Psychosocial outcomes in diabetes
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Chapter 1

Introduction
Diabetes is a serious chronic disease that has evolved into a major public health issue. Treatment of diabetes consists of a combination of diet, exercise, and medication (tablets and/or insulin injections), which is necessary to keep blood glucose levels within a normal range (for more details on diabetes, see Box 1.1). The required self-care behaviors are viewed as burdensome by many patients (Weijman et al., 2005; Woodcock & Kinmonth, 2001). Moreover, a substantial number of patients express a fear of developing diabetes complications (Woodcock & Kinmonth, 2001). As diabetes may have a large impact on one’s life, and can be a burden to patients, it may come as no surprise that adults with diabetes were found to have elevated levels of depressive symptoms compared to adults from the general population (e.g., Pouwer et al., 2003; for meta-analyses see Ali, Stone, Peters, Davies, & Khunti, 2006; Anderson, Freedland, Clouse, & Lustman, 2001). However, a large number of patients do not report elevated levels of depressive symptoms, which may indicate that patients differ in the way they appraise their disease. This will be illustrated by examples of two patients, who will be referred to as John and Mary.

When John received the diagnosis of diabetes he had quite some difficulties accepting this chronic illness. He is quite anxious that he will develop complications in the future, and every day he is occupied with trying to avoid either too low or too high blood sugar levels. Mary was just like John devastated when she received the diagnosis of diabetes. Soon however, she became determined to deal with the diabetes in a positive manner, and to try to maintain good health. Mary engages in adequate self-care behaviors to balance her blood sugar levels, without focusing on her diabetes too much. One can readily see that the way John deals with his diabetes is more likely to evoke high levels of distress than the way Mary is dealing with the diabetes. Paragraph 1.1 will discuss how certain individual characteristics of patients may determine the way patients cope with the disease and the levels of (diabetes-related) distress they experience.

Besides individual characteristics of patients, the support behavior of the partner may greatly influence patients’ levels of distress. A patient whose partner provides support by showing interest in how the patient is coping with the disease is less likely to feel distressed than a patient whose partner is too much involved, for example by constantly reminding the patient to check his or her blood sugar levels. The influence of partner’s support behaviors on patients’ psychosocial outcomes will be discussed in paragraph 1.2.

Earlier it was described how a patient like John, with his negative outlook, may be at risk of experiencing high levels of distress. If John has a partner who supports him in a positive way, and stimulates John to focus on the things he is still able to do, then this may compensate for John’s less adequate coping behavior, and his distress levels may decrease. In contrast, if John’s partner expresses worries by constantly telling John what to do, then John’s own worries may aggravate, thereby further increasing his levels of distress. This combined impact of patients’ individual characteristics and support behavior...
of the partner on patients’ levels of distress will be described in paragraph 1.3.

Diabetes may not only be burdensome for patients themselves, but may also negatively affect the partner of the patient. For example, the partner may feel that the diabetes has a limiting influence on some of the activities they enjoy doing together. Furthermore, just like the patient, the partner may worry whether the patient will develop complications. It is therefore important that not only the partner will provide adequate support to the patient, but it is perhaps of equal importance that the patient adequately supports the partner, for example by actively involving the partner in the self-care regimen the patient needs to adhere to. Paragraph 1.4 will therefore explain the support behaviors of couples dealing with diabetes, so of both patients and partners, and it will be explained how these behaviors may impact relationship functioning in these couples.

A great part of this thesis focuses on the influence the partner may have on patients’ psychosocial outcomes. However, there are other persons in the patient’s social environment besides the partner that may exert an influence on how the patient deals with the disease. Patients may encounter fellow patients who are doing either better or worse than themselves in terms of self-management who may motivate patients to perform just as well or to avoid performing just as inadequately. Paragraph 1.5 will describe how fellow patients may motivate patients with diabetes to manage their disease.

To summarize, the present thesis addresses psychosocial outcomes in patients with diabetes and their partners, by taking both an intrapersonal and an interpersonal perspective. The overall framework of this thesis and the corresponding paragraphs and chapters is presented below.

1.1 Intrapersonal factors: regulatory focus

The burden of self-management and the prospect of complications may increase psychosocial problems in patients with diabetes. Psychosocial problems may also be increased in patients who for example have made the transition from oral medication to insulin injections (Delahanty et al., 2007; Katon et al., 2004; Pouwer et al., 2003), and in patients who already have developed diabetes complications (Katon et al., 2004; Peyrot & Rubin, 1997; Polonsky et al., 1995; Pouwer et al., 2003; Trief, Grant, Elbert, & Weinstock, 1998; Vileikyte et al., 2005). Although disease-related variables may influence psychosocial outcomes, patients’ individual characteristics such as coping strategies and personality traits may be of equal or even greater importance (e.g., Paddison, Alpass, & Stephens, 2008; Pibernik-Okanovic, Begic, Peros, Szabo, & Metelko, 2008; Rose et al., 1998). Previous studies have suggested that psychosocial outcomes in patients may be positively affected by patient’s characteristics such as high levels of self-efficacy (Eiser,
Riazi, Eiser, Hammersley, & Tooke, 2001; Senecal, Nouwen, & White, 2000; Van Der Ven et al., 2003), having optimistic beliefs (Fournier, De Ridder, & Bensing, 2002), and having an active coping style (Rose, Fliege, Hildebrandt, Schirop, & Klapp, 2002).

A characteristic that has been mostly overlooked thus far in the context of a chronic illness, but which may be very relevant for psychosocial adaptation is called regulatory focus (Higgins, 1998; Higgins, 1997; Lockwood, Jordan, & Kunda, 2002). It is a characteristic that may influence the way patients appraise their disease outcomes and that may determine which strategies and behaviors patients engage in to manage their disease. According to regulatory focus theory there are two distinct self-regulatory systems: self-regulation with a promotion focus and self-regulation with a prevention focus. Individuals with a strong promotion focus are striving to achieve an ideal self and are oriented towards obtaining positive outcomes. Individuals with a strong prevention focus are striving to achieve an ought self, that is, how they think they should be as a person, and these individuals are oriented towards avoiding negative outcomes. Since regulatory focus determines how individuals appraise their environment, and the type of goals they pursue, it can be viewed as a basic individual characteristic.

Regulatory focus is believed to be a stable trait-like characteristic that develops early on in childhood during interactions with caretakers (Higgins & Silberman, 1998). Empirical support is provided by studies that found regulatory focus to be related to
parenting styles (Keller, 2008; Manian, Papadakis, Strauman, & Essex, 2006). For example, individuals’ prevention focus was associated with perceiving parents’ behavior during childhood as critical and punitive, while individuals’ promotion focus was associated with perceiving parents’ behavior as responsive and encouraging (Keller, 2008). It may seem that persons either have a strong promotion focus or a strong prevention focus. However, it is also possible that promotion and prevention focus are both strongly or both weakly developed. The theoretical notion that all combinations of promotion and prevention focus are possible is supported by the weak or non-significant correlations that previous studies found between these two self-regulatory orientations (e.g., Coolsen, 2004; Keller & Bless, 2006; Keller, 2008; Lockwood et al., 2002; Oyserman, Uskul, Yoder, Nesse, & Williams, 2007; Sullivan, Worth, Baldwin, & Rothman, 2006).

Previous research on regulatory focus has mainly been conducted within the field of experimental social or applied health psychology. The majority of these studies examined the regulatory fit hypothesis (e.g., Higgins, 2000; Keller & Bless, 2006; Mann, Sherman, & Updegraff, 2004; Shah, Higgins, & Friedman, 1998; Spiegel, Grant-Pillow, & Higgins, 2004), which states that individuals’ performance and motivation is enhanced when a task or message is framed in terms that are congruent with individuals’ regulatory focus. For example, it was demonstrated that students with a relatively strong promotion focus performed better on a task when it was framed in terms that were congruent with their promotion focus (e.g., ‘there are no point deductions for wrong answers’ and ‘try and solve as many items as possible’). In contrast, students with a relatively strong prevention focus performed better on a task when it was framed in terms that fitted their prevention focus (‘one point will be deducted for every wrong answer’ and ‘try and avoid errors’; Keller & Bless, 2006). It can be concluded from these studies that there is no a priori advantage of either promotion or prevention focus on motivation and performance. Instead, it is the fit between a person’s regulatory focus and the situational context that determines whether motivation and performance is enhanced.

Only little is known about regulatory focus in relation to psychological outcomes such as distress. Whereas both promotion and prevention focus may have beneficial effects on outcomes such as motivation and performance, depending on the fit of one’s focus with the situation at hand, it can be expected that this will not hold with regard to outcomes such as well-being and distress. Based on literature on approach and avoidance goals (cf. promotion and prevention focus) it can be expected that unlike promotion focus, prevention focus will lead to a range of maladaptive perceptual, attentional, and mental control processes (for an overview of research on approach and avoidance goals, see Elliot & Friedman, 2007). Individuals with a strong prevention focus can be expected to have a heightened sensitivity to negative information (Higgins & Tykocinski, 1992). Furthermore, they may be biased towards negative information, a so-called ‘hypothesis test’ for the presence of negative information (Wegner, 1994). For example, if your prevention goal
is to ‘avoid high blood sugar levels’, it is likely that you are constantly occupied whether high blood sugar levels are present at that moment. Together, these processes may lead to an increase of negative feelings, and heighten one’s level of distress. In line with this reasoning, there are a few studies of samples of healthy individuals suggesting that overall, a strong promotion focus is more adaptive in terms of psychological outcomes than a weak promotion focus (Coolsen, 2004; Miller & Markman, 2007), while a weak prevention focus is more adaptive than a strong prevention focus (Coolsen, 2004; Eiser, Eiser, & Greco, 2004; Miller & Markman, 2007). Furthermore, one study of women with breast cancer showed that although overall, distress levels were not related to promotion focus, they were positively related to prevention focus (Frieswijk & Hagedoorn, 2009).

To date, it is unknown how a basic characteristic like regulatory focus is associated with distress in adults dealing with a chronic illness such as diabetes. Diabetes is an illness that requires an intensive self-management regimen, in which patients’ self-regulatory orientations (i.e., promotion and prevention focus) may prove to be highly salient. Although a long-term goal for patients with diabetes may be to try to prevent the development of complications, which is a prevention goal, they may also formulate the goal of trying to stay or become healthy, which is a promotion goal. These different regulatory goals may prove to have different associations with patients’ level of distress. In chapter 2 of this thesis, these associations in patients will be examined.

1.2 Interpersonal factors: support behavior of the partner

In addition to patient characteristics, interactions with the family and in particular those with the partner may be associated with patients’ psychosocial outcomes (e.g., Fisher et al., 2004; Hagedoorn et al., 2006; Wearden, Tarrier, & Davies, 2000). There are several explanations for the important role of the partner. First of all, most of the self-management behavior takes place within the family or home (see also Fisher et al., 2000). Secondly, the support provided by patient’s intimate partner may not be compensated for by other sources of support (Coyne & DeLongis, 1986).

In research on social or spousal support, often a distinction is made between different types of support such as emotional and instrumental support (House, 1981). However, these types of support can be provided in different ways. For example, emotional support can be provided by openly discussing patients’ feelings about the illness, by letting the patient believe everything is fine, or by asking how the patient feels every time he or she exerts himself or herself. Instrumental support can be provided by bringing the patient his or her insulin pen after consulting with the patient, or the partner may bring the patient’s pen without discussing this with the patient beforehand. This thesis examines three different ways of providing support: Active engagement, Protective Buffering,
and Overprotection (ABO; Buunk, Berkhuysen, Sanderman, & Nieuwland, 1996). Active engagement means that the partner asks how the patient feels, and this support behavior is further characterized by using constructive problem-solving methods, like openly discussing the illness with the patient. Protective buffering is characterized by hiding your concerns from the patient, and trying to prevent the patient from thinking about the illness. Finally, overprotection involves providing unnecessary help, and giving excessive praise for accomplishments. Although previous studies have not been entirely consistent (Buunk et al., 1996; Coyne & Smith, 1994; Coyne & Smith, 1991; De Ridder, Schreurs, & Kuijer, 2005; Hagedoorn et al., 2000; Hinnen, Hagedoorn, Ranchor, & Sanderman, 2007; Joekes, Maes, & Warrens, 2007; Kuijer et al., 2000; Langer, Brown, & Syrjala, 2009; Manne et al., 2007), in general, active engagement can be viewed as adequate support behavior that is associated with positive psychosocial outcomes in patients, whereas protective buffering and overprotection can be perceived as less adequate support behaviors which seem to have negative effects on patients’ psychosocial outcomes.

Most studies that used the Active engagement, Protective Buffering, and Overprotection (ABO) questionnaire concern patients with heart disease or cancer (e.g., Berkhuysen, Nieuwland, Buunk, Sanderman, & Rispens, 1999; Buunk et al., 1996; Coyne & Smith, 1991; 1994; Hagedoorn et al., 2000; Hinnen et al., 2007; Joekes, Van Elderen, & Schreurs, 2007; Kuijer et al., 2000; with the exception of De Ridder et al., 2005; Hagedoorn et al., 2006). This thesis examines the role of active engagement, protective buffering, and overprotection in the context of diabetes, a disease that is partly controllable by the patient.

Chapter 3 specifically focuses on overprotection by the partner, and examines how this behavior is associated with distress in patients. Overprotection is a behavior that may especially occur within the context of diabetes. Patients with this disease need to engage in several self-care behaviors and partners of patients may worry whether the patient is capable of doing so. Consequently, partners may overprotect their partners by expressing these worries to patients and by taking over several activities from the patient. Partners’ overprotective behavior is probably well-intended but is expected to have a negative impact on patients’ level of diabetes-related distress. Besides examining the association between overprotection by the partner and patient’s diabetes-related distress, the aim of chapter 3 is to gain insight in the underlying mechanism in this association.

Previous research has identified coping behavior as a mediator in the association between support and distress (e.g., Holahan, Moos, Holahan, & Brennan, 1997; Karlse, Idsoe, Hanestad, Murberg, & Bru, 2004; Manne & Zautra, 1989; Manne, Ostroff, Winkel, Grana, & Fox, 2005; for an overview see Schreurs & De Ridder, 1997). Based on social learning theory it can be predicted that self-efficacy determines whether an individual adopts adaptive coping behaviors (Bandura, 1977; Bandura, 1982). Several studies supported this prediction by demonstrating that self-efficacy can indeed be viewed as a coping resource (Jensen, Turner, & Romano, 1991; Schwarzer, Boehmer, Luszczynska,
Mohamed, & Knoll, 2005; Terry, 1994). Therefore, in chapter 3 of this thesis, self-efficacy is proposed as an important mediator in the association between overprotection and distress.

1.3 Combined impact of intra- and interpersonal factors

Although patients’ individual characteristics as well as partner support may separately affect patients’ level of distress, it is also conceivable that they conjointly affect distress levels. However, this possibility has received little attention thus far. A few studies of other chronic diseases did point out that low levels of positive support or high levels of negative support in combination with a vulnerable coping style or personality trait may lead to negative psychosocial outcomes (e.g., Danoff-Burg, Revenson, Trudeau, & Paget, 2004; Devine, Parker, Fouladi, & Cohen, 2003; Jacobsen et al., 2002). Especially within the context of diabetes, the interplay between inter- and intrapersonal factors is an unexplored area.

In chapter 2, the combined effect of regulatory focus and partner support will be examined. More specifically, it will be investigated whether patients with either a weak promotion focus or a strong prevention focus report high levels of distress, especially when they receive low levels of positive support (i.e., active engagement) or high levels of negative support (i.e., protective buffering and overprotection).

In chapter 3 it is proposed that patients whose partners are relatively overprotective will experience more diabetes-related distress through diabetes-specific self-efficacy. This indirect link between overprotection and diabetes-related distress is expected to apply most strongly to patients with poor glycemic control. Overprotection may transfer the message to the patient that the partner has little confidence in the patient’s abilities. When patients have poor glycemic control this may lead them to believe that the partner is right in having little confidence in their abilities with regard to diabetes management, thus increasing patients’ levels of distress to a higher extent. In contrast, if patients have good glycemic control, this may point out to patients that they are capable of managing their disease. In this case, overprotective behaviors from their partner will have a less strong impact on their levels of distress. Furthermore, the indirect link between overprotection and diabetes-related distress is expected to apply more strongly to female than to male patients, since some studies have shown that women are more strongly influenced by partner behavior and characteristics than are men (e.g., Acitelli & Antonucci, 1994; Hagedoorn et al., 2000; Hagedoorn et al., 2001; Mcrae & Brody, 1989). The role of gender will also be explored in the other chapters concerning partner support.
Chapter 1

1.4 Interpersonal factors: support behavior of both patients and partners

A chronic illness such as diabetes will not only affect the patient, but also the partner of the patient, and their intimate relationship (for overviews see Berg & Upchurch, 2007; Burman & Margolin, 1992; Thompson & Pitts, 1992). In order to maintain a satisfactory relationship patients and partners need to engage in certain support behaviors or relationship-focused coping strategies, that is, ways to cope with the illness and each others’ emotional responses. To date, an increasing number of studies have demonstrated significant associations between partner or family support behavior and patients’ psychosocial outcomes (e.g., Chesla et al., 2003; Fisher et al., 2000; Fisher et al., 2004; Hagedoorn et al., 2006; Trief et al., 2003; Trief, Ploutz-Snyder, Britton, & Weinstock, 2004). However, less is known about whether patients’ support behaviors are associated with partners’ psychosocial outcomes such as relationship satisfaction. Chapter 4 fills this gap by examining received support behaviors and how these behaviors are associated with relationship satisfaction in both patients and partners. More specifically, this chapter focuses on patients’ and partners’ received active engagement and protective buffering, since these behaviors can be enacted by both patients and partners. That is, both patients and partners may for example express interest in how the other is coping with the illness (active engagement), or may try to distract the other from thinking about the illness (protective buffering). To conclude, the first aim of chapter 4 will be to examine associations between support behaviors (i.e., received active engagement and protective buffering) and relationship satisfaction in both patients and partners. Moreover, this will be done by using a dyadic data analytic approach (Kenny, Kashy, & Cook, 2006). A strength of this approach is that it takes into account the interdependence between patients and partners.

A second aim of chapter 4 is to examine the interactive effects of received active engagement and protective buffering on patients’ and partners’ relationship satisfaction. It is possible that a person receives both active engagement and protective buffering to a certain extent throughout a period of time. At one moment, a person may show active engagement, while at another moment the same person may show protective buffering. Another possibility is that a person shows active engagement with regard to some illness aspects, and protective buffering with regard to other aspects.

Negative support behaviors of the partner, such as protective buffering, may be interpreted as less negative if at other times or with respect to other issues, the partner acts supportively (cf. Hagedoorn et al., 2009). For example, imagine that John, a person with diabetes comes home from work, rather upset because he had an important meeting today, but his blood sugar levels were too low and he had trouble keeping focus. John’s partner reacts rather indifferently when he tells her about his day, as she believes that there
are worse things that could happen. John is not pleased with this reaction. However, John may be less offended by his partner’s reaction when his partner showed more interest the other day when the two of them talked openly about his diabetes. In this case, John may believe that his partner’s reaction of today has to do with the fact that she had a rough day herself for example. If however John believes that his partner’s reaction is typical of how she normally reacts, than he interprets her behavior more negatively which may lead John to evaluate his whole relationship negatively. Indeed, it has been shown that negative interpretations of certain support behaviors are associated with less relationship satisfaction (e.g., Fincham & Bradbury, 1992). It is therefore expected that the protective buffering one receives will have a less negative effect on relationship satisfaction, when at the same time one receives high instead of low levels of active engagement.

A number of previous studies found support for an interactive effect of positive and negative support on psychological outcomes (Kleiboer et al., 2007; Manne et al., 2003; Revenson, Schiaffino, Majerovitz, & Gibofsky, 1991; Sherman, 2003). These studies focused on the patient as the person of interest and not on the partner (with the exception of Kleiboer et al., 2007). Our study will be the first to test the interactive effects of positive and negative support (i.e., active engagement and protective buffering) on relationship satisfaction in both patients with diabetes and their partners, using a dyadic data analytic approach.

1.5 Influence of fellow patients

The current thesis focuses on the influence of the intimate partner on patients, but will also examine the influence fellow patients may exert on patients. Persons with diabetes may know of other patients in their family or work environment, or they encounter other patients when visiting the hospital for their check-up. Furthermore, patients may read or hear about other patients with diabetes in magazines, newspapers, on television programs, or on the internet. In chapter 5, the aim is to examine the impact of such a fellow patient on patients’ motivation to manage the disease.

The process of comparing oneself with others is referred to as social comparison (Festinger, 1954), and was originally thought to be driven by a desire for self-evaluation, that is, the motivation to establish that one’s opinions are correct, and to correctly estimate one’s capabilities. Later on, research acknowledged that people may engage in social comparisons for various other reasons, for example to feel better about oneself (Tennen, McKee, & Affleck, 2000; Wills, 1981) or to improve oneself (Aspinwall, 1997; Collins, 2000). It is argued (Wills, 1981) that individuals who encounter situations that produce a decrease in their well-being will compare downward in order to repair their well-being. Seeing others
who are doing worse, for example in terms of disease outcomes, may lead individuals to feel better about themselves and their own outcomes. It has been demonstrated that downward comparisons are quite prevalent in patients with a chronic illness (Gorawara-Bhat, Huang, & Chin, 2008; Wood, Taylor, & Lichtman, 1985; for a review see Tennen et al., 2000). Several studies have shown that downward comparisons are indeed positively associated with patients’ well-being and adjustment (e.g., Helgeson & Taylor, 1993; Van der Zee et al., 1996; for a review see Tennen et al., 2000). However, downward comparison targets may also represent a feared future (Markus & Nurius, 1986) and as such evoke distress in patients (e.g., Ybema & Buunk, 1995).

Individuals may compare themselves with better-off others (upward comparison) when they have an interest in improving themselves (e.g., Taylor & Lobel, 1989). This notion has been supported by studies that found that students who compared themselves with other students who were doing better than themselves in school or college, showed enhanced performance at a later time point in terms of higher grades (Blanton, Buunk, Gibbons, & Kuyper, 1999; Gibbons, Blanton, Gerrard, Buunk, & Eggleston, 2000; Huguet, Dumas, Monteil, & Genestoux, 2001). Another study showed that students were most motivated to work on their career when they were confronted with a recent graduate who was successful instead of unsuccessful in the job market (Buunk, Peiro, & Griffioen, 2007).

The majority of the studies on the influence of (upward) social comparisons on motivation have been conducted in the context of academic performance. In contrast, although several studies of patients with a chronic illness investigated the impact of social comparisons on affect and well-being, less is known about the impact on patients’ motivation to manage the disease. This is an important research question, especially in a sample of patients with diabetes, since a number of aspects of this illness are controllable with adequate self-care behaviors. Motivated patients are more likely to carry out such behaviors (e.g., Courneya & Friedenreich, 1999) and motivation is therefore a relevant outcome. The impact of social comparison information (upward and downward) on patients’ motivation to work on their diabetes regulation will be investigated in chapter 5.

Furthermore, the role of patients’ regulatory focus will be examined. As described earlier, chapter 2 will address the combined impact of regulatory focus and partner support on patients’ level of distress. In chapter 5, the combined impact of regulatory focus and social comparison information on patients’ motivation will be investigated. More specifically, the regulatory fit hypothesis that was mentioned previously will be tested. This hypothesis states that a task or message that is framed in terms that are congruent with one’s regulatory focus, is most likely to enhance motivation and performance (for an overview see Higgins, 2000). In a similar manner, it can be expected that social comparison information that fits one’s regulatory focus will most likely boost one’s motivation. In fact, this has already been demonstrated in studies of students and healthy older individuals showing that both upward and downward comparison information may
motivate individuals, e.g. to study harder, depending on individuals’ regulatory focus (e.g., Lockwood, Marshall, & Sadler, 2005; Lockwood et al., 2002; for an overview see Lockwood & Pinkus, 2008). It was found that promotion-focused individuals are motivated by upward social comparison information, while prevention-focused individuals are motivated by downward social comparison information. These findings demonstrate that under some circumstances, downward social comparisons can have a motivating effect, as much as upward social comparisons.

However, it is not yet known whether a fit between social comparison information and regulatory focus will lead to enhanced motivation in individuals dealing with a chronic disease, such as patients with diabetes. This is the first aim that will be addressed in chapter 5. Another aim of chapter 5 is to examine whether the interactive effect of social comparison information will be further qualified by patient’s self-efficacy. Previous studies have identified the positive role of control and attainability (Aspinwall, 1997; Lockwood & Kunda, 1997; Major, Testa, & Blymsa, 1991) when examining the effects of social comparison information. Individuals, who encounter other individuals doing either better or worse than them, will show more persistence and motivation to obtain a similar positive future, or avoid a similar negative future, when they have confidence in their own abilities to do so. In chapter 5 it is therefore proposed that patients will be motivated by social comparison targets that match with their regulatory focus, and that this will apply even more strongly for patients who feel self-efficacious in managing their diabetes.

Overview
To conclude, the different chapters focus on intrapersonal and interpersonal factors when studying psychosocial outcomes in diabetes. The outline of the thesis can be summarized as follows:
Chapter 2 addresses both intra- and interpersonal factors by examining whether the association between regulatory focus (intrapersonal) and general distress in patients is moderated by partner support (interpersonal).
Chapter 3 addresses both intra- and interpersonal factors by examining the indirect link between overprotection by the partner (interpersonal) and diabetes-related distress in patients and by examining whether this indirect link is moderated by intrapersonal factors, that is, gender and glycemic control.
Chapter 4 specifically focuses on interpersonal factors by examining the interactive effects of active engagement and protective buffering on relationship satisfaction in both patients and partners.
Chapter 5 focuses on both intra- and interpersonal factors by investigating whether the impact of social comparison information (interpersonal) on patient’s motivation depends on regulatory focus and self-efficacy (intrapersonal).
Chapter 1

Box 1.1 Diabetes and its treatment

Diabetes is a chronic disease affecting 220 million people worldwide (WHO, 2009) with a rising prevalence. As for the Netherlands, data from The National Institute for Public Health and the Environment (RIVM) indicate the number of known cases with diabetes in the Netherlands around 740,000 (RIVM, 2009). Furthermore, it is estimated that there are around 250,000 people with diabetes who have not yet been diagnosed as such. These numbers add up to a total of 1 million people with diabetes in the Netherlands. Diabetes does not only negatively affect the patient, but may also carry societal costs. In 2003, the costs associated with diabetes health care in the Netherlands were estimated around 735 million euro. Furthermore, the lower work force participation and the higher percentage of disability of people with diabetes compared to healthy people may lead to additional costs (RIVM, 2007).

There are two main types of diabetes: type 1 and type 2. Both types reflect an endocrine disorder that occurs when the pancreas does not produce insulin anymore (type 1) or alternatively, when a disturbed secretion and / or decreased sensitivity is present, and the body does not respond adequately to the insulin it produces (type 2). Insulin is a hormone that enables cells to absorb glucose in order to turn it into energy needed to function. In both type 1 and type 2 diabetes, glucose is not (adequately) converted into energy, leading to elevated blood glucose levels (hyperglycemia). Type 1 diabetes is usually contracted at an early age, in childhood or adolescence. Although it is not fully understood what causes type 1 diabetes, it is believed to be of immunological origin. Type 2 is much more prevalent than type 1 diabetes (around 90% of all diabetes patients have type 2 diabetes), and is usually contracted later on in adulthood, although due to lifestyle, the number of patients that develop type 2 diabetes at an earlier age is growing. Type 2 diabetes is often caused by a combination of hereditary factors, obesity and a lack of exercise. It has a more gradual onset than type 1 diabetes, and therefore, type 2 diabetes may remain undiagnosed for years.

In both type 1 and type 2 diabetes, the treatment goal is to keep blood glucose levels within a normal range. The percentage of glycosylated hemoglobin, HbA1c, is used as a measure of glycemic control and reflects the average blood glucose levels of the preceding 6 to 8 weeks. The aim for diabetes patients is to obtain HbA1c values that resemble the values of healthy people as closely as possible (reference values for healthy people: 4-6%). Prolonged elevated blood glucose levels increase patients’ risk of developing microvascular and macrovascular complications (Diabetes Control and Complications Trial Research Group, 1993; Lawson, Gerstein, Tsui, & Zinman, 1999; UK Prospective Diabetes Study Group, 1998; 2000). Microvascular complications include retinopathy (eye disease, which may eventually lead to blindness), nephropathy (kidney disease) and neuropathy (nerve disease, which in the long term can lead to amputation of extremities). Macrovascular
complications include cardiovascular disease and stroke.

To prevent these complications patients with diabetes need to keep their blood glucose levels within a normal range by performing several self-care behaviors. Patients need to follow a daily routine of taking medication, injecting insulin, self-testing blood glucose levels multiple times per day, and adhering to a specific diet and exercise. The difficulty is that patients cannot take a vacation from their diabetes; they need to perform these self-care behaviors every day. Another complicating factor is that patients need to keep a balance in these behaviors, since they may work in opposite directions. For example, activity and insulin will lower blood glucose levels, whereas certain foods and stress may elevate blood glucose levels. Patients need to find out for themselves how much activity is needed, and which foods they can take, in response to the insulin dosage they injected.
Chapter 1

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