years with 10.7 cases per 100 000 per year from 1999 to 2002 (Chong et al., 2007). Unfortunately there are no prevalence figures available for females aged 18 to 25 years with Type 1 Diabetes in the state of Victoria (Australian Institute of Health and Welfare, 2007) and as such it is not possible to determine whether the numbers recruited with a diagnosis before the age four years are representative of the Australian population as a whole. As recruitment for the present study only took place at two sites in the metropolitan area of Melbourne it is perhaps not surprising that only a small number of young women diagnosed before the age of four years was recruited. In order to further investigate the hypothesis that the age of onset of Type 1 Diabetes results in different perceptions of received parenting and affects later separation-individuation in adolescence and young adulthood a much larger sample of individuals with Type 1 Diabetes would need to be recruited.

5.4 Factors Affecting Diabetes Management in Young Adult Women

Preliminary analysis suggested that the presence of more depressive symptoms and less acceptance of having diabetes were associated with poorer diabetes management in this sample of young women. When these associations were further tested in a hierarchical regression analysis none of the variables entered (illness duration, perception of past parental involvement, separation-individuation, depressive

symptoms, and acceptance of having diabetes) individually significantly contributed to the variance in diabetes management.

Correlational analysis suggested that more depressive symptoms were related to poorer diabetes management which is in agreement with results from previous research (Kyrios et al., 2006; Law et al., 2002). Adults of all ages with Type 1 Diabetes who had high scores on a measure of depressive symptoms were found to have poorer overall diabetes management compared to adults who had a lower score (Kyrios et al., 2006). This relationship was explained by depressed adults reporting that they found it more difficult to adhere to recommendations around diet, exercise, and glucose testing suggesting that lack of motivation which is a symptom of depression may be an important factor in the relationship between depression and diabetes management (Kyrios et al., 2006). Similar results have been reported in a sample of adolescents aged 13 to 19 years (Law et al., 2002).

The present study failed to find a significant relationship between depressive symptoms and metabolic control. Similarly, there was no difference in depression scores based on metabolic control when participants were divided into two groups: one group including participants with HbA1c level of 7.0 and below and one group including participants with HbA1c levels of 7.1 and above. A non-significant correlation between glycemic control and depressive symptoms has also been reported by Kyrios et al. (2006). In contrast to the findings reported by Kyrios et al. (2006) and the findings of the present study, a number of studies have reported an association between depression and metabolic control (Bryden et al., 2001; McGrady et al., 2009). Kyrios et al. (2006) reported a small to moderate association between depression and metabolic control and suggested that this association was non-significant due to small sample size. Similarly in the present study a small but non-significant association

between metabolic control and depressive symptoms was evident. It is possible that the failure to find a significant association was related to the small sample size but also to the limited range of HbA1c levels among the participants in the present study.

Another explanation for the non-significant association between depressive symptoms and metabolic control might be related to there being an indirect relationship rather than a direct relationship between these variables. As suggested by the results of a recent study (McGrady et al., 2009) it may be that the association between depressive symptoms and metabolic control is mediated by specific diabetes related behaviours. In this study the researchers entered participants' frequency of blood glucose monitoring together with depressive symptoms in a model of metabolic control. The results suggested that only the frequency of blood glucose monitoring was significantly associated with metabolic control. The authors suggested that the adolescents who had more depressive symptoms might find it difficult to initiate and motivate themselves to do tasks related to diabetes management, such as blood glucose monitoring, as they might have the belief that these behaviours would be ineffective (McGrady et al., 2009). Thus, depressive symptoms might have consequences for the management of diabetes which in turn impacts metabolic control.

As has been mentioned above the limited range of HbA1c scores among this population of young adult women participating in the present study could be a possible explanation for the lack of a significant association between depressive symptoms and metabolic control. Comparing the mean HbA1c level of the present study to that reported in other studies of young adults of similar ages (Bryden et al., 2003) suggests that the mean HbA1c score of the present study is lower (suggesting better metabolic control). This lower average of metabolic control may be related to the recruitment process of the present study where only young women who attended the diabetes clinics

at regular intervals were recruited. It is possible that young women who did not regularly attend diabetes clinics had poorer metabolic control (higher HbA1c levels) and possibly higher levels of psychopathology including depression.

Examinations and comparisons of the results of the present study to that of a recent study examining the trajectories of metabolic control from early adolescence to young adulthood highlighted the emergence of divergent paths over time (Luyckx & Seiffge-Krenke, 2009). Three main trajectories of metabolic control were found in this recent longitudinal study: optimal control with HbA1c levels ranging from 5.95 to 7.40; moderate control with HbA1c levels ranging from 7.44 to 8.50; and deteriorating control with HbA1c levels ranging from 6.57 to 9.89 (Luyckx & Seiffge-Krenke, 2009). Comparing the mean HbA1c level of the present study to the means for the three different trajectories in the Luyckx and Seiffge-Krenke (2009) study suggests that as a group the young women in the present study were on the moderate trajectory.

In the present study it was hypothesised that diabetes management and metabolic control (HbA1c level) would be significantly associated, with poorer diabetes management indicating poorer metabolic control. This was not supported as there was a small but non-significant correlation in the expected direction between diabetes management and diabetic control. Further analysis however indicated that when the sample was divided into two groups based on high and low HbA1c levels, participants with HbA1c of 7.1 or above reported poorer diabetes management than participants with HbA1c of 7.0 or below. This result further indicated that even though diabetes management was assessed by a self report measure it nevertheless appeared to give some indication as to how well the young women were managing their diabetes which was reflected in an objective measure of metabolic control such as HbA1c level. Similar results have been reported in the literature with a significant association between

diabetes management behaviours and metabolic control found in adolescents (Duke et al., 2008; Stewart, Emslie, Klein, Haus, & White, 2005).

The significant difference in young women's score on diabetes management depending on their HbA1c level suggested that the measure used to assess diabetes management was adequate and appropriate. The SCI-R (Weinger et al., 2005) was used in the present study in order to assess overall adherence to diabetes management behaviours. This measure asks about behaviours closely related to behaviours thought to be important to successful management of diabetes such as monitoring blood glucose level, following a specified diet, partaking in regular exercise, and attending clinic appointments. It is thought that not performing these behaviours as prescribed is indicative of poor metabolic control. Weinger et al. (2005) suggested that a person's score on this self care measure would be related to emotional functioning and the more emotional aspects of diabetes management as a person's emotions would be related to and could potentially interfere with the degree of adherence to the recommended treatment regimen. The findings of the present study support this view with young women's diabetes management found to be moderately correlated with depressive symptoms and acceptance of having diabetes. Young women who reported poorer adherence to the different diabetes management behaviours were more likely to experience more depressive symptoms and less acceptance of having diabetes.

Even though significant moderate correlations between acceptance of having diabetes, depressive symptoms, and diabetes management were evident, neither of these variables significantly contributed on its own in the model of diabetes management in this sample of young women. Significant correlations between acceptance of having diabetes, depressive symptoms, and separation-individuation were also found with less

acceptance of having diabetes being related to more depressive symptoms and a less resolved separation-individuation process.

Previous studies have suggested that poor acceptance of having diabetes is related to poorer diabetes management and metabolic control (Hanson et al., 1989; Wysocki et al., 1992). Wysocki et al. (1992) found a significant association between metabolic control and adjustment/acceptance of having diabetes which is contrary to the findings of the present study where no association between metabolic control and acceptance of having diabetes was evident. Wysocki et al. asked young adults aged 18 to 22 years about how they had adjusted to having Type 1 Diabetes at the ages of 13 to 17 years and how they were adjusting to Type 1 Diabetes at the time of the study taking place. However, the association with metabolic control was only significant for the retrospective question related to adjustment to diabetes when aged 13 to 17 years. Similar to the present study Wysocki et al. (1992) did not find a significant association between metabolic control and current adjustment to diabetes. Longitudinal studies that examine acceptance of having diabetes and adjustment to the diagnosis and the association with metabolic control and diabetes management over time could increase understanding of these complex associations.

That both depressive symptoms and acceptance of having diabetes failed to independently predict diabetes management might be related to a possible overlap in what is measured by the depression scale and acceptance of having diabetes scale utilised in the present study. The high correlation between these two measures does indeed suggest some overlap. Examination of the questionnaire items used to measure acceptance of having diabetes indicated that some items asked about the level of guilt associated with having diabetes, feelings of hopelessness, and loss of control (Welch et al., 1994) which are also thought to be symptoms central to depressive disorders

(American Psychiatric Association, 2000). This overlap in the constructs of acceptance of having diabetes and depressive symptoms may explain why these two variables did not independently predicted diabetes management.

The hypothesis that perception of past parental involvement in the management of diabetes would be related to how the young women currently managed their diabetes was not supported. No significant correlation between perception of past parental involvement and diabetes management or diabetes control was found and perception of past parental involvement did not predict diabetes management in this sample of young women. A possible explanation for this lack of association could be the measure used to assess perception of past parental involvement. The DFRQ (Anderson et al., 1990) was adjusted to suit the purposes of the present study where only the young women were asked about who in the family took responsibility for diabetes management behaviours when participants were in secondary school. In the original version of this measure the parent most closely involved in the child's diabetes management is also asked these questions. The adapted version used in the present study required responses to these questions that were retrospective views of responsibility taken for diabetes related behaviours. Moreover, the age at which the young women were diagnosed with Type 1 Diabetes may also have influenced the link between perception of past parental involvement in diabetes management and current diabetes management.

If the diagnosis of diabetes occurred during adolescence it would be expected that the young person would move quickly into self management of their diabetes without much parental involvement. However, if on the other hand the diagnosis took place during early childhood a different picture might have emerged with parental involvement continuing into adolescence and young adulthood. Because of the small number of participants diagnosed with Type 1 Diabetes during early childhood it was

not possible to test this proposition. Future research might want to investigate the effects of perception of past parental involvement in a larger sample where it is possible to track participants longitudinally.

It is important to note that previous research has suggested that continued parental support with diabetes management throughout the adolescent years and into the young adult years is important (Anderson, 2004) and this support might be an important factor as to whether the young person attends appointments at a diabetes clinic. Since it was not possible to recruit young women not attending diabetes clinic appointments this could not be assessed. Consideration needs to be given to the distinction between parental support and continuing parental involvement in diabetes management that may interfere with young adults taking responsibility for their treatment regimen.

In the literature available on the transition from paediatric services to adult services it has been reported that there is a marked decrease in attendance at diabetes clinics after the transition to adult diabetes services take place (Kipps et al., 2002). Moreover, young people with higher HbA1c level (poorer metabolic control) two years prior to the transition from paediatric services to adult services took place were more likely to fail to attend adult services two years post transfer (Kipps et al., 2002). One possible factor in decreased attendance at diabetes clinics in the young adult years could be that parents and health professionals are no longer closely monitoring the young person's diabetes related behaviour and as a result the young person does not attend medical appointments as often as needed. Recently authors have suggested guidelines and recommendations related to working with young adults who have Type 1 Diabetes (Weissberg-Benchell, Wolpert, & Anderson, 2007) in the context of Arnett's (2000) theory of emerging adulthood. It is possible that past parental involvement with the

management of a young person's diabetes treatment may be related to continued attendance at diabetes clinics for adults.

Contrary to the proposed hypotheses illness duration did not contribute to the overall model of diabetes management in young women. Contradictory findings regarding the relationship between illness duration and diabetes management and diabetic control has been reported in the literature with some authors reporting that longer illness duration is related to poorer diabetes management (Wiebe et al., 2005) and poorer diabetic control (Pereira et al., 2008) and others finding no such relationships (Grey et al., 1998). Moreover, some studies have found a relationship between illness duration and metabolic control with longer illness duration being associated with poorer metabolic control but no relationship between illness duration and diabetes management (Duke et al., 2008).

In order to further understand this lack of association between illness duration and diabetes management and metabolic control in the present study, age distributions of other studies that have investigated the impact of illness duration on diabetes management and metabolic control were examined. When comparing illness duration in years in the present study (M = 11.24, SD = 5.2) with that of other studies with participants of similar ages (Bryden et al., 2003; Bryden et al., 2001; Kay et al., 2009; Mayou et al., 1991; Pacaud et al., 2007) no large differences were evident. The mean illness duration for female young adults in these studies were 9.2 (SD = 5.3), 15.7 (SD = 2.9), 11.92 (SD = 5.3), and 9.6 (SD = 4.5) respectively. Thus, the average illness duration in the present study was comparable to previous research suggesting that this cannot explain the inconsistent findings in regards to illness duration.

A possible explanation for the lack of relationship between diabetes management and illness duration and diabetic control and illness duration may be the sample

recruited. As has been mentioned above, only young women attending medical appointments at regular intervals of at least every six months were included. The expected relationship between illness duration and diabetes management and metabolic control may only apply to young people who do not attend appointments regularly at a diabetes clinic and would thus also be expected to have poorer diabetes management and metabolic control. Broader recruitment procedures that do not depend on regular attendance at clinics such as random selection from a comprehensive diabetes register would be necessary to test this possibility.

5.5 Limitations of the Present Study and Suggestions for Future Research

A number of limitations need to be considered when interpreting the findings from the present study. The results were based on self reported paper and pencil measures with the exception of HbA1c level. One difficulty with self-reported measures is that the information collected is given by the participant only and the participant might give information that is perceived as socially desirable. Future research might want to collect information relevant to diabetes management and separation-individuation from different sources including the young person, parents, and health professionals working with the young person.

A cross sectional design was utilised in the present study and so it was not possible to measure the changes in separation-individuation and diabetes management across time. Future research could include longitudinal designs that would allow investigation of the effects of separation-individuation on diabetes management across time during the developmental stages of adolescence and young adulthood into adulthood. This might further increase our understanding of what is important to the

separation-individuation process and diabetes management across time and in different developmental stages.

HbA1c level was collected the same day as the questionnaires were completed and as such this measure of HbA1c level is only able to provide a limited view of how factors examined in the present study are related to the young women's metabolic control (Palmer et al., 2009). All the young women with Type 1 Diabetes participating in the present study knew their HbA1c level at the time of completing the questionnaires and this may have influenced their responses to the diabetes management measure in that respondents who perceived their HbA1c level as "good" might have answered that they engage in recommended self care behaviours more often than was the case. It is also possible that in the period immediately prior to their clinic appointment all participants attempt to improve their diabetes management.

Generalizability of the statistical findings should be made with care due to factors such as no information about SES background, the recruitment process, and a small sample of participants with Type 1 Diabetes. Previous overseas research has found a link between SES of the young person's family and metabolic control with lower SES being related to poorer metabolic control in children , adolescents (Pereira et al., 2008), and adults (Jiang, Andrews, Stryer, & Friedman, 2005). As this information was not collected in the present study it is difficult to make assumptions of how the results may generalize to different populations of young women with Type 1 Diabetes. However, it is also important to recognise the impact of low SES may not be so evident in Australian samples because of availability of free health care.

As recruitment of young women with a diagnosis of Type 1 Diabetes took place during routine check ups at diabetes clinics only young women with diabetes who attended appointments at regular intervals were included in the present study. Thus,

generalization of the results to young women who do not regularly attend medical appointments in relation to their diabetes cannot be assumed. The recruitment process also affected the number of young women with Type 1 Diabetes who participated in the present study. It was not possible to send out letters to all the young women with Type 1 Diabetes who were registered with a specific diabetes clinic due to limited resources. Mail outs inviting all patients registered with a hospital or clinic have been used as a recruitment procedure in previous studies and have resulted in recruitment of larger samples (Ciechanowski et al., 2005).

Separation-individuation and diabetes management is of course relevant and important in males as well as females. Another limitation of the present study is that only young women were recruited. Sex differences in young adult roles and in autonomous behaviour have been reported in the literature (P. Cohen et al., 2003). Literature on the separation-individuation process further suggests that there are differences between male and females in terms of how they view the importance of relationships with parents and suggests that relationship factors may play a more important role for women (Lapsley et al., 1989). In a study of American university students males were reported to have greater difficulties in the separation-individuation process compared to females (Lapsley et al., 2001). Future research might want to explore gender differences in the separation-individuation process in an Australian sample of adolescents and young adults.

Furthermore, this study only investigated the young person's perception of maternal attachment, care, and overprotection. Including parental factors related to fathers and asking about paternal attachment may provide important information in relation to the process of separation-individuation and factors important for diabetes management in the young person.

5.6 Contributions of the Study

The present study has contributed to the research literature on separation-individuation and diabetes management in young Australian adult women. Very few studies have explored the general factors influencing the important developmental process of separation-individuation in adolescence and young adulthood and there have been no Australian studies that have examined separation-individuation specifically in young adult women. The results of the present study suggested that depressive symptoms together with the parental factor perceived maternal care and attachment to peers were important predictors of the level of separation-individuation in young women. Such findings may have implications for psychological work undertaken with this population.

While a number of studies have alluded to changes in parenting when a child has been diagnosed with a chronic illness there have been no studies that have considered whether being diagnosed with Type 1 Diabetes would influence separation-individuation in young adults. Even though the results of the present study could not satisfactorily answer this question due to the small number of participants diagnosed with Type 1 Diabetes in early childhood, correlations between depressive symptoms, acceptance of having diabetes, and separation-individuation suggested that there is a relationship between more depressive symptoms, a less resolved separation-individuation process, and poorer acceptance of having diabetes.

Correlational analysis revealed that more depressive symptoms and less acceptance of having diabetes were associated with poorer diabetes management in this sample of young women with Type 1 Diabetes which is consistent with findings from previous studies. However, these factors did not reliably predict the variance of diabetes management when tested via a hierarchical regression. Nevertheless, screening for

depressive symptoms in young people as part of the professional care they receive seems important as this may help to identify people who will have difficulties managing their diabetes and who can then be offered treatment (McGrady et al., 2009).

Research in the area of diabetes management in young people is of great importance as poor diabetes management can result in serious health risks. Generally research attention has been focused on adolescents or adults of varying ages. The inclusion of young adults as part of samples covering the complete adult spectrum may mask the issues that arise for young people in the transitional period between adolescence and adulthood. The current study aimed to redress this neglect by focusing specifically on this important developmental period.

5.7 Summary and Concluding Remarks

This thesis aimed to examine factors thought important to the separation-individuation process of young adult women and further investigate the effects of having a diagnosis of a chronic illness, such as Type 1 Diabetes, on this developmental process. To gain further understanding of diabetes management in young adult women a proposed model of diabetes management was tested. The present study contributed to the area of separation-individuation as this is the first study that has investigated this concept in a sample of young women living in Australia. Inclusion of young adults in studies examining adolescents or adults of all ages has made it difficult to consider the developmental tasks that may affect diabetes management. The specific focus on young adult women and recognition of important developmental factors in the present study addressed this gap and further contributed to the understanding of diabetes management in this age group.

Continued research in the area of separation-individuation and diabetes management in young adulthood is of importance as difficulties in the separation-individuation process may have implications for the person's wellbeing and future relationships. A greater understanding of this process may assist professionals working with young people. As poor diabetes management is related to increased risk of ongoing complications and premature mortality understanding the factors that influence diabetes management is critical in order to appropriately assist young adults with the challenges related to managing their diabetes.

6 References

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7 Appendices

Appendix A: Participant Information and Consent Form for Participants with Type 1 Diabetes

Appendix B: Participant Information and Consent Form for Participants without Type 1 Diabetes

Appendix C: Background Questionnaire

Appendix D: The Separation-Individuation Process Inventory (S-IPI)

Appendix E: The Inventory of Parent and Peer Attachment (IPPA)

Appendix F: The Parental Bonding Instrument (PBI)

Appendix G: Depression Anxiety and Stress Scale (DASS)

Appendix H: The Self-Care Inventory Revised (SCI-R)

Appendix I: ATT19 Measure of Psychological Adjustment to Diabetes

Appendix J: The Diabetes Family Responsibility Questionnaire (DFRQ)

Appendix K: Posters Advertised for Participants with Type 1 Diabetes

Appendix L: Posters Advertised for Participants without Type 1 Diabetes

Appendix M: Results from Hierarchical Regression Analysis for Model 1 (Factors Influencing Separation-Individuation in Young Women) with Transformed Variables

Appendix N: Results from Hierarchical Regression Analysis for Model 2 (Factors Influencing Diabetes Management in Young Women) with Transformed Variables

7.1 *Appendix A: Participant Information and Consent Form for Participants with Type 1 Diabetes*

Participant Information and Consent Form
Version 3 Dated 22.05.2008
Site: Western Health / Victoria University / Royal Melbourne Hospital

Full Project Title: Adjustment in Young Women with and without Type 1 Diabetes

Principal Researcher:	Professor Sandra Lancaster
Associate Researcher(s):	Associate Professor Shane Hamblin
	Cheryl Steele
	Associate Professor Peter Colman
Student Researcher(s):	Hege K. Andreassen
	Sonal Sachdeva

This Participant Information and Consent Form is **6** pages long. Please make sure you have all the pages.

1. Your Consent

You are invited to take part in this research project.

This Participant Information contains detailed information about the research project. Its purpose is to explain to you as openly and clearly as possible all the procedures involved in this project before you decide whether or not to take part in it.

Please read this Participant Information carefully. Feel free to ask questions about any information in the document. You may also wish to discuss the project with a relative or friend or your local health worker. Feel free to do this.

Once you understand what the project is about and if you agree to take part in it, you will be asked to sign the Consent Form. By signing the Consent Form, you indicate that you understand the information and that you give your consent to participate in the research project.

You will be given a copy of the Participant Information and Consent Form to keep as a record.

2. Purpose and Background

There are two purposes of this project:

a) To examine how young women become more independent and autonomous and how this affects people with and without a chronic illness such as Type 1 diabetes.

b) To understand more about how young women think about their bodies, how that might affect eating related behaviour and whether these issues create more difficulties for young women with Type 1 diabetes

A total of 120 people will participate in this project.

Previous research has shown that during the time when young adults become more independent a number of factors such as their mood and their relationship with parents and their friends are important. There has been no research that has tried to understand more about the experience of becoming more independent when you are a young woman with a chronic illness such as Type 1 diabetes. Eating behaviour and how young women think about

their bodies are also relevant issues in this period of life. Family influences, relationships with friends, personality and mood are important factors that influence our eating behaviour. Management of diabetes requires young women to pay particular attention to the food they eat and this may be a further pressure. It is possible that these factors may affect management and control of the diabetes.

You are invited to participate in this research project because your experience of the issues described above will help us to get a better understanding of independence and eating behaviour and the impact of having Type 1 diabetes over a period of time.

This project will be done as a part of the above mentioned students' post-graduate research.

3. Procedures

Participation in this project will involve completing a questionnaire booklet. Questions will be about relationships with friends and family, your mood, independence and eating behaviour. In addition to this there will also be questions about your experience and the management of diabetes. Most questions will require you to tick or circle one of the possible responses. It will take approximately 45 minutes to answer all the questions.

Participation in this research will also involve your consent for researchers to access your medical records. The only medical information necessary for our research will be your recent metabolic control as assessed by glycosylated hemoglobin (HbA1c).

4. Possible Benefits

Participating in this study will not benefit you directly; however, results of this study may offer benefits to young women in the future. Results of the study may contribute to greater understanding of independence and eating behaviour in young women and help professionals offer appropriate services to young women with diabetes.

5. Possible Risks

There are no expected risks associated with this study; however it is possible that some people may find certain questions distressing. If you are upset by any of the questions let the researchers know and they will suggest ways that you could obtain help.

At any point you may withdraw your participation in this study.

6. Privacy, Confidentiality and Disclosure of Information

Any information obtained in connection with this project will remain confidential. It will only be disclosed with your permission, except as required by law (e.g. possible harm to self or others). Only the results from the group of participants will be written up and published. No individuals will be identified in the writing up of the results. Information and data collected will be stored in locked filing cabinets in the psychology department of Victoria University. Only student researchers and the principal researcher will have access to the data.

7. Results of Project

If you would like to know the results of the study at the completion of the project we will send you a general summary of the results. To receive this summary you need to provide your contact details in the questionnaire booklet.

8. Further Information or Any Problems

If you require further information or if you have any problems concerning this project you can contact the principal researcher.

Principal researcher: Professor Sandra Lancaster Ph: (03) 9919 2397

Email: sandra.lancaster@vu.ede.au

9. Other Issues

If you have any complaints about any aspect of the project, the way it is being conducted or any questions about your rights as a research participant, then you may contact

Name: **Dr Stacey Gabriel**

Position: **Manager, Mental Health Human Research Ethics Committee**

Telephone: **(03) 9342 7098**

You will need to tell **Dr Stacey Gabriel** the name of one of the researchers given in section 8 above.

Or

Name: **the Secretary**

Position: **Secretary, Victoria University Human Research Ethics Committee**

Telephone: **(03) 9919 4710**

10. Participation is Voluntary

Participation in any research project is voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage.

Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your relationship with Western Hospital, Royal Melbourne Hospital or Victoria University.

Before you make your decision, a member of the research team will be available to answer any questions you have about the research project. You can ask for any information you want. Sign the Consent Form only after you have had a chance to ask your questions and have received satisfactory answers.

If you decide to withdraw from this project, please notify a member of the research team before you withdraw.

11. Ethical Guidelines

This project will be carried out according to the *National Statement on Ethical Conduct in Research Involving Humans* (June 1999) produced by the National Health and Medical Research Council of Australia. This statement has been developed to protect the interests of people who agree to participate in human research studies.The ethical aspects of this research project have been approved by the Human Research Ethics Committee of Melbourne Health and Victoria University.

CONSENT FORM

VERSION 3 DATED 22.05.2008

SITE WESTERN HEALTH / VICTORIA UNIVERSITY / ROYAL MELBOURNE HOSPITAL

Full Project Title: Adjustment in Young Women with and without Type 1 Diabetes

---

I have read, and I understand the Participant Information version ***3*** dated ***22/05/08***.

Please tick boxes when signing the consent form:

I freely agree to participate in this project according to the conditions in the Participant Information, including completion of questionnaire booklet. ☐ Yes ☐ No

I freely agree to the researchers obtaining information regarding my recent metabolic control (glycosylated hemoglobin) from my medical records. ☐ Yes ☐ No

I will be given a copy of the Participant Information and Consent Form to keep

The researcher has agreed not to reveal my identity and personal details if information about this project is published or presented in any public form.

Participant's Name (printed) ……

Signature Date

Name of Witness to Participant's Signature (printed) ……

Signature Date

Declaration by researcher*: I have given a verbal explanation of the research project, its procedures and risks and I believe that the participant has understood that explanation.

Researcher's Name (printed) ……

Signature Date

* A senior member of the research team must provide the explanation and provision of information concerning the research project.

Note: All parties signing the Consent Form must date their own signature.

CONSENT FORM

VERSION 3 DATED 22.05.2008

SITE WESTERN HEALTH / VICTORIA UNIVERSITY / ROYAL MELBOURNE HOSPITAL

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---

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Signature Date

Name of Witness to Participant's Signature (printed) ……

Signature Date

Declaration by researcher*: I have given a verbal explanation of the research project, its procedures and risks and I believe that the participant has understood that explanation.

Researcher's Name (printed) ……

Signature Date

* A senior member of the research team must provide the explanation and provision of information concerning the research project.

Note: All parties signing the Consent Form must date their own signature.

Revocation of Consent Form

Full Project Title: Adjustment in Young Women with and without Type 1 Diabetes

I hereby wish to WITHDRAW my consent to participate in the research proposal described above and understand that such withdrawal WILL NOT jeopardize any treatment or my relationship with Western Hospital or Victoria University.

Participant's Name (printed) …….

Signature Date

7.2 *Appendix B: Participant Information and Consent Form for Participants without Type 1 Diabetes*

Participant Information and Consent Form
Version 2 Dated 13.06.2007
Site: Western Health / Victoria University

Full Project Title: Adjustment in Young Women with and without Type 1 Diabetes

Principal Researcher:	Professor Sandra Lancaster
Associate Researcher(s):	Associate Professor Shane Hamblin
Student Researcher(s):	Hege K. Andreassen
	Sonal Sachdeva

This Participant Information and Consent Form is **6** pages long. Please make sure you have all the pages.

1. Your Consent

You are invited to take part in this research project.

This Participant Information contains detailed information about the research project. Its purpose is to explain to you as openly and clearly as possible all the procedures involved in this project before you decide whether or not to take part in it.

Please read this Participant Information carefully. Feel free to ask questions about any information in the document. You may also wish to discuss the project with a relative or friend or your local health worker. Feel free to do this.

Once you understand what the project is about and if you agree to take part in it, you will be asked to sign the Consent Form. By signing the Consent Form, you indicate that you understand the information and that you give your consent to participate in the research project.

You will be given a copy of the Participant Information and Consent Form to keep as a record.

2. Purpose and Background

There are two purposes of this project:

a) To examine how young women become more independent and autonomous and how this affects people with and without a chronic illness such as Type 1 diabetes.

b) To understand more about how young women think about their bodies, how that might affect eating related behaviour and whether these issues create more difficulties for young women with Type 1 diabetes.

A total of 120 people will participate in this project.

Previous research has shown that during the time when young adults become more independent a number of factors such as their mood and their relationship with parents and their friends are important. There has been no research that has tried to understand more about the experience of becoming more independent when you are a young woman. Eating behaviour and how young women think about their bodies are also relevant issues in this period of life. Family influences, relationships

with friends, personality and mood are important factors that influence our eating behaviour.

You are invited to participate in this research project because your experience of the issues described above will help us to get a better understanding of independence and eating related behaviour in young women.

This project will be done as a part of the above mentioned students' post-graduate research.

3. Procedures

Participation in this project will involve completing a questionnaire booklet. Questions will be about relationships with friends and family, your mood, independence, and eating behaviour and most questions will require you to tick or circle one of the possible responses. It will take approximately 45 minutes to answer all the questions.

4. Possible Benefits

Participating in this study will not benefit you directly; however, results of this study may offer benefits to young women in the future. Results of the study may contribute to greater understanding of independence and eating behaviour in young women and help professionals offer appropriate services to young women with and without diabetes.

5. Possible Risks

There are no expected risks associated with this study, however; it is possible that some people may find certain questions distressing. If you are upset by any of the questions let the researcher know and they will suggest ways that you could obtain help.

At any point you may withdraw your participation in this study.

6. Privacy, Confidentiality and Disclosure of Information

Any information obtained in connection with this project will remain confidential. It will only be disclosed with your permission, except as required by law (e.g. possible harm to self or others). Only the results from the group of participants will be written up and published. No individuals will be identified in the writing up of results. Information and data collected will be stored in locked filing cabinets in the psychology department of Victoria University. Only student researchers and the principal researcher will have access to the data.

7. Results of Project

If you would like to know the results of the study at the completion of the project we will send you a general summary of the results. To receive this summary you need to provide your contact details in the questionnaire booklet.

8. Further Information or Any Problems

If you require further information or if you have any problems concerning this project you can contact the principal researcher.

Principal researcher: Professor Sandra Lancaster Ph: (03) 9919 2397

Email: sandra.lancaster@vu.edu.au

9. Other Issues

If you have any complaints about any aspect of the project, the way it is being conducted or any questions about your rights as a research participant, then you may contact

Name: **Dr Stacey Gabriel**

Position: **Manager, Mental Health Human Research Ethics Committee**

Telephone: **(03) 9342 7098**

You will need to tell **Dr Stacey Gabriel** the name of one of the researchers given in section 8 above.

Or

Name: **the Secretary**

Position: **Secretary, Victoria University Human Research Ethics Committee**

Telephone: **(03) 9919 4710**

10. Participation is Voluntary

Participation in any research project is voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage.

Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your relationship with Western Hospital or Victoria University.

Before you make your decision, a member of the research team will be available to answer any questions you have about the research project. You can ask for any information you want. Sign the Consent Form only after you have had a chance to ask your questions and have received satisfactory answers.

If you decide to withdraw from this project, please notify a member of the research team before you withdraw.

11. Ethical Guidelines

This project will be carried out according to the *National Statement on Ethical Conduct in Research Involving Humans* (June 1999) produced by the National Health and Medical Research Council of Australia. This statement has been developed to protect the interests of people who agree to participate in human research studies.

The ethical aspects of this research project have been approved by the Human Research Ethics Committees of Melbourne Health and Victoria University.

CONSENT FORM

VERSION 2 DATED 13.06.2007

SITE: WESTERN HEALTH / VICTORIA UNIVERSITY

Full Project Title: Adjustment in Young Women with and without Type 1 Diabetes

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I have read, and I understand the Participant Information version *2* dated *24/04/07.*

Please tick box when signing the consent form:

I freely agree to participate in this project according to the conditions in the Participant Information, including completion of questionnaire booklet. ☐ Yes ☐ No

I will be given a copy of the Participant Information and Consent Form to keep.

The researcher has agreed not to reveal my identity and personal details if information about this project is published or presented in any public form.

Participant's Name (printed) ……

Signature Date

Name of Witness to Participant's Signature (printed) ……

Signature Date

Declaration by researcher*: I have given a verbal explanation of the research project, its procedures and risks and I believe that the participant has understood that explanation.

Researcher's Name (printed) ……

Signature Date

* A senior member of the research team must provide the explanation and provision of information concerning the research project.

Note: All parties signing the Consent Form must date their own signature.

CONSENT FORM

VERSION 2 DATED 13.06.2007

SITE: WESTERN HEALTH / VICTORIA UNIVERSITY

Full Project Title: Adjustment in Young Women with and without Type 1 Diabetes

---

I have read, and I understand the Participant Information version *2* dated *24/04/07.*

Please tick box when signing the consent form:

I freely agree to participate in this project according to the conditions in the Participant Information, including completion of questionnaire booklet. ☐ Yes
☐ No

I will be given a copy of the Participant Information and Consent Form to keep.

The researcher has agreed not to reveal my identity and personal details if information about this project is published or presented in any public form.

Participant's Name (printed) ……

Signature Date

Name of Witness to Participant's Signature (printed) ……

Signature Date

Declaration by researcher*: I have given a verbal explanation of the research project, its procedures and risks and I believe that the participant has understood that explanation.

Researcher's Name (printed) ……

Signature Date

* A senior member of the research team must provide the explanation and provision of information concerning the research project.

Note: All parties signing the Consent Form must date their own signature.

Revocation of Consent Form

Full Project Title: Adjustment in Young Women with and without Type 1 Diabetes

I hereby wish to WITHDRAW my consent to participate in the research proposal described above and understand that such withdrawal WILL NOT jeopardize any treatment or my relationship with Western Hospital or Victoria University.

Participant's Name (printed) …….

Signature Date

7.3 *Appendix C: Background Questionnaire*

This section asks personal information about you.

1) **Date of birth:** ☐☐☐☐☐☐ 2) **Today's date:** ☐☐☐☐☐☐

3) **For each question, please circle one of the options.**
Highest education level reached:

Completed Primary School

Completed Secondary School **Year 7** **Year 8** **Year 9** **Year 10** **Year 11** **Year 12**

Tertiary Education – please specify _____

4) **Marital Status:**

a) Single ☐ **b) Married** ☐
c) Divorced/Separated ☐ **d) De-Facto** ☐
e) Other ☐ **-please specify _____**

5) **Living Arrangements:**

a) With Parent (s) ☐ **b) With Housemate (s)** ☐
c) With Partner ☐ **d) Alone** ☐
e) Other ☐ **-please specify_____**

6) **Current Employment Status, please circle and specify:**

a) Unemployed

b) Part-time employment for _____ hours per week as _____

c) Full-time employment as _____

d) Student: Secondary Tertiary: Degree/Course:_____

7) In which country were you born?

a) Australia ☐

b) Other ☐ **-please specify**_____

8) Which of the following ethnic groups best describes you?

a) Caucasian (Anglo-Saxon, European) ☐

b) Aboriginal/Torres Strait Islander ☐

b) African (non-Arabic) ☐

c) North African (Middle East region) ☐

d) East Asian (e.g. India, Pakistan, Bangladesh, Sri Lanka) ☐

e) Far East Asian and South East Asian

(e.g. China, Japan, Korea, Philippines, Indonesia) ☐

f) Polynesia ☐

g) Other ☐ **-please specify**

_____

9) What is your order in the family:

a) 1st Born ☐ **b) 2nd born** ☐

c) 3rd Born ☐ **d) 4th born** ☐

e) Other ☐ **-please specify**_____

10) Weight **kg: _____** **or** **pounds: _____**

11) Height **m/cm: _____** **or** **feet/inches: _____**

12) At what age were you diagnosed with Diabetes: _____

13) Current Treatment Regimen:

a) Insulin Pump ☐ **b) Insulin Injections** ☐

14) Frequency of diabetes clinic attendance:

a) Once a week ☐ **b) Once a fortnight** ☐

c) Once a month ☐ **d) Once every two months** ☐

e) Once every six months ☐ **f) Once a year** ☐

g) Less than once a year ☐

15) At what age did you begin managing your insulin medication? _____

16) At what age did you begin managing your diet? _____

17) Have you ever been hospitalised in relation to your diabetes in the last 3 years?

a) Yes ☐

If yes, please specify the reason for your admission_____

b) No ☐

18) Have you ever experienced any complication as a result of your diabetes?

a) Yes ☐

If yes, please specify _____

b) No ☐

7.4 *Appendix D: The Separation-Individuation Process Inventory (S-IPI)*

Please tick the appropriate box. On a rating scale of 10 please rate how **characteristic each statement is of you or of other people in general**. 10 is very characteristic and 1 is not at all characteristic.

		1	2	3	4	5	6	7	8	9	10
1.	When people really care for someone, they often feel worse about themselves.										
2.	When someone gets too emotionally close to another person, they often feel lost.										
3.	When people get really angry at someone, they often feel worthless.										
4.	It is when people start getting emotionally close to someone that they are most likely to get hurt.										
5.	People need to maintain control over others to keep from being harmed.										
6.	I find that people seem to change whenever I get to know them.										
7.	It is easy for me to see both good and bad qualities that I have at the same time.										
8.	I find that people either really like me or they hate me.										
9.	I find that others often treat me as if I am only there to meet their every wish.										
10.	I find that I really vacillate between really liking myself and really disliking myself.										
11.	When I am by myself, I feel that something is missing.										
12.	I need other people around me to not feel empty.										
13.	I sometimes feel that part of me is lost whenever I agree with someone else.										
14.	Like others, whenever I see someone I really respect and to whom I look up, I often feel worse about myself.										
15.	I find it easy to see myself as a distinct individual.										
16.	Whenever I realise how different I am from my parents, I feel very uneasy.										
17.	In my experience, I almost always consult my mother before making an important decision.										
18.	I find it relatively easy to make and keep commitment to other people.										

		1	2	3	4	5	6	7	8	9	10
19.	I find that, when I get emotionally close to someone, I occasionally feel like hurting myself.										
20.	I find that either I really like someone or I can't stand them.										
21.	I often have dreams about falling that make me anxious.										
22.	I find it difficult to form mental pictures of people significant to me.										
23.	I have on more than one occasion seemed to wake up and find myself in a relationship with someone, and not be sure of how or why I am in the relationship.										
24.	I must admit that, when I feel lonely, I often feel like getting intoxicated.										
25.	Whenever I am very angry with someone, I feel worthless.										
26.	If I were to tell my deepest thoughts, I would feel empty.										
27.	In my experience, people always seem to hate me.										
28.	Whenever I realise how similar I am to my parents, I feel very uneasy.										
29.	Often, when I am in a close relationship, I find that my sense of who I am gets lost.										
30.	I find it difficult to see others as having both good and bad qualities at the same time.										
31.	I find that the only way that I can be me is to be different from other people.										
32.	I find that when I get emotionally too close to someone, I sometimes feel that I have lost a part of who I am.										
33.	Whenever I am away from my family, I feel very uneasy.										
34.	Getting physical affection itself seems more important to me than who gives it to me.										
35.	I find it difficult to really know another person well.										
36.	I find that it is important for me to have my mother's approval before making a decision.										

		1	2	3	4	5	6	7	8	9	10
37.	I must admit that when ever I see someone else's faults I feel better.										
38.	I am tempted to try to control other people in order to keep them close to me.										
39.	I must admit that whenever I get emotionally close to someone I sometimes want to hurt them.										

7.5 *Appendix E: The Inventory of Parent and Peer Attachment (IPPA)*

The questions below ask you about **your relationship with your mother**. Please **place a tick in the appropriate box**.

		Almost always or always true	Often true	Sometimes true	Seldom true	Almost never or never true
1.	My mother respects my feelings					
2.	I feel my mother is successful as a parent					
3.	I wish I had a different mother					
4.	My mother accepts me as I am					
5.	I have to rely on myself when I have a problem to solve					
6.	I like to get my mother's point of view on things I'm concerned about					
7.	I feel it's no use letting my feelings show					
8.	My mother senses when I'm upset about something					
9.	Talking over my problems with my mother makes me feel ashamed or foolish					
10.	My mother expects too much of me					
11.	I get upset easily at home					
12.	I get upset a lot more than my mother knows about					
13.	When we discuss things, my mother considers my point of view					
14.	My mother trusts my judgement					
15.	My mother has her own problems, so I don't bother her with mine					
16.	My mother helps me to understand myself better					
17.	I tell my mother about my problems and troubles					
18.	I feel angry with my mother					
19.	I don't get much attention at home					
20.	My mother encourages me to talk about my difficulties					
21.	My mother understands me					

		Almost always or always true	Often true	Sometimes true	Seldom true	Almost never or never true
22.	I don't know whom I can depend on these days					
23.	When I am angry about something, my mother tries to be understanding					
24.	I trust my mother					
25.	My mother doesn't understand what I'm going through these days					
26.	I can count on my mother when I need to get something off my chest					
27.	I feel that no one understands me					
28.	If my mother knows something is bothering me, she asks me about it					

The questions below ask you about **your relationships with your closest friends**.
Please **place a tick in the appropriate box**.

		Almost always or always true	Often true	Sometimes true	Seldom true	Almost never or never true
1.	I like to get friends' point of view on things I'm concerned about					
2.	My friends sense when I'm upset about something					
3.	When we discuss things, my friends consider my point of view					
4.	Talking over my problems with my friends makes me feel ashamed or foolish					
5.	I wish I had different friends					
6.	My friends understand me					
7.	My friends encourage me to talk about my difficulties					
8.	My friends accept me as I am					
9.	I feel the need to be in touch with my friends more often					
10.	My friends don't understand what I'm going through these days					

		Almost always or always true	Often true	Sometimes true	Seldom true	Almost never or never true
11.	I feel alone or apart when I am with my friends					
12.	My friends listen to what I have to say					
13.	I feel my friends are good friends					
14.	My friends are fairly easy to talk to					
15.	When I am angry about something, my friends try to be understanding					
16.	My friends help me to understand myself better					
17.	My friends are concerned about my well-being					
18.	I feel angry with my friends					
19.	I can count on my friends when I need to get something off my chest					
20.	I trust my friends					
21.	My friends respect my feelings					
22.	I get upset a lot more than my friends know about					
23.	It seems as if my friends are irritated with me for no reasons					
24.	I tell my friends about my problems and troubles					
25.	If my friends know something is bothering me. They ask me about it					

7.6 *Appendix F: The Parental Bonding Instrument (PBI)*

This section lists various attitudes and behaviours of parents. **As you remember your Mother in your first 16 years place a tick in the most appropriate box** next to each question.

		Very like	Moderately like	Moderately unlike	Very unlike
1.	Spoke to me with a warm and friendly voice				
2.	Did not help me as much as I needed				
3.	Let me do things I liked doing				
4.	Seemed emotionally cold to me				
5.	Appeared to understand my problems and worries				
6.	Was affectionate to me				
7.	Liked me to make my own decisions				
8.	Did not want me to grow up				
9.	Tried to control everything I did				
10.	Invaded my privacy				
11.	Enjoyed talking things over with me				
12.	Frequently smiled at me				
13.	Tended to baby me				
14.	Did not seem to understand what I needed or wanted				
15.	Let me decide things for myself				
16.	Made me feel I wasn't wanted				
17.	Could make me feel better when I was upset				
18.	Did not talk with me very much				
19.	Tried to make me dependent on her				
20.	Felt I could not look after myself unless she was around				
21.	Gave me as much freedom as I wanted				
22.	Let me go out as often as I wanted				
23.	Was overprotective of me				
24.	Did not praise me				
25.	Let me dress in any way I pleased				

7.7 *Appendix G: Depression Anxiety and Stress Scale (DASS)*

Please read each statement and **circle a number 0, 1, 2, or 3** which indicates **how much the statement applied to you** over the past week. There are **no right or wrong answers** so do not spend too much time on each statement.

The rating scale is as follows:
0 = Did not apply to me at all
1 = Applied to me to some degree, or some of the time
2 = Applied to me to a considerable degree, or a good part of the time
3 = Applied to me very much, or most of the time

		Did not apply to me at all	Applied to me to some degree, or some of the time	Applied to me to a considerable degree, or a good part of the time	Applied to me very much, or most of the time
2.	I was aware of dryness of my mouth	0	1	2	3
3.	I couldn't seem to experience any positive feeling at all	0	1	2	3
4.	I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5.	I just couldn't seem to get going	0	1	2	3
7.	I had a feeling of shakiness (e.g., legs going to give way)	0	1	2	3
9.	I found myself in situations that made me so anxious I was most relieved when they ended	0	1	2	3
10.	I felt that I had nothing to look forward to	0	1	2	3
13.	I felt sad and depressed	0	1	2	3
15.	I had a feeling of faintness	0	1	2	3
16.	I felt that I had lost interest in just about everything	0	1	2	3
17.	I felt I wasn't worth much as a person	0	1	2	3
19.	I perspired noticeably (e.g., hands sweaty) in the absence of high temperatures or physical exertion	0	1	2	3
20.	I felt scared without any good reason	0	1	2	3
21.	I felt that life wasn't worthwhile	0	1	2	3
23.	I had difficulty in swallowing	0	1	2	3

		Did not apply to me at all	Applied to me to some degree, or some of the time	Applied to me to a considerable degree, or a good part of the time	Applied to me very much, or most of the time
24.	I couldn't seem to get any enjoyment out of the things I did	0	1	2	3
25.	I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)	0	1	2	3
26.	I felt down-hearted and blue	0	1	2	3
28.	I felt I was close to panic	0	1	2	3
30.	I feared that I would be "thrown" by some trivial but unfamiliar task	0	1	2	3
31.	I was unable to become enthusiastic about anything	0	1	2	3
34.	I felt I was pretty worthless	0	1	2	3
36.	I felt terrified	0	1	2	3
37.	I could see nothing in the future to be hopeful about	0	1	2	3
38.	I felt that life was meaningless	0	1	2	3
40.	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
41.	I experienced trembling (e.g., in the hands)	0	1	2	3
42.	I found it difficult to work up the initiative to do things	0	1	2	3

7.8 *Appendix H: The Self-Care Inventory Revised (SCI – R)*

The questions below ask about **your diabetes self-care activities** and **how often you have followed recommendations for self-care during the past month**. Please answer the questions as honestly and accurately as you can and **place a tick in the appropriate box**. Your responses will be confidential.

		Never do it	Almost never do it	Sometimes do it	Almost always do it	Always do this as recom-mended, without fail
	How often do you:					
1.	Exercise regularly					
2.	Attend clinic appointments					
3.	Eat recommended food portions					
4.	Adjust insulin					
5.	Keep food records					
6.	Treat low blood glucose					
7.	Carry quick acting sugar for lows					
8.	Read food labels					
9.	Wear medic alert					
10.	Check blood glucose with monitor					
11.	Eat meals/snacks on time					
12.	Take insulin at the right time					
13.	Record blood glucose results					
14.	Check ketones					
15.	Take correct dose of insulin					

7.9 *Appendix I: ATT19 Measure of Psychological Adjustment to Diabetes*

This section contains questions related to how you feel about diabetes and its effect on your life. There are **no right or wrong answers** so do not spend too long on each question. For each question please circle one of the **five possible answers.**

		I disagree com-pletely	**I disagree**	**I don't know**	**I agree**	**I agree com-pletely**
1.	If I did not have diabetes I think I would be quite a different person.	1	2	3	4	5
2.	I dislike being referred to as "a diabetic".	1	2	3	4	5
3.	Diabetes is the worst thing that has happened to me.	1	2	3	4	5
4.	Most people would find it difficult to adjust to having diabetes.	1	2	3	4	5
5.	I often feel embarrassed about having diabetes.	1	2	3	4	5
6.	There is not much I seem to be able to do to control my diabetes.	1	2	3	4	5
7.	There is little hope of leading a normal life with diabetes.	1	2	3	4	5
8.	The proper control of diabetes involves a lot of sacrifice and inconvenience.	1	2	3	4	5
9.	I try not to let people know about my diabetes.	1	2	3	4	5
10.	Being told you have diabetes is like being sentenced to a life time of illness.	1	2	3	4	5
11.	My diabetic diet does not really spoil my life.	1	2	3	4	5
12.	In general, doctors need to be a lot more sympathetic in their treatment of people with diabetes.	1	2	3	4	5
13.	Having diabetes over a long period changes the personality.	1	2	3	4	5
14.	I often find it difficult to decide whether I feel sick or well.	1	2	3	4	5
15.	Diabetes is not really a problem because it can be controlled.	1	2	3	4	5
16.	There is really nothing you can do if you have diabetes.	1	2	3	4	5
17.	There is really no-one I feel I can talk to openly about my diabetes.	1	2	3	4	5
18.	I believe I have adjusted well to having diabetes.	1	2	3	4	5
19.	I often think it is unfair that I should have diabetes when other people are so healthy.	1	2	3	4	5

7.10 ***Appendix J: The Diabetes Family Responsibility Questionnaire (DFRQ)***

In this section we want you to **think back on how diabetes management was handled in your family when you were 16 years old**. Below are different tasks or situations that relate to your diabetes management at **that** time. **Circle one number from the three statements** that best describes the way each task or situation was handled in your family.

1 = Parent(s) took or initiated responsibility for this almost all of the time
2 = Parent(s) and I shared responsibility for this about equally
3 = I took or initiated responsibility for this almost all of the time

		Parent(s)	Parent(s) and Self	Self
	Situation or task:			
1.	Remembering day of clinic appointment	1	2	3
2.	Telling teachers about diabetes	1	2	3
3.	Remembering to take morning or evening injection	1	2	3
4.	Making appointments with dentists and other doctors	1	2	3
5.	Telling relatives about diabetes	1	2	3
6.	Taking more or less insulin according to results of blood sugar or urine tests	1	2	3
7.	Noticing differences in health, such as weight changes or signs of an infection	1	2	3
8.	Telling friends about diabetes	1	2	3
9.	Noticing the early signs of an insulin reaction	1	2	3
10.	Giving insulin injections	1	2	3
11.	Deciding what should be eaten when family has meals out (restaurants, friend's home)	1	2	3
12.	Examining feet and making sure shoes fit properly	1	2	3
13.	Carrying some form of sugar in case of an insulin reaction	1	2	3
14.	Explaining absences from school to teachers or other school personnel	1	2	3
15.	Rotating injection site	1	2	3
16.	Checking expiration dates on medical supplies	1	2	3
17.	Remembering times when blood sugar or urine should be tested	1	2	3

7.11 *Appendix K: Poster advertised for participants with Type 1 diabetes*

Adjustment in Young Women

Professor Sandra Lancaster, Hege Andreassen and Sonal Sachdeva

You are invited to participate in a study being conducted by the above researchers that is investigating factors related to independence and eating habits of young women.

We are looking for young women between 18 and 24 years.

If you have been diagnosed with Type 1 Diabetes before the age of 15 years and don't have any other chronic illnesses, you are eligible to participate in this study

- You will be asked to fill in a questionnaire booklet that it is expected to take no longer than 45 minutes to complete.

If you are interested in taking part in this study please contact:

Hege Andreassen
Mobile: 0405 151 135
Email: hege.andreassen@research.vu.edu.au

Sonal Sachdeva
Mobile: 0423 776 195
Email: sonal.sachdeva@research.vu.edu.au

7.12 *Appendix L: Poster advertised for participants without Type 1 Diabetes*

Adjustment in Young Women

Professor Sandra Lancaster, Hege Andreassen and Sonal Sachdeva

You are invited to participate in a study being conducted by the above researchers that is investigating factors related to independence and eating habits of young women.

We are looking for young women between 18 and 24 years.

You will be asked to fill in a questionnaire booklet that it is expected to take no longer than 40 minutes to complete.

If you are interested in taking part in this study please contact:

Hege Andreassen
Mobile: 0405 151 135
Email: hege.andreassen@live.vu.edu.au

Sonal Sachdeva
Mobile: 0423 776 195
Email: sonal.sachdeva@live.vu.edu.au

7.13 *Appendix M: Results from Hierarchical Regression Analysis for Model 1 (Factors Influencing Separation-Individuation in Young Adult Women) with Transformed variables*

Table 7: *Hierarchical Regression Model 1 (Factors Influencing Separation-Individuation in Young Adult Women) with Transformed Variables*

Predictor	*B*	SE_B	β	R^2 *change*	*F change*[a]
Step 1				.157	9.590***
Perceived Maternal Care	-13.760	4.617	-.320**		
Perceived Maternal Overprotection	.681	.618	.118		
Step 2				.011	1.354
Perceived Maternal Care	-8.456	6.482	-.197		
Perceived Maternal Overprotection	.413	.659	.072		
Current Attachment to Mother	-4.642	3.988	-.186		
Step 3				.243	20.625***
Perceived Maternal Care	-5.886	5.558	-.137		
Perceived Maternal Overprotection	.157	.566	.027		
Current Attachment to Mother	.604	3.488	.024		
Attachment to Peers	-.719	.305	-.212*		
Depressive Symptoms	16.126	2.899	.469***		

Table 7 (continued)

Predictor	*B*	SE_B	B	R^2 *change*	*F change*[a]
Step 4				.003	.478
Perceived Maternal Care	-5.785	5.574	-.134		
Perceived Maternal Overprotection	.034	.595	.006		
Current Attachment to Mother	.377	3.512	.015		
Attachment to Peers	-.763	.312	-.225*		
Depressive Symptoms	16.289	2.916	.474***		
Diagnosis of Type 1 Diabetes	-5.763	8.333	-.057		

Note. $N = 106$. [a] $df_{Step1} = 2, 103$; $df_{Step2} = 1, 102$; $df_{Step3} = 2, 100$; $df_{Step4} = 1, 99$.

Transformed Variables: Perceived Maternal Care; Current Attachment to Mother; Depressive Symptoms.

* $p < .05$; ** $p < .01$; *** $p < .001$.

7.14 *Appendix N: Results from Hierarchical Regression Analysis for Model 2 (Factors Influencing Diabetes Management in Young Adult Women) with Transformed variables*

Table 8: *Hierarchical Regression for Model 2 (Factors Influencing Diabetes Management in Young Adult Women) with Transformed Variables*

Predictor	*B*	SE_B	β	R^2 *change*	*F change*[a]
Step 1				.007	.280
Illness Duration (in years)	-.210	.397	-.083		
Step 2				.000	.003
Illness Duration (in years)	-.215	.410	-.085		
Perception of Past Parental Involvement	-.020	.346	-.010		
Step 3				.202	3.065*
Illness Duration (in years)	-.241	.382	-.096		
Perception of Past Parental Involvement	.081	.329	.038		
Separation-Individuation	.007	.046	.027		
Depressive Symptoms	-1.785	1.854	-.210		
Acceptance of Having Diabetes	.316	.204	.304		

Note. $N = 42$. [a] $df_{Step1} = 1, 40$; $df_{Step2} = 1, 39$; $df_{Step3} = 3, 36$.

Transformed variable: Depressive Symptoms.

* $p < .05$.