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Chapter 6

General discussion
This thesis examined whether psychosocial outcomes in patients with diabetes (and their partners) could be explained by the interplay of intrapersonal factors (e.g., regulatory focus and self-efficacy) and interpersonal factors (i.e., partner support and social comparison information). Four overall conclusions can be drawn from the results of this thesis. A first conclusion is that patients who receive inadequate support from their partner perceive more (diabetes-related) distress, especially when patients possess individual characteristics that make them vulnerable to experience distress, such as a weak promotion focus or a poor glycemic control. A second conclusion is that the negative effects of protective buffering on relationship satisfaction may be compensated for by high levels of active engagement, in both patients and partners. A third conclusion is that we did not find consistent gender differences with regard to associations between support behavior and psychosocial outcomes. Finally, a fourth conclusion is that social comparison information is most likely to boost patients’ motivation when this information is congruent with patients’ regulatory focus. Patients who are oriented towards obtaining positive outcomes are most motivated by information on a fellow patient with a very good diabetes self-management. In contrast, patients who are oriented towards avoiding negative outcomes are most motivated by information on a fellow patient doing poorly in terms of diabetes management. For each conclusion, the most important findings will be discussed, theoretical and clinical implications will be addressed, and directions for future research will be described.

CONCLUSION 1
“Patients with vulnerable individual characteristics and patients with poor disease outcomes may be at risk of experiencing high levels of distress, especially when their partner provides inadequate support”

Main effects of regulatory focus and partner support
We proposed regulatory focus as an individual characteristic that might be important for psychosocial outcomes in patients with a chronic illness such as diabetes. Regulatory focus is a characteristic that determines to what extent individuals are occupied with obtaining positive outcomes (promotion focus) and to what extent they are occupied with avoiding negative outcomes (prevention focus). An orientation towards avoiding negative outcomes implies that one is constantly on the lookout whether these negative outcomes are present (Wegner, 1994) and a strong prevention focus may therefore evoke high levels of distress. A promotion focus on the other hand, was expected to be associated with less distress. To the best of our knowledge, our study is the first that examined associations between regulatory focus and distress in a sample of patients with a chronic illness requiring self-management behaviors. In chapter 2, we showed that promotion focus was not related to distress, and that there was a weak positive association between prevention
focus and distress\(^1\). These findings for promotion focus are not entirely in line with a study of students that demonstrated a moderate negative association between promotion focus and distress (Miller & Markman, 2007), but they are in line with a study of breast cancer patients that also reported a nonsignificant association (Frieswijk & Hagedoorn, 2009). Although no causal conclusions can be drawn, the results suggest that overall, a promotion focus does not alleviate levels of distress, but having a strong prevention focus might be detrimental in terms of higher levels of (diabetes-related) distress.

We further proposed support behavior of the intimate partner as an important factor with regard to patients’ psychosocial outcomes. Only a limited number of previous studies have examined associations between partner support and diabetes patients’ psychosocial outcomes. Partners are involved in many of the self-care behaviors the patient needs to perform (Fisher et al., 2000). Furthermore, the support that is provided by the patient’s partner may not be easily compensated for by other sources of support (Coyne & DeLongis, 1986). It is thus important to study support by the partner and its association with patient’s psychological outcomes. In chapter 2, we found a weak negative association between active engagement and general distress, indicating that patients experience less distress when they feel that their partner is actively involving them in discussions, and showing interest in their well-being than when their partner shows less of these behaviors. Protective buffering and overprotection both showed weak positive associations with general distress. These findings suggest that as partners deny their worries and pretend everything is fine, patients experience higher levels of distress. Also, patients may experience higher levels of distress when their partner is overprotecting them, for example by telling the patient what to eat and when to monitor blood sugar levels. Furthermore, in chapter 3 we specifically focused on overprotection, and although partner’s overprotective behavior as perceived by the patient was not significantly associated with diabetes-related distress, we did find that partner’s overprotective behavior, as perceived by the partner, was weakly positively associated with diabetes-related distress. Thus, if a partner overprotects the patient and worries whether the patient is able to engage in the necessary behaviors, this may increase patient’s own worries and emotional problems concerning the diabetes. The previously mentioned associations are in line with previous studies that used the Active Engagement, Protective Buffering, and Overprotection (ABO) questionnaire and support the notion that active engagement can be considered as an adequate support style, whereas protective buffering and overprotection seem to be less adequate support styles\(^2\).

In conclusion, we did find several main effects of regulatory focus (an intrapersonal factor) and partner support (an interpersonal factor) on patients’ levels of distress, but these main effects were not very strong. This raises the question whether the combination of these intra- and interpersonal factors is of greater importance than the separate effects.
when explaining patients’ level of distress. In the next section I will discuss the combined impact of intra- and interpersonal factors, that is, the moderating effects we found.

**Moderating effects**

In chapter 2 we investigated whether the association between regulatory focus (i.e. promotion and prevention focus) and distress was moderated by partner support. It was shown that although overall, having a weak promotion focus does not seem to be problematic, it may increase patient’s distress if at the same time the patient receives either low levels of positive support (active engagement) or high levels of negative support (protective buffering and overprotection). Put differently, the findings indicate that patients with a relatively weak promotion focus may benefit more from adequate partner support behaviors that stimulate promotion-oriented strategies and cognitions in patients. At the same time, these patients may be harmed more by inadequate partner support behaviors that induce a prevention-oriented mind set in patients.

In chapter 3, we examined whether the indirect link between overprotection by the partner and diabetes-related distress through diabetes-specific self-efficacy was moderated by patients’ level of glycemic control. It was found that this link was strongest when levels of glycemic control were high instead of low. Patients with relatively poor glycemic control and whose partners were relatively overprotective reported the highest levels of diabetes-related distress.

As briefly mentioned in the previous section, in chapter 3 we found that overprotection was associated with diabetes-related distress through diabetes-specific self-efficacy, that is, the confidence patients have in their ability to manage the disease. Thus, we not only identified a moderator effect of glycemic control in this association, but also a mediator effect of self-efficacy (see also Figure 3.1 in chapter 3). Although overprotection by the partner and the possible impact on patients’ psychosocial outcomes has been studied previously, no study has yet examined through which underlying mechanism overprotection may exert its’ negative effects. It has been previously shown that partners may overprotect the patient because they have little confidence in the patient’s ability to adequately deal with the disease (Kuijer et al., 2000). Our findings suggest that overprotective behavior, although perhaps well-intended, indeed confers the message to the patient that the partner has little confidence in the patient’s abilities. As a consequence, patients themselves experience less confidence in their own ability to manage the disease, which in turn leads to more diabetes-related distress.

In sum, the results of chapter 2 and 3 show that inadequate partner support and vulnerability in terms of individual or disease characteristics are only weakly (to moderately) associated with distress. Importantly, the findings are in line with the notion that especially the combination of these factors is harmful.
Chapter 6

Theoretical and clinical implications

The findings in chapter 2 and 3 are in line with the stress-buffering and stress-exacerbation hypotheses. The stress-buffering hypothesis (Cohen & Wills, 1985) entails that high levels of positive support buffer the negative impact of a stressor on psychosocial outcomes. The stress-exacerbation hypothesis (Rook, 1998) entails that high levels of negative support exacerbate the negative impact of a stressor on psychosocial outcomes. Several studies found support for these hypotheses. For example, the association between job stress and distress was only present when levels of positive social support were low, thus demonstrating a buffering effect of support (Larocco, House, & French, 1980). Support for a stress-exacerbation effect was found in a study that indicated that negative support may exacerbate the negative effect of life events on psychological outcomes (Ingersoll-Dayton, Morgan, & Antonucci, 1997). Another study showed that the association between caregiving demand and distress was stronger when negative support was high (Rauktis, Koeske, & Tereshko, 1995). A final example is a study of breast cancer patients (Koopman, Hermanson, Diamond, Angell, & Spiegel, 1998) that demonstrated a positive association between life stress and mood disturbance, but only when levels of negative support were high. Furthermore, life stress was positively associated with mood disturbance, only when patients reported having just a few persons in their social network instead of many. This study thus demonstrated both a buffering and an exacerbating effect of support or network ties.

Studies demonstrating a stress-buffering or stress-exacerbating effect often focus on how support may buffer or exacerbate the effects of stressors, such as life events, or job stress. A number of studies suggested that the buffering effect of positive support and the exacerbating effect of negative support may also occur with regard to vulnerable traits (Danoff-Burg, Revenson, Trudeau, & Paget, 2004; Devine, Parker, Fouladi, & Cohen, 2003; Jacobsen et al., 2002) and our findings are in line with these studies. The findings in chapter 2 indicated that the negative association between promotion focus and distress is buffered by high levels of engagement, and exacerbated by high levels of protective buffering or overprotection. Furthermore, in chapter 3, results were indicative of an exacerbating effect of overprotection. We demonstrated that the indirect link between overprotection and diabetes-related distress was stronger in patients with poor glycemic control. Patients with poor glycemic control and highly overprotective partners appeared to be worst off in terms of high levels of distress.

The findings of chapter 2 and 3 may have important clinical implications. When trying to lower patients’ (diabetes-related) distress, interventions could either target intrapersonal factors (i.e., regulatory focus and self-efficacy) or interpersonal factors (i.e., partner support). To date, most intervention studies that were successful in improving psychosocial outcomes included some form of cognitive behavioral therapy (for reviews see Ismail, Winkley, & Rabe-Hesketh, 2004; Steed, Cooke, & Newman, 2003). The
successfulness of these interventions might be enhanced if they would also target the cognitions attached to a strong prevention focus or a weak promotion focus. For example, patients may be challenged to reformulate some of their diabetes management goals. Patients who are focused on avoiding diabetes complications may adopt a somewhat different focus, by trying to keep their blood glucose levels within a normal range, and trying to maintain in good health.

At first sight it may seem difficult to influence regulatory focus, since it is considered to be a stable trait-like characteristic. However, studies have shown that a promotion or prevention focus can also be situationally induced, for example through a word-categorization task that includes words related either to promotion or to prevention (Lockwood, Jordan, & Kunda, 2002) or by letting individuals describe personal experiences that are related to promotion or prevention focus (Higgins, Roney, Crowe, & Hymes, 1994). It is not yet known whether these inducements of either prevention or promotion focus will have a long-lasting impact. On the other hand, the assumption that regulatory focus is a stable trait-like individual characteristic has also not yet been investigated.

In our study, patients’ and partners’ regulatory focus was assessed four times over a period of more than a year. Based on the correlations and mean scores that we found for promotion and prevention focus over time³, we conclude that regulatory focus does show a moderate stability over time. However, the correlations are not extremely high, which indicates that one’s regulatory focus may also be somewhat malleable.

Correlations of diabetes-specific self-efficacy over time appeared to be somewhat higher (.76 - .82) than those of regulatory focus. Even though self-efficacy appears to be rather stable, perhaps even more stable than regulatory focus, interventions targeting patient education, patient empowerment, self-monitoring of physical activity, cognitive behavioral group training or social learning variables did appear to be successful at enhancing patients’ self-efficacy (Glasgow, Toobert, Hampson, & Strycker, 2002; Gleeson-Kreig, 2006; Howorka et al., 2000; Piette, Weinberger, & Mcphee, 2000; Van Der Ven et al., 2005). However, it can be questioned whether those interventions are equally successful when patients have overprotective partners. Results of a previous study indicated that the beneficial effects of interventions may be decreased in this case, by showing that a diabetes education program enhanced feelings of control but to a lesser extent in patients with relatively overprotective partners (Hagedoorn et al., 2006). It may therefore be necessary to target supportive behavior of the partner as well. Interventions that not only included patients, but partners as well were found to have a positive impact on patients’ psychosocial outcomes (Kuijer, Buunk, De Jong, Ybema, & Sanderman, 2004; Martire, Schulz, Keefe, Rudy, & Starz, 2007). Based on our findings, it may be expected that interventions targeting patients’ characteristics and coping behavior, as well as partners’ support behavior will be most effective.
Future research
Before the findings are implemented in interventions, more research is necessary to establish causal chains between the variables. That is, experimental and intervention studies are needed to confirm whether altering patients’ regulatory focus and self-efficacy, or partners’ supportive behaviors will lead to lower or higher levels of distress.

An underlying assumption in chapter 2 was that a support behavior such as active engagement will encourage patients to adopt a stronger promotion-oriented mind set while support behaviors such as protective buffering and overprotection will urge patients to adopt a stronger prevention-oriented mind set and/or a weaker promotion-oriented mind set. Although our findings supported our line of reasoning, this assumption was not actually tested. Future studies might look into the question whether these support behaviors can alter patients’ regulatory focus in the long run.

Another recommendation for future research is assessing possible mediators in the moderate association between prevention focus and distress. It can be expected that patients with a strong prevention focus have a tendency to avoid certain behaviors and situations, and as such adopt avoidant coping strategies. For example, a patient with a strong prevention focus may be occupied with avoiding hypoglycemia (too low blood sugar levels) and he or she may avoid engaging in very intensive exercise, as this may cause a serious decrease in blood sugar levels. These avoidant coping strategies in turn can be expected to be related to more distress and lower well-being (e.g., Felton, Revenson, & Hinrichsen, 1984; Jacobsen et al., 2002; Macrodimitris & Endler, 2001; Manne, Ostroff, Winkel, Grana, & Fox, 2005).

Finally, it is not known whether the findings of chapter 2 and 3 are only applicable to patients dealing with a chronic illness requiring self-management behaviors, or whether the findings would also apply to patients with other chronic diseases, or to individuals dealing with other stressful situations.

CONCLUSION 2
“The negative effects of protective buffering on relationship satisfaction may be compensated for by high levels of active engagement, in both patients and partners”

Main effects
A chronic illness such as diabetes may not only affect patients, but partners of patients as well. Consequently, it can be expected that not only the partner will try to support the patient, but also that the patient will support the partner, for example by trying to discuss the partner’s feelings about the disease. Both patients and partners may show active engagement towards the other, that is, openly discussing feelings that the disease may
evoke and thinking of constructive problem-solving methods to deal with the disease. Similarly, both patients and partners may show protective buffering, that is, hiding their feelings concerning the disease and pretending everything is fine. Since both patients and partners may be affected by the disease, and both patients and partners may be supported by the other, we examined how received active engagement and protective buffering are associated with relationship satisfaction in patients as well as in partners. For both, it was shown that relationship satisfaction was positively associated with received active engagement, and negatively associated with received protective buffering. These results are in line with the reasoning that couples who adopt active engagement as a support style perceive each other as responsive and understanding, which in turn promotes relationship satisfaction (Laurenceau, Barrett, & Pietromonaco, 1998; Reis & Shaver, 1988). Couples who adopt protective buffering experience less relationship satisfaction since this support style consists of withholding concerns and feelings instead of sharing them.

Moderating effects
In chapter 4, we showed that patients and their partners experienced the lowest levels of relationship satisfaction when they reported to receive both low levels of positive support (i.e., active engagement) as well as high levels of negative support (i.e., protective buffering). An underlying explanation for these results is that the receipt of both support behaviors are not interpreted independent of each other, but rather, that these behaviors are interpreted in light of each other. In general, protective buffering may be interpreted as negative support behavior, and may consequently have a negative impact on relationship satisfaction. Thus, individuals (either the patient or the partner) who feel that the other is hiding his or her worries, and is pretending everything is fine, may experience their relationship as less satisfactory. However, if individuals also feel that at other times, their partner shows active engagement by being responsive, and by engaging in open discussions about the illness, they may interpret the protective buffering as less negative behavior. For example, they may think that the other is just having a bad day and that is why he or she is reacting indifferently. These more benign (or less negative) interpretations are in turn expected to mitigate the negative association between protective buffering and relationship satisfaction (for reviews see Bradbury & Fincham, 1990; Bradbury, Fincham, & Beach, 2000). Previous studies have further shown that more positive attributions to and interpretations of certain behaviors were associated with forgiving the other for engaging in these behaviors (Fincham, Paleari, & Regalia, 2002). If you think for example, that the other engages in protective buffering because he or she had a bad day, you are probably more likely to forgive him or her for this behavior than when you think the other adopts this support style because he or she truly is indifferent about you. In turn, forgiving one's partner has been found to be positively associated with relationship satisfaction (Fincham, 2000; Paleari, Regalia, & Fincham, 2005; for an overview see Fincham, Hall, & Beach, 2006).
Theoretical and clinical implications
The findings of chapter 4 are in line with previous studies that found support for the hypothesis that adequate support may buffer the negative impact of inadequate support on psychosocial outcomes (e.g., Kleiboer et al., 2007; Manne et al., 2003; Revenson, Schiaffino, Majerovitz, & Gibofsky, 1991). Our results further underline the importance of considering both patients and partners when studying support behavior. The majority of previous studies focused on the patient, and not on the partner. However, a chronic illness can be perceived as a stressor shared by both patients and partners (Berg & Upchurch, 2007; Bodenmann, 1997). Partners may therefore benefit from positive support and be harmed by negative support, just like patients. This notion is supported in this thesis by the fact that the associations between supportive behavior and relationship satisfaction, as well as the interactive effects, were found in both patients and partners.

Interventions aimed at enhancing relationship satisfaction in couples dealing with diabetes are probably most effective when they target supportive behaviors enacted by both patients and their partners. These interventions seem promising, which is supported by research that showed that interventions that included both patients with a chronic illness (e.g., cardiovascular disease, cancer) and their partners had a beneficial impact on patients’ psychosocial outcomes (for a meta-analysis see Martire, Lustig, Schulz, Miller, & Helgeson, 2004). Moreover, intervention studies for cancer patients and their partners, targeting relationship aspects, showed that relationship satisfaction improved not only in patients, but in partners as well (Baucom et al., 2009; Kuijer et al., 2004). The intervention programs in these studies focused on what both partners need from each other in terms of supportive behavior, and couples were given homework assignments in which they had to practice specific supportive behaviors. To the best of our knowledge, no intervention studies for diabetes have been published that targeted psychosocial outcomes in both patients and their partners. Such interventions may prove to be as useful in couples dealing with diabetes as they have been in couples dealing with other chronic illnesses.

Future research
We argued that active engagement and protective buffering may co-occur. Future studies could examine how these behaviors actually co-occur in practice. For example, do active engagement and protective buffering interchange within a certain period of time? Or does a person consistently adopt active engagement with regard to some aspects of the illness and protective buffering with regard to other aspects of the illness?

Our explanation for the interactive effects was that protective buffering is interpreted less negatively, and is more easily forgiven when at the same time levels of active engagement are high instead of low. However, this assumption needs to be confirmed in future studies. Diary and observational studies may be suitable to test such questions and will provide better insight into these support processes than self-report studies.
CONCLUSION 3

“There are no consistent gender differences with regard to associations between support behavior and psychosocial outcomes”

Throughout this thesis we explored the role of gender. Previous studies have shown that women seem to attach more value to relationship-oriented aspects than men do (Cross & Madson, 1997; Strough, Berg, & Sansone, 1996; Thoits, 1992). As a consequence, relationship-oriented aspects, such as support from one’s partner, may have a stronger impact on women’s than on men’s psychosocial outcomes. In chapter 3 it was indeed shown that the indirect link between overprotection by the partner and diabetes-related distress was stronger for female than for male patients. It was further shown that the moderating effect of gender was specifically found in the association between diabetes-specific self-efficacy (the mediator) and diabetes-related distress. This finding can be explained by previous research suggesting that female patients perceive their diabetes as more serious and intruding upon their life than male patients (Helgeson & Novak, 2007; Mosnier-Pudar et al., 2009). Consequently, if female patients do not feel self-efficacious in dealing with a disease that is such a central aspect of their self, they will feel more distressed about their disease than male patients, for whom the disease is less central to their self. It is possible that for male patients it is more important in terms of well-being to feel self-efficacious in other domains of their life. More research is needed to unravel the role of gender in perceptions of and attitudes towards diabetes.

We also examined whether gender would qualify the findings of the other chapters that included support behavior as an independent variable. The interactive effects of regulatory focus and partner support in chapter 2 were not further qualified by gender, nor were the interactive effects of active engagement and protective buffering in chapter 4. Apparently, the finding that the combination of vulnerability in terms of individual or disease characteristics and inadequate partner support is associated with the highest levels of distress applies to both male and female patients. Also the finding that adequate support may buffer the negative effect of inadequate support on relationship satisfaction seems to apply to both male and female individuals (both patients and partners). The main effects in chapter 2 and 4 of support behavior were also not consistently moderated by gender.

Altogether, the results show that the role of gender with regard to supportive behavior and psychological outcomes is not clear. Previous research also showed inconsistent results. That is, some studies did find support for the notion that women are more strongly influenced by partner support than men are (e.g., Acitelli & Antonucci, 1994; Hagedoorn et al., 2000; Hagedoorn et al., 2001; Horwitz, McLaughlin, & White, 1998; Mcrae & Brody, 1989), whereas other studies did not show gender differences (e.g., Sherman, 2003; Vinokur, Price, & Caplan, 1996). It seems that more research is necessary examining when and why support behavior will have a stronger impact on women than on men.
CONCLUSION 4

“Social comparison will boost patients’ motivation to manage their disease when this information is congruent with patients’ self-regulatory focus”

Main effects of social comparison information and regulatory focus

The results of chapter 2-4 demonstrated that the partner may have an important impact on the patient. Other persons in the social environment of the patient, such as fellow patients, may also affect the patient. In chapter 5 we focused on comparisons patients make with fellow patients, and on the impact of these comparisons on patients’ motivation to manage the disease. Comparing oneself with others is referred to as social comparison (Festinger, 1954), and research on the effects of social comparisons within the context of health and illness is flourishing (e.g., Aspinwall, 1997; Bennenbroek, Buunk, Van der Zee, & Grol, 2002; Buunk, Zurriaga, Gonzalez, Terol, & Roig, 2006; Buunk et al., 2009). Most of this research focuses on the impact of social comparison information on outcomes such as affect and well-being. Less is known about the effects on patients’ motivation. Especially for patients with diabetes, this is an important question. These patients can largely control a number of aspects of their disease by performing the proper self-care behaviors, and therefore patients need to be motivated to do so.

In chapter 5, we examined the impact of social comparison information (i.e., upward vs. downward targets) on patients’ motivation to manage the disease, and whether regulatory focus (i.e., promotion and prevention focus) and self-efficacy as individual characteristics determine which type of social comparison information is most likely to boost motivation. Before discussing the interactive effects of social comparison information, regulatory focus and self-efficacy, I will summarize the main effects.

Social comparison information (i.e., upward or downward) was not significantly associated with patients’ motivation to manage the disease. Thus, upward comparison information did not lead to increased motivation compared to downward comparison information. We also examined whether regulatory focus (i.e., promotion and prevention focus) and self-efficacy were related to motivation to manage the disease. There was only a weak main effect of prevention focus such that patients with a stronger prevention focus reported a higher motivation to work on their own diabetes regulation after reading the interview fragment containing social comparison information.

The fact that the direction of social comparison was not associated with patients’ motivation may indicate that there are individual characteristics that determine whether upward or downward social comparison information is most likely to increase one’s motivation.
Moderating effects

In chapter 5, regulatory focus and self-efficacy were put forward as important characteristics that may influence how patients interpret social comparison information. As expected, patients with a strong promotion focus were most motivated to work on their own diabetes regulation when they had read the description of the upward target, that is, a fellow patient doing better than themselves in terms of diabetes management. Patients with a strong prevention focus were most motivated when they had read the description of the downward target. The underlying process for the interactive effect of regulatory focus and social comparison information may be that patients with a strong promotion focus are more attuned to information that highlights positive outcomes and strategies, which may guide them to achieve their ideal possible self. The increased attention to this type of information may lead to increased motivation. Patients with a strong prevention focus on the other hand are more attuned to and therefore more motivated by information that highlights negative outcomes and strategies, which guides them to avoid their feared possible self.

The interactive effect of social comparison information and prevention focus was further qualified by self-efficacy, such that patients with a strong prevention focus were more motivated than patients with a weak prevention focus, but only when they had read the description of the downward target and when they felt highly self-efficacious with regards to setting and achieving their diabetes goals. In other words, patients who are focused on negative outcomes, but believe that they can reach their diabetes goals, are especially motivated to work on diabetes management after reading about a fellow patient who shows poor management.

Theoretical and clinical implications

Our study is one of the first, if not the only, to examine the effects of social comparison information on motivation to work on their diabetes regulation in patients with diabetes. The findings stress the importance of considering individual differences in regulatory focus and self-efficacy when examining the impact of social comparison information. Depending on these individual differences, social comparison information may be interpreted in different ways and have different effects on motivation. Our findings were supportive of the regulatory fit hypothesis (Higgins, 2000) which states that a task or message should be framed in terms that are congruent with one's regulatory focus in order to enhance motivation and performance. Similar to the findings of Lockwood and colleagues (e.g., Lockwood, Marshall, & Sadler, 2005; Lockwood et al., 2002), our findings show that also social comparison information may be most effective when it is framed in terms that fit one's focus. Furthermore, our study demonstrated that the findings can be generalized to a sample of patients with diabetes.
We extended the regulatory fit hypothesis by showing that the interactive effects of social comparison information and prevention focus were further qualified by self-efficacy in diabetes management. Our findings showed that patients who are focused on negative outcomes were motivated to work on their diabetes management after reading about a fellow patient who showed poor management, but only if they believed that they can reach their diabetes goals. This may seem contradictory with a previous study that found that motivation was boosted only in students who perceived themselves vulnerable to the fate of the negative role model (Lockwood, 2002). However, also students who perceived themselves as vulnerable still scored relatively high on perceived control. Apparently, on the one hand, one needs to feel susceptible to the negative outcomes experienced by the negative role model in order to become motivated. But at the same time, one needs to feel self-efficacious in avoiding these negative outcomes.

Our study focused on how the influence of social comparison information may be dependent on individual differences in self-efficacy and regulatory focus. Previous research on social comparison also demonstrated a great interest in individual difference variables. Some researchers have put forward that both upward and downward comparison information may have positive and negative effects on well-being, depending on whether individuals contrast or identify themselves with this information (Buunk & Ybema, 1997). Contrasting yourself with others who are doing better and identifying yourself with others who are doing worse have been indicated as negative interpretations of social comparison information, whereas identifying yourself with others who are doing better and contrasting yourself with others who are doing worse have been put forward as positive interpretations (Van der Zee, Buunk, Sanderman, Botke, & Van den Bergh, 2000). Furthermore, it has been demonstrated that individual differences in neuroticism for example may account for whether social comparison information is interpreted negatively or not (Van Oudenhoven-van der Zee, Buunk, Sanderman, Botke, & Van den Bergh, 1999).

It is plausible that prevention focus, like neuroticism, is associated with a negative interpretation of social comparison information, which may lead to negative emotions, such as anxiety and fear. These negative emotions however, might in turn activate and motivate individuals. That is, if you see a fellow patient doing worse than yourself, you may fear that a similar future lies ahead of you. This fear in turn may stimulate you to engage in behaviors that are needed to avoid such a future.

The results of our study not only have theoretical but clinical implications as well. Interventions aimed at improving motivation and self-care behaviors may sort positive effects if they would present patients with social comparison information, that is, descriptions of fellow patients doing either worse or better than themselves. Role models could perhaps also be implemented in regular care. For example during consultations, physicians could use examples of (fictitious) fellow patients. The recurrent use of role...
models during interventions or in daily practice may lead to enhanced motivation and actual behavioral change in the long run. Based on our results, presenting patients with social comparison information must be done carefully, taking into account individual differences in self-efficacy and regulatory focus. Furthermore, in group interventions, social comparisons are most likely automatically made by patients since members of the group may function as upward or downward targets to each other (cf. Taylor et al., 2007). Patients may be taught to actively compare themselves with those patients who are most likely to enhance their motivation.

Future research
More research is needed that will examine the underlying explanation of our findings. It was argued that individuals are more attuned to social comparison information that matches their regulatory focus, and that this increased attention in turn will lead to increased motivation. When individuals are more attuned to certain information they can be expected to better process and remember this information then when they are less attuned to it. Some support for this line of reasoning has been found by a previous study demonstrating that promotion-focused individuals were more likely to recall information relating to the achievement of success by another person (i.e., positive outcomes), whereas prevention-focused individuals were more likely to recall information relating to the avoidance of failure by another person (i.e., negative outcomes) (Higgins & Tykocinski, 1992). However, this study used a different measure of regulatory focus than we did, and effects on motivation were not assessed.

Reconciling chapter 3 and 5
In light of this previous discussion, the results of chapter 2 and 5 that may seem contradictory at first sight (i.e., prevention focus in chapter 2 was associated with negative outcomes, while in chapter 5 it was found to have positive effects in some circumstances) can be more easily reconciled. If one considers the fact that these two chapters refer to different patient outcomes; distress in chapter 2, and motivation in chapter 5, the results are logical. Patients with a strong prevention focus are more likely to be attuned to negative information in their environment. Even though this focus on negativity may lead to more distress, at the same time, it may lead to more motivation when patients encounter (social comparison) information that fits their negativity bias.

Having a strong promotion focus may also lead to enhanced motivation in some circumstances, and unlike prevention focus, promotion focus is not positively associated with distress. Moreover, a strong promotion focus may compensate for low levels of positive support or high levels of negative support. Thus, it can be argued that overall, it is more beneficial to have a strong promotion focus than it is to have a strong prevention
focus. A question that arises is whether a person’s regulatory focus can be changed in the long run. As discussed earlier, previous studies did show that a person’s regulatory focus can be situationally induced. It is not yet known whether these inducements of either prevention or promotion focus will have a long-lasting impact, although the correlations and means presented earlier do seem to indicate that regulatory focus seems to be stable only to a certain extent.

Future studies should not only assess the effects of social comparison information on patients’ motivation, but should also examine whether social comparison information will lead to actual behavior change in the long run. Both promotion-focused and prevention-focused patients may engage more strongly in self-care behaviors after having been confronted with social comparison information. However, the type of behaviors may be different for promotion-focused and prevention-focused patients. A previous study found support for the notion that a strong promotion focus is related to additive behaviors and that a strong prevention focus is related to subtractive behaviors (Lockwood, Sadler, Fyman, & Tuck, 2004). For example, patients who formulate the prevention-focused goal “to avoid an unhealthy weight” may be inclined to engage in subtractive behaviors, such as cutting back on fat and reducing calorie intake. Patients who have adopted the promotion-focused goal of “achieving a healthy weight” may be inclined to engage in additive behaviors, such as increasing their exercise level, and eating more fruit and vegetables. It would be interesting to examine whether the additive behaviors associated with promotion focus and the subtractive behaviors associated with prevention focus are both equally effective in terms of achieving or maintaining a good self-management, or whether one type of behavior is superior over the other.

**Strengths and limitations of the study**

The research described in this thesis has several strengths. We have a rather large sample size, and our study is one of the few that included both patients and their partners. Most studies purely focus on patients and their outcomes. Partners of patients are less often included in diabetes studies, and the studies that did focus on partners did not examine how patient’s behavior may affect the partner.

The fact that our research considered the interplay between intra- and interpersonal factors is also relatively unique within the context of diabetes. Many studies focus on either intrapersonal or interpersonal factors, or they focus on the separate effects of these factors. Our findings show that these intra- and interpersonal factors do not operate in isolation, but rather that they interact and influence each other.

In chapter 5, we used an experimental design within questionnaire research. That
is, patients were randomly assigned to one of the two versions of the questionnaire containing social comparison information. Future studies could make use of experimental designs more often, especially since these designs can provide a good model of testing which components may be useful in interventions. Finally, a clear strength in our research is the utilization of sophisticated methods to analyze the data; in chapter 3 we used a technique that allowed us to test moderated mediation, and in chapter 4 a dyadic data analytic approach was used, which takes into account the nonindependence between patient and partner data.

Nevertheless, there were also some limitations attached to our study. One limitation is that it is not certain whether our sample was representative of all insulin-dependent patients with diabetes. The majority of the patients in our sample did not experience severe diabetes-related distress. Another study of Dutch diabetes outpatients found a mean score of 23.2 with an SD of 19.5 (Klis, Vingerhoets, De Wit, Zandbelt, & Snoek, 2008; Zandbelt, De Wit, Lubach, Breas, & Snoek, 2007) which is significantly higher than our mean score of 18.2 at T0 ($t = 3.72, p < .001$). Furthermore, the percentage of patients with seriously elevated levels of diabetes-related distress was also higher than in our study (19.6% vs. 10.9%). The fact that our sample seems to experience less severe diabetes-related distress could be due to the rather strict inclusion criteria we handled (e.g., no serious complications such as polyneuropathy, age between 18 and 70, etc.).

A second limitation is that although we did have a longitudinal data set, it was not very suitable for predicting changes over time. The patients included in our study had been diagnosed with diabetes several years ago, and most patients had long-term relationships with their partner. As indicated by the correlations and mean scores, patients’ and partners’ relationship-focused coping strategies had stabilized to some extent (see chapter 4). Furthermore, patients may have developed rather stable routines of dealing with the diabetes. This is supported by the rather high correlations between the four assessment points on self-care activities (.75 - .80), on diabetes-related distress (.71 - .88), and on diabetes-specific self-efficacy (.76 - .82). Future longitudinal studies may have more predictive value and shed more light on causality if they for example include couples in which the patient has been recently diagnosed, or if they include patients who have only recently been involved in a relationship with an intimate partner.

A final limitation is that all of our results are based on self-report measures, and future studies should include observational measures as well. The perception of support may not only reflect the actual support that has been given or received, but may in addition partially reflect the person’s personality and how the person processes social interactions. Furthermore, support processes between couple members are dynamic in nature which is probably better captured by observing interactions between patients and partners, than by using self-report measures.
Chapter 6

Concluding remarks
The present thesis has shown that it is important to consider the interplay between patients’ individual characteristics and patients’ social environment when explaining psychological outcomes. The results indicate that positive support behavior of the partner may compensate for patients’ vulnerable characteristics whereas negative support behavior seems to aggravate the negative effects of vulnerability within the patient. As diabetes can be considered as a stressor shared by both the patient and the partner, it was proposed and demonstrated that patients as well as partners may benefit from positive support behaviors in terms of high relationship satisfaction, but may be harmed by negative support behaviors. Moreover, positive support may compensate the detrimental effects of negative support, in both patients and partners. Finally, it was shown that information on fellow patients may boost patients’ motivation to manage their disease when this information matches the patients’ regulatory orientations.
Discussion

Footnotes

¹To test the robustness of these findings, we also examined the associations between regulatory focus and two other measures of distress in the ‘couples with diabetes data set’ (not previously presented). Again, promotion focus showed no significant, or only very weak correlations with general distress (CES-D) and with diabetes-related distress (PAID) (respectively $r = .11$, $p = .04$, and $r = .10$, $p = .07$). Prevention focus was moderately associated with general distress and with diabetes-related distress (respectively $r = .45$, $p < .001$, and $r = .31$, $p < .001$). It seems that, depending on the specific instrument that is used to measure distress, correlations with prevention focus may be somewhat stronger. However, associations between promotion focus and (diabetes-related) distress remain weak or nonsignificant.

²We also tested associations between the ABO and other psychological outcomes. Active engagement was negatively related to general distress, although not always significantly, while protective buffering and overprotection were both positively related to general distress, again, not always significantly. Reverse associations were found for relationship satisfaction. That is, active engagement was positively related to relationship satisfaction, while protective buffering and overprotection were both negatively related to relationship satisfaction. Again, these associations were not always significant.

³Correlations of promotion focus and prevention focus were moderate to relatively high (.59 - .69) and there were no significant differences in mean scores between the four assessment points ($F(3,207) = 0.98$, $p = .41$, and $F(3,206) = 2.01$, $p = .11$, for promotion and prevention focus respectively.

⁴In chapter 2 we showed that the mean score on diabetes-related distress was 18.3 with an SD of 16.7. The results of this chapter were based on the T1 sample of patients whose partners also completed the questionnaire. If we look at the T1 sample which includes all patients then the mean score seems comparable ($M = 18.5$, $SD = 17.3$). Also the screening questionnaire (T0) showed a comparable mean score of 18.2, with an SD of 16.5. At T0, 55 (10.9%) of the 503 patients that completed the questionnaire had a score of 40 or higher, which is indicative of more severe diabetes-related distress. At T1, 42 (12.4%) of the 340 patients had a PAID score of 40 or higher.
References


