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Internet-based treatment of Social Anxiety Disorder

Mechanisms of change and innovative approaches

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Meinen Eltern

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Introduction

Chapter 1

Michael is a 28-year-old student who avoids going to university because he suffers from anxiety in groups and also in performance situations. He spends most of his days at home playing video games. On his short excursions to the next supermarket, Michael is consumed with fears of what other shoppers might think. He is afraid that they might judge him to walk or behave in a funny way. His academic career has come to a pass. If he misses any more classes, he will be expelled. However, his fear of negative judgment by professors and other students keeps him away from university.

Michael thinks that he will not be able to overcome his fears on his own. Yet, he is not sure where to get help and is afraid to humiliate himself in front of a professional.

Regina, 34 years old, suffers from progressing muscular dystrophy and is confined to a wheelchair. A year ago, she split up with her boyfriend and moved back to her hometown, a small town in Eastern Germany. Once installed there, she had to realise that her social fears had increased. She does not feel at ease with her old schoolmates and thinks that all her friends only meet her because they pity her and secretly think her weird and tiresome. Consequently she spends most of her days alone. Trips to her physician once a month are preceded by days of heightened nervousness. On the day of the trip itself and during the examination Regina suffers intense fears of behaving in an embarrassing and humiliating way.

Both Michael and Regina registered for a trial on Internet-based self-help for Social Anxiety Disorder (SAD). As much as they differ in their history, their symptomatology,

and their resources, they both share the problem of extensive social fears. They also share an interest in the Internet-based treatment of their anxiety problems. They registered for one of the two randomised controlled trials that constitute the basis of the current thesis. In addition to Michael and Regina, over 600 other people inscribed for the Internet-based treatment of social anxiety from February to June 2010.

Web-based treatment of mental health problems has piqued the interest not only of patients, but also of clinicians and researchers. This has led to an effort to evaluate and disseminate such treatments. The efficacy of online self-help programmes for anxiety disorders is already established (e.g. Barak, Hen, Boniel-Nissim, & Shapira, 2008). The current thesis focuses on two aspects of web-based interventions for SAD. First, predictors and mechanisms of change in unguided self-help for SAD are examined. The role of the clinician contact in the assessment phase of web-based self-help (study 1) is studied and the effects of patient expectations are explored (study 2). Second, an innovative approach that is derived from the elaborate work on cognitive bias modification in anxiety disorders is examined. An attention training programme is translated to the Internet-based setting and its efficacy to reduce attention bias and social fears is evaluated (study 3).

The current thesis aims at furthering our understanding of what works for whom in cognitive-behavioural self-help and how other approaches might broaden the spectrum of web-based self-help. Internet-based self-help programmes are efficacious, but they do not work for everyone and not for everyone in the same way. The studies conducted within this dissertation shed some light on how and what best to offer to which patients in an online self-help setting for SAD.

In the first chapter of this thesis, a brief description of Social Anxiety Disorder is given and the evidence regarding Internet-based interventions in the field of this disorder is

summarised. In the following chapters, the three studies conducted are presented as they were submitted to peer reviewed journals. In the introductory section of each manuscript, the theoretical basis of the specific research question is depicted. In the last chapter of this thesis, findings of the studies are summarised and their collective implications for further research and practice in web-based self-help are discussed.

Social Anxiety Disorder

Characteristics of Social Anxiety Disorder

Feelings of shyness and nervousness in social situations are part of the human condition. Most individuals feel apprehensive before oral exams, feel shy and tongue-tied when asking for a date or are nervous when asking their supervisor for a raise. They feel anxious because the outcome of these situations is important to them, to their academic or occupational career, to their relationships, or to their image of themselves. However, individuals differ in the degree of shyness. Some persons feel self-confident and optimistic in most social situations whereas others experience intense anxiety in almost all social encounters. At this end of the continuum of shyness, social anxiety can lead to major impairments and therefore fulfils the criteria of a mental disorder (Stangier & Fydrich, 2002).

Social Anxiety Disorder (SAD) is characterized by an intense fear of embarrassment and humiliation in social situations. Individuals with SAD are afraid of the judgement and critique of others and avoid relevant situations. Although all feared situations are different, they can be classified into social interaction situations (e.g. going to a party), formal speaking situations (e.g. speaking up in a work meeting), and non-speaking observational situations (e.g. writing while someone watches) (Stein & Deutsch, 2003). Most of these situations, especially those of the interactional type, cannot be completely avoided in daily life. Individuals with SAD are always faced with some of their feared situations. Learning theories of anxiety suggest that repeated exposure to feared situations results in habituation and an alleviation of anxiety (Mowrer, 1960). However, social anxiety perseveres. Cognitive models describe how individuals with SAD experience social situations and explain the tenacity of social anxiety. Figure 1.1 depicts the cognitive model suggested by Clark & Wells (1995). Its major focus lies on three

maintaining factors: perceiving a situation as threatening, activation of safety behaviours and processing of self as social object. In a social situation, patients with SAD become highly self-focused. They shift their attention towards themselves and use internal information (e.g. feeling nervous) to evaluate their performance in the situation. At the same time they apply various behaviours that are designed to avoid the pending failure and humiliation in the social situation. If the expected catastrophe does not occur, patients will attribute this to their efforts in applying safety behaviours. This means that they keep their negative assumptions about themselves and their performance in social situations. Two biases in information processing further restrict their perception of the social situation: hyper-vigilance towards external social threat cues and negative interpretation of ambiguous social cues (Clark & McManus, 2002).

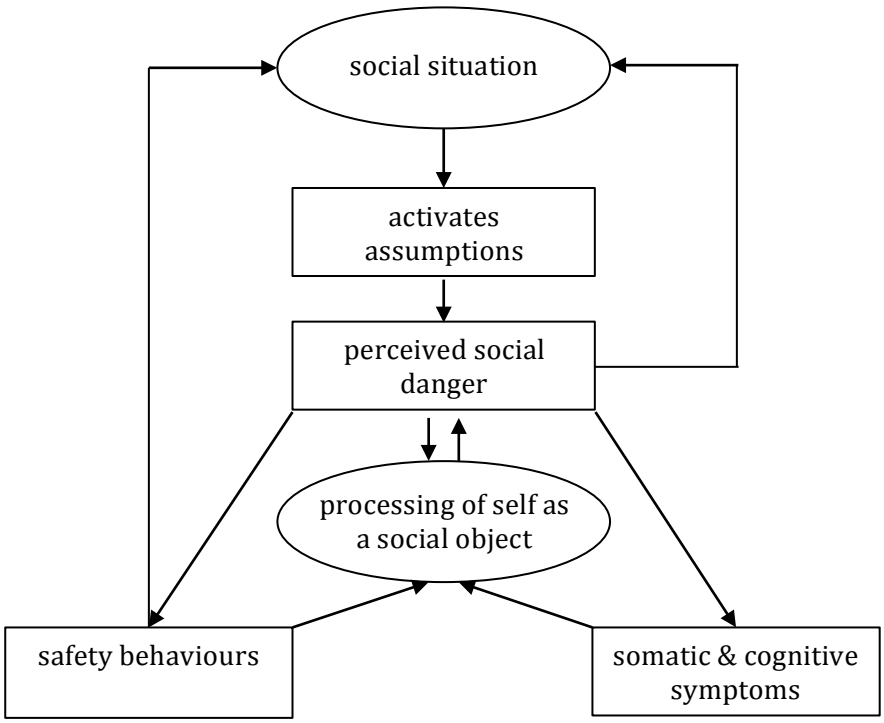

Figure 1.1: Cognitive model of social anxiety (Clark & Wells, 1995)

Epidemiology and associated impairments

The interaction of the factors of the cognitive model explains why SAD frequently becomes a chronic disorder. There are now several prospective studies examining the course of SAD. In patient populations, cumulative probabilities of recovery in a 5- to 8-years interval were p=.40 and p=.31 respectively (Beard, Moitra, Weisberg, & Keller, 2010; Yonkers, Bruce, Dyck, & Keller, 2003). Whether patients enrolled in treatment or not did not predict recovery. This somewhat disheartening result is common in prospective studies on courses of illness and is probably due to the differences in severity. Less severe cases are most likely to recover spontaneously and least likely to access treatment. Prospective studies in the community shed a slightly more optimistic light on the course of SAD. Rates of full recovery vary between 36% after 18 months in adult women and 53% after 4 years in male and female adolescents and young adults (Müller, 2002; Vriends et al., 2007). The majority of individuals with SAD seem to experience a chronic course of social anxiety symptoms, a conclusion supported by retrospective data on duration of illness. On average, patients with SAD suffer from this disorder between 20-25 years (e.g. Beard, et al., 2010; Keller, 2003).

The ratio of 12-month prevalence rates and life-time prevalence rates is a further indicator of the persistence of mental disorders (Kessler et al., 2012). The National Comorbidity Survey Replication (NCS-R) identified a life-time prevalence of 12.1% for SAD (Kessler et al., 2005). The 12-months prevalence was estimated at 6.8% (Kessler, Chiu, Demler, & Walters, 2005). Compared, for example, to major depressive disorder with a life-time and 12-months prevalence of 16.6% and 6.7% respectively, SAD seems more stable over the course of time. The high prevalence rate of the NCS-R, which qualifies SAD as one of the most common mental disorders in the U.S., is contrasted by the findings of its European equivalent, the European Study of Mental Disorders

(ESEMeD, Alonso et al., 2004). The ESEMeD project and the NCS-R applied similar diagnostic criteria and assessment strategies. The ESEMeD study revealed a low life-time prevalence of 2.4% and a 12-months prevalence rate of 1.2% for SAD. A recent re-analysis which combined this and other European data-sets resulted in a median 12-months prevalence rate of 2.0% for SAD (Wittchen et al., 2011). Fehm, Pelissolo, Furmark, and Wittchen (2005) reviewed various epidemiological studies in Europe. The authors reported a life-time prevalence of 6.6% in Europe with a range of 7.8 – 16% in Germany and Switzerland (Fehm, et al., 2005). In summary, SAD is a common mental disorder, even though epidemiological data vary considerably from study to study. SAD seems to be less frequent in Europe than in the U.S., although the difference might not be as drastic as suggested by the ESEMeD project.

SAD is associated with severe impairments in personal, occupational and educational life. Compared to healthy controls, individuals with SAD are less likely to be married, less likely to finish school and more likely to be unemployed (Bruch, Fallon, & Heimberg, 2003; Stein & Kean, 2000). Besides, they more often stay in jobs below their level of education (Lampe, Slade, Issakidis, & Andrews, 2003; Ruscio et al., 2008). The causal relation of these impediments to social anxiety has yet to be established. On the one hand, symptoms of social anxiety are deemed to interfere with personal and professional goals. On the other hand, perceived failings in the achievement of those goals likely foster low self-esteem and negative self-view of socially anxious individuals and therefore maintain and increase social anxiety symptoms. Economic, personal, and life-style impairments afflict men as well as women with social anxiety. However, Dahl & Dahl (2010) reported that socially anxious men were more likely to live alone and less likely to receive a low annual income than socially anxious women. General gender differences may explain the difference in income, but not the difference in relationship

status. SAD is more common in women than in men. This difference of approximately 3:2, however, is only present in community samples but not in clinical samples (Lieb & Müller, 2002). While women experience symptoms of social anxiety more often, men seem to be more likely to seek treatment because of these symptoms. An explanation of this unusual difference could be that extreme shyness interferes more strongly with the male stereotype and therefore leads to greater impairments, for instance in forming intimate relationships as suggested by the study of Dahl & Dahl (2010).

Individuals with SAD often suffer from co-morbid mental disorders which further aggravate their psychological well-being and their quality of life. Other anxiety disorders, affective disorders, substance use disorders and eating disorders are the most common co-morbid conditions. Comorbidity is high with some studies showing rates of comorbidity of up to 87.6 % (Fehm, Beesdo, Jacobi, & Fiedler, 2008). SAD's co-morbid nature also increases the economic burden associated with SAD. The German National Health Survey assessed days of absence from work due to disability over the last 12 months (Jacobi et al., 2002). Disability days were much more frequent in persons with SAD than in healthy controls (39.4 days compared to 9.9 days). However, a closer inspection of individuals with pure social anxiety and those with comorbid social anxiety revealed that the majority of disability days were due to comorbid disorders (pure social phobia: M = 7.4, SD = 8.5; comorbid: M = 38.8, SD = 78.7, Fehm, et al., 2005). Co-morbid disorders such as major depression or substance abuse most often develop after the onset of social anxiety in early adolescence (e.g. Ohayon & Schatzberg, 2010). The chronicity of SAD, the related impairments and costs as well as the associated risk for developing co-morbid disorders emphasize the importance of effective treatments for SAD.

Treatment of Social Anxiety Disorder

In the treatment guideline for SAD, published by the German Society of Psychology, psychotherapy is clearly recommended as first choice treatment (Heinrichs, Stangier, Gerlach, Willutzki, & Fydrich, 2010). Pharmacological treatments, especially the treatment with second-generation antidepressants, have also proven effective in reducing symptoms of SAD (de Menezes et al., 2011). However, as convincing evidence of a superior benefit of medication, either as stand-alone treatment or in the combination with psychotherapy, is still lacking, cognitive-behaviour therapy (CBT) can be considered as first line treatment (Heinrichs, et al., 2010). According to the guideline, cognitive-behaviour therapy is an empirically validated treatment of SAD. The American Psychological Association also lists CBT for SAD as an evidence-based treatment with "strong empirical support" (Teachman, 2012). CBT for social anxiety is indeed based on a solid ground of empirical evidence. Several meta-analyses, conducted on numerous randomised controlled trials, concluded that CBT interventions are effective in reducing symptoms of SAD (Chambless, Hope, & Salkovskis, 1996; Fedoroff & Taylor, 2001; Feske & Chambless, 1995; Gould, Buckminster, Pollack, Otto, & Yap, 1997; Gould, Johnson, Hofmann, & DiBartolo, 2001; Taylor, 1996). The most recent meta-analyses reported controlled effect sizes of d=.70 - .86 (Acarturk, Cuijpers, van Straten, & de Graaf, 2009; Powers, Sigmarsson, & Emmelkamp, 2008). These effect-sizes imply that the average treated patient is better off than 76-81% of untreated patients. Achieved benefits seem stable over time. Acarturk and colleagues (2009) found small but significant further improvements for the treated patients in follow-up periods between 1 and 18 months. Studies evaluating the long-term effects 5 years after treatment have also been favourable (Fava et al., 2001; Heimberg, Salzman, Holt, & Blendell, 1993; Mörtberg, Clark, & Bejerot, 2011). Not all studies on the effects of CBT for SAD report significant

clinical change. In their review, Rodebaugh, Holaway, and Heimberg (2004) estimated that about two thirds of treated patients experience significant clinical change through cognitive-behaviour therapy.

The reported positive effects of CBT in randomised controlled trials (RCT) seem to generalise to the clinical practice. Several effectiveness studies found no differences when comparing the results in clinical routine to those of RCTs and meta-analyses (Gaston, Abbott, Rapee, & Neary, 2006; Lincoln et al., 2003; McEvoy, 2007). Moreover, Lincoln and colleagues (2003) found that the application of exclusion criteria typical for RCTs did not affect outcomes in standard clinical routine.

There are two widely acknowledged manuals for the cognitive-behavioural treatment of SAD. Heimberg & Becker's group therapy for SAD centres on the challenge of dysfunctional thoughts and beliefs (Heimberg & Becker, 2002). The individual cognitive therapy by Clark (2001) addresses the elements of the cognitive model (see figure 1.1). There is some discussion whether group or individual therapy is most suited in treating social anxiety. Group therapy activates specific mechanisms of change: cohesion, sharing of information, learning from each other and universality of suffering (Fiedler, 2005). In addition to that, group therapy sessions can be considered as on-going exposure exercise for socially anxious patients. Individual therapy, on the other hand, guarantees more time and focus for the detailed exploration of the individual's specific beliefs and for the design of adequate behavioural experiments. Four direct comparisons between group and individual therapy have been conducted. Three of them favoured the individual format (Mörtberg, Clark, Sundin, & Wistedt, 2007; Stangier, Heidenreich, Peitz, Lauterbach, & Clark, 2003; Wlazlo, Schroeder-Hartwig, Hand, & Kaiser, 1990), one the group format (Scholing & Emmelkamp, 1993). In meta-analyses, the comparison of studies applying group therapy with studies applying individual therapy did not reveal

significant differences (Fedoroff & Taylor, 2001; Gould, et al., 1997; Powers, et al., 2008; Taylor, 1996).

Mechanisms and predictors of change

Group and individual therapy both aim at allowing the socially anxious patient to experience social situations differently. Whether CBT interventions focus primarily on cognitive or behavioural techniques, whether they are delivered in a group or an individual setting, they all share the assumption that change will occur through the experience of a social situations as it "is actually like, as opposed to how clients fear or think it will be" (Rodebaugh, et al., 2004, p. 891). This difference in experiencing social situations is achieved by a variety of cognitive-behavioural techniques, like behavioural experiments, socratic dialogue, video feedback, and exposure exercises. In addition to these specific techniques, common factors as described by Grawe (2004) or Weinberger (1995) determine the outcome of cognitive-behaviour therapy. Common factors encompass the therapeutic relationship, confronting the problem, experience of mastery, activation of resources, attribution of outcome, motivational clarification, and expectations (Grawe, 2004; Weinberger, 1995). Two studies examined the influence of common factors in the treatment of SAD and corroborated the importance of the therapeutic relationship, of problem activation, and resource activation (Hoffart, Borge, Sexton, & Clark, 2009; Stangier, Von Consbruch, Schramm, & Heidenreich, 2010). Patients' expectations have mainly been addressed as predictors of change. In a recent study, expectations explained 16-33% of the outcome variance in CBT for SAD (Price & Anderson, 2012). This finding is supported by a systematic review of Eskildson and collegues (2010) reviewing the literature on prediction of outcome and drop-out in SAD. They examined demographic variables as well as comorbid conditions and specific personality traits. Apart from evidence supporting the role of expectations, they failed to

identify any consistent predictor of treatment outcome. The only consistent finding was that higher initial symptom severity was associated with lower end-state functioning. Patients who were more severly impaired prior to the treatment (either experiencing high symptom severity or meeting criteria for comorbid Avoidant Personality Disorder) experienced more social anxiety at post-treatment. However, the rate of improvement did not differ between more and less severe cases.

In summary, empirical studies show that cognitive-behaviour therapy is an effective approach to treating SAD. It works for more and less severely disturbed clients, in a group and in an individual format, in randomised controlled trials as well as in the clinical routine. About two thirds of the clients benefit from the treatment and the majority is able to maintain the achieved improvement after the termination of the treatment.

Help-seeking and treatment rate

Any optimistic conclusion one could draw for individuals with chronic and disabling social anxiety is corrupted by the low treatment rate in persons with SAD. Studies on service utilisation show that about 50-60% of individuals with SAD seek help for their problems with a health professional (Issakidis & Andrews, 2002; Wang, Berglund, et al., 2005). However, only about 20-40% are referred to and consult with a mental health specialist (Gross et al., 2005; Issakidis & Andrews, 2002; Wittchen, Stein, & Kessler, 1999). A still lower proportion of about 24% receive adequate treatment defined as anti-depressant medication or CBT (Issakidis & Andrews, 2002). Treatment rates are lower in rural areas, in individuals with low income, in ethnic minorities and in individuals over 60 years (Wang, Berglund, et al., 2005; Wang, Lane, et al., 2005). In a German study, Wittchen, Stein, and Kessler (1999) reported that treatment rates rise

with comorbidity, with only 12% of those persons with pure SAD receiving help compaired to 28% of those with comorbid SAD.

This low treatment rate is certainly partly due to restricted health care facilities. On the other hand, the disorder's specific fear of social situations offers a further explanation for why it takes individuals with SAD up to 20 years to consult a professional (Keller, 2003). Olfson and colleagues (2000) found that about 20% of those individuals with SAD who do not seek treatment avoid this because of their fear what others may think of them. This inherent fear of social contacts could account for the differences in treatment rates between SAD and, for example, Panic Disorder. Patients with Panic Disorder are much more likely to consult a health professional (95.1%; Wang, Berglund, et al., 2005) and are also more likely to seek help with a mental health specialist (56.6%; Issakidis & Andrews, 2002).

Self-help

Considering these low treatment rates in SAD, self-help and self-help groups become an important part of health care in SAD. Although self-help approaches promise to be very relevant, there is no research regarding the effectiveness of self-help groups and only little research regarding self-directed help with books etc. Two studies showed encouraging results for self-directed help in SAD. Self-help consisted of written cognitive-behavioural material provided with clinician guidance. Abramowitz, Moore, Braddock, and Harrington (2009) reported large effect-sizes for guided self-help at post-assessment and at three months follow-up (d=1.07-1.39). Rapee and colleagues (2007) compared a guided self-help condition to unguided self-help and to cognitive-behaviour group therapy. They did not detect any differences between guided self-help and the group therapy condition. In comparison, participants in the unguided self-help group showed less improvement on social anxiety measures (Rapee, et al., 2007).

The efficacy of elements of cognitive-behaviour therapy is not limited to the traditional therapeutic setting. Developing an understanding of the symptoms of social anxiety, identifying and modifying dysfunctional thoughts, as well as (self-guided) exposure to difficult social situations seem to alleviate symptoms of social anxiety even if not delivered within weekly therapeutic sessions (Abramowitz, et al., 2009; Rapee, et al., 2007). The next chapter will focus on a novel approach of self-help in SAD, self-help provided via the Internet.

Internet-based interventions

In 2011, 76% of German citizens and 85.2% of Swiss citizens accessed the Internet (BFS, 2012; Czaika & Jechova, 2012). The Internet has revolutionised communication and information search in daily life. It has also brought a change in the way people access health-related information. The majority of Internet users also employ the Internet to search for information on health and health care delivery (Czaika & Jechova, 2012). More and more people use "Dr Google, M.D." [1], placing their trust in the obtained information (Lam-Po-Tang & McKay, 2010). For example, in a study with psychiatric outpatients, two thirds of the Internet users reported searching for symptoms, treatments, side-effects, and service providers in the Internet. Nearly 40% reported that the information thus obtained influenced their decisions regarding mental health issues (Lam-Po-Tang & McKay, 2010). The Internet offers novel ways to reach out to people and thereby opens new opportunities for the health care system and also the delivery of interventions. In the last fifteen years, the internet's increasing use has been acknowledged as huge potential and a variety of Internet-based interventions has been developed and evaluated.

Internet-based interventions take various shapes. They aim at preventing or treating psychological problems or address the rehabilitation from mental disorders. They target specific mental disorders (e.g. depression) or distinct psychosocial problems (e.g. bullying), health-related problems (e.g. chronic fatigue) or broader psychological concepts (e.g. wellbeing). Psychological interventions in general are defined as "all forms of professional psychological help that aim at changing psychological, but also somatic and social impairments and dysfunctions" (Bastine, 1998, p. 26). Internet-based

[1] Lam-Po-Tang, J., & McKay, D. (2010). Dr Google, MD: A survey of mental health-related internet use in a private practice sample. *Australasian Psychiatry, 18*(2), 130-133

interventions could be similarly defined, with the adjunct of "all forms of professional psychological help *delivered via the Internet* that aim at changing […] impairments and dysfunctions". Internet-based interventions encompass psycho-educational websites that offer information on mental health problems, and online psychotherapy and counselling where clinician and client are in direct contact via e-mail, chat, or videoconference. Further, there are Internet-based self-help programmes where clients are directed through interactive self-help manuals (e.g. Barak & Grohol, 2011).

Advantages and disadvantages of Internet-based self-help programmes

Different forms of Internet-based interventions embody different patterns of associated benefits and risks. All Internet-based interventions hold important advantages in the dissemination of effective treatments for mental disorders. Web-based help is available to a wide range of individuals who are, in some way or other, prevented from seeking help. Internet-based programmes reach out to individuals in remote areas, to individuals with decreased mobility or hearing deficits, to individuals with unusual working hours, or to parents without available childcare (Danaher, Hart, McKay, & Severson, 2007).

Internet-based self-help programmes hold the additional advantage of cost-effectiveness (e.g. Gerhards et al., 2010; Hedman et al., 2011; Warmerdam, Smit, van Straten, Riper, & Cuijpers, 2010). For example, when comparing guided Internet-based self-help versus group therapy for SAD, Hedman et al. (2011) reported that therapists on average spent 5.5 minutes per patient per week in the online setting compared to 50 minutes per patient and week in the group therapy setting. In unguided Internet-based self-help programmes, costs are further reduced and the required clinician time is mainly limited to the diagnostic assessment prior to the intervention. Moreover, as many patients can be treated simultaneously, waiting times are reduced.

Internet-based interventions may appeal to individuals who would otherwise not seek treatment. For example, Ryan, Shochet, and Stallman (2010) reported that highly distressed university students were more likely to access online help but not more likely to access traditional help than their less distressed colleagues. One barrier to seeking treatment is the preference to rely on oneself rather than on external help to solve mental health problems (Farrand, Perry, Lee, & Parker, 2006; Olfson, et al., 2000). Internet-based self-help programmes empower clients to work on their problems and solve their problems on their own. First tentative empirical results support the role of empowerment through Internet-based interventions (Samoocha, Bruinvels, Elbers, Anema, & Van Der Beek, 2010). Another major barrier to seeking help is the associated embarrassment and stigma (e.g. Gulliver, Griffiths, & Christensen, 2010). Web-based interventions lower this barrier as help can be obtained in relative anonymity.

A main concern in Internet-based self-help is that specific needs of the individual patient may remain undetected. Programmes are mostly designed for well-defined and very specific problems. In traditional face-to-face settings, the therapist can react spontaneously to problems not addressed in treatment manuals or to patients who indicate suicidal ideation. The restricted, more distant, and asynchronous communication in online self-help as well as the geographic distance might make it more difficult for patients to express specific needs, and to detect and to react to those needs on the clinician's side.

Benefits and risks of Internet-based self-help in SAD

The relative anonymity of Internet-based interventions seems of special importance in the treatment of SAD (see page 12). Due to the inherent fear of social interactions, it is particularly difficult for individuals with SAD to overcome feelings of embarrassment and shame when contacting a health professional. Phoning a psychotherapist, leaving a

message on an answering machine, and preparing for a first meeting with someone to talk about oneself for an hour might prove too threatening for individuals with SAD. The circumvention of a direct face-to-face contact and the communication via e-mail in Internet-based interventions facilitate the first step for socially anxious individuals. Furthermore, in traditional therapies, patients might suffer from so much anxiety during the first face-to-face contact with a clinician that they might find it difficult to process the session's contents. In web-based self-help programmes, patients receive the relevant information when they feel at ease, in their own home, and are thus able to process the offered information in its entirety.

A preference for communicating via chat or e-mail also shows in personal relationships of socially anxious individuals. In Internet users, social anxiety correlates with a preference for online relationships and with a tendency to consider online contacts as closer and more personal compared to real-world friendships (McKenna, Green, & Gleason, 2002). In the indirect web-based communication, socially anxious individuals can evade the feeling of being exposed to the scrutiny of others. Socially anxious individuals experience more control and less threat of negative evaluation in online interactions (Lee & Stapinski, 2012; Mazalin & Klein, 2008). The effects of online communication on social anxiety are not yet empirically established. On the one hand, online communication could be considered useful in establishing meaningful relationships with others. On the other hand, online communication could lead to an avoidance of face-to-face interactions and could thus increase fears of direct interactions. The encouragement of avoiding direct contacts could be considered a major disadvantage of Internet-based interventions in SAD. Web-based treatments deny patients the experience of being able to overcome their fears in direct personal contact.

All things considered, Internet-based self-help programmes encompass important advantages such as availability, cost-effectiveness, as well as easy and anonymous access. In social anxiety, reducing shame and embarrassment seems to be especially important in order to facilitate the initiation of treatments. At the same time, web-based help cannot always be suitable and might also hold risks for patients with specific needs. Web-based self-help might further encourage the preference for indirect communication in socially anxious individuals and thereby actually make it easier for them to avoid direct contact. Encouraging avoidance is the exact opposite of what CBT therapists want to achieve. Their goal in CBT for anxiety disorders is reducing avoidance. However, CBT manuals for SAD allow for and even recommend some avoidance strategies in the initiation of the therapeutic relationship (e.g. using the flipchart to direct attention away from the client) in order to make it easier for the client to engage in the therapeutic process (e.g. Stangier, Heidenreich, & Peitz, 2006). Thus, Internet-based interventions could also be viewed as a means of engaging in a process of change that will result in a reduction of avoidance of real-life face-to-face interactions. Moreover, patients' preferences for certain interventions should be taken into consideration as long as treatments are equally effective (Heinrichs, et al., 2010). The next section will discuss the efficacy and effectiveness of Internet-based interventions, including the comparison to face-to-face treatments. Social Anxiety Disorder is one of the most researched mental disorders in the field of Internet-based interventions. The questions considered in the following section can be viewed as exemplary for the field of Internet-based self-help.

Current state of research in Internet-based interventions for SAD

There are now four different programmes of guided and unguided Internet-based self-help evaluated in the treatment of SAD. One programme was developed in Sweden

("SOFIE"; Andersson et al., 2006), one in Switzerland (Berger, Hohl, & Caspar, 2009), one in Australia ("Shyness"; Titov, Andrews, Schwencke, Drobny, & Einstein, 2008) and one in Spain ("Talk to me"; Botella et al., 2010). The programme of Botella et al. (2010) has a special focus on fear of public speaking. The programmes differ somewhat in the way they present the relevant information and exercises. Whereas the "SOFIE" programme asks the participant to download written pages from a self-help manual, Berger et al. (2009) as well as Botella et al. (2010) include more interactive elements, e.g. videotaped real audiences for public speaking exercises. In the programme of Titov et al. (2008) participants are guided through the "Shyness" manual by a fictional character who suffered from social fears and overcame his anxiety with the help of a CBT therapist. All programmes except "Talk to Me" encourage participants to use an online discussion forum which is usually moderated or supervised by a clinician. With the exception of "Talk to Me" all programmes have been evaluated in a guided as well as in an unguided format (see below).

Efficacy and maintenance of treatment gains

Table 1.1 summarises the current state of research on Internet-based treatments of SAD. According to my knowledge, twenty-one studies have been conducted to evaluate the (comparative) efficacy and effectiveness of Internet-based self-help, including altogether *N*=1692 socially anxious participants. Research started off with trials estimating the efficacy of newly developed programmes for the treatment of SAD. The first study was published in 2006 by Andersson and colleagues. Until now, sixteen studies reported results on the efficacy of Internet-based self-help (the comparisons with face-to-face therapy are examined separately).

With the exception of the open study of Carlbring and colleagues (2006) all studies were randomised controlled trials. Seven trials focused on the comparison of Internet-based

self-help with a waitlist control group (Andersson, et al., 2006; Berger, et al., 2009; Berger, Hohl, & Caspar, 2010; Carlbring et al., 2007; Gallego, Emmelkamp, van der Kooij, & Mees, 2011; Tillfors et al., 2011; Titov, Andrews, & Schwencke, 2008; Titov, Andrews, Schwencke, et al., 2008) whereas one study compared Internet-based cognitive-behavioural self-help (ICBT) to an online discussion group condition (Andersson, Carlbring, & Furmark, 2012). Seven studies compared different forms of ICBT, six of them focusing on different degrees of therapists' guidance (Berger, Caspar, Richardson, Kneubühler, et al., 2011; Furmark et al., 2009; Tillfors et al., 2008; Titov, Andrews, Choi, Schwencke, & Johnston, 2009; Titov, Andrews, Choi, Schwencke, & Mahoney, 2008; Titov, Andrews, Schwencke, et al., 2009). One study examined ICBT with and without Motivational Enhancement Therapy (Titov et al., 2010). Mean within effect sizes from pre- to post-assessment varied between d=.33 and d=1.54. Weighted by sample size, the combined average effect size in all 16 studies was large with d=1.06. In the trials comparing ICBT to a waitlist condition, the controlled effect size at post-assessment averaged d=0.98. Compared to a more active control condition, ICBT still fared better with a moderate controlled effect size of d=0.78 (Andersson, et al., 2012).

These consistently positive results of mostly large within and between group effect sizes seem even more reliable when considering the low drop-out rate. In eight out of the 16 studies, less than ten per cent of the participants did not provide post-assessment data. The other eight studies report drop-out rates between 10-13%, with one exception reporting a high proportion of drop-out of 41% (Gallego, et al., 2011).

Not all studies reported data on significant clinical change and those who did differed in the definition of clinical change and the outcome measures applied. Seven studies described the rates of significant clinical improvement according to the Reliable Change Index (Jacobson & Truax, 1991). The percentage of improved participants measured by

the Liebowitz Social Anxiety Scale (LSAS-SR, Baker, Heinrichs, Kim, & Hofmann, 2002) ranged between 36-53%. Five studies applied the stricter criteria of improvement *and* recovery (Jacobson & Truax, 1991). One study reported data of the LSAS-SR and four analysed data of the Social Interaction Anxiety Scale (SIAS, Mattick & Clarke, 1989). Rates of improved and recovered participants varied between 38-56%.

Ten studies evaluated the maintenance of treatment gains. Follow-up periods varied between 3 to 12 months, with most of the studies choosing follow-up periods of 1 year. Treatment gains were stable. The mean within effect size in all ten studies, weighted by sample size, was large with d=1.17. In a study on the long-term benefit of web-based self-help for SAD, Hedman and colleagues (2011a) found that improvements remained stable for up to 5 years after termination of the treatment. Participants attributed 60% of the attained improvement to the Internet-based self-help (Hedman, Furmark, et al., 2011a).

Table 1.1: Trials on Internet-based cognitive-behaviour self-help (ICBT) in SAD

	N (randomised)	*Control group*	*Intervention*	*mean within ES pre-post*	*mean within ES pre-FU*	*mean controlled ES post*	*drop-out at post*	*Clinical change*
Efficacy								
Andersson, et al., 2006	64	WL	Guided ICBT	1,06	1,25	0,74	3%	43%[a]
Andersson, et al., 2012	204	Forum	Guided ICBT	1,09	1,19[e]	0,78	5%	45.1%[a]
Berger, et al., 2009 Berger, et al., 2010	52	WL	Guided ICBT	0,82	1,25	0,76	10%	54,80% [b]
Carlbring, Furmark, et al., 2006	30		Guided ICBT	1,04	1,61	—	13%	—
Carlbring, et al., 2007	60	WL	Guided ICBT	1,08	1,2	1,14	7%	—
Gallego, et al., 2011	41	WL	Unguided ICBT	1,13		0,86	41%	
Tillfors, et al., 2008	38		Guided ICBT	1	1,31	—	5%	47.4%[a]
			Guided ICBT+exp.	1,01	0,98	—		50 %[a]
Tillfors, et al., 2011	19	WL	Guided ICBT	0,98	0,64	1,38	5%	53%[a]
Titov, Andrews, Schwencke, et al., 2008	105	WL	Guided ICBT	1,15	—	0,95	11%	
Titov, Andrews, & Schwencke, 2008	88	WL	Guided ICBT	1,18	—	1,2	11%	
Titov, Andrews, Schwencke, et al., 2009	85	none	Guided ICBT-Tel	1,31	—	—	11%	
			Guided ICBT - Forum	1,54	—	—		
Titov, Andrews, Schwencke, et al., 2010	113		Unguided ICBT	1,1	1,06	—	12%	38% [c]
			Unguided ICBT+MET	0,95	1,07	—		42% [c]

Guided versus Unguided Self-help	*N (randomised)*	*Control group*	*Intervention*	*mean within ES pre-post*	*mean within ES pre-FU*	*mean controlled ES post*	*drop-out at post*	*Clinical change*
Berger, Caspar, Richardson, Kneubühler, et al., 2011	82		Unguided ICBT	1,5	1,58	0,19[+]	7%	55,6%[c]
			Guided ICBT	1,49	1,5			53,8%[c]
Furmark, et al., 2009	138		Unguided ICBT	0,68[d]	0,75[d]	0,09[d,+]	1%	48%[a]
			Guided ICBT	0,88[d]	1,03[d]			36%[a]
Titov, Andrews, Choi, et al., 2008	98		Unguided ICBT	0.33	—	0,66[+]	7%	
			Guided ICBT	1,32	—			
Titov, Andrews, Choi, et al., 2009	168		Unguided ICBT	0,86	—	0,28[+]	12%	
			Guided ICBT	1,15	—			
ICBT versus Face-to-Face Therapy & Effectiveness								
Andrews, Davies, & Titov, 2011	37		Guided ICBT	0,85	—	- 0.11	32%	
			Face-to-face	0,66	—			
Aydos, Titov, & Andrews, 2009	17	None	Guided ICBT	0,77	—	—	35%	
Botella, et al., 2010	127		Unguided ICBT	0,51	1,04	-0,07	39%	
			Face-to-face	0,49	0,99			
Hedman, et al., 2011b	126		Guided ICBT	0,98	1,24	0,23	1%	66%[f]
			Face-to-face	0,83	1,12			55% [f]

Mean within and between group effect sizes are averaged across different social anxiety measures (except [e]) *a:* LSAS-SR: improved according to Reliable Change Index (Jacobson & Truax, 1991) *b:* LSAS-SR improved and recovered (Jacobson & Truax, 1991) *c:* SIAS improved and recovered (Jacobson & Truax, 1991) *d:* mean effect sizes on primary *and* secondary measures *+:* <0: in favour of the guided condition *e*: only LSAS-SR *f*: Clinical Global Impression Scale rated by a clinician

Effectiveness

The efficacy of Internet-based self-help programmes seems to be established. However, these results are limited to the research context with its specific recruitment procedures, specific therapists, and elaborate exclusion criteria. How does Internet-based self-help transfer to the standard clinical routine? Three studies examined the effectiveness of ICBT for SAD differing in the extent to which they assimilated to the clinical routine setting. Two of the studies used standard ways of recruitment. Participants were referred by their general practitioner or psychiatrist (Andrews, et al., 2011; Hedman, Andersson, et al., 2011b). Only one effectiveness study did without detailed inclusion criteria (Andrews, et al., 2011). Two studies employed therapists who not only worked as researchers (Andrews, et al., 2011; Aydos, et al., 2009). All three studies reported acceptable effect sizes for the web-based treatments in routine care. Within effect-sizes based on intention-to-treat analyses varied between *d*=.77-.98. Two studies reported increased drop-out rates between 27-38%. These results imply that Internet-based self-help is effective in clinical routine albeit a substantial proportion of participants do not provide post-assessment data. Furthermore, Andrews et al. (2011) reported that about half of the patients in routine care do not wish to take part in Internet-based treatments. Thirty-eight out of 75 referrals refused to participate in the Internet-based treatment. Hedman et al. (2011b) reported similar proportions. Forty-six per cent of the participants preferred face-to-face therapy whereas 54% preferred the Internet-based treatment.

Internet-based self-help versus face-to-face therapy

The effect sizes reported in Internet-based self-help are consistent or even exceed effect sizes of face-to-face treatments in SAD (see page 10). However, the comparison of effect

sizes derived from different studies is fraught with methodological difficulties. There are three studies directly comparing Internet-based treatments with face-to-face treatments. Hedman et al. (2011b) compared the guided "SOFIE" self-help programme with 15 sessions of cognitive-behavioural group therapy following the manual of Heimberg & Becker (2002). Botella et al. (2010) compared their „Talk To Me" programme with individual psychotherapy addressing the same components as the programme. Andrews et al. (2011) examined the different effects of the "Shyness" programme and a group therapy condition where patients met weekly for four hours. All three comparisons resulted in no significant differences between Internet-based treatments and face-to-face treatments. The average between-group effect size was *d*=.06.

Mechanisms of change in Internet-based self-help

Internet-based self-help programmes and face-to-face therapies seem to lead to a similar rate of improvement in social anxiety. However, this does not necessarily mean that they employ the same mechanisms of change (Kazdin, 2005). The understanding of the role of common mechanisms of change such as the therapeutic relationship clearly has to be re-evaluated in web-based self-help. Other common mechanisms, such as patient expectations, are probably less affected by the difference in setting. Regarding the specific mechanisms of work, the same elements of cognitive-behaviour therapy applied in an Internet-based setting may have very different effects from the ones in traditional therapeutic settings. The following section reviews the existing evidence on predictors and mechanisms of change in Internet-based self-help. The four programmes evaluated for the Internet-based treatment of SAD all incorporate the core elements of cognitive behaviour therapy. They include sessions on psycho-education, cognitive restructuring, and exposure. Most of them also encourage participants to work on self-

focused attention, to prepare for and prevent relapses, to take part in a discussion forum, and to communicate with a therapist on a regular basis.

Psycho-education includes information on the symptoms of SAD, its prevalence, its aetiology and an explanation of its maintaining factors. Andersson, Carlbring, and Furmark (2012) examined whether the use of a self-help programme led to an increase in the knowledge of SAD and whether this increase was associated with therapeutic outcome. They found a small but significant correlation between knowledge and improvement on social anxiety measures.

Cognitive restructuring sessions explain the impact of automatic negative thoughts and their contribution to maintaining social fears. Participants are encouraged to identify and challenge their automatic dysfunctional thoughts using thought records and behavioural experiments. There is no data available about how cognitive restructuring sessions contribute to the overall outcome of Internet-based self-help in SAD.

Sessions on exposure exercises/ behavioural experiments mostly are preceded by the preparation of an exposure hierarchy. Sessions on exposure explain the rationale of exposure and reality testing and mention common obstacles. Participants are then encouraged to conduct self-guided exposure exercises and to document how these exercises affected their social fears and dysfunctional assumptions. There are yet no analyses to estimate the specific effect of the exposure sessions.

Modification of self-focused attention: The role of self-focused attention in the maintenance of SAD is explained and exercises are offered that demonstrate how self-focus attention affects social performance and social fears. Participants are encouraged to pay more attention to the situation and to their interaction partners and to reduce focusing on bodily symptoms and their own performance. There is no empirical

evidence of how modifying one's self-focused attention affects outcome in Internet-based self-help for SAD.

Relapse prevention modules comprise routines of taking stock of any changes during therapy, of setting goals for the future, and of developing strategies to deal with setbacks and relapses. So far, no studies have examined the specific efficacy of relapse prevention modules.

The effect of the overall adherence to these treatment modules has been studied in several trials. Most results suggest that if participants adhered to the treatment protocol and completed more modules they benefited more fully from the treatment (Andersson, et al., 2006; Furmark, et al., 2009; Tillfors, et al., 2008). There is only one study which found no difference in outcome between completers and non-completers (Titov, Andrews, & Schwencke, 2008). In a re-analysis of several Swedish trials on the "SOFIE" programme, Nordgreen and colleagues (2011) reported that adherence predicted outcome in guided self-help programmes but not in unguided programmes.

Communication with a therapist most often takes place weekly via e-mail. Most of the work on mechanisms of change in web-based self-help has focused on the question of guidance. To estimate the amount of required guidance and to examine who should provide this guidance is highly relevant for the wide implementation of Internet-based interventions in routine care. In two studies, Titov and colleagues used technicians and research assistants to provide feedback for the participants. Participants were encouraged and commended, but no clinical advice was given. The trials resulted in good effects for the non-clinician guidance conditions (Titov, Andrews, Choi, et al., 2009; Titov, Andrews, Schwencke, et al., 2009). Andersson et al. (2012) investigated whether experienced CBT therapists yielded better results than advanced psychology students in treating socially anxious patients online. They did not find a difference in therapeutic

outcome, but students needed more time to provide the relevant support. Four studies directly compared guided and unguided self-help approaches. In three programmes, this comparison did not result in any significant differences (Berger, Caspar, Richardson, Kneubühler, et al., 2011; Botella, et al., 2010; Furmark, et al., 2009). In a fourth programme the initial comparison favoured guided self-help (Titov, Andrews, Choi, et al., 2008). However, after enhancing the unguided approach with automatic reminders in a further study, the unguided approach achieved good effects (Titov, Andrews, Choi, et al., 2009). This line of research emphasizes the importance of prompts and reminders in the work with a self-help programme. However, results do not imply that these reminders have to be delivered by trained therapists or that clinician contact is necessary to achieve good outcomes.

Online discussion forums are offered so that participants can share their experiences regarding social anxiety and the treatment programme. Online forums are likely to instigate group therapeutic factors such as universality of suffering and learning from each other (see page 10). Andersson et al. (2012) came to the conclusion that the use of an online discussion forum alone did not lead to substantial change in social anxiety. The authors compared an Internet-based self-help programme (including an online forum) with a control condition where participants were asked to take part in a weekly online discussion forum. The authors reported a large between groups effect size in disfavour of the discussion forum condition. However, as there are yet no studies comparing self-help programmes with and without online discussion forums one cannot draw conclusions on the additional effect of such forums.

Expectancy is the one common mechanism of change that received considerable attention in research on Internet-based interventions. In face-to-face treatments for SAD, expectancy seems an important predictor of treatment outcome (see page 11). In

the Internet-based treatment of SAD, results are not conclusive. Four studies examined the relationship between positive expectations and treatment outcome. Two trials reported no significant correlation between treatment expectancy and outcome measures (Titov, Andrews, Choi, et al., 2009; Titov, Andrews, Schwencke, et al., 2009), whereas two studies identified positive correlations between expectancy and a subset of outcome measures (Titov, Andrews, Choi, et al., 2008; Titov, Andrews, & Schwencke, 2008).

Research questions

In summary, research so far has led to the understanding that Internet-based self-help programmes work for socially anxious patients. The efficacy in research settings is seemingly indubitable. The effectiveness in clinical routine has also been positively evaluated. In its effect sizes as well as in direct comparisons, Internet-based self-help was as effective as face-to-face therapy. However, not all participants benefited from web-based help. Data on clinical change suggests that about sixty to forty per cent of patients in Internet-based self-help did not improve during the course of treatment. These figures emphasize the need to further study the mechanisms that lead to change. Empirical evidence on the specific and common mechanisms that work in Internet-based self-help is still scarce. Research so far suggests that it is helpful to motivate participants to complete the whole treatment programme. Data further supports the beneficial effect of psycho-education. Clinician guidance, on the other hand, does not seem necessary to achieve good outcomes. However, in trials studying unguided self-help, participants were not left without initial guidance and support. Clinician contact was still provided in the diagnostic phase. Its impact on patient expectations, adherence and outcome has not yet been studied. The first two studies of the current thesis focus on the role of clinician contact in the diagnostic phase and examine patient expectations in Internet-based unguided self-help. They aim at answering the following research questions:

How does a pre-treatment diagnostic interview affect the outcome in unguided Internet-based self-help for SAD?

Do patient expectations predict outcome, adherence, and drop-out in unguided Internet-based self-help?

In addition to the examination of mechanisms of change, the proportion of participants who do not improve in Internet-based self-help also implies a necessity to explore novel treatment approaches. There is growing evidence on the efficacy of attention modification programmes in laboratory studies (Hakamata et al., 2010). The beneficial effect of such programmes has strong theoretical support, as biased attention towards social threat cues is thought to be crucial for maintaining social anxiety (see page 5). Attention modification programmes have not yet been studied in an Internet-based setting. The third study of the current thesis explores the efficacy of an Internet-based attention programme and aims at answering the following question:

How efficacious is an Internet-based attention modification programme in treating SAD?

Study 1: Does a pre-treatment diagnostic interview affect the outcome of Internet-based self-help for Social Anxiety Disorder?

Chapter 2

A slightly adapted version of this chapter has been published as Boettcher, J., Berger, T. & Renneberg, B. (2012). Does a Pre-Treatment Diagnostic Interview Affect the Outcome of Internet-Based Self-Help for Social Anxiety Disorder? A Randomized Controlled Trial. *Behavioural and Cognitive Psychotherapy,* 40(5), 513-528.

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Abstract

Numerous studies suggest that Internet-based self-help treatments are effective in treating anxiety disorders. Trials evaluating such interventions differ in their screening procedures and in the amount of clinician contact in the diagnostic assessment phase. The present study evaluates the impact of a pre-treatment diagnostic interview on the outcome of an Internet-based treatment for Social Anxiety Disorder (SAD).

109 participants seeking treatment for SAD were randomised to either an interview-group (IG, *N*=53) or to a non-interview group (NIG, *N*=56). All participants took part in the same 10-week cognitive-behavioural unguided self-help programme. Before receiving access to the programme, participants of the IG underwent a structured diagnostic interview. Participants of the NIG started directly with the programme.

Participants in both groups showed significant and substantial improvement on social anxiety measures from pre- to post-assessment (d_{IG}=1.30-1.63; d_{NIG}=1.00-1.28) and from pre- to 4-months-follow-up assessment (d_{IG}=1.38-1.87; d_{NIG}=1.10-1.21). Significant between-groups effects in favour of the IG were found on secondary outcome measures of depression and general distress (d=0.18-0.42).

These findings suggest that Internet-based self-help is effective in treating SAD, whether a diagnostic interview is involved or not. However, the pre-treatment interview seems to facilitate change on secondary outcomes such as depression and general distress.

Introduction

Internet-based interventions are a promising approach to increase treatment rates and outcomes for several mental health problems (Andersson, Carlbring, & Cuijpers, 2009). The last two decades witnessed a considerable number of trials on Internet-delivered treatments for various mental disorders. Meta-analyses document the overall efficacy of Internet-based interventions for anxiety disorders and depression (Barak, et al., 2008; Spek et al., 2007). The Internet-based treatment of anxiety disorders proved particularly beneficial with a mean controlled effect size of *d*=.97 (Spek, et al., 2007).

Internet-based treatments combine the advantages of low costs, high availability and relative anonymity. Especially for individuals with Social Anxiety Disorder (SAD), Internet-based treatments have the potential to lower the threshold of seeking professional help. SAD is characterized by an intense fear of being criticized, judged or rejected by others. It is one of the most common mental disorders, with an estimated life time prevalence of 12.1% (Kessler, Berglund, et al., 2005). Individuals with SAD avoid situations in which they could be judged by others which can lead to long delays in treatment seeking (Olfson, et al., 2000). On average, individuals with SAD take 16 years to make initial treatment contact (Wang, Berglund, et al., 2005).

To date, four independent research groups have developed and evaluated Internet-based treatments for SAD (Andersson, et al., 2006; Berger, et al., 2009; Botella, et al., 2010; Titov, Andrews, Schwencke, et al., 2008). Numerous randomised controlled trials document the efficacy of this new treatment form in SAD (e.g. Andersson, et al., 2006; Berger, et al., 2009; Botella, et al., 2010; Carlbring, Furmark, et al., 2006; Carlbring, et al., 2007; Titov, Andrews, Johnston, Schwencke, & Choi, 2009; Titov, Andrews, & Schwencke, 2008; Titov, Andrews, Schwencke, et al., 2008; Titov, Andrews, Schwencke, et al., 2010). Long-term effects up to 30 months post-treatment have also been

established (Berger, et al., 2010; Carlbring, Nordgren, Furmark, & Andersson, 2009). The applied interventions mostly consisted of guided cognitive-behavioural self-help programmes. Guided self-help programmes combine psycho-education and exercises with regular feedback from a therapist/clinician or trained assistant. Feedback is most often provided weekly via e-mail or telephone.

The availability and costs of Internet-based treatments highly depend on how much therapist time is needed to ensure the efficacy of a certain programme. In the meta-analysis of Spek et al. (2007) guided treatment programmes yielded higher mean effect-sizes (d=1.00) than unguided programmes (d=.24-.26). Moreover, in interventions without support, the dropout rates were considerably higher than in interventions with support (Spek, et al., 2007). This difference stimulated research to systematically compare guided versus unguided treatment approaches. In the field of Social Anxiety Disorder, five studies directly compared programmes varying in the degree of therapist involvement (Berger, Caspar, Richardson, Kneubuhler, et al., 2011; Botella, et al., 2010; Furmark, et al., 2009; Rapee, et al., 2007; Titov, Andrews, Choi, et al., 2008). The majority of these randomised controlled trials found no differences between guided and unguided self-help programmes and indicate that the amount of therapist involvement is not crucial for the efficacy of Internet-based interventions in SAD (Berger, Caspar, Richardson, Kneubuhler, et al., 2011; Botella, et al., 2010; Furmark, et al., 2009). These results contradict the difference between guided and unguided approaches outlined by Spek and colleagues (2007). However, the studies analysed in Spek's meta-analysis did not only differ in the amount of therapist involvement during the treatment. For instance, in the studies on unguided programmes participants mostly suffered from depression whereas most of the studies on guided approaches investigated anxiety disorders. The need for a therapist could be more pronounced in some disorders (e.g.,

depression) than in others (e.g. anxiety disorders). Studies also differed regarding the screening procedures. In the majority of studies applying unguided self-help, participants underwent no (Clarke et al., 2005; Clarke et al., 2002) or only minimal screening procedures (Christensen, Griffiths, & Jorm, 2004). Trials on guided self-help programmes, on the other hand, applied intense screening methods such as diagnostic interviews (Andersson et al., 2005; Andersson, et al., 2006; Carlbring et al., 2005; Carlbring, Westling, Ljungstrand, Ekselius, & Andersson, 2001; Klein, Richards, & Austin, 2006). Therefore, it is possible that differences in screening methods affect the outcome of Internet-based treatments. Barak et al. (2008) compared studies using open website programmes with studies using closed websites, in which participants were screened before receiving access to the website. Closed website trials yielded significantly better results than open website trials. Marks & Cavanagh (2009) point out that " a few minutes or even seconds of informed contact may catalyse continuation and improvement of computer-aided psychotherapy (CP). […] CP is more likely to be used well if recommended by a trusted healthcare professional" (Marks & Cavanagh, 2009, p. 131). Detailed assessment of the mental health problem ensures the suitability of a certain programme. Moreover, diagnostic interviews may hold further benefits for the participants. For example, in a study on the acceptance of diagnostic interviews, Suppiger et al. (2009) found that diagnostic interviews proved helpful for the patients, that patients felt that they were being taken seriously and that the interview helped to establish a positive relationship between interviewer and interviewee. Minero (1999) also found that the majority of patients rated a structured diagnostic interview as helpful. Thus, diagnostic interviews may positively affect the adherence and the outcome in Internet-based treatments.

In the present study, we explore the impact of a diagnostic interview on the efficacy of an Internet-based unguided self-help programme for SAD using a randomised controlled design. To this end, we compare the benefits of an Internet-based unguided self-help treatment for SAD when delivered with or without a pre-treatment structured interview.

Method

Participants

Participants were recruited through advertisements in regional newspapers and postings in several Internet forums which provided the address of the study's website. The website presented general information about SAD and its treatment as well as an outline of the study. After registering with their e-mail address, participants obtained detailed information on the theoretical background, the goals and the design of the study and were asked to give written informed consent.

Participants who printed, signed, and returned the informed consent form by mail were asked to complete online versions of the outcome questionnaires. Only participants who scored higher than 22 on the Social Phobia Scale (SPS; Stangier, Heidenreich, Berardi, Golbs, & Hoyer, 1999) or higher than 33 on the Social Interaction Anxiety Scale (SIAS; Stangier, et al., 1999) were included in the study (Cut-offs: Stangier & Heidenreich, 1995). We excluded participants in on-going psychological treatment and individuals who indicated suicidal ideation. Potential suicidal ideation was screened for using three items: the suicide item of the Beck Depression Inventory (BDI-II; Hautzinger, Kühner & Keller, 2006) and the question 95 and 96 of the Questionnaire of the Structured Clinical Interview for DSM-IV-Axis II Disorders (SCID-II, Fydrich, Renneberg, Schmitz, & Wittchen, 1997). Questions 95 and 96 refer to former self-mutilations and suicide attempts. Participants who scored ≥1 on the suicide item of the BDI or answered in the affirmative to question 95 or 96 of the SCID-II were contacted by phone and, if necessary, encouraged to contact a local psychiatrist or psychologist.

A total of 668 individuals showed an interest in the study and 217 returned the signed informed consent. Criteria for inclusion were (a) being at least 18 years old, (b) having access to the Internet, (c) a total of >22 on the SPS or a total of >33 on the SIAS, (d) not

participating in any other psychological treatment for the duration of the study, and (e) if on prescribed medication for anxiety/depression, dosage had to be constant for 1 month prior to the start of the treatment.

Out of the 217 participants who signed informed consent, 10 did not complete the social phobia measures (SPS & SIAS), 46 were excluded due to potential suicidal ideation, 37 were in on-going psychological treatment, 8 did not exceed cut-off scores on the SPS or SIAS, 2 were excluded due to unstable medication, and 1 was unwilling to participate due to time restraints (see flow chart in Figure 2.1).

113 participants met all inclusion criteria and were randomly assigned to the interview group (IG, *N*=57) or the non-interview group (NIG, *N*=56). Four participants in the IG were not reached for the telephone interview resulting in an *N*=53 for the IG.

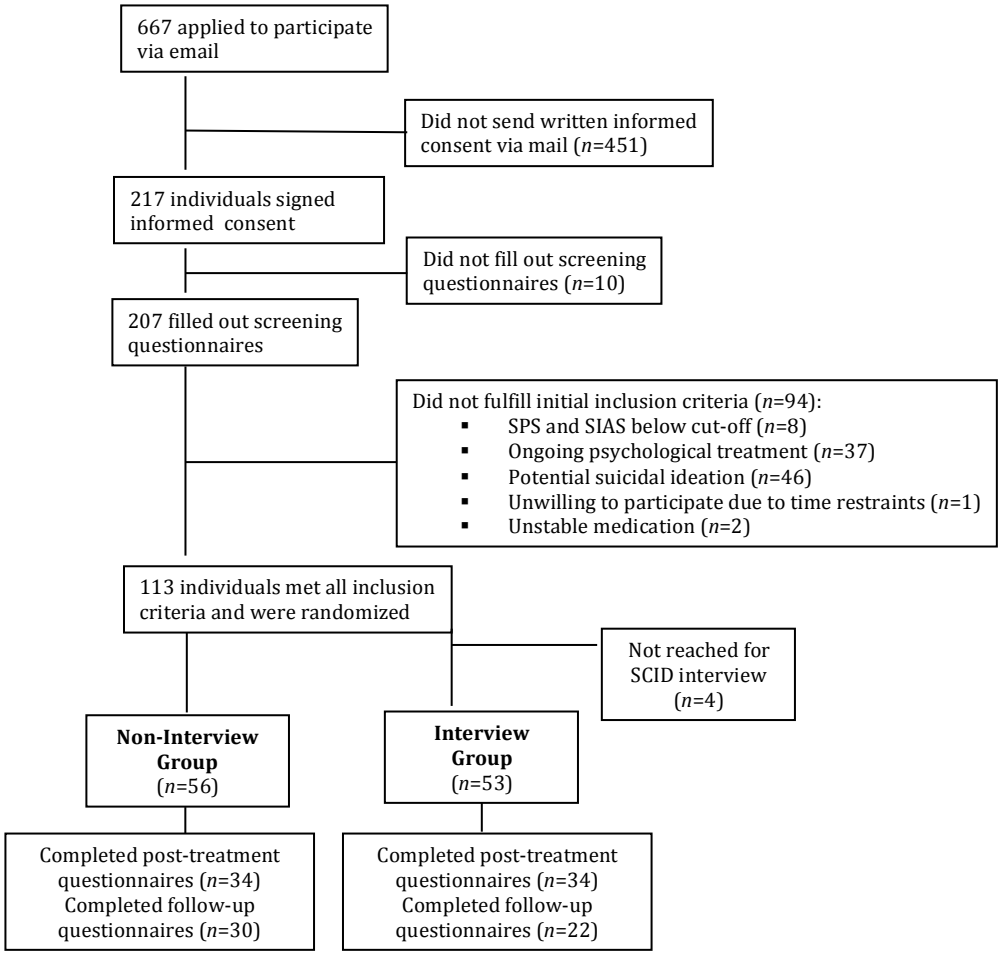

Figure 2.1: Participants' flow

Participants of the study were between 18 and 72 years old. Mean age was 35.1(*SD*=11.27) in the interview group and 35.9 (*SD*=12.69) in the non-interview group. Table 2.1 depicts demographic characteristics as well as mean scores of the outcome measures at pre-assessment. Groups did not differ on demographic variables and on primary and secondary outcome measures at pre-assessment.

Table 2.1: Characteristics of participants at pre-assessment

		IG (*N*=53)	NIG (*N*=56)	test statistics
Demographics	Age (*M, SD*)	35.51 (11.27)	35.91 (12.69)	$t(107)=0.26$; $p=.80$
	Women	28 (52.8%)	32 (57.1%)	$\chi^2(1)=.21$; $p=.70$
	Former psychotherapy	19 (35.8%)	24 (42.9%)	$\chi^2(1)=.56$; $p=.56$
	High level of education	34 (64.2%)	43 (76.8%)	$\chi^2(1)=2.10$; $p=.21$
Outcome measures	SPS (*M, SD*)	38.74 (14.31)	37.43 (14.71)	$t(107)=0.47$; $p=.64$
	SIAS (*M, SD)*	53.79 (12.25)	53.30 (10.90)	$t(107)=0.22$; $p=.83$
	LSAS (*M, SD*)	92.72 (27.74)	88.18 (20.42)	$t(107)=0.98$; $p=.33$
	BDI (*M, SD*)	20.60 (9.95)	20.29 (10.24)	$t(107)=0.16$; $p=.87$
	BSI (*M, SD*)	1.42 (0.64)	1.39 (0.59)	$t(107)=0.24$; $p=.81$
SCID Diagnoses	Social Anxiety Disorder	46 (86.8%)		
	Current Mood Disorder	17 (32.1%)		
	Other Anxiety Disorder	13 (24.5%)		
	Substance Use Disorder	3 (5.7%)		
	Somatoform Disorder	2 (3.8%)		
	Eating Disorder	1 (1.9%)		
	Any comorbid disorder	27 (50.9%)		

Table 2.1 also presents diagnoses for the interview group. Forty-six out of 53 participants in the IG (87%) met the criteria for Social Anxiety Disorder according to DSM-IV. Twenty-seven (51%) of the participants reported at least one other comorbid condition.

Nineteen participants in the interview group (35.8%) and 22 participants in the non-interview group (39.3%) did not complete the post-assessment. Four months after the treatment, 23 persons in the IG (43.4%) and 34 persons in the NIG (60.7%) failed to complete the follow-up-assessment. Drop-out rates did not differ between the two

groups at post-assessment ($\chi^2(1)=0.14$, $p=.84$) and at follow-up-assessment ($\chi^2(1)=3.27$, $p=.09$).

Procedure

The protocol of this study was approved by the Local Ethics Committee of the Faculty of Human Sciences at the University of Bern.

After the pre-assessment, a computer algorithm randomly assigned participants to either the interview group or the non-interview group. Participants in the non-interview group received access to the self-help programme after a delay of 3 days. This delay was chosen to roughly match the average time period between pre-assessment and interview in the IG. Participants in the IG were interviewed by phone using the Structured Clinical Interview for DSM-IV-Axis-I Disorders (SCID-I; Wittchen, Wunderlich, Gruschwitz, & Zaudig, 1997) . Two advanced Masters students in clinical psychology and the two first authors who all had been trained in using SCID-I conducted the interviews. Regardless of the outcome of the interview, participants in the IG received access to the programme immediately after the interview. Interviews lasted between 25 and 100 minutes ($M=47.3$, $SD=14.2$). The length of the interviews was determined by the amount of symptoms described. Lengths were normally distributed ($D(53)=0.11$, $p=.17$) with 50% of the interviews lasting between 39 and 55 minutes.

Intervention

The self-help programme consists of five cognitive-behavioural sessions over 10 weeks. It follows the established cognitive-behavioural model by Clark and Wells (1995) and comprises five largely text-based sessions, several exercises and diaries (e.g. negative thoughts record) and the possibility to participate in an online discussion forum. Table 2.2 describes the five sessions. For a more detailed description see Berger et al. (2011).

Table 2.2: Internet-based cognitive behavioural self-help programme

Session 1: Motivational enhancement	Reasons to initiate change, definition of goals Record of difficult social situations
Session 2: Psycho-education	Information on SAD and its maintaining processes such as negative beliefs, self-focused attention and safety behaviours Development of own individual model of SAD
Session 3: Cognitive restructuring	Identification and modification of dysfunctional assumptions using a thought record
Session 4: Self-focused attention	Various exercises to reduce self-focused attention, e.g. short behavioural experiments
Session 5: Behavioural experiments	Planning and conducting in vivo exposures Record of negative assumptions and their (in)validation in the social situation

Each website and session builds upon the previous one, and users only gain access to the next session if the previous sessions and tasks have been completed. However, as many tasks and exercises are repeated, working with the self-help guide is far from a sequential process. At the end of each session, the importance of repetition and practice is emphasized. Participants have the opportunity to share their experiences with the other participants in various ways. In the diaries, participants are asked if they want to anonymously publish their input in the programme. In addition, participants are encouraged to use a discussion forum. Participants had only access to the input of participants of the same treatment condition.

Outcome Measures

Primary and secondary outcome measures were administered before, immediately after and four months after the treatment. We used the following social anxiety scales as primary outcome measures of the study: the self-report version of the Liebowitz Social Anxiety Scale (LSAS; Baker, et al., 2002; German version: Stangier & Heidenreich, 2003), the Social Phobia Scale, and the Social Interaction Anxiety Scale (Mattick & Clarke, 1989;

German version: Stangier, et al., 1999). Participants were asked to complete the SPS and the SIAS additionally at week 2 and 6 of the intervention.

As secondary outcome measures, we administered the Beck Depression Inventory (Beck, Steer, & Brown, 1996; German version: Hautzinger, Keller, & Kühner, 2006) and the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983; German version: Franke, 2000) to assess depression and general distress. We assessed treatment satisfaction with an 8-item client satisfaction questionnaire (Schmidt, Lamprecht, & Wittmann, 1989) at post-treatment. All outcome measures were administered via the Internet, a procedure that showed adequate psychometric properties (Hedman et al., 2010).

Statistical Analyses

Statistical Analyses were conducted using SPSS 19. All analyses on primary and secondary outcome measures were calculated as intention-to-treat analyses using a linear mixed models approach. Linear mixed models are appropriate to analyse repeated measure data with many drop-outs (e.g. Chan, 2004; Houck et al., 2004). For the SPS and the SIAS, we entered five assessment points (pre-treatment, week 2, week 6, post-treatment, & follow-up) into the analyses. LSAS, BDI and BSI were evaluated at pre, post- and follow-up-assessment. Separate mixed model analyses were conducted for each outcome measure. Results are reported for the models which best fitted the data according to the -2 Log Likelihood fit index. As could be expected in repeated measures, autoregressive covariance structures best fitted the data. For the SPS, the SIAS, and the LSAS, autoregressive covariance structures with homogenous variances proved best. For the BDI and the BSI, autoregressive covariance structures with heterogeneous variances best fitted the data. For the three social anxiety measures (SPS, SIAS, LSAS), alpha levels were Bonferroni corrected (number of comparisons=3, α <.017).

Effect sizes were calculated for the estimated means and standard deviations (*SD=SE×SQRT(N)*) of the ITT sample using Cohen's formula based on pooled standard deviations (Cohen, 1988). Clinical significant change at post- and follow-up assessment was calculated based on the completer sample. Clinical significance was determined for the SPS and the SIAS since these are two of the most widely used social anxiety measures. In a first step, reliable change according to the Reliable Change Index (Jacobson & Truax, 1991) was determined by using re-test reliabilities reported for the German versions of the questionnaires (Stangier, et al., 1999). In a second step, cut-off scores were calculated on the basis of Formula 'c' reported by Jacobson and Truax (1991). Normative data were taken from a German data set (Lincoln, et al., 2003). Based on these assumptions, clinically significant improvement (improved and recovered) for a given participant was defined as showing a pre-post / pre-follow-up change score of 8 or greater and a post /follow-up test score below 21 on the SPS, and a pre-post/pre-follow-up change score of 9 or greater and a post/follow-up test score below 31 on the SIAS.

Results

Adherence

During the ten-week intervention period, participants in the interview group took part in 4.23 (*SD*=1.26) out of 5 modules and completed 83.24% (*SD*=26.47) of the self-help material. Participants in the non-interview group completed on average 4.02 (*SD*=1.54) sessions and 79.13% (*SD*=31.85) of the self-help material. These differences were not significant (*t*(107)=0.73 – 0.77, *p*=.44 - .47). On average, participants in the IG spent 8.65 hours (*SD*=9.96) using the programme. Participants in the NIG spent significantly less time using the programme (*M*=4.23h (3.56); *t*(107)2.99, *p*=.004).

Table 2.3: Observed and estimated means and standard deviations / errors for the Interview Group and the Non-Interview Group

		Observed				Estimated						
		Interview Group		Non-Interview Group		Interview Group		Non-Interview Group		*d within IG*	*d within NIG*	*d IG-NIG*
		M	*SD*	*M*	*SD*	*M*	*SE*	*M*	*SE*			
SPS	Pre	38.74	14.31	37.43	14.72	38.74	1.85	37.43	1.80			
	Post	18.21	11.37	21.62	13.81	18.58	2.12	22.67	2.12	1.39	1.00	0.26
	Follow-Up	16.53	9.69	17.82	11.97	16.48	2.26	19.08	2.48	1.48	1.13	0.15
SIAS	Pre	53.79	12.25	53.30	10.90	53.79	1.70	53.30	1.65			
	Post	31.91	11.50	34.12	14.74	32.01	1.97	35.89	1.97	1.63	1.28	0.27
	Follow-Up	26.93	8.52	33.27	14.80	27.74	2.10	35.01	2.33	1.87	1.21	0.44
LSAS	Pre	92.72	27.74	88.18	20.42	92.72	3.61	88.18	3.52			
	Post	50.62	27.33	54.65	33.02	48.08	4.25	54.58	4.24	1.55	1.15	0.21
	Follow-Up	42.80	23.08	51.09	32.85	42.12	4.63	51.42	5.26	1.67	1.10	0.25
BDI	Pre	20.60	9.95	20.29	10.24	20.60	1.40	20.29	1.36			
	Post	11.41	13.07	14.76	11.05	11.80	1.95	14.37	1.94	0.71	0.47	0.18
	Follow-Up	7.50	7.70	13.18	10.82	7.29	1.49	13.80	1.67	1.27	0.57	0.56
BSI	Pre	1.42	0.64	1.39	0.59	1.42	.09	1.39	.09			
	Post	0.67	0.51	0.91	0.63	.66	.09	.93	.09	1.18	0.70	0.42
	Follow-Up	0.55	0.39	0.78	0.53	.54	.07	.82	.08	1.51	0.93	0.51

Primary outcome measures

Table 2.3 presents observed and estimated means and standard deviations/errors for all outcome measures. Separate mixed model analyses for all social anxiety measures revealed that participants in both groups showed a significant decline of social anxiety from pre- to follow-up-assessment (SPS: $F(274,4)=38.23$, $p<.001$; SIAS: $F(280,4)=74.21$, $p<.001$; LSAS: $F(148,2)=102.19$, $p<.001$). There were no significant between group differences (SPS: $F(117,1)=0.37$ $p=.54$; SIAS: $F(124,1)=1.49$ $p=.22$; LSAS: $F(126,1)=.69$ $p=.41$), nor significant interaction effects of group × time (SPS: $F(274,4)=.96$ $p=.43$; SIAS: $F(280,4)=1.70$ $p=.15$; LSAS: $F(148,2)=2.23$ $p=.11$). Within group effect sizes were large in both groups. Participants reported a substantial improvement in social anxiety from pre- to post-assessment (d(IG)=1.30 - 1.63; d(NIG)= 1.00 - 1.28) and from pre- to follow-up-assessment (d(IG)=1.48 - 1.87; d(NIG)= 1.10 - 1.21). Between group effect sizes were small at post-assessment (d=0.21 - 0.26), and small to moderate at follow-up-assessment (d=0.15 - 0.44) all favouring the interview-group. The CBT self-help programme effectively reduced social fears in both groups. Mixed model analyses did not reveal a significant advantage for the interview group. Nonetheless, effect sizes indicate a trend towards an additional benefit of the pre-treatment telephone interview.

Secondary outcome measures

Depression (BDI): The mixed model analysis showed a significant main effect of time ($F(111,2)=34.74$, $p<.001$), no significant group effect ($F(105,1)=2.52$ $p=.12$) and a significant interaction effect of time × group ($F(111,2)=3.64$ $p=.03$). Participants in the interview group showed significantly more improvement from pre- to follow-up assessment than did participants in the non-interview group (see table 2.3 for means and standard errors). Between group effect sizes were small at post-assessment (d=0.18) and moderate at follow-up-assessment (d=0.56).

General psychopathology (BSI): Results of the mixed model analysis of the BSI indicated a significant decline of general distress from pre- to follow-up-assessment in both groups (main effect of time: $F(119,2)=71.45$, $p<.001$). There was a trend towards a significant group difference ($F(106,1)=3.36$ $p=.07$) which was qualified by a significant interaction effect of time × group ($F(119,2)=3.79$ $p=.03$). The interview group showed more improvement on the BSI from pre- to follow-up-assessment than the non-interview group (see table 2.3 for means and standard errors). Between group effect sizes after the treatment and four months after the treatment were moderate ($d_{Post}=0.42$, $d_{FU}=0.51$).

Clinical change

Clinical improvement and recovery were assessed for the completer sample based on the SPS and the SIAS at post-treatment and at follow-up (see Statistical Analyses). At post-assessment, 21 (61.8 %) participants in the IG and 14 (41.1%) participants in the NIG could be classified as improved and recovered according to the SPS ($\chi^2(1)=2.89$; $p=.15$). The SIAS revealed similar proportions of clinical change in both groups ($N_{IG}=15$ (41.1%), $N_{NIG}=15$ (41.1%); $\chi^2(1)=0.00$; $p>.99$).

At follow-up-assessment, 19 (63.3%) participants in the IG and 13 (59.1%) participants in the NIG classified as improved and recovered according to the SPS ($\chi^2(1)=0.10$; $p=.78$). Based on the SIAS, the proportion of clinically changed participants was significantly higher in the IG ($N=19$ (63.3%)) than in the NIG ($N=7$ (31.8%), $\chi^2(1)=5.04$; $p=.048$).

Treatment satisfaction

After the treatment, participants completed the 8-item client satisfaction questionnaire. The mean score ranged between 1 and 4, with 4 indicating a very high treatment satisfaction. The interview group reported a mean score of $M=3.25$ ($SD=0.42$); the non-

interview group a mean of M=2.89 (SD=0.63). This difference in satisfaction was significant (t(66)=2.81, p=.01) and substantial (d=0.68).

Mediation analysis

To examine whether the amount of time spent using the programme explained change in social anxiety, we conducted a mediation analysis. We hypothesized that the effect of the SCID interview on change in social anxiety would be mediated by the amount of time spent using the programme. To measure change in social anxiety, a composite score of social anxiety measures (SPS, SIAS, LSAS) was calculated. Following the procedures recommended by Rosnow & Rosenthal (1991), and used by Clark et al. (2006), the composite score was generated by converting each social phobia scale across all assessment points to z-scores, and then by averaging across the measures. The mediation analysis was conducted on the completer sample (N=52). We entered group affiliation (IG/ NIG) as the independent variable, simple change scores of the social anxiety composite from pre- to follow-up assessment as the dependent variable, and amount of time spent using the programme as mediator. Following the recommendations of Preacher & Hayes (2008), we applied bootstrapping to estimate the confidence interval of the total indirect effect of group affiliation on change in social anxiety through time spent using the programme. According to this procedure, a variable can be classified as a mediator if the corresponding confidence interval does not include zero. The mediation model explained 25% of the variance in social anxiety change (R^2=.25, F(49,2)=8.20, p<.01). The confidence interval of the total indirect effect did not include zero (*Coeff.* = 0.17, SE=.10, CI: 0.04 – 0.46). The amount of time spent using the programme mediated the effect of the SCID interview on change in social anxiety.

Discussion

The present study evaluated the impact of a pre-treatment structured interview on the efficacy of an Internet-based self-help treatment for SAD. Patients were screened with self-report questionnaires and then randomised to either an interview group or a non-interview group. Results showed no significant differences between the two groups on any of the primary social anxiety measures. Both groups improved substantially from pre- to follow-up-assessment. However, the groups differed significantly on secondary outcome measures. Participants in the interview group were less depressed and indicated less general psychopathology than in the non-interview group after the treatment. It may be that depressive symptoms are particularly sensitive to the contact to a clinician, a notion which is supported by the superiority of guided approaches in the treatment of depression (Andersson & Cuijpers, 2009). Another explanation could be that the diagnostic interview could serve as an intervention in itself. Suppiger et al. (2009) report that two thirds of the clients indicated that the diagnostic interview helped them to better understand their problems. Whereas the self-help programme only targeted symptoms of social anxiety, the diagnostic interview also involved the discussion of depressive symptoms and other symptoms included in our measure of general psychopathology. Thus, the impact of the diagnostic interview could have been especially pronounced in symptom domains only targeted in the diagnostic interview.

Furthermore, our data suggest that the beneficial effect of the pre-treatment interview could also be related to its impact on the subsequent use of the self-help programme. Participants in the interview group spent nearly twice as much time in the programme than participants in the non-interview group. Moreover, the amount of time spent in the programme mediated the relationship between interview and primary outcome. The results suggest that the pre-treatment interview increased the use of the programme

which, in turn, improved the outcome. Hence, a pre-treatment interview could have a direct positive effect on symptoms described during the interview and, at the same time, improve adherence to a subsequent self-help treatment. However, it is not easy to explain why the increased use of the self-help programme was particularly related to an improvement on secondary outcomes such as depression. In the present study, effect sizes of primary social anxiety measures suggest a slight advantage of the interview group even if the difference did not prove significant. This effect was more pronounced at four-months follow-up, indicated by moderate between group effect sizes, and by a significant difference in clinical change assessed by the SIAS (IG: 63.3% vs. NIG: 31.8%). This difference in perceived change of social anxiety may also affect secondary symptoms. A small difference in social anxiety may lead to significant differences in depression and related symptoms. Depressive symptoms are closely related to the concept of hopelessness (Abramson, Metalsky, & Alloy, 1989; Henkel, Bussfeld, Möller, & Hegerl, 2002). Hopelessness, in turn, is likely affected by the amount of change in social anxiety symptoms and the related changes in self-view (e.g. Gibbons et al., 2009). A decrease in social anxiety symptoms may cause a decrease of feelings of hopelessness and thus an alleviation of depressive symptoms. Moreover, it may be hypothesized that the pre-treatment interview and the increased use of the programme positively influence common factors such as the trust in the approach and the expectancy of positive change. Enhanced credibility of the approach and positive expectancies may be responsible for at least part of the improvement on the depression and global symptom measures.

In their influential meta-analysis, Spek et al. (2007) reported differences between guided and unguided self-help programmes. This discrepancy was confounded by differences in the conditions treated (depression vs. anxiety disorder) and by varying

screening methods. The present study does not support the hypothesis that the differences between unguided and guided self-help can be explained by the difference in screening procedures alone. However, the current study also suggests that results of studies on unguided self-help programmes applying pre-treatment interviews cannot be readily generalized to studies using more economic screening procedures. In the field of Internet-based treatments with its ever increasing amount of trials using heterogeneous screening methods, this is an important result.

The findings from this study therefore reignite the question of which screening procedures should best be applied in unguided Internet-based self-help treatments. In favour of the broad dissemination of Internet-based treatments, Marks & Cavanagh (2009) argue for brief effective assessments. In the present study, participants had to exceed cut-off scores on two social phobia measures in order to be included in the study and randomised to one of the groups. Eighty-seven per cent of the participants in the interview group fully met DSM-IV criteria of SAD according to the SCID. Hence, for the large majority of the participants a brief screening with symptom questionnaires seems appropriate, a fact that corresponds with the suggestion of Marks & Cavanagh (2009). However, the better outcome on secondary measures and the higher treatment satisfaction and adherence in the interview group point to the importance of some kind of pre-treatment contact. A promising approach would be the combination of screening questionnaires with a short interview (delivered face-to face or via telephone). The interview should assess main symptoms and additional mental health problems as well as impeding factors such as suicidal ideation. We assessed suicidal ideation with three screening items and excluded all participants who affirmed one of these items. This screening procedure proved far too sensitive as only one of the 46 excluded participants actually indicated suicidal ideas in the subsequent telephone interview. Brief pre-

treatment interviews for all participants could enhance both the sensitivity and the specificity of the screening procedure.

The major limitation of the current study is the high drop-out rate. In both groups, nearly 40% of the participants were lost to post-assessment. This proportion is much higher than those usually reported in unguided self-help trials in SAD (e.g. Furmark, et al., 2009; Titov, Andrews, Choi, et al., 2009). In a study applying the identical self-help programme, Berger et al. (2011) report a drop-out of 3.7% at post-assessment. In contrast to this prior study, the current research design did not include a post-treatment interview. It could be hypothesized that the prospect of speaking with a professional after concluding the treatment enhances the motivation to complete the treatment as well as the post-assessment. In order to strengthen adherence and reduce drop-out we recommend a brief post-treatment interview where symptoms can be re-assessed and further treatment options could be discussed.

In conclusion, the present study supports the overall evidence of unguided self-help programmes in SAD. A pre-treatment interview does not seem to directly affect primary outcome. At the same time, the pre-treatment interview seems crucial to enhance adherence and to facilitate change on secondary symptoms. Future studies should focus on mechanisms of change in Internet-based self-help treatments especially those associated with clinician contact. One focus should lie on the repeated assessment and analysis of common mechanisms of change, such as working alliance, outcome expectations, and experience of mastery. Another focus should constitute the examination of specific mechanisms of change, such as the change in safety behaviours, negative thoughts, or attention processes. The self-help material in Internet-based CBT already contains information on these specific mechanisms of change (e.g. negative

thoughts record). The analysis of this material would constitute a first and very feasible step towards a better understanding of what works for whom in Internet-based, cognitive-behavioural self-help.

Study 2: Patient expectations in Internet-based self-help for social anxiety

Chapter 3

An adapted version of this chapter has been submitted for publication as Boettcher, J., Renneberg, B., & Berger, T. (submitted). Patient Expectations in Internet-based Self-help for Social Anxiety. *Cognitive Behaviour Therapy*.

Abstract

A number of controlled trials have demonstrated the efficacy of Internet-based cognitive-behaviour therapy for treating Social Anxiety Disorder (SAD). However, little is known about what makes those interventions work. The current trial focuses on patient expectations as one common mechanism of change. The study examines whether patients' expectancy predicts outcome, adherence, and drop-out in an unguided Internet-based self-help programme for SAD.

Data of 109 participants in a 10-week self-help programme for SAD were analysed. Social anxiety measures were administered prior to the intervention, at week two, and after the intervention. Expectancy was assessed at week two.

Patient expectations were a significant predictor of change in social anxiety (β=-.35 –.40, all p<.003). Patient expectations also predicted treatment adherence (β=.27, p=.02). Patients with higher expectations showed more adherence and better outcome. Drop-out was not predicted by expectations. The effect of positive expectations on outcome was mediated by early symptom change (from week 0 to week 2).

Results suggest that positive outcome expectations have a beneficial effect on outcome in Internet-based self-help for SAD. Furthermore, patient expectations as early process

predictors could be used to inform therapeutic decisions such as stepping up patients to guided or face-to-face treatment options.

Introduction

Internet-based interventions are a promising new approach to the treatment of mental disorders. A multitude of randomised controlled trials and several meta-analyses demonstrate the efficacy of web-based interventions (e.g. Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010; Barak, et al., 2008; Spek, et al., 2007). While Internet-based treatments seem suitable for various mental disorders, they hold an additional advantage for the treatment of Social Anxiety Disorder (SAD). Individuals with SAD fear situations in which they could be judged or criticised by others. The avoidance of such situations can lead to long delays in treatment seeking (Olfson, et al., 2000; Wang, Berglund, et al., 2005). The distant treatment via Internet may lower the threshold to seek professional help.

Four independent research groups have developed and evaluated four different programmes for treating SAD online in several controlled trials (Andersson, et al., 2006; Berger, et al., 2009; Botella, et al., 2010; Titov, Andrews, Schwencke, et al., 2008). Results are very encouraging with most of the studies reporting large effect sizes for the Internet-based treatment of SAD. In the majority of these studies, treatment consisted of a cognitive behavioural self-help guide plus brief clinician support via email. While meta-analyses including trials on several conditions suggest that human support is important to generate good outcomes (Spek, et al., 2007), there is evidence that unguided self-help may be efficacious in the treatment of SAD when a proper diagnosis is established (Berger, Caspar, Richardson, Kneubuhler, et al., 2011; Titov, Andrews, Choi, et al., 2009). Overall, evidence suggests that Internet-based interventions for SAD work. But what makes them work? And what works for whom? Research on predictors of change and mechanism of work in Internet-based treatments is still scarce (Andersson, Carlbring, Berger, Almlöv, & Cuijpers, 2009).

For traditional face-to-face therapy, Lambert et al. (1986) speculate that only about 15% of the outcome variance can be attributed to specific techniques, 30% are attributed to common factors, and an additional 15% to patient expectations (Lambert, et al., 1986). Weinberger (1995) conceptualizes expectancy as one of five mechanisms of change common to all psychotherapies. Weinberger and other authors emphasize the central role of a credible treatment rationale and the expectancy of improvement as stimulator of hope and agent of change early in the psychotherapy process (for a brief overview see Greenberg, Constantino, & Bruce, 2006). Positive expectations of improvement are also considered as an important part of the early response to psychotherapy (Lambert, 2005). In psychotherapy process research, early response to treatment is a consistent predictor of outcome (e.g. Haas, Hill, Lambert, & Morrell, 2002; Lutz, Stulz, Smart, & Lambert, 2007). The more patients benefit in the first sessions of treatment, the more they seem to improve over the course of therapy. Early symptom change often occurs before the active ingredients of a treatment have been delivered. Positive expectations may explain at least part of this early improvement.

There is some discussion whether treatment credibility and expectancy are distinct constructs as they are highly correlated (e.g. Constantino, Arnkoff, Glass, Ametrano, & Smith, 2011). Treatment credibility refers to how logical, trustworthy and beneficial a treatment seems. Expectancy describes the individual change a client expects in the course of therapy. The most commonly used measure, the Credibility / Expectancy Questionnaire, assesses both constructs and allows the calculation of two subscale scores as well as a total score (Devilly & Borkovec, 2000). Reviews of the empirical evidence most often merge results on credibility and expectancy (Arnkoff, Glass, Shapiro, & Norcross, 2002; Constantino, et al., 2011; Dew & Bickman, 2005; Noble, Douglas, & Newman, 2001). Expectancy and credibility are highly interdependent

(Greenberg, et al., 2006). In our point of view, expectancy and credibility seem to describe two aspects of one construct which we will, in order to simplify, refer to as 'expectancy' or 'expectations'. Constantino et al. (2011) analysed 47 studies and reported a small but significant relationship between expectancy and treatment outcome in traditional face-to-face therapies. A recent study on the cognitive-behavioural treatment of SAD confirms this positive association of expectancy and outcome. Patient expectations explained 16-32% of the outcome variance (Price & Anderson, 2012).

The novel treatment format of Internet-delivered interventions is also new to most of the clients. Treatment expectations could therefore vary widely from exceedingly positive ('innovative, state-of-the-art approach') to very negative ('low budget treatment'). In the Internet-based treatment of SAD, four trials reported correlations of expectancy with treatment outcome. Of these four trials, two reported no significant correlations of treatment expectancy with outcome measures (Titov, Andrews, Choi, et al., 2009; Titov, Andrews, Schwencke, et al., 2009), whereas two studies identified positive correlations between expectancy and a subset of outcome measures (Titov, Andrews, Choi, et al., 2008; Titov, Andrews, & Schwencke, 2008). In a re-analysis of several data sets, Nordgreen et al. (2011) found no significant correlation between expectancy and outcome. However, the authors reported that positive expectations predicted treatment adherence in unguided self-help programmes but not in guided self-help programmes. In the Internet-based treatment of other anxiety disorders, results on the role of expectancies are not consistent either. Some studies reported correlations with outcome measures (e.g. Carlbring et al., 2006; Carlbring, et al., 2005) and others not (e.g. Carlbring, Ekselius, & Andersson, 2003; Titov, Andrews, Robinson, et al., 2009).

Results so far are not conclusive. With the exception of Nordgreen et al. (2011), none of the above mentioned studies included other important predictors such as initial symptom severity or early symptom change. Neither did they examine the association between expectations and adherence or drop-out. Two reviews examined predictors of drop-out and adherence in Internet-based treatments for various mental disorders but did not include data on patient expectations. Melville, Casey, and Kavanagh (2010) reviewed the literature regarding the prediction of drop-out and failed to identify any consistent predictors in Internet-based treatments. Christensen, Griffiths, and Farrer (2009) reported that client variables such as symptom severity and chronicity predicted adherence in some studies but not in others.

Clearly, further research is needed to clarify the role of patient expectancies in Internet-based interventions taking into account the influence of initial symptom severity. The present study investigates whether patient expectations predict outcome, adherence, and drop-out in an Internet-based unguided self-help programme for SAD. It further aims at studying potential pathways that lead from positive expectation to therapeutic outcome, examining the mediating role of early symptom change and adherence.

Method

Procedure and participants

Participants were recruited through advertisement in regional newspapers and postings in several Internet forums providing the address of the study's website. After registering with their email address, participants obtained detailed information and were asked to give written consent. Participants were then requested to complete online versions of the outcome questionnaires. Only participants who scored higher than 22 on the Social Phobia Scale or higher than 33 on the Social Interaction Anxiety Scale were included in the study (SPS & SIAS, Mattick & Clarke, 1989). Criteria for inclusion were a) severe social anxiety according to the SPS & SIAS, b) no suicidal ideation indicated by the Beck Depression Inventory (BDI, Beck, et al., 1996), c) no other on-going psychological treatment, and d) no or stable medication for depression/anxiety 1 month prior to the intervention.

The current sample was initially recruited for a randomised trial investigating the effect of a structured diagnostic interview comparing two groups (Boettcher, et al., 2012). One group underwent the Structured Clinical Interview for DSM-IV-Axis-I Disorders (SCID-I; Wittchen, et al., 1997) prior to the intervention (interview group) whereas the other group started directly with the self-help programme (non-interview group). In summary, the groups did not differ on primary outcome measures after the treatment (Boettcher, et al., 2012).The two groups neither differed in their level of expectancy (interview group: *M(SD)*=5.58 (1.44), non-interview group: *M*(*SD*)=5.21 (1.94); *t(df)*=-1.05(89), *p*=.30). Therefore, results on the predictive value of patient expectations are reported for the total sample.

One hundred and nine participants met all inclusion criteria. Drop-out at post-assessment was considerable, with 41 participants (37.6%) not providing post-

assessment data. Participants of the study were between 18 and 72 years old. Mean age was 36.2 years (*SD*=11.97). Fifty-five per cent of the participants were female. Table 3.1 depicts demographic characteristics, mean scores of the outcome measures at pre-assessment as well as data of adherence for participants who completed post-assessment (completers) and for participants who did not provide post-assessment (non-completers). Completers and non-completers did not differ on demographic variables and on primary social anxiety measures at pre-assessment. On average, completers spent significantly more time using the programme and completed more modules and self-help material than did non-completers.

Table 3.1: Characteristics of completers and non-completers

	Whole sample (*N*=109)		Completer (*N*=68)		Non-completer (*N*=41)		test statistics
	N	*(%)*	*N*	*%*	*N*	*%*	
male	49	45.0	29	42.6	20	48.8	$\chi^2(df)$=.40(1), *p*=.56
single	65	59.6	39	57.4	26	63.4	χ^2(df)=.39(1), *p*=.55
living alone	40	36.7	23	33.8	17	41.5	χ^2(df)=.64(1), *p*=.54
not employed	48	44.0	25	36.8	23	56.1	χ^2(df)=3.89(1), *p*=.07
lower education	32	29.4	24	35.3	8	19.5	χ^2(df)=3.07(1), *p*=.08
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	
Social Phobia Scale (Pre)	38.06	14.47	39.12	15.10	36.32	13.36	*t(df)*=-.98(107), *p*=.33
Social Interaction Anxiety Scale (Pre)	53.54	11.52	53.07	12.36	54.32	10.09	*t(df)*=.53(107), *p*=.60
Expectancy (week 2)	5.39	1.72	5.58	1.67	4.87	1.76	*t(df)*=-1.77(89), p=.08
Time spent using programme	6.42	7.68	8.13	8.79	3.59	4.07	*t(df)*=-3.11(107), p=.02
Modules completed	4.13	1.41	4.70	0.60	3.17	1.80	*t(df)*=-5.30(107), p<.01
% of self-help material completed	81.12	29.30	93.15	13.54	61.18	36.83	*t(df)*=-5.35(107), p<.01

Intervention

Participants took part in a 10-week unguided Internet-based self-help programme (Berger, Caspar, Richardson, Kneubühler, et al., 2011). The programme followed the established cognitive-behavioural model by Clark and Wells (1995). It comprised five sessions, integrating text-based information, exercises, and diaries (e.g., negative

thoughts record). Additionally, participants had the opportunity to share their experiences with the other participants in various ways. For example, in each diary, participants were asked if they wanted to publish their input anonymously. Participants also had the opportunity to take part in an online discussion forum.

Measures

Social anxiety measures were administered pre- and post-treatment. We administered the Social Phobia Scale and the Social Interaction Anxiety Scale (SPS & SIAS; Mattick & Clarke, 1989; German version: Stangier, et al., 1999), as well as the Liebowitz Social Anxiety Scale (LSAS; Baker, et al., 2002; German version: Stangier & Heidenreich, 2003). Two weeks after the start of the programme, outcome expectancy and rationale credibility was assessed by the six-item Credibility Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000; German version: Walach et al., 2008). The CEQ contains two subscales with items 1-3 assessing rationale credibility and items 4-6 measuring outcome expectancies and allows for the calculation of a total score. The SPS and the SIAS were additionally administered two weeks after the start of the intervention in order to capture early symptom change.

Statistical Analyses

The predictive value of expectancy for treatment outcome was analysed in multiple regression models. As drop-out was considerable, we used multiple imputation to estimate the missing values of the outcome variables. We entered all available variables (target and auxiliary variables) into the imputation model that correlated significantly either with social anxiety measures at post-assessment or with drop-out at post-assessment (Spratt et al., 2010). Post-treatment scores on the SPS, the SIAS, and the LSAS were entered as dependent variables into three regression analyses. Pre-treatment scores of these variables were entered as a predictor into the regression analyses.

Patient expectations, assessed by the CEQ at week 2, were entered as second predictor in each regression model. The CEQ subscales correlated highly with each other (r=.83, p<.01) and with the total score (r=.95-.96, p<.01). We conducted all regression analyses with the CEQ total score. Alpha levels were corrected for multiple comparisons (α=.05/3=.017).

To predict treatment adherence, a multiple regression analysis was calculated. As recommended by Donkin (2011), we computed an adherence composite score, derived of three measures of adherence: total time spent using the programme, modules completed, and percentage of self-help material completed. The adherence composite was calculated by first standardizing and then summing the three adherence measures. To assess initial symptom severity across all three measures of social anxiety, we calculated a social anxiety composite score. Following the procedures recommended by Rosnow and Rosenthal (1991) and applied by Clark et al. (2006), the composite score was generated by converting each social phobia scale across both assessment points to z-scores, and then by averaging across the measures. Expectancy and initial symptom severity, assessed by the social anxiety composite score at pre-treatment, were entered as predictors.

The predictive value of expectancy for drop-out at post-assessment was estimated by a logistic regression analysis using expectancy and initial symptom severity as predictors.

Results

Preliminary analyses: outcome and expectancy

On average, participants benefited of the training and indicated to be less socially anxious after the intervention compared to baseline. Assessed by the social anxiety composite score and based on the completer sample, this improvement was significant and substantial ($F(1,87)=143.67$, $p<.001$, $d=1.67$). A more detailed description of the therapeutic outcome of the self-help programme is provided in a previous article (Boettcher, et al., 2012). Two weeks after the start of the programme, the average participant rated his or her expectancy with 5.39 ($SD=1.72$) on a scale from 1-9, with 9 indicating the highest possible expectancy.

Prediction of outcome

Table 3.3 presents the results of the regression analyses. On all three social anxiety measures, patient expectations significantly predicted treatment outcome (SPS: $\beta=-.40$, $p=.001$; SIAS: $\beta=-.35$, $p=.002$; LSAS: $\beta=-.36$, $p=.002$). More positive expectations were associated with lower post-treatment symptom scores. In addition, initial symptom severity predicted treatment outcome (SPS: $\beta=.41$, $p<.001$; SIAS: $\beta=.41$, $p<.001$; LSAS: $\beta=.33$, $p=.001$).

The analysed sample comprised two conditions: the interview group and the non-interview group. To check for any potential differences between the two groups, we ran all regression analyses with group affiliation as an additional predictor. Group affiliation was no significant predictor in any of the regression models and did not affect the results on the other predictors.

Table 3.2: Prediction of outcome, adherence, and drop-out

Dependent Variables		Predictors	*B*	*SE B*	*β*	*p*	*Model*
Outcome pre-post	SPS	*Constant*	7.00	3.86			R^2=.25
		Expectancy	-1.02	0.30	-.40	.001	
		SPS (pre-treatment)	0.37	0.09	.41	<.001	
	SIAS	*Constant*	8.71	6.38			R^2=.24
		Expectancy	-0.91	0.28	-.35	.002	
		SIAS (pre-treatment)	0.47	0.18	.41	<.001	
	LSAS	*Constant*	16.15	12.09			R^2=.24
		Expectancy	-2.40	0.76	-.36	.002	
		LSAS (pre-treatment)	0.42	0.12	.33	.001	
Adherence composite		*Constant*	0.69	0.25			R^2=.08
		Expectancy	0.09	0.04	0.27	.02	
		Social Anxiety Composite (pre)	0.18	0.28	0.07	.51	
			B	**SE**	**OR (95% CI)**	*p*	
Drop-out		*Expectancy*	-0.07	0.05	.93 (.84-1.03)	*.19*	R_N^2=051
		Social Anxiety Composite (pre)	-0.30	0.39	.74 (.35-1.60)	.45	
		Constant	-1.03	0.38			

SPS: Social Phobia Scale, SIAS: Social Interaction Anxiety Scale, LSAS: Liebowitz Social Anxiety Scale

Prediction of adherence and drop-out

Results of the regression analysis on the prediction of treatment adherence are presented in table 3.3. Data showed that expectancy significantly predicted treatment adherence (β=.27, p=.02). Initial symptom severity, as assessed by the social anxiety composite score, did not predict treatment adherence (β=.07, p=.51). Entering group affiliation as an additional predictor did not alter these results.

Results on the prediction of drop-out are summarized in table 3.3. Expectancy and initial symptom severity did not predict drop-out at post-assessment. These results were not modified with group affiliation as an additional predictor.

Mediation analysis

To examine potential ways in which expectancy could influence treatment outcome, we conducted a mediation analysis. We hypothesized that the effect of expectancy on

change in social anxiety could be mediated by early symptom change and by treatment adherence. We conducted two mediation analyses using residual gain scores on the SPS and the SIAS as dependent variables. Residual gain scores capture an individual's gain adjusted by his or her pre-score. Residual gain scores were calculated by subtracting a post-score predicted by the pre-score from the observed post-score. Negative residual gain scores indicate that a person changed more than would be expected by the baseline measure. In each mediation analysis, we entered the CEQ total score as independent variable, the adherence composite score and the early symptom change score on the SPS or SIAS as mediators. Early symptom change was measured by simple change scores from pre-assessment to week-2-assessment on the SPS and the SIAS. Figure 3.1 illustrates the mediation model for the prediction of the residual gain on the SPS at post-assessment.

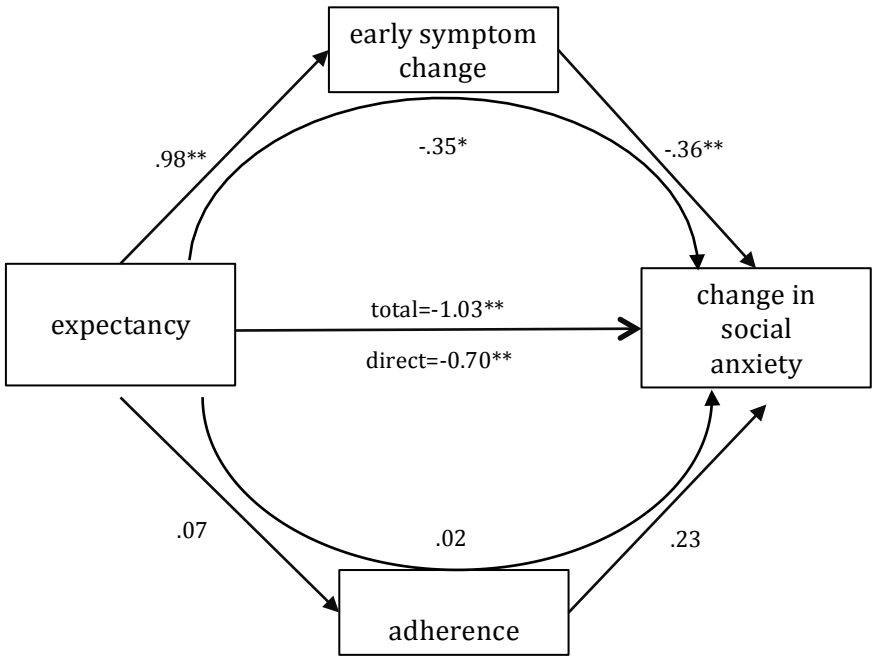

Figure 3.1.: Mediation model

Following the recommendations of Preacher and Hayes (2008), we applied bootstrapping to estimate the confidence intervals of the indirect effects of expectancy on change in social anxiety through adherence and early symptom change. According to this procedure, a variable can be classified as a mediator if the corresponding confidence interval does not include zero. As table 3.3 shows, early symptom change was a significant mediator of the relationship between expectancy and outcome at post-assessment. The corresponding confidence intervals did not include zero. In contrast, treatment adherence did not classify as a mediator in any of the analyses.

Table 3.3: Mediators of the relationship of expectancy and change in social anxiety

			Coeff.	*SE*	*p*	*Lower*	*Upper*
Outcome Pre-Post	SPS[a]	Direct effect	-0.70	0.26	0.01		
		Indirect through adherence	0.02	0.06	0.76	-.10	.15
		Indirect through early symptom change	-0.35	0.15	0.02	-0.82	-0.09
	SIAS[b]	Direct effect	-0.55	0.27	0.04		
		Indirect through adherence	0.03	0.06	0.63	-.06	.20
		Indirect through early symptom change	-0.51	0.18	0.00	-.95	-.22

SPS: Residual Gain Score on the Social Phobia Scale; SIAS: Residual Gain Score on the Social Interaction Anxiety Scale
a: R^2=0.32, F(60,3)=10.81, p< .001; b: R^2=.35, F(60,3)=12.22, p<.001

Discussion

The present study aimed at clarifying the role of treatment expectancies in Internet-based self-help for individuals with SAD. The results suggest that positive expectancies promoted change in social anxiety. Patient expectations also significantly predicted treatment adherence. Patients with higher expectations invested more time and effort in the treatment.

Frank (1961), who positioned outcome expectancies at the core of therapeutic change processes, describes a virtuous circle of positive expectancies, enhanced self-efficacy and perceived improvements. The patient first comes to therapy in a demoralised state with beliefs like “I will never be able to speak in front of others”. The beginning of therapy and the expectation of improvement alter his/her beliefs “This programme is going to help me. I will overcome my anxiety.” These beliefs positively influence the performance in social situations and lead to first symptomatic improvements, which, in turn, confirm and enhance the positive outcome expectations. The results of the present study support the hypothesis of a beneficial interplay of expectation of improvement and early symptom alleviation. Early symptom change proved a significant mediator of the relationship between expectancy and outcome. One could hypothesize that high expectations lead to first improvements which, in turn, lead to a better outcome after the treatment. At the same time, the mediation analyses also showed a significant direct effect of expectancy on outcome, suggesting that positive expectancies also enhance treatment outcome directly, independent of their impact on early symptom change and adherence. The significant direct effect could be interpreted as an independent, enduring effect of expectancy on treatment outcome. It could also include the influence of other predictors or mediators not assessed in the current study. Taken together, the

present results suggest two possible pathways on which expectancy can influence treatment outcome, one mediated by early symptom change and one direct path.

Until now, only very few studies on Internet-based treatment in SAD reported data on expectancy. Results are not conclusive and are confounded by several differences in the applied programmes, including the amount of clinician guidance. In an elaborate analysis of predictors, Nordgreen et al. (2011) reported differences between guided and unguided self-help programmes. Expectancy was a significant predictor of adherence in unguided but not in guided programmes while the level of expectancy did not differ between the two conditions. The results of the present study support the findings of Nordgreen and colleagues (2011) on treatment adherence in unguided self-help programmes. At the same time, they contrast the finding of this previous report regarding the prediction of treatment outcome. Nordgreen et al. (2011) could not detect any significant effects of patient expectations on treatment outcome. However, the authors assessed treatment outcome as a dichotomous variable (diagnosis-free-status). As the current study applied a continuous outcome measure, findings are difficult to compare.

Mechanisms of change are likely to differ to some degree between guided and unguided self-help programmes. Frank (1961) states that in traditional face-to-face therapies the association between expectations and outcome is mediated by the therapeutic relationship. The interaction of treatment alliance and outcome expectations has been the focus in recent research. Several studies confirmed the mediating role of the working alliance in the association of expectancy and outcome (Abouguendia, Joyce, Piper, & Ogrodniczuk, 2004; Gaudiano & Miller, 2006; Joyce, Ogrodniczuk, Piper, & McCallum, 2003; Meyer et al., 2002). The influence of working alliance is one potential difference

between guided and unguided self-help programmes. It is therefore possible that the effect of expectancy on outcome may be different in guided and unguided treatments.

The influence of the working alliance is one possible explanation for the conflicting results on treatment expectancies in Internet-based interventions differing in the amount of clinician guidance. At the same time, the studies reporting data on expectancy also differed regarding the time of the assessment. In several studies expectancy was assessed prior to the intervention (Titov, Andrews, Choi, et al., 2009; Titov, Andrews, Choi, et al., 2008; Titov, Andrews, & Schwencke, 2008; Titov, Andrews, Schwencke, et al., 2009) whereas Furmark et al. (2009) assessed outcome expectancies after one week of treatment. The current study evaluated outcome expectancies at week two of the intervention allowing the participant to form stable expectations about this new treatment format.

The present study demonstrates that the promotion of positive expectancies is of high relevance in the application of unguided Internet-based self-help. The level of expectancy was roughly comparable to former studies in Internet-based self-help (e.g. Furmark, et al., 2009) with participants being rather confident that the treatment will lead to change. Still, expectancy ratings were not excellent and showed room for improvement. A professional website, the provision of a credible treatment rationale, information on the rates of improvement in former trials or the description of a former participant benefitting of the treatment are some possible ways to further positive outcome expectancies. Patient expectations could also be promising for informing therapeutic decisions early in the treatment process. Patients with low expectations two weeks after the start of the programme could immediately be stepped up to a more intensive treatment such as a guided or face-to-face approach.

Future research should focus on theoretical models of the interplay of outcome expectations with other common predictors, such as working alliance and adherence as well as with specific techniques applied in Internet-based treatments. Testing theoretical models with complex statistical methods would require larger sample sizes than in the present study. Our sample size was reduced by the high drop-out rate. Drop-out rates of 37% at post-assessment are not typical for Internet-based self-help programmes. For example, Berger et al. (2011) applied the same unguided self-help programme and reported a drop-out rate of 3.7%. The high drop-out rate is the central limitation of this study. At the same time, the high proportion of non-completers allowed us to examine potential predictors of early termination. Another limitation of the current study is the one-time assessment of outcome expectations. Repeated assessments of several potential predictors could shed light on the interaction of expectancy, early symptom change, working alliance and outcome. The present study constitutes an important first step to an understanding of the role of patient expectations in Internet-based interventions. Future studies on expectations and other common and specific mechanisms of change will further our understanding of predictors and mechanisms of change in Internet-based self-help.

Study 3: Internet-based attention training for Social Anxiety Disorder

Chapter 4

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Abstract

Several studies suggest that computer-based attention modification programmes can be a promising new approach for the treatment of various anxiety disorders, including Social Anxiety Disorder (SAD). The current study investigates the efficacy of a four-week Internet-delivered version of an attentional training for SAD in a randomised controlled double-blind trial.

Sixty-eight individuals seeking treatment for SAD were randomly assigned to either an attention training group (ATG, *N*=33) or a control group (CG, *N*=35). Participants of the ATG completed modified dot-probe tasks designed to facilitate attentional disengagement from threat. Participants in the CG completed control dot-probe tasks. At post-assessment, participants in both groups showed significant symptom reductions with medium to large within-group effect sizes on social anxiety measures (ATG: Cohen's *d*=0.47-0.80; CG: *d*=0.56-0.63). However, no significant differences between groups were found at post-treatment for any outcome measure. These findings will be discussed along with the results of a 4-month follow-up assessment.

Introduction

Social Anxiety Disorder (SAD) is characterized by an intense fear of being criticized, judged or rejected by others. It is one of the most common mental disorders, with an estimated lifetime prevalence of 12.1% (Kessler, Berglund, et al., 2005). Untreated, SAD most often takes a disabling and chronic course with mean durations of illness of 10-29 years (Keller, 2003).There are effective psychological treatments for SAD, cognitive-behavioural therapies (CBT) in particular (Rodebaugh, et al., 2004). Delivered in a group or individual setting, CBT usually involves 12-16 sessions with trained and supervised therapists (e.g. Clark, et al., 2006; Heimberg et al., 1998).

Recently, two randomised controlled trials presented striking results on a short-term, computer-based intervention for SAD. Schmidt, Richey, Buckner, & Timpano (2009) and Amir et al. (2009) applied an attention modification programme based on the dot-probe paradigm. After only eight 20-minutes sessions, both studies found substantial improvement in social anxiety. In Schmidt et al.'s trial, 72% of the subjects in the attention modification group did no longer meet criteria for SAD at post-assessment, compared to 11% of the participants in the placebo condition. Accordingly, Amir et al. (2009) reported proportions of 50% in the attention training group and 14% in the control condition. Moreover, in this study, the change of attention processes was identified as a mediator of change in social anxiety.

The computerized attention training programmes aim to target biases in information processing which are thought to be crucial to the maintenance of anxiety disorders including SAD (Clark & Wells, 1995; Rapee & Heimberg, 1997). Cognitive models of SAD emphasize the importance of biased attention and interpretation processes in social situations. Empirical studies show that individuals with SAD tend to interpret ambiguous social interactions as negative and mildly negative interactions as

catastrophic (e.g. Amir, Foa, & Coles, 1998; Constans, Penn, Ihen, & Hope, 1999; Stopa & Clark, 2000). Furthermore, patients with SAD allocate their attention to potential social threat cues. These can be either internal cues such as bodily anxiety symptoms and negative self-representations or external cues in the social environment (Rapee & Heimberg, 1997).

Selective attention towards external threat cues has been investigated in many studies using different experimental paradigms. Most studies applied either the emotional Stroop or the dot-probe paradigm. Consistently, findings of the emotional Stroop test showed higher response latencies for social threat words compared to neutral words suggesting an impaired ability to disengage attention from threat (e.g. Hope, Rapee, Heimberg, & Dombeck, 1990; Lundh & Öst, 1996; Maidenberg, Chen, Craske, & Bohn, 1996; Mattia, Heimberg, & Hope, 1993). A recent eye-tracking study confirmed a prolonged disengagement from threat in social anxiety (Buckner, Maner, & Schmidt, 2010).

Results of the dot-probe paradigm are more mixed. In this paradigm, two stimuli (e.g. one neutral and one social threat word) are simultaneously displayed on a screen for a certain length of time. Immediately afterwards, a probe appears in the location of one of the stimuli. Subjects are asked to respond to the probe (by pressing a button on the keyboard) as quickly as possible. Faster responses to probes in the location of the social threat word compared to responses to neutral words indicate a biased attention towards threat. Studies applying the dot-probe paradigm vary regarding the stimulus type (words vs. faces), the length of presentation (80ms, 200ms, 500ms, >1000ms), and the population under study (subclinical vs. clinical socially anxious). Not surprisingly, studies have produced inconsistent results.

Most studies present stimuli for 500ms. Of these, at least four studies found that socially anxious individuals reacted faster to social threat than to neutral cues (Using words as stimuli: Asmundson & Stein, 1994; Musa, Lepine, Clark, Mansell & Ehlers, 2003; Using faces as stimuli: Helfinstein, White, Bar-Haim & Fox, 2008; Mogg, Philippot & Bradley, 2004) . On the other hand, four studies revealed no attention bias towards threat cues (Using words: Horenstein & Segui, 1997; Roberts, Hart & Eastwood, 2010; Using faces: Bradley, Mogg & Lee, 1997; Pineles & Mineka, 2005) . Two studies revealed an attention bias away from threat at an exposure time of 500ms (Using faces: Chen, Ehlers, Clark, & Mansell, 2002; Using words: Vassilopoulos, 2005). In the study of Pishyar, Harris & Menzies (2004) socially anxious individuals showed a biased attention towards threat faces but not towards threat words.

At shorter presentation times of less than 200ms, three studies revealed an attention bias towards threat cues (Using words: Roberts et al., 2010; Vassilopoulos, 2005; Using faces: Mogg & Bradley, 2002). At presentation times of 1000ms or more, patients with SAD showed no attention bias (Using faces: Gotlib, Krasnoperova, Yue, & Joormann, 2004; Using words: Musa, et al., 2003).

In summary, the findings of the dot-probe and other paradigms suggest that socially anxious individuals differ from non-anxious controls in attention to social threat information. Results of dot-probe studies suggest that there is some evidence of an attention bias towards threat early in cue detection (≤ 500ms) but no attention bias at longer presentation times (>500ms). Fewer studies suggest that there may be an attention bias away from threat at 500ms, supported by an eye-tracking study revealing initial and sustained attentional avoidance of social threat faces (Mühlberger, Wieser, & Pauli, 2008).

Negatively biased attention processes are one potential maintaining factor for SAD. Schmidt et al. (2009) and Amir et al. (2009) demonstrated that it is possible to modify this factor and that this modification leads to a decrease of social anxiety. On self-report measures of social anxiety, Schmidt et al. (2009) found a controlled effect size of d=0.35 at post-treatment and of d=0.52 at follow-up. Amir et al. (2009) reported a controlled effect size of d=1.59 at post assessment. These effect-sizes range within or even exceed effect sizes reported in meta-analyses of complex cognitive-behavioural treatments (CBT). CBT yielded controlled effect sizes of d=0.74-0.86 when compared to wait-list and of d=0.34 when compared to psychological placebo (Gould, et al., 1997; Powers, et al., 2008).

At present, cognitive-behavioural therapies are the treatment of choice. However, not all patients respond to these treatments. Rodebaugh et al. (2004) conclude that about one sixth of the treated patients with SAD do not improve. And this proportion only applies to patients who actually enrol in treatment. Other data suggest that the majority of patients with SAD do not seek treatment (Keller, 2003). An Australian study showed that only about one third of patients with SAD consult a mental health professional and only 39.4% receive effective treatment defined as CBT or medication (Issakidis & Andrews, 2002). On average, individuals with SAD take 16 years to make initial treatment contact (Wang, Berglund, et al., 2005). Among other reasons, this long delay of treatment seeking may be due to one inherent factor of social anxiety – the fear of being negatively evaluated – and the avoidance of such situations (Olfson, et al., 2000).

Internet-based interventions address some of the potential factors underlying the low treatment rate in SAD. The easy access and the anonymity of Internet-based interventions facilitate seeking treatment especially for individuals with SAD. There is culminating evidence for the acceptability and effectiveness of Internet-based

interventions in SAD (e.g. Andersson, et al., 2006; Berger, et al., 2009; Carlbring, Furmark, et al., 2006; Carlbring, et al., 2007; Titov, Andrews, & Schwencke, 2008; Titov, Andrews, Schwencke, et al., 2008). Most online interventions for SAD consist of guided cognitive-behavioural self-help programmes. However, not all patients with SAD respond to CBT, neither in face-to-face settings nor in Internet-based approaches. For instance, Berger et al. (2011) report recovery rates between 52.2% and 58.3% in an Internet-based CBT intervention. Computer-based attention trainings may further improve the efficacy of treatments for SAD.

The goal of the present study is to combine the advantages of Internet-delivered interventions with the innovative approach of attention modification. Programmes of attention modification seem to be especially fit to be adapted for the Internet. They are computer-based and do not require regular therapist contact. If positive results of the attention modification programme could be replicated in an Internet-based adaptation, it would promise a low-threshold, low-cost and highly available intervention for SAD. To evaluate the efficacy of an Internet-based attention training we compared an attention modification condition to a control condition in a double-blind randomised design. We examined the following hypotheses:

1) Participants in the attention modification condition show lower levels of social anxiety at post-treatment compared to the control condition.

2) Participants in the attention modification condition show lower levels of depression and general psychopathology at post-treatment compared to the control condition

3) The attention modification condition leads to a greater reduction of the attention bias from pre- to post-assessment compared to the control condition.

Method

Participants

Participants were recruited through advertisement in regional newspapers in Germany and Switzerland and through postings in several Internet forums. Advertisements and postings described a scientific study evaluating a cost-free, innovative Internet-based treatment for SAD and provided the address of the study's website. The website gave information on SAD in general and on the study in particular. After registering with their e-mail address, participants obtained detailed information on the theoretical background, the goals and the design of the study and were asked to give written consent. Participants were advised that the study aimed at modifying biased attention processes typical for individuals with social anxiety. No detailed rationale of the attention training was given. Subjects did not receive any kind of monetary compensation for participation in the study.

The selection of participants followed two steps. First, we administered two self-report measures of social anxiety. Only subjects who scored higher than 22 on the Social Phobia Scale or higher than 33 on the Social Interaction Anxiety Scale were included in the study (SPS & SIAS; Stangier, et al., 1999). Second, we conducted clinical interviews via telephone to ascertain a primary diagnosis of SAD. All participants were interviewed using the Structured Clinical Interview for DSM-IV – Axis I disorders (SCID-I; Wittchen, et al., 1997). Subjects who fulfilled the criteria for any other disorder were asked whether social anxiety was their primary concern. Additionally, the Avoidant Personality Disorder (APD) section of the SCID-II (Fydrich, et al., 1997) was administered. Two advanced master students in clinical psychology and the first and second author conducted the interviews. All interviewers had been trained in using the SCID-I. To date, there are no German studies assessing the psychometric properties of

the Structured Clinical Interview for DSM-IV. In other studies of our research group, the German version of the SCID showed good to excellent reliability (Renneberg, Theobald, Nobs, & Weisbrod, 2005). The high reliability and validity of the Structured Clinical Interview for DSM-III-R has been demonstrated in two German studies (Saile, Weiland-Heil, & Schwenkmezger, 2000; Wittchen et al., 1991).

We administered the Beck Depression Inventory (BDI-II; Hautzinger, et al., 2006) to identify participants with suicidal ideation. A score of ≥1 on the suicide item of the BDI led to a detailed assessment of suicidal tendencies by phone. Suicidal participants were referred to local psychiatrists or psychotherapists and subsequently excluded from the study.

A total of 327 individuals applied to participate and 93 returned the signed informed consent. Criteria for inclusion were (a) being at least 18 years old, (b) having access to the Internet, (c) a total of >22 on the SPS or a total of >33 on the SIAS, (d) not participating in any other psychological treatment for the duration of the study, (e) if on prescribed medication for anxiety/depression, dosage had to be constant for 1 month prior to the start of the treatment and (f) meeting diagnostic criteria for a primary diagnosis of social anxiety disorder according to the SCID.

Out of the 93 participants who signed informed consent, 5 did not complete the social phobia self-report measures, 4 did not exceed cut-off scores on the SPS or SIAS, 6 were in an on-going psychological treatment, 1 was unwilling to participate due to time restraints, and 1 could not be reached for the SCID interview. Out of the 76 persons that underwent the SCID interview, 8 were excluded after the interview (see flow chart in Figure 4.1). Sixty-eight participants met all inclusion criteria and were randomly assigned to the attention training group (ATG, *N*=33) or the control group (CG, *N*=35). One participant in the attention training condition and 3 participants in the control

condition did not complete the post-assessment. Another two in the active group and one other participant in the control group were unavailable for the post SCID interview. Four months after the training, 10 persons in the active group (30.3%) and 12 persons in the placebo group (34.3%) failed to complete the follow-up assessment. The amount of drop-outs did not differ between the two groups at post-assessment ($\chi^2(1)=0.10$, $p=.54$) or at follow-up ($\chi^2(1)=0.12$, $p=.46$).

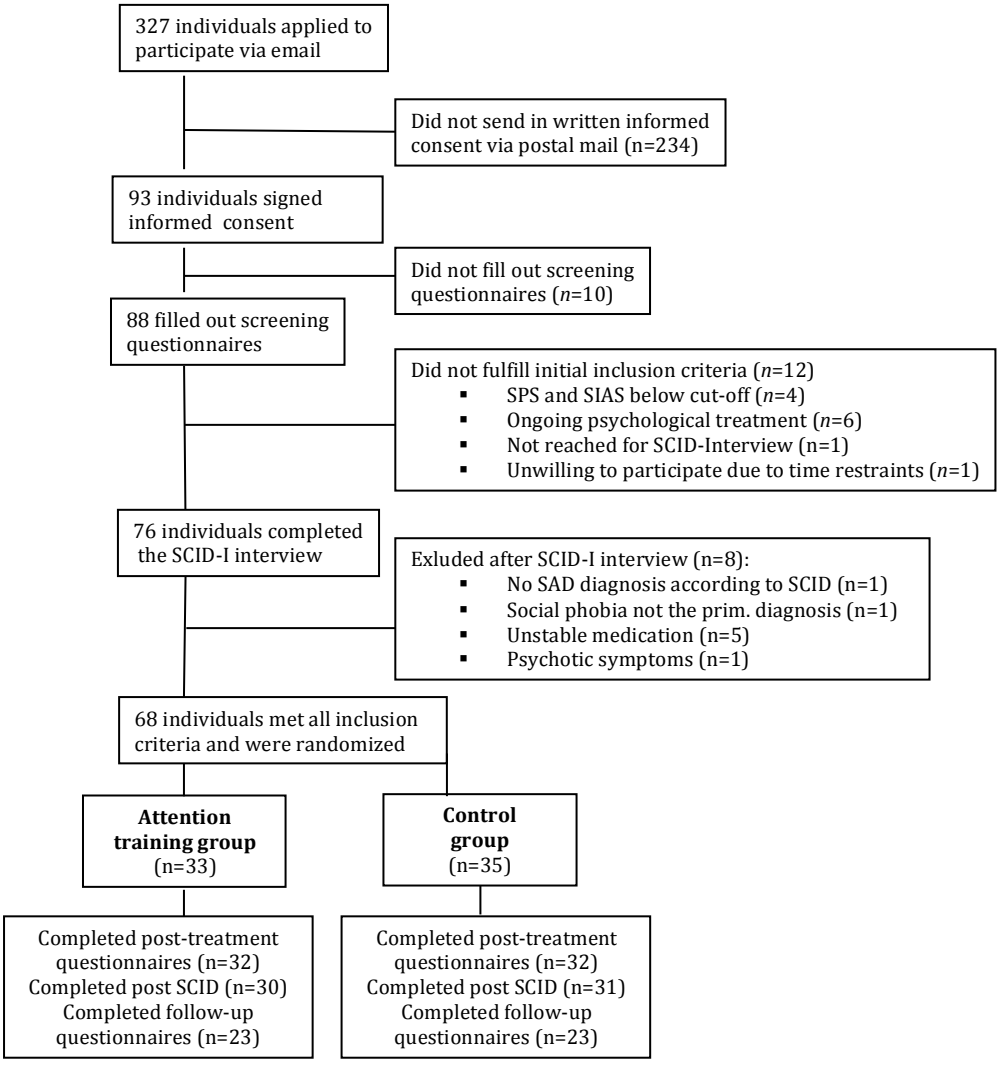

Figure 4.1: Participants 'flow

Participants of the study were between 18 and 69 years old. Mean age in the attention training group was 38.3 years (*SD*=9.54) and 37.5 years (*SD*=12.38) in the control group. The majority of participants in both groups were men. Groups did not differ on any assessed demographic variable. Table 4.1 presents demographic characteristics, comorbid disorders, and scores on primary and secondary outcome measures at pre-assessment. Groups did not differ regarding social anxiety measures, depression and general psychopathology.

Table 4.1: Characteristics of participants and co-morbid disorders at pre-assessment

		Attention Training	**Control Condition**	
		***N*=33**	***N*=35**	**test statistics**
M (SD) Age		38.3 (9.54)	37.5 (12.83)	$t(66)=0.31$; $p=.75$
N (%) Male		21 (63.64)	22 (62.86)	$\chi^2(1)=0.004$; $p>.99$
N (%) Higher Education		23 (68.70)	19 (54.29)	$\chi^2(1)=1.71$; $p=.22$
N (%) Living Alone		10 (30.30)	14 (40.00)	$\chi^2(1)=0.70$; $p=.45$
N (%) Former Psychotherapy		12 (36.36)	16 (45.71)	$\chi^2(1)=0.61$; $p=.41$
N (%) On Stable Medication		0 (0)	4 (11.43)	$\chi^2(1)=4.01$; $p=.12$
N (%) Mood Disorders		17 (51.51)	14 (40.00)	$\chi^2(1)=0.91$; $p=.47$
N (%) Substance Use Disorders		3 (9.10)	2 (5.71)	$\chi^2(1)=0.28$; $p=.67$
N (%) Other Anxiety Disorders		11 (33.33)	12 (34.29)	$\chi^2(1)=0.01$; $p>.99$
N (%) Eating Disorders		0 (0)	1 (2.90)	$\chi^2(1)=0.96$; $p>.99$
N (%) Somatoform Disorders		1 (3.00)	1 (2.90)	$\chi^2(1)=0.002$; $p>.99$
N (%) Avoidant Personality Disorder		24 (72.70)	26 (74.30)	$\chi^2(1)=0.21$; $p>.99$
M (SD) Social Anxiety	SPS	35.24 (13.52)	36.40 (12.29)	$t(66)=0.37$; $p=.71$
	SIAS	51.45 (11.62)	50.00 (13.17)	$t(66)=0.48$; $p=.63$
	LSAS	83.12 (22.88)	80.49 (25.41)	$t(66)=0.45$; $p=.66$
M (SD) Depression	BDI	19.33 (9.86)	16.26 (14.22)	$t(66)=1.03$; $p=.31$
M (SD) General Psychopathology	BSI	1.19 (0.61)	1.17 (0.51)	$t(66)=0.21$; $p=.84$

Procedure

After the pre-assessment, a computer algorithm randomly assigned participants to either the attention training or the control condition. The allocation schedule was unknown to the investigators and the participants. Participants then received access to a website, where the respective tasks for the training and the control condition were

presented. The tasks rely on the dot-probe paradigm and are described in detail below. On the website, participants could follow their progress through the tasks and got feedback on how fast and accurate the tasks were solved. The feedback was designed to enhance participants' motivation in the completion of the tasks. We asked participants to carry out the attention modification/control tasks twice a week to total an amount of eight training sessions. Each training session took about 10 minutes. Primary and secondary outcome measures were administered before and after the training period. Four months after the training, participants were invited by e-mail to complete the follow-up assessment. Telephone SCID interviews were conducted before and after the attention/control training. Both groups completed an attention bias assessment (see below) at the beginning and at the end of the four-weeks training period.

After the training, at post-treatment telephone SCID, participants in both groups were asked whether they were interested to enrol in another free Internet-based self-help programme. We explained that this programme, developed and evaluated by Berger et al. (2011), was based on cognitive-behavioural therapy and had already proven efficacious in previous studies. We decided to offer this opportunity as, at the time of the study, the Internet-based attention training was of unknown efficacy and acceptability.

Intervention

The goal of the present study was to extend the results of previous attention modification studies (Amir, et al., 2009; Schmidt, et al., 2009), now using an Internet-based approach. According to this goal, we applied the same modified dot-probe task used in previous studies to change the attentional bias (Amir, et al., 2009; Schmidt, et al., 2009). The modified dot-probe task aims at linking a probe to a *neutral* cue, hence turning the attention away from the simultaneously presented *negative* cue.

Administration of attention training and control tasks was browser-based (e.g. Internet Explorer, Firefox, Safari). All programmes were developed with a client-sided programming language (javascript), which means that presentation and reaction times did not depend on the Internet connection speed.

Modified dot-probe task

Each dot-probe trial began with a fixation cross ("+") presented in the centre of the monitor for 500ms. Immediately after the fixation cross, the computer presented two faces of the same individual for 500ms, one face on top and one at the bottom. We used faces from the NimStim face stimuli set (Tottenham et al., 2009) and selected faces of eight individuals (4 men, 4 women). The faces displayed either a neutral and a disgust expression (in 80% of the trials) or two neutral expressions (in 20% of the trials). Faces were 6.0 cm high and 4.7 cm wide. Both faces were centred horizontally and vertically, and they were separated by 1 cm between the bottom of the top image and the top of the bottom image. After the presentation of the faces, a letter (E or F) appeared in the location of one of the faces. Participants were asked to decide whether the letter was an E or an F and to press the corresponding button (left or right arrow button) on the keyboard. After the decision was made, the next trial began. Figure 4.2 shows an example of a dot-probe trial. The instruction was to react as quickly and accurately as possible.

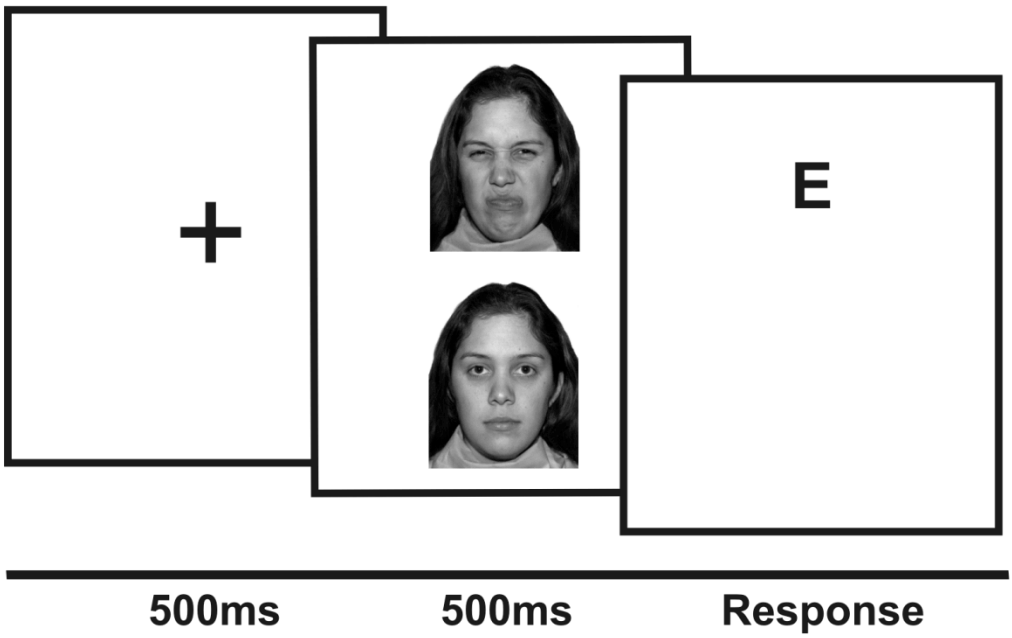

Figure 4.2: Example of a dot-probe trial

Attention training and control condition

Every training session consisted of 160 dot-probe trials. Participants were asked to carry out eight training sessions within four weeks. The attention training and the control condition differed in the 80% of trials where neutral and disgust faces were presented simultaneously. In 80% of these trials, in the training condition, the probe replaced the neutral face. In contrast, in the control condition, the probe replaced either the neutral or the disgust face equally as much. Consequently, only the attention training established a link between the probe and the neutral cue.

Attention Bias Assessment

Before and after the training sessions, an attention bias assessment was administered applying a modified version of the Posner task (Amir, Elias, Klumpp, & Przeworski, 2003; Posner, 1980). To reduce the effect of the materials on the training progress, we used words rather than faces as stimuli in the attention bias assessment. We chose eight

social threat words (e.g., “criticized,” “embarrassed”) and eight neutral words (e.g., “original,” “governmental”) out of an evaluated set of words (Schiller, 2004). Social threat and neutral words were matched according to length and frequency in the German language. The modified Posner task started with the presentation of a fixation cross centred between two rectangles (width: 11 cm, height: 12 cm). Following the fixation cross, the computer displayed a neutral or a social threat word in one of the two rectangles for 600ms. After the presentation of the word, a cue (*) appeared either in the location of the word or opposite of the location of the word. Participants were asked to detect the cue (*) as quickly as possible. The bias assessment consisted of 192 trials. Two thirds (128) of these trials were valid trials, one sixth (32) were invalid trials and one sixth (32) were uncued trials (no word preceded the cue). In valid trials the cue appeared in the location of the word. In invalid trials it appeared opposite the location of the word.

Outcome Measures

We used the following social anxiety scales as primary outcome measures of the study: the self-report version of the Liebowitz Social Anxiety Scale (LSAS; Baker, et al., 2002; German version: Stangier & Heidenreich, 2003), the Social Phobia Scale, and the Social Interaction Anxiety Scale (SPS & SIAS; Mattick & Clarke, 1989; German versions: Stangier, et al., 1999). The SPS & SIAS are companion scales that assess fear of social interactions and performance situations respectively. Each scale contains 20 items rated on 0-to-4 Likert-type scales. The SPS and the SIAS show high internal consistency and proved useful to classify SAD patients and healthy controls (Stangier, et al., 1999). The LSAS is a 24-items scale designed to assess fear in and avoidance of social situations. The total score ranges between 0 and 144. The scale proved reliable and valid in assessing

social anxiety (Fresco et al., 2001). In addition, as secondary outcome measures, we administered the Beck Depression Inventory (BDI-II; Beck, et al., 1996; German version: Hautzinger, et al., 2006) and the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983; German version: Franke, 2000). The BDI-II assesses depression on 21 items. Total scores of 14 or more indicate clinically relevant depression. The BDI proved highly reliable and valid in German samples (Kühner, Bürger, Keller, & Hautzinger, 2007). The BSI is a short version of the Symptom-Checklist (Derogatis & Cleary, 1977) and consists of 53 items. It is designed to assess general psychopathology on nine subscales. The total score (Global Severity Index) ranges between 0 and 4. Internal consistencies of primary and secondary outcome measures in the present sample were high, ranging from α=.86 for the SPS to α=.94 for the BSI. All questionnaires were administered via the Internet, which is a procedure with appropriate psychometric properties (Holländare, Askerlund, Nieminen, & Engström, 2008).

Statistical Analyses

All analyses on primary and secondary outcome measures were conducted as intention-to-treat analyses, applying the Last Observation Carried Forward method by replacing the missing post-assessment with the pre-assessment score and the missing follow-up score with the post-assessment score or, if missing, with the pre-assessment score. Participants in both groups had the opportunity to receive another active treatment after the training (Internet-based CBT self-help). As the majority of participants enrolled in this further treatment and the attendance was likely to affect follow-up social anxiety scores, we conducted ITT follow-up analyses on those participants who attended CBT self-help (N_{ATG}=29, N_{CG}=29).

To examine changes in social anxiety from pre- to post-assessment, a composite score of social anxiety measures (SPS, SIAS, and LSAS) was calculated. Following the procedures

recommended by Rosnow & Rosenthal (1991) and applied by Clark et al. (2006), the composite score was generated by converting each social phobia scale across both assessment points to z-scores, and then by averaging across the measures. Due to the attendance of a further self-help programme after the training, we excluded the follow-up assessment from the calculation of the composite score. Separate repeated measure ANOVAs were conducted using the composite score and the single social phobia scales (SPS, SIAS, and LSAS) as dependent variables to analyse change in social anxiety from pre- to post-assessment in both groups. Post-hoc analyses consisted of t-tests. Alpha levels were corrected for multiple comparisons (number of comparisons=4, α <.01). Effect sizes for t-tests were calculated using Cohen's formula based on pooled standard deviations (Cohen, 1988). Secondary outcome measures were analysed using repeated measure ANOVAs, followed by t-tests.

Clinical significant change at post- and follow-up assessment was calculated based on the completer sample. Clinical significance was determined for the SPS and the SIAS since these are two of the most widely used social anxiety measures. In a first step, reliable change according to the Reliable Change Index (Jacobson & Truax, 1991) was determined by using retest reliabilities reported for the German versions of the questionnaires (Stangier, et al., 1999). In a second step, cut-off scores were calculated on the basis of Formula 'c' reported by Jacobson and Truax (1991). Normative data were taken from a German data set (Lincoln, et al., 2003). Based on these assumptions, clinically significant improvement for a given participant was defined as showing a pre-post / pre-follow-up change score of 8 or greater and a post /follow-up test score below 21 on the SPS, and a pre-post/pre-follow-up change score of 9 or greater and a post/follow up test score below 31 on the SIAS.

Maintenance of treatment effects was scrutinized using repeated measure multivariate and univariate ANOVAs followed by t-tests for primary and secondary outcome measures. Effect sizes (Cohen's *d*) were calculated from post- to follow-up-assessment.

The attention bias assessment produced reaction times for every participant to the four kinds of trials: valid social threat trials, valid neutral trials, invalid social threat trials, and invalid neutral trials. We calculated the mean reaction time for each participant for each type of trial, eliminating response latencies for inaccurate trials and response latencies less than 50ms or greater than 1,200ms. This led to an exclusion of 1.2% of the trials. Explorative data analyses identified three outliers in the valid social threat condition at post-treatment which were excluded from the analyses of attention bias. One participant did not complete the post bias assessment. To examine changes in attention bias, we conducted a 2 (pre-assessment/ post-assessment) x 2 (attention training/control condition) x 2 (valid / invalid) x 2 (social threat / neutral) ANOVA.

Results

Training

During the four weeks of training, participants in the active group completed on average 11.0 training sessions (range: 6-23) and participants in the control group completed on average 9.1 training session (range: 4-14). The study protocol prescribed two training sessions a week. On average, the attention training group completed 3.6 training sessions in week one, 2.7 in week two, 2.8 sessions in week three, and 1.9 training sessions in week four. The control group trained 2.7 times in week one, 2.4 times in week two, 2.3 times in week three, and 1.7 times in week four. A repeated measure ANOVA revealed no significant group differences regarding the amount of training sessions over the weeks (effect of group × time: $F(3,198)=1.18$, $p=.32$, $\eta_p^2=.02$). Neither was there a significant group difference on the total amount of training sessions (main effect of group: $F(1,66)=3.59$, $p=.06$, $\eta_p^2=.05$) even though there was a trend indicating that participants in the ATG trained more often than participants in the control group. Mean training durations lasted from 7.36 (SD=0.18) to 7.84 (SD=0.33) minutes per training session.

Primary Outcome Measures

The repeated measure ANOVA using the social anxiety composite score as dependent variable revealed a significant main effect of time ($F(1,66)=66.26$, $p<.001$, $\eta_p^2=.50$), indicating a substantial decrease in social anxiety from pre- to post-assessment. However, there was no significant main effect of group ($F(1,66)=0.08$, $p=.79$, $\eta_p^2<.001$) nor a significant interaction effect of time × group ($F(1,66)=0.03$, $p=.87$, $\eta_p^2<.001$). There were no differences between the attention training group and the control condition. Repeated measure ANOVAs on the individual social phobia measures yielded the same results. ANOVAs on all three measures showed a significant effect of time (SPS:

$F(1,66)=47.57$, $p<.001$, $\eta_p^2=.42$; SIAS: $F(1,66)=39.19$, $p<.001$, $\eta_p^2=.37$; LSAS: $F(1,66)=62.22$, $p<.001$, $\eta_p^2=.49$), but no main effect of group (SPS: $F(1,66)=0.02$, $p=.88$, $\eta_p^2<.001$; SIAS: $F(1,66)=0.44$, $p=.51$, $\eta_p^2=.01$; LSAS: $F(1,66)=0.06$, $p=.81$, $\eta_p^2=.001$) nor a significant interaction effect of time × group (SPS: $F(1,66)=0.36$, $p=.55$, $\eta_p^2=.01$; SIAS: $F(1,66)=0.19$, $p=.67$, $\eta_p^2=.003$; LSAS: $F(1,66)=0.34$, $p=.56$, $\eta_p^2=.01$).

Table 4.2: Means, standard deviations and effect sizes for primary and secondary outcome measures

		Attention Training			Control Condition		
		Mean	*SD*	*Within ES*	*Mean*	*SD*	*Within ES*
Social anxiety composite	Pre	0.31	0.76	**0.69**[a]	0.27	0.77	**0.67**[a]
	Post	-0.26	0.87		-0.32	0.98	
SPS	Pre	35.24	13.52		36.40	12.29	**0.56**[a]
	Post	28.39	15.55	**0.47**[a]	28.26	16.53	
	Follow-Up	21.79	13.79	**0.45**[b]	23.76	14.33	**0.29**[b]
SIAS	Pre	51.45	11.62	**0.60**[a]	50.00	13.17	**0.63**[a]
	Post	43.55	14.48		40.91	15.78	
	Follow-Up	34.41	12.99	**0.66**[b]	36.07	15.50	**0.31**[b]
LSAS	Pre	83.12	22.88	**0.80**[a]	80.49	25.41	**0.59**[a]
	Post	64.73	23.18		64.63	28.50	
	Follow-Up	47.45	25.68	**0.71**[b]	56.03	24.57	**0.32**[b]
BDI	Pre	19.33	9.86	**0.57**[a]	16.26	14.22	**0.71**[a]
	Post	13.67	10.12		8.09	7.95	
	Follow-Up	9.83	9.92	**0.38**[b]	7,79	8.13	**0.04**[b]
BSI	Pre	1.19	0.61	**0.75**[a]	1.17	0.51	**0.95**[a]
	Post	0.77	0.52		0.69	0.48	
	Follow-Up	0.57	0.46	**0.41**[b]	0.61	0.50	**0.17**[b]

Pre / Post: N(ATG)=33, N(CG)=35 Follow-Up: N(ATG)=29, N(CG)=29

a. $d=(M_{PRE} - M_{POST}) / SD_{POOLED}$

b. $d=(M_{POST} - M_{FOLLOW\text{-}UP}) / SD_{POOLED}$

We followed up the main effect of time by paired-sample t-tests for the composite score and all three social anxiety measures in both groups. Reductions of social anxiety were significant for all measures in both groups (ATG: $t(32)=4.54\text{-}6.61$, all $p<.001$; CG: $t(34)=4.26\text{-}5.53$, all $p<.001$). Table 4.2 shows means, standard deviations and effect sizes for both groups. Pre-post effect sizes in the attention training group ranged between

0.47 and 0.80 indicating medium to large effects. In the control condition, effect sizes ranged from 0.56 to 0.67.

Secondary Outcome Measures

Depression (BDI). The repeated measure ANOVA revealed a significant main effect of time ($F(1,66)=36.03$, $p<.001$, $\eta_p^2=.35$). Participants in both groups were less depressed at post-treatment. There was no significant main effect of group ($F(1,66)=3.38$, $p=.07$, $\eta_p^2=.05$) nor a significant interaction effect of group × time ($F(1,66)=1.18$, $p=.28$, $\eta_p^2=.02$). Paired sample t-tests proved a significant decline of depression in both groups (ATG: $t(32)=3.96$, $p<.001$; CG: $t(34)=4.57$, $p<.001$). Pre-post effect sizes were $d=0.57$ for the active group and $d=0.71$ for the control group (see table 4.2).

General psychopathology (BSI). The ANOVA showed a significant main effect of time ($F(1,66)=66.35$, $p<.001$, $\eta_p^2=.50$), no main effect of group ($F(1,66)=0.21$, $p=.65$, $\eta_p^2<.001$) and no interaction effect of time × group ($F(1,66)=0.21$, $p=.65$, $\eta_p^2<.001$). The groups did not differ in the decline of general psychopathology from pre- to post- treatment. Paired-sample t-tests were significant in both groups with medium to large effect sizes of $d=0.75$ in the attention training group and $d=0.95$ in the control condition (ATG: $t(32)=4.77$, $p<.001$; CG: $t(34)=7.10$, $p<.001$).

Clinical Change

Two measures were used to assess clinical change. First, the number of participants who no longer fulfilled the criteria for Social Anxiety Disorder according to the SCID interview at post-assessment was determined. Second, clinically significant improvement for the SPS and SIAS was calculated.

Thirty (90.9%) participants in the ATG and 31 (88.6%) participants in the CG were available for the SCID interview at post-assessment. Twenty-three participants in both groups completed the follow-up assessment. According to the SCID, 13.3 % in the

attention training group and 23.3% in the control group did no longer meet the diagnostic criteria of SAD. Table 4.3 shows the proportion of participants who fulfilled the criteria of clinical significant change. Proportions at post-treatment did not differ between the groups with 15.6 – 21.9% clinically improved participants in the attention training group and 18.8 – 34.4% in the control group. Percentages were higher at follow-up and ranged between 47.8 – 52.2% in the ATG and between 39.1 – 47.8% in the CG.

Table 4.3: Clinical significant change at post- and follow-up-assessment

		Attention Training	**Control Condition**	
		N (%)	*N (%)*	
% not meeting SAD diagnosis	Post	4 (13,3)	7 (23,3)	$\chi^2(1)$=0.88 n.s.
SPS	Post	7 (21,9)	11 (34,4)	$\chi^2(1)$=0.12 n.s.
	Follow-up	11(47,8)	11(47,8)	$\chi^2(1)$=0.00 n.s.
SIAS	Post	5 (15,6)	6 (18,8)	$\chi^2(1)$=0.11 n.s.
	Follow-up	12 (52.2)	9 (39.1)	$\chi^2(1)$=0.79 n.s.

Post: SCID: *N*(ATG)=30, *N*(CG)=31 SPS&SIAS: *N*(ATG)=32, *N*(CG)=32
Follow-Up: *N*(ATG)=23, *N*(CG)=23

We also calculated the agreement between the two measures of clinical significance at post-treatment (clinical interview and self-report).The percentage of agreement between clinical significance obtained using self-report measures (SPS and SIAS) and clinical significance as judged by the SCID interview was 77.1% (SPS) and 81% (SIAS). These acceptable to high concordance rates provide support for the validity of our judgments on clinical significance.

Attention Bias

Figure 4.3 illustrates the main result of the 2x2x2x2 ANOVA regarding change in attention bias. There were no differences between the attention training and the control group (no significant main effect of group, no significant interaction effects with group, all p>.05). Over all types of trials, participants in both groups responded more quickly at

post-assessment than at pre-assessment (significant main effect of time: $F(1,32)=37.88$, $p<.001$, $\eta_p^2=.38$). Participants in both groups reacted faster to valid trials than to invalid trials (significant main effect of validity: $F(1,32)=78.52$, $p<.001$, $\eta_p^2=.56$). In invalid trials, participants reacted more slowly to neutral words than to social threat words (significant interaction of validity × emotion: $F(1,32)=16.27$, $p<.001$, $\eta_p^2=.21$). The interaction of validity and emotion remained significant in two separate ANOVAs at pre- and post-assessment ($F_{pre}(1,64)=8.22$, $p_{pre}=.01$, $\eta_p^2{}_{pre}=.11$; $F_{post}(1,63)=6.50$, $p_{post}=.01$, $\eta_p^2{}_{post}=.09$). The results suggest that participants in both groups showed a biased attention away from threat at pre- and at post-assessment.

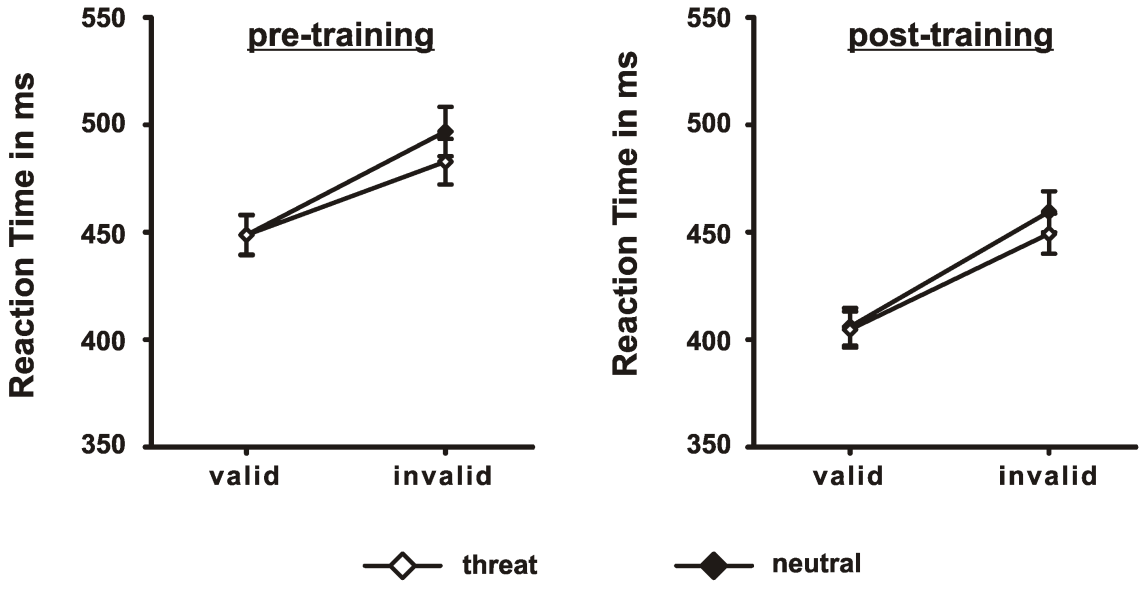

Figure 4.3: Response latencies for the attention bias assessment

To follow up the differences between reaction times to neutral and social threat words in invalid trials, we calculated an individual bias score subtracting reaction times to invalid social threat trials from reaction times to invalid neutral trials (Bias score = RT(Invalid neutral)-RT(Invalid Social Threat)) (see Amir, et al., 2009; Amir, et al., 2003). A positive bias score indicates a bias away from threat whereas a negative score

indicates a bias towards threat. The higher the absolute value of the bias score the more pronounced the bias.

In line with the results of the ANOVA, participants in both groups showed a biased attention away from threat before and after treatment. Average bias scores were positive at pre-assessment (M (SD)$_{ATG}$=5.85 (27.98); M (SD)$_{CG}$=17.91 (30.30)) and at post-assessment (M (SD)$_{ATG}$=5.93 (29.54); M (SD)$_{CG}$=12.30 (23.61)). A repeated measure ANOVA failed to detect any significant differences between groups (F(1,62)=0.38, p=.54, η_p^2=.01) or assessment points (F(1,62)=0.40, p=.53, η_p^2=.01). However, individual bias scores varied considerably in both groups and results should be interpreted carefully.

Predictors of Change

We investigated if post-treatment and follow-up outcomes could be predicted by a) change in attention bias, b) change in overall reaction times, and c) amount of training sessions. We calculated separate regression models for each group. To analyse predictors of change at post-assessment, we entered simple change scores on the social anxiety composite measure as dependent variable. Change in individual bias scores, change in mean reaction times from pre- to post-assessment, and amount of training sessions were entered as predictor variables in a stepwise regression model. None of these predictors proved significant, neither in the attention training group nor in the control group. To determine predictors of change at follow-up assessment, we calculated separate stepwise regression models for each social anxiety measure in each group. Dependent variables were change from pre- to follow-up-assessment on the SPS, the SIAS, and the LSAS. Again, predictor variables were change in individual bias scores, change in mean reaction times and amount of training sessions. For both groups, none of these variables predicted change on the SPS, the SIAS, or the LSAS. Table 4.4 shows the correlation coefficients between predictors and social anxiety change scores.

Table 4.4: Pearson correlation coefficients (r) for predictors of change in social anxiety

ATG	Social anxiety Post	SPS FU	SIAS FU	LSAS FU
Attention Bias Change	-.25	-.14	-.26	.08
Change in Mean RT	.07	-.07	-.03	-.26
Amount of Training Sessions	-.18	-.24	-.07	-.10
CG	Social anxiety Post	SPS FU	SIAS FU	LSAS FU
Attention Bias Change	.11	-.07	.03	.01
Change in Mean RT	.26	-.18	.03	-.04
Amount of Training Sessions	.06	.30	.41	.27

Note: Social anxiety Post, Social Anxiety Composite Change from Pre- to Post-Assessment; SPS FU, Social Phobia Scale Change from Pre- to Follow-Up-Assessment; SIAS FU, Social Interaction Anxiety Scale Change from Pre- to Follow-Up-Assessment; LSAS FU, Liebowitz Social Anxiety Scale Change from Pre- to Follow-Up-Assessment

Assumed Group Affiliation

After the training, participants were asked whether they thought they had received the active or the control intervention. About one fifth of the participants in both groups believed that they had been in the active group (21.9% in the ATG, 18.8% in the CG). To evaluate the impact of the conviction of being in the active group, we conducted a repeated measure ANOVA, including the assumed group affiliation as independent variable and the social anxiety composite as dependent variable. Results suggest that participants who believed to be in the active group showed significantly more improvement on social anxiety measures than those who believed to be in the placebo group (time × group interaction: $F(1,62)=28.52$, $p<.001$, $\eta_p^2=.32$). After the post assessment, participants received an e-mail disclosing their actual group affiliation. Assumed group affiliation was also predictive of social anxiety scores at follow-up assessment. Regression analyses with the follow-up SPS, SIAS, and LSAS scores as dependent variables revealed that the assumed group affiliation was a significant predictor for the SPS ($R^2=.07$, $\beta=.27$, $p=.04$) and the SIAS ($R^2=.10$, $\beta=.31$, $p=.02$). For the LSAS, the regression showed a trend towards significance ($R^2=.06$, $\beta=.24$, $p=.07$).

Maintenance of Treatment Effects

Data of the 29 participants in each group who attended the additional CBT self-help programme were analysed four months after the training. Table 4.2 depicts means, standard deviations and within effect sizes for primary and secondary outcome measures from post- to follow-up-assessment. All three social phobia measures were entered in a repeated measure MANOVA. There was a main effect of time ($F(1,56)=30.30$, $p<.001$, $\eta_p^2=.35$) and a trend towards a significant interaction effect of time × group ($F(1,56)=2.77$, $p=.10$, $\eta_p^2=.05$). There was no main effect of group ($F(1,56)=0.14$, $p=.71$, $\eta_p^2=.003$). Bonferroni corrected follow-up t-tests revealed that participants in the active group improved significantly from post to follow-up ($t(28)=2.87$-5.03, all $p<.017$) with medium effect sizes of $d=0.45$-0.71. There were no significant changes in the control condition ($t(28)=0.00$-2.51, all $p>.017$, $d=0.29$-0.32). To analyse change in secondary outcome measures from post- to follow-up-assessment, repeated measure ANOVAs were conducted for the BDI and the BSI. Data of the BDI revealed a significant main effect of time ($F(1,56)=5.79$, $p=.02$, $\eta_p^2=.10$) which was qualified by a significant interaction effect of time × group ($F(1,56)=5.79$, $p=.02$, $\eta_p^2=.10$). The attention training group improved significantly from post- to follow-up-assessment ($t(28)=2.87$, $p=.01$, $d=0.38$), the control group remained stable ($t(28)=0.00$, $p>.99$, $d=0.04$). Regarding general psychopathology, there was a significant main effect of time ($F(1,56)=11.37$, $p=.001$, $\eta_p^2=.17$) but no interaction effect of time × group ($F(1,56)=1.54$, $p=.22$, $\eta_p^2=.03$). Participants in the ATG improved significantly from post- to follow-up assessment ($t(28)=3.49$, $p=.002$, $d=0.41$), whereas participants in the control group did not ($t(28)=1.42$, $p=.17$, $d=0.17$).

Between post- and follow-up-assessment, the large majority of participants in both groups enrolled in the Internet-based self-help programme, offered to them at post-

telephone SCID (ATG: *N*=29 (88%), CG: *N*=29 (83%), $\chi^2(1)=0.34$, $p=.74$). Participants who attended the CBT self-help did not differ in their post-assessment social anxiety scores from those who did not attend the CBT programme ($t(66)=2.92$, $p=.77$).To further our understanding of the changes from post- to follow-up assessment, we analysed whether the attention training and the control group differed in the use of the new self-help programme. There were no group differences regarding the amount of time spent in the programme ($M(SD)_{ATG}$=5.46h(7.48), $M(SD)_{CG}$=5.39h(4.35); $t(56)=0.04$, $p=.97$) and the number of CBT modules completed ($M(SD)_{ATG}$=3.83(1.65), $M(SD)_{CG}$=4.10(1.74); $t(56)=-0.62$; $p=.54$).

Discussion

In the present study, a four-week attention modification programme was adapted for the Internet, realising a low-cost and easy-access innovative approach for treating SAD. The first aim of the study was to evaluate the efficacy of the Internet-based attention training. Both groups, the attention training and the control group, improved significantly from pre- to post-assessment. They showed moderate to large effect sizes on social anxiety measures as well as on depression and general psychopathology measures. However, changes did not differ between the two groups.

The second aim of the study was to examine the hypothesized agent of the training: change in attention bias. At pre-assessment, participants in both groups allocated their attention away from threat. This did not change to post-assessment. Again, groups did not differ. Apart from an overall training effect, resulting in decreased average reaction times, there were no significant differences between pre- and post-assessment. These findings contrast with results of previous studies. In their report on attention modification, Schmidt et al. (2009) and Amir et al. (2009) both found substantial differences on social anxiety measures between the attention training and the control group. Amir and colleagues (2009) also reported significant group differences in the change of the attention bias. Participants in the attention training group disengaged more easily from social threat cues at post-assessment than did participants in the control group. Integrating several attention modification studies in anxiety disorders, Hakamata et al. (2010) reported an average controlled effect size of d=0.78 on anxiety measures. Where did the differences between our study and previous reports lie? Participants in the present study were older than those in the study of Schmidt et al. (2009) and Amir et al. (2009). However, Hakamata and colleagues (2010) failed to identify age as moderator variable in attention modification trials. One major difference

between our study and previous reports constitutes the setting. Whereas previous researchers invited their participants into the laboratory, our participants conducted the attention exercises at home. The Internet-based deliverance of the tasks holds many advantages regarding availability, anonymity and costs of the programme. Yet, there are various ways in which the different setting may reduce the efficacy of the attention training. Presentation times of stimuli and assessment of the response latencies were controlled using client-sided programming (javascript). However, monitor size and distance to the monitor could not be standardized. Furthermore, participants may be exposed to interruptions and diversions while completing the training tasks. Confounding variables of that sort would probably lead to increased duration of the individual training sessions. In the present study, however, sessions lasted seven to eight minutes on average, less than half of the 20 minutes per session reported by Schmidt et al. (2009). Hence, participants in the present study completed the training tasks rather swiftly. Still, inferring from excluded trials in the attention bias assessment tasks, the participants did not work less accurately. 1.2% of the trials of the attention bias assessment were excluded due to inaccurate reactions and timeouts. This rate ranges well within percentages reported in other dot-probe studies (e.g. Amir, et al., 2009; Roberts, et al., 2010).

Another important difference between laboratory and home settings is the level of stress and arousal. The unfamiliar lab surrounding most probably evokes higher levels of stress. The presence of a research assistant supervising the progress in the attention tasks should be particularly agitating for patients with SAD. In their model of stress and learning, Joels, Pu, Wiegert, Oitzl, & Krugers (2006) integrate recent empirical findings and emphasize the beneficial role of stress and arousal within the learning experience on learning and memory. One possible explanation for the lack of change in the

attentional bias could therefore be that the home setting did not evoke sufficient arousal to facilitate the training of the attention bias. Following this line of thought, the training failed to modify the attention bias and therefore failed to improve social anxiety. With this explanation, the substantial change in social anxiety (effect sizes *d*=0.69 in the active and *d*=0.67 in the control group) could be considered as placebo effect. This notion is supported by the strong effect of the assumed group affiliation. Participants convinced to be in the active group scored significantly lower on social anxiety measures than participants convinced to be in the placebo group. On the other hand, the reported effect sizes exceed the effects of psychological placebo conditions reported in meta-analyses (e.g. *d*=0.44 for attention placebo in Fedoroff & Taylor (2001)) even if they fall short compared to most of the cognitive behavioural treatments (Rodebaugh, et al., 2004).

The similar decrease of social anxiety in the active and the control group could also be viewed as a result of a shared mechanism of change such as enhanced attentional control. In a recent review of attention modification studies in anxiety, Bar-Haim (2010) suggests that the applied programmes do not train specific value-related attentional biases but, more generally, improve control over attention processes. The very similar attention training and control conditions in the present study could both lead to an improvement of attentional control. Furthermore, one could hypothesize that the specific training effect that led to significant group differences in Amir et al. (2009) did not apply to the participants in the present study. The attention modification programme aims at facilitating disengagement from threat. However, participants in our study showed a biased attention away from threat prior to the intervention. It is possible that participants in both groups increased their attentional control, but that the active group failed to improve their disengagement from threat because they did not need it. This would explain why both groups improved similarly to post-assessment and,

at the same time, why effect sizes on social anxiety measures were considerably smaller than those reported by Schmidt et al. (2009) and Amir et al. (2009). Albeit, it would not explain the results at four-month follow-up. After the training, more than 80% of the participants in both groups enrolled in the additional self-help programme participating in six modules of information and CBT exercises. After four months, there was a trend towards a group difference indicating that the attention training group showed substantial additional improvement on social anxiety and depression. The control group, in contrast, remained stable from post to follow-up showing none or little further improvement. These tentative group differences at follow-up could be a result of the applied research procedure. After the post-assessment, participants remained no longer blind to their initial group affiliation. Expectancy of positive change could lead to additional improvement in the active group. On the other hand, the knowledge of group affiliation did not influence the motivation to engage in the self-help programme. There were no group differences regarding modules completed or time spent in the programme. One could therefore also assume that there is a beneficial interaction between attention training and CBT self-help programme. The attention training could produce a long-term impact on attention processes which do not show at post-assessment but which influence the efficacy of the following self-help programme.

Our study has limitations. First of all, the present study does not allow drawing conclusions about the long-term effects of the attention training due to the additional active treatment in the follow-up period. We offered this further treatment out of ethical considerations. A future randomised controlled trial with an intervention-free follow-up period is clearly needed. To examine potential interaction effects of attention training and CBT self-help, future studies should also combine these two approaches and evaluate their combination systematically. A second limitation is breaking the blind at

post-assessment. Future studies should maintain participants' being blind to the assigned condition up to the follow-up assessment to reduce potential expectancy effects. A third limitation lies in the assessment of the attention bias at pre- and post-assessment. In the present study, the attention bias assessment was conducted according to Amir et al. (2009) presenting neutral and social threat stimuli for 600ms. However, previous dot-probe experiments with presentation times of 500ms produced conflicting results. In a vigilance-avoidance paradigm, 500ms could be viewed as some sort of "grey area" where some socially anxious individuals still show an attention bias towards threat and others already avoid threat. To measure change in attention bias, future studies should apply shorter presentation times of 200ms or less. Furthermore, the attention bias should also be assessed at follow-up to examine any long-term change in attention processes.

In conclusion, attention modification programmes present theoretically well-founded, short-term interventions for SAD. Internet-based adaptations of such programmes promise even less time and cost restrictions for both practitioners and patients. Results of the present study do not recommend an Internet-based attention training as stand-alone intervention for SAD. However, the integration of attention training tasks into cognitive-behavioural treatment protocols seems promising and warrants further research.

Discussion

Chapter 5

Main results

Study 1 and 2

The present thesis aims at furthering our understanding of the Internet-based treatment of socially anxious individuals. Two randomised controlled trials have been conducted; three research questions have been answered. The first study examined the impact of a pre-treatment diagnostic interview on the outcome of Internet-based cognitive-behavioural self-help for SAD. We hypothesized that a brief contact with a clinician in the assessment phase would positively influence treatment outcome. The interview did not affect outcome on social anxiety measures. The self-help programme not only reduced social fears in the group of participants who received a diagnostic interview but also in the group who started with the self-help programme right away. This implies that contact with a clinician and his or her diagnostic assessment is not a prerequisite for effectively reducing social anxiety through Internet-based self-help. While the diagnostic interview was not crucial for the treatment outcome of social anxiety, it had a beneficial effect on secondary complaints. Participants in the interview group felt less depressed and reported less general distress at post-treatment than did participants in the non-interview group. The interview also increased participants' adherence.

The second study concentrated on further factors influencing the therapeutic outcome in the Internet-based self-help programme. It examined the predictive value of patient expectations and initial symptom severity. The study confirmed findings of the face-to-

face psychotherapy research (e.g. Rodebaugh, et al., 2004). Participants who expected the treatment to reduce their symptoms and who perceived the treatment as logical and trustworthy benefited more from the treatment than participants with less positive expectations. Expectancy also predicted treatment adherence. Positive expectations lead to more time spent using the programme, higher proportions of completed self-help material (e.g. negative thoughts records, record of exposure exercises) and more completed modules.

All things considered, the first two studies of the present thesis highlight the crucial role of positive expectations and treatment adherence. Patients' adherence, but not patients' expectations, was influenced by a pre-treatment diagnostic interview. The open feedback provided by the participants at post-assessment offers some further information of what worked in the Internet-based self-help programme.

The participants' perspective

After the treatment, participants were asked how they experienced working with the Internet-based self-help programme. Fifty-seven out of the 68 participants who provided post-assessment data offered open feedback (see appendix table 5.1, p.147). Twenty-three participants described which specific parts or modules of the programmes were especially helpful to them. Nine participants stated that they benefited from the insight into others patients' problems gained either in the discussion forum or in the published self-help material. Nine participants felt that they benefited of the psycho-education session. They stated that they came to understand their social anxiety symptoms and that this increased understanding improved how they felt and performed in social situations. Another six participants reported that the session on cognitive restructuring was particularly helpful. Five participants emphasized the beneficial impact of the session on self-focused attention and one participant commended the

relaxation exercises. Participants' open feedback is in line with previously scarce research on the helpfulness of specific elements in Internet-based self-help. As outlined in the introduction (p. 27), increased understanding of SAD achieved by psycho-education is associated with treatment outcome (Andersson, et al., 2012). The opportunity to share with others seemed to be important to the participants of the current study. However, Andersson et al. (2012) clearly demonstrated that sharing with others in an online discussion forum is not sufficient to achieve good therapeutic outcome.

The open feedback also offers some information on common mechanisms of change. Adherence was correlated with treatment outcome in the present thesis as well as in previous studies (see page 28). In their open feedback, participants clearly emphasized the role of motivation and treatment adherence (e.g. "you really need a lot of discipline in the programme"). Sixteen participants stated that it was difficult for them to keep up their motivation through the course of treatment. The most salient disadvantage in the participants' perspective was the lack of guidance. Twenty-nine participants stated that they missed discussing their progress with a clinician, that they sometimes felt unsure whether they were on the right track and that they felt left to "stew in their own juice".

The open feedback at the end of the treatment also reflected the advantages and disadvantages of Internet-based interventions in general, outlined in the introduction. Twenty-one participants valued the flexibility allowed by the programme, and endorsed the possibility to work on their social fears whenever and wherever they chose to. Participants emphasized that the barrier to seek treatment was lowered by the anonymity of the self-help programme. Moreover, three participants felt empowered and stated that they felt supported in overcoming their social anxiety on their own. In

regard to general disadvantages, nine participants criticized the lack of individuality of the Internet-based programme.

Apart from gaining insight in predictors and mechanisms of work in Internet-based self-help, the first two studies also documented the overall efficacy of the Internet-based self-help programme. Participants improved significantly from pre-to-post-treatment. Effect sizes for the intention-to-treat analyses revealed large treatment effects (*d*=1.00-1.68). Treatment gains were stable four months after the end of the programme. These positive results fit in with previous results on Internet-based self-help programmes for SAD which reported within group effect sizes of *d*=1.06 (see page 21). One to two thirds (32-63%) of the participants in the present study reported significant clinical improvement. These rates are based on the completer sample. A more conservative estimate which classifies all non-completers as non-responders results in proportions of clinical change of 28-32% at post-assessment and 24-29% at follow-up assessment. Since previous studies on the Internet-based treatment for SAD reported rates of improvement and recovery between 36-56% (see page 22), I assume that the more conservative calculation on the intention-to-treat sample underestimates the true proportion of participants who benefited from the training. However, even based on the completer sample, there is still a substantial proportion of participants (37-68%) who does not improve. Therefore, the zeal to explore new treatment options that fuelled the third study is well justified.

Study 3

The third study of the current thesis evaluated an attention training programme in an Internet-based setting. The analyses from pre-to post-assessment suggest that the attention training was not superior to a control training. Both training conditions produced moderate change in social anxiety measures. Effect sizes at post-assessment ranged between *d*=0.47-0.80. Proportions of clinical change were 15-34%. These results are reflected in the participants' open feedback. Forty-seven out of the 64 participants who provided post-assessment data offered open feedback at the end of the training (see appendix table 5.2, p.148) Fourteen participants stated that they did not perceive any changes in their social anxiety symptoms. Only four participants stated that the programme was helpful to alleviate social fears. One third of the participants criticized that they did not understand the rationale of the training ("I missed an explanation how and in which way these exercises are helpful for my problem."). This feedback emphasizes the role of a credible treatment rationale to enhance participants' outcome expectations.

The non-significant group differences in the third study contradict initial findings in laboratory settings published in 2009 (Amir, et al., 2009; Schmidt, et al., 2009). However, since 2009, several additional studies on attention training programmes have emerged producing more mixed results. Julian, Beard, Schmidt, Powers, and Smits (2012) as well as Heeren, Lievens, and Philippot (2011) could not find significant differences between an attention training and a control training on social anxiety measures. In a study on an Internet-based attention training, Carlbring and colleagues (2012) replicated the non-significant results of the present thesis. In contrast, Heeren and colleagues (2012), Klumpp and Amir (2010) and Amir, Taylor, and Donohue (2011) all reported significant effects of the attention training programme. The question

whether attention modification programmes are effective or not still seems unanswered. Reviewing attention modification studies, Emmelkamp (2012) concluded that attention training programmes are the "emperor's new suit", not worth further scientific investigation. However, this one-sided view neglects all positive findings.

All participants in study 3 were offered to take part in the CBT self-help programme which was applied in study 1 and 2 after the completion of the attention / control training. Participation in the CBT self-help programme led to further change in social anxiety. This further improvement resulted in a pre-follow-up change comparable to that found in study 1 and 2 (see appendix figure 5.1, p. 149).

Limitations and future research

The findings of the present thesis are subject to some limitations which will be discussed in the following section. The findings also point to several topics of future research. One topic is the examination of predictors and mechanisms of change, another is the investigation of innovative approaches. A third field of research is the dissemination of Internet-based self-help programmes in clinical routine.

Participants

A major limitation of the present thesis lies in the recruitment of the participants. Participants for both randomised controlled trials were recruited at the same time. We posted the link to our website in several social phobia forums (e.g. www.sozphobie.de). In addition, a press notice was released which was taken up by different media (e.g. Tagesspiegel). As a result, over 600 individuals registered for our trials. It is difficult to estimate how the participants of the current thesis represent individuals with SAD in the general population and in other treatment studies. Andrews et al. (2011) reported that only about half of the patients with SAD referred from their general practitioner (GP) were willing to take part in an Internet-based intervention. It is important to examine

and compare the characteristics of the patients who are reached by Internet-based interventions. The good effects of Internet-based self-help might be explained by differences in severity, by younger age or less frequent comorbid disorders. According to Titov and colleagues (2010), the core question is ‘‘are people who seek Internet treatment different to people who seek face-to-face treatment or different to the average person in the population with the same disorder?”(Titov, Andrews, Kemp, et al., 2010, p. 1). The authors compared individuals with depression or anxiety disorders in three samples; patients in Internet-based treatment, patients in face-to-face treatment, and individuals of an epidemiological study. The analysis of socio-demographic variables revealed that the two groups in treatment (either Internet-based or face-to-face) were more educated than individuals in the general population. Patients in face-to-face treatment were younger than both patients in the general population and in Internet-based treatment. Patients in Internet-based treatment were similar to patients in face-to-face treatment regarding symptom severity, associated distress and disablement (Titov, Andrews, Kemp, et al., 2010).

When comparing the combined sample of the two randomised controlled trials of the present thesis with a large sample of a German effectiveness study on face-to-face CBT for SAD (Lincoln, et al., 2003), no apparent differences on socio-demographic variables evolve (see appendix table 5.3, p.150). Participants in both samples were highly educated. Sixty-seven per cent of the 177 participants in the present thesis and 63% of the 217 participants in the study of Lincoln et al. (2003) had a high school diploma[2]. A substantial difference between our sample and the sample described by Lincoln et al. (2003) lay in the medical history of the participants. In the study of Lincoln et al. (2003), 66% of the participants reported prior experience with psychotherapy compared to

[2] In 2010, 26% of the German citizens had a high school diploma (https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/BildungForschungKultur/Bildungsstand/Aktuell.html.)

40% in our sample. An even larger difference between the two samples materialized in the history of psychotropic medication. Sixty-eight per cent of the participants in the study of Lincoln and colleagues (2003) were on psychotropic medication, compared to 9% in the current thesis. This substantial difference cannot be explained by differences in comorbidity or different levels of severity. Pre-treatment scores on measures of social anxiety and depression were roughly comparable (see table 5.3, p. 150). Furthermore, the proportion of participants meeting the criteria for any other comorbid axis I disorder was higher in the Internet sample (59% vs. 44%). The difference in medical history is more likely explained by the exclusion criteria applied in the two randomised controlled trials of the current thesis. Patients with unstable psychotropic medication were excluded from the studies.

The descriptive comparison between our sample and the sample of a face-to-face effectiveness study (Lincoln, et al., 2003) supports the findings of Titov et al. (2010): patients seeking Internet-based treatment are not younger, nor more educated, nor less disabled than patients in face-to-face treatment. They are as severely disturbed by their symptoms as are patients in face-to-face treatment.

Predictors and mechanism of change

Individuals who enrol in and benefit from Internet-based self-help do not seem to constitute a specific subgroup of patients with SAD. However, studies so far failed to investigate parameters other than socio-demographic factors and psychopathological symptoms. Study 3 revealed that patients' expectations predicted treatment outcome. Even if this result is valuable, outcome expectancy constitutes only one patient variable that is hypothesized to be associated with good performance in Internet-based

interventions. Future research should investigate what other patient characteristics influence therapeutic outcome in Internet-based self-help.

Unguided self-help programmes are very easily accessed and require very little effort in the initiation of treatment. The completion of an unguided self-help programme, on the other hand, requires quite a lot of effort from the patient. Self-help programmes ask patients to work on their problems without regular assistance of a professional. This self-directed process requires that patients feel motivated, able and determined to overcome their problems on their own. The 'feeling able' to adhere to the treatment protocol is best described by the definition of self-efficacy. Self-efficacy refers to the belief in one's capabilities to execute the course of action required for a certain result (Bandura, 1997). Self-efficacy has repeatedly been associated with positive outcome in treatment protocols that put high demands on patients' motivation and adherence, i.e. CBT for insomnia or substance abuse treatments (e.g. Bouchard, Bastien, & Morin, 2003; Kadden & Litt, 2011). So far, neither self-efficacy nor motivation has been investigated in the prediction of outcome in Internet-based self-help programmes. Apart from their predictive value, motivation and self-efficacy can also be conceptualized as mediators of change. Change in self-efficacy, for example, has been associated with symptomatic improvement in substance abuse treatment studies (e.g. Kadden & Litt, 2011).

We still know very little about mediators of change in Internet-based self-help programmes. In a first attempt to comprehensively assess mechanisms of change in Internet-based self-help, Warmerdam and colleagues (2010) examined the role of change in dysfunctional attitudes, worrying, perception of control, and problem orientation. These variables were significantly associated with change in two forms of Internet-based self-help for depression (Warmerdam, Smit, et al., 2010). Future studies should examine common and specific mechanisms of change that are likely to be

associated with improvements in social anxiety, for example, change in dysfunctional thoughts, change in cognitive biases, experience of mastery in social situations, problem activation, and motivational clarification. Future studies should also investigate how outcome expectations, motivation and self-efficacy interact with each other and with other mechanisms of change. Potential pathways of change should be explored applying multiple assessments in large samples.

Just as the open feedback of the participants in study 1 and 2 provided some insight into which modules were particularly helpful, qualitative outcome interviews could be applied to generate new hypotheses on the mechanisms of change in Internet-based self-help. Investigating moderators and mediators of change is an important step towards improving the existing programmes for Internet-based treatment of SAD. Innovative approaches for the treatment of SAD, as outlined in the following section, might be incorporated into existing programmes or might evolve into alternative treatment formats.

Innovative approaches

The attention training that was offered in study 3 of the current thesis did not prove superior to a control training condition. Other studies on (Internet-based) attention training programmes produced inconsistent results. The conflicting results could be explained by a moderator variable. For example, attention training programmes aiming at the reduction of attention bias towards threat might only work for those socially anxious individuals who actually experience biased attention towards threat. Experimental studies on the assessment of attention bias in social anxiety are not conclusive. Some studies demonstrated an attention bias towards threat in social anxiety, others demonstrated an attention bias away from threat and still others found

no bias at all (see page 75). Methodological differences might explain part of this inconsistency. However, it is also possible that the differences between studies reflect differences in socially anxious individuals. There could be sub-groups of socially anxious individuals with some experiencing a bias towards threat and others rather avoiding threat cues (bias away from threat). Amir et al. (2011) found that individuals who exhibited a greater tendency to allocate their attention towards social threat benefited more from an attention modification training. Legerstee et al. (2009) identified two subgroups of children with SAD. One subgroup demonstrated an attention bias towards threat whereas the other group demonstrated an attention bias away from threat. These findings as well as the inconsistent results of attention assessment and attention training studies support the hypothesis that not all individuals with SAD experience the same bias in attention processes. Tailoring the attention modification training according to the individuals' specific biases warrants further research. In a tailored attention training, individuals with an attention bias *towards* threat would receive a programme that trains them to focus *less* on social threat cues and participants who show an attention bias *away* from threat would receive a programme that trains them to focus their attention *more* on social threat cues.

A bias in the allocation of attention is only one of several biases in information processing associated with SAD (e.g. Hertel, Brozovich, Joormann, & Gotlib, 2008; Voncken, Bögels, & de Vries, 2003). Biases in the interpretation of social situations could also be subjected to specific training programmes. Several attempts have been made to modify the interpretation of ambiguous social stimuli in socially anxious individuals (e.g. Beard & Amir, 2008; Vassilopoulos, Banerjee, & Prantzalou, 2009). Results are mostly positive. However, so far, none of the trials achieved substantial symptom reductions in clinically anxious individuals. Moreover, no attempts have been made to offer

interpretation modification trainings via the Internet. Future studies should focus on the development and evaluation of Internet-based interpretation programmes. In a further step, programmes on the modification of attention and interpretation bias could be incorporated into existing CBT self-help programmes. Thus, patients would be enabled to work simultaneously on all assumed maintaining factors of the cognitive model for SAD (Clark & McManus, 2002).

Apart from improving the contents of Internet-based self-help programmes, future researchers should also work on the presentation of therapeutic elements in the Internet-based setting. Internet-based interventions have been criticized because they stick too closely to the model of face-to-face therapy, use only verbal and mostly written material, and do not make use of the potential of modern technologies (Marks & Cavanagh, 2009). Serious games are a different approach to the presentation of therapeutic material. At present, serious games are mostly developed for the treatment of children, as, for example, the game Treasure Hunt which aims at supporting face-to-face CBT with children (Brezinka, 2007) or the game SPARX developed for adolescents with depressive disorders (Merry et al., 2012). In the future, elements of serious gaming could be introduced to the treatment of adults. Especially in the treatment of SAD, where role plays are an important part of face-to-face psychotherapies, serious gaming sessions could enhance patient satisfaction and treatment outcomes. They could also make Internet-based interventions more approachable for individuals with less pronounced reading skills. At the moment, the whole process of change in CBT self-help is based on written material. According to Martinez, Whitfield, Dafters, and Williams (2008), the reading age of most common CBT self-help material is over 13. To place this in context, the authors compared the reading age of CBT self-help material to the reading age of newspapers. The English “Sun” requires a reading age of 11, the “Times” a

reading age of 17. Serious gaming could constitute an approach for individuals who prefer and benefit more from non-written material.

Implementation in clinical routine

Whereas the efficacy and effectiveness of Internet-based self-help is established, dissemination and implementation of such treatments into routine care becomes a crucial topic. When considering how to implement Internet-based interventions in standard clinical routine, the question of guidance is highly relevant. As will be described below, other European countries already have developed strategies to implement guided self-help programmes. The inclusion of guidance may be due to the fact that guidance is associated with better outcomes in the Internet-based treatment of depression (Andersson & Cuijpers, 2009). In the treatment of SAD, on the other hand, direct comparisons of guided and unguided self-help programmes did not result in significant differences (Berger, Caspar, Richardson, Kneubühler, et al., 2011; Botella, et al., 2010; Furmark, et al., 2009). It seems that guidance is not associated with symptomatic improvement. Furthermore, study 1 of the present thesis demonstrated that clinician contact in the assessment phase is also no prerequisite for good therapeutic outcome in Internet-based self-help for SAD. There are, however, several reasons why the inclusion of guidance might be useful in the treatment of SAD. First, guidance can help to partly alleviate the high demands placed on participants in Internet-based self-help for SAD. Guidance can help to reassure, to motivate and to direct patients in the self-help programme. It can be offered to answer direct questions of the patients, to provide feedback on the progress, and to give practical advice in case of stagnation or draw-backs. Second, the inclusion of guidance allows the identification of non-responders early in the treatment process. For example, if participants report low outcome expectations or do not engage in the self-help process, the guiding clinician

can examine and discuss potential barriers and can eventually suggest other treatment options. Guiding clinicians can also react to potential crises and suicidal tendencies. Last but not least, a substantial proportion of patients seem to desire contact with a therapist. In their comparison of guided and unguided self-help for SAD, Berger et al. (2011) also evaluated a step-up on command condition. Participants in this (unguided) condition could ask for additional guidance via e-mail or telephone. Half of the participants in this condition asked for guidance throughout the course of treatment. In the guided condition, 75% of the participants stated that they would not have been able to complete the treatment without clinician guidance. In the purely unguided condition, 50% of the participants stated that they would have preferred to have contact to a therapist. These results and the open feedback provided by the participants in study 1 and 2 imply that about half of the participants in unguided Internet-based self-help wish for personal contact and would benefit from the option of guidance

Therefore, the following section will focus on the implementation of *guided* self-help programmes. First, I will shortly review how the implementation of guided Internet-based interventions is realised in the UK and in Sweden. Then I will outline ideas of how Internet-based self-help for SAD might be integrated into the German healthcare system.

United Kingdom

Starting in 2004, the National Institute of Clinical Excellence (NICE) published guidelines on the treatment of affective and anxiety disorders (Clark, 2011). The NICE guidelines recommended a stepped care approach. According to the guidelines, patients with depression and / or anxiety problems first enter into “low-intensity” treatments. These low-intensity treatments encompass guided self-help with books, psycho-educational groups, and computerized self-help. Computerized self-help, delivered on a stand-alone computer or via the Internet, is recommended for mild to moderate depression, Panic

Disorder, Obsessive-Compulsive Disorder and Generalized Anxiety Disorder. The NICE guidelines did not include low-intensity treatment recommendations for SAD (Clark, 2011). Patients who do not sufficiently benefit from the low-intensity treatment and patients who initially present with severe depressive symptoms or Post-traumatic Stress Disorder enter into "high-intensity" care. High-intensity care consists of weekly, face-to-face psychotherapy either in combination with medication or without. The publication of the NICE guidelines initiated an ambitious project to disseminate efficacious treatments for mental health problems. The IAPT programme (Improving Access to Psychological Therapy) was granted with over 300 million pounds from the Government (Clark, 2011). This money is mainly invested into the training of mental health care professionals who can provide the stepped care recommended in the NICE guidelines. Low-intensity care is provided by the so called Psychological Wellbeing Practitioners, who attend a one-year post-graduate programme and are trained to manage, guide and treat patients in the low-intensity treatment step.

The usage of computerised self-help has been low in the initial phase of IAPT with only about 3-6 % of the patients receiving computerized self-help in two primary care trusts (Clark et al., 2009). The IAPT programme is now in its third year. Preliminary results indicate that the aspired treatment rate is met. IAPT services are currently seeing about 310,000 patients per year in 95% of the primary care trusts in Britain (Clark, 2011). Recovery rates are now at 40% for all kinds of treatment over all treatment steps (Glover, Webb, & Evison, 2010). Primary care trusts are free to establish their own routine to implement guided (computerised) self-help. They are also free in the choice of programme they offer to the patients. The specific outcome of computerised self-help has not been reported within the IAPT project. However, Cavenagh, Seccombe and Lidbetter (2011) analysed the outcome of computerised self-help applying three

popular programmes in a third-sector self-help clinic. The authors reported a recovery rate of 55% per cent and large effect sizes between *d*=1.06-1.26 (Cavanagh, et al., 2011).

Sweden

The Swedish National Board on Health and Welfare published guidelines on the treatment of depression and anxiety in 2010 (Socialstyrelsen, 2010). These included recommendations to apply Internet-based cognitive-behavioural self-help in depression and anxiety disorders. Guided Internet-based self-help was recommended as one of three equally effective interventions in the treatment of mild to moderate depression. In SAD, Internet-based self-help was listed as third choice option. Face-to-face psychotherapy (CBT) and antidepressant medication were judged superior (Carlbring, Andersson, & Kaldo, 2011). The dissemination of Internet-based self-help in Sweden is highly dependent on the county. In Stockholm, the Internet Psychiatry Department provides exemplary Internet-based care. Patients with depression or anxiety disorders can either self-refer of be referred by their GP or psychiatrist. Patients register online, are then screened and invited to a diagnostic interview at the Internet Psychiatry. The Internet Clinic is integrated within a regular psychiatric outpatient clinic and has the same organizational status. Health insurance covers costs (Hedman et al., submitted). After the diagnostic interview, patients can start with guided self-help programmes on Panic Disorder, depression, or SAD. Guidance is provided by trained psychologists or psychiatrists who are each expected to have about 80 on-going patients. Hedman et al. (submitted) examined the effectiveness of the programme on Panic Disorder. The authors included all 570 patients treated for this disorder in the Internet Psychiatry Department from 2007 to 2012. The guided self-help programme effectively reduced symptoms of Panic Disorder and depression. About half of the patients showed

significant clinical improvement. The study also demonstrated that the quality of care in the Internet Clinic increased with the years of experience (Hedman, et al., submitted).

Germany

The UK and the Swedish strategies to implement Internet-based self-help into standard clinical routine represent two different pathways in the dissemination of Internet-based interventions. Considering the implementation of Internet-based self-help in Germany, both pathways have different advantages and disadvantages.

Establishing a specialised Internet clinic would fit in well with the health care system in Germany where patients can choose freely and directly access primary and secondary care. At the moment, hospital-based outpatient care is mainly restricted to university hospital settings. Following the Swedish example, an Internet clinic might be incorporated into the Psychiatry Department of a university hospital. Trained psychologists / psychiatrists could provide the monitoring and the guidance through CBT self-help programmes. A web-site could offer information on the procedure and available treatments and could allow individuals to self-refer. The option for self-referral would be beneficial for socially anxious individuals who often avoid contacting a health care professional (see page 12). However, face-to-face interactions could not be avoided entirely. Psychological and medical treatments in Germany require an initial face-to-face assessment session (Almer, 2003). This also implies that the treatment with Internet-based self-help programmes would be restricted to the single area where the university hospital is located. The implementation of Internet-based treatments in an Internet clinic would also come with the disadvantages associated with the specialised secondary care in Germany. The difficulties of coordinating treatments and guaranteeing long-term patient-centred care would be eminent.

Implementing Internet-based self-help programmes in primary care, on the other hand, would facilitate the coordination of treatments. At the same time, Internet-based self-help programmes would be restricted to individuals who actually seek help with their GP.

The health care system in Germany is undergoing constant changes. Several legal reforms have been initiated to move from a highly fragmented health care system to a system of integrated care (Schlette, Lisac, & Blum, 2009). In integrated care, GPs/family doctors are the ones who are first contacted for any new health need and who then provide comprehensive, patient-focused long-term care for the majority of complaints, including mental health problems. Furthermore, in integrated care, GPs coordinate treatments with other health care providers (Schlette, et al., 2009). The implementation of Internet-based self-help programmes into primary care would contribute to a more integrated health care system. Patients could get treatment where they first seek help (Stein et al., 2011), from a trusted physician who knows about their social and occupational circumstances. Hanel and colleagues (2009) reported that every second patient in primary care met the criteria of a mental disorder. Patients with depressive and anxiety disorders are common in primary care practices. A German study revealed that 23% of patients in GP practices suffered from depression and 16% from an anxiety disorder. About four per cent of the patients suffered from SAD (Mergl et al., 2007). However, GPs recognize and diagnose anxiety disorders in only about one fourth of the patients (Fernández et al., 2012). The low rate of recognition can be explained by several factors: First, the patient might be reluctant to speak about emotional problems, second he or she could present with multiple somatic complaints, or, out of habit, both patient and physician could focus on somatic complaints only. Fernandez et al. (2012) showed that if patients presented emotional problems as main concern, the recognition rate of

anxiety disorders increased significantly. Taking this low rate of recognition into consideration, it is not surprising that only about one fourth of the patients with anxiety disorders in primary care receive adequate treatment (Fernández et al., 2007; see also page 12). The integration of Internet-based self-help in primary care practices would provide GPs with a tool to offer effective treatment within limited time resources.

The implementation of Internet-based self-help in primary care raises the question of who should provide the necessary guidance throughout the programmes. In the IAPT approach in the UK, Psychological Well-Being Practitioners were especially trained to provide low-intensity treatments. In Germany, GP practices mainly employ one or several GPs and one or several health care assistants. Gensichen and colleagues (2009) conducted a trial on the treatment of depression in primary care practices where health care assistants were trained to enhance compliance to psychotropic medication by structured telephone calls. Qualitative interviews with the health care assistants revealed that they evaluated their new task in a positive manner, but, at the same time, they perceived the care for depressed patients as demanding and time-consuming (Gensichen, Jaeger, et al., 2009). A randomised controlled trial resulted in better depression outcomes for those patients who were taking part in the management of care programme provided by the health care assistants (Gensichen, von Korff, et al., 2009). These positive results imply that health care assistants could be trained to provide feedback in Internet-based self-help programmes. They could provide support and encouragement and could monitor the patients' progress. It would be necessary for them to report back to the GP in a structured manner allowing the GP to be informed of the patients' progress. In case of non-response or the emergence of other treatment needs, the GP could make the necessary treatment decisions and could refer to local psychotherapists, psychiatrists or clinics. In order to facilitate the recognition of SAD

and other anxiety disorders, leaflets in the waiting room could inform the patients about the new treatment option of Internet-based self-help and could encourage them to discuss their anxiety problems with their GP.

First trials have been published on the incorporation of (Internet-based) guided self-help programmes into primary care practices in the Netherlands and in the U.S. Results are very positive for anxiety disorders (Rose et al., 2011; Roy-Byrne et al., 2010; Seekles, van Straten, Beekman, van Marwijk, & Cuijpers, 2011).

Both pathways of dissemination,, the Internet clinic and the integration into primary care, show promising results in other countries. The pathways are not mutually exclusive. However, both pathways would face various obstacles, one of them being the financing of the treatments. Serious consideration and empirical research will be needed to decide on a way to incorporate Internet-based self-help into the German health care system. In-depth discussions with health insurance companies, GPs, health care assistants, psychiatrists and psychotherapists will be needed to find a way to establish Internet-based self-help in a sensible and sustainable manner. Guided Internet-based self-help programmes have the potential to address the reality of restricted treatment facilities in the present and future health care system. They could become an important part of the treatment for patients with Social Anxiety Disorder, in addition to and not instead of face-to-face psychotherapy. There are many valid reasons why patients with SAD might prefer and clinicians might champion face-to-face treatment. Although, Internet-based self-help programmes are no substitute for face-to-face psychotherapy, they constitute an alternative, evidence-based form of intervention.

Summary

Chapter 6

Social anxiety disorder (SAD) is characterised by an intense fear of being judged or criticised by others. It is common, chronic, disabling and treatable. Cognitive-behaviour therapy is effective in reducing symptoms of SAD and in modifying maintaining factors such as safety behaviours, biases in the perception of the social situation, and dysfunctional beliefs. However, treatment rates are low. Only 20-40 per cent of the individuals with SAD receive adequate treatment. The existing gap between treatment needs and treatment facilities can be addressed by the development and dissemination of Internet-based interventions. Internet-based self-help programmes combine the advantages of easy access, high availability and low costs. Numerous controlled trials demonstrated the efficacy of Internet-based self-help programmes for SAD. So far, little is known about predictors and mechanisms of change in these programmes. Clinician guidance, which is held to be a crucial factor in the Internet-based treatment of depression, did not affect therapeutic outcome in direct comparisons of guided and unguided self-help programmes for SAD. The first study of the present thesis extended the results on the role of clinician contact to the diagnostic phase. The hypothesis was that the brief contact with a clinician during a diagnostic interview would positively influence treatment outcome. Results of a randomised controlled trial indicated that a diagnostic interview did not affect primary outcome measures. The self-help programme effectively reduced social fears in the group of participants who underwent a diagnostic interview as well as in the group of participants who started with the programme right away. However, the pre-treatment interview did affect secondary outcome measures

such as depression and general distress. It also had a positive effect on participants' adherence. In order to further understand what influences participants' adherence and treatment outcome, the second study looked at the predictive values of patient expectations and initial symptom severity. To this end, the two groups of the first study were combined in one sample. Patient expectations predicted patients' adherence and change in social anxiety symptoms. Participants who expected the treatment to reduce their symptoms and who perceived the treatment as logical and trustworthy benefited more from the treatment and engaged more actively in the treatment process than participants with less positive expectations. Hence, the first two studies emphasized the relevance of outcome expectations and treatment adherence in Internet-based self-help for SAD. Treatment adherence but not outcome expectations were positively influenced by a pre-treatment interview. The first two studies also replicated results on the efficacy of Internet-based self-help programmes. As in previous studies, a substantial proportion of participants showed significant clinical change. However, not all participants benefited from the cognitive-behavioural programme. Examining what works for whom in Internet-based self-help is one way to address the problem of non-response. Another is the development and evaluation of innovative approaches. Programmes of cognitive bias modification have the potential to broaden the spectrum of Internet-based self-help programmes. The third study of the present thesis evaluated an Internet-based attention bias modification programme. The biased allocation of attention to social threat cues is considered a core maintaining factor in SAD. Prior studies in laboratory settings produced very encouraging results for a computerised attention modification programme. In the Internet-based setting, the attention training did not prove superior to a control training. Both training conditions produced only moderate change in social

anxiety symptoms. In contrast to previous studies, the attention training also failed to reduce the biased attention towards threat cues.

The three studies of the current thesis enhance our knowledge in the field of Internet-based interventions for social anxiety. They provide insight into what works (CBT self-help) and what does not work (attention training) in Internet-based interventions. The studies also provide insight into what are necessary (expectations, adherence) and less necessary (diagnostic interview) ingredients of these interventions. Thus, they contribute to building evidence on Internet-based self-help programmes. In some European countries, i. e. Sweden, United Kingdom, these interventions have already been successfully incorporated into the clinical routine.

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Appendix

Table 5.1. Participants open feedback (*N*=57)

Feedback on…		*N(%)*	Example
Specific parts / modules	sharing with others	9 (16)	*„Man bekommt das Gefühl in einer Gemeinschaft zu sein und man erkennt in den Problemen der anderen Teilnehmer die eigenen Schwierigkeiten“*
	psycho-education	9 (16)	*„Besonders gefallen hat mir der theoretische Background. Zu verstehen ist der erste Schritt, um etwas verändern zu können“*
	cognitive restructuring	6 (11)	*„Positiv: Das Hinterfragen eigener Befürchtungen und Konsequenzen bzw. das Einschätzen was passiert, wenn sie eintreten“*
	self-focused attention	5 (9)	*„Die grössten Vorteile, empfand ich bei den Konzentrationsübungen! Schon nach kürzester Zeit, wurden meine Angstgedanken ,sowie die innere Nervosität und meine Unruhe immer weniger!“*
	relaxation exercises	1 (2)	*„Die Übungen zur Entspannung haben mir auch gefallen, da ich schon finde, dass mir diese etwas bringen“*
Advantages	Barrier to seek treatment / anonymity	10 (18)	*„Also der große Vorteil des Online-Angebot ist, dass diese Art sehr unpersönlich ist und das man auf keine Person direkt zugehen muss um daran teilzunehmen (was ja das Problem von dieser Art Patient ist)“*
	Flexibility	21 (37)	*„Ich fand es sehr gut, dass ich es immer nutzen konnte, wann ich Zeit hatte. Auch dass ich Kapitel wiederholen konnte, war sehr gut“*
	Empowerment	3 (5)	*„Einen weiteren Vorteil sehe ich persönlich für mich, das ich durch das Online Programm, selbst die Möglichkeit hatte durch Eigeninitiative ,meine Angstproblematik in den Griff zu bekommen! Das war immer schon mein Bestreben!“*
Disadvantages	Lack of individuality	9 (16)	*„Nachteil ist, das manche Fragen überhaupt nicht zutreffen und man hat nicht die Möglichkeit, dies zu äußern“*
	Motivation	16 (29)	*„Nachteile: -Eigene Motivation finden die erlernten Dinge anzuwenden und das Programm zu nutzen“*
	Lack of guidance	29 (51)	*„Ohne persönliche Begleitung gehe ich gerade bei den unbequemen Dingen weiter in die Vermeidung.“* *„fehlende Rückmeldung, ein wursteln im eigenen Saft“*
	presentation of therapeutic material, only written material	4 (7)	*„Vielleicht sollte die Gestaltung des Programms überdacht werden. Mehr Grafiken, Animationen, weniger nüchtern, vielleicht auch mit Dialoge“*

Table 5.2: Participants' open feedback (*N*=47)

Feedback on		*N (%)*	Example
The training was…	helpful	3 (6)	*Das Online Programm wirkt sofort und sehr intensiv. Ich habe an manchen Tagen die Welt nicht mehr verstanden in positiver Hinsicht.*
	not helpful	14 (30)	*Ich konnte keinen Nutzen für mich erkennen*
Advantages	Barrier to seek treatment, anonymity	10 (21)	*Online-Behandlung bzw. Kontaktaufnahme kostet weniger Überwindung*
	Flexibility	23 (49)	*Man kann die Zeit selber bestimmen, wann und wo man die Übungen machen möchte*
	No costs	3 (6)	*das es gratis ist*
	Exercises and statistical analyses	2 (4)	*gefallen hat der "spielerische" Anteil sowie die statistischen auswertungen*
Disadvantages	Lack of individuality	2 (4)	*grösster Nachteil: die fehlende Individualität*
	Motivation	2 (4)	*Die Ausdauer war oft sehr gefordert*
	Lack of guidance / feedback	5 (11)	*Zudem hat mir in dem persönlichen Gespräch gefehlt, das mir der Profi sagt "komm Laie, ich nehm dich an die Hand. Du hast das und das Problem und du mußt die und die Wege gehen um dein Problem in den Griff zu bekommen*
	No treatment rationale	15 (32)	*Gefehlt hat mir insbesondere eine Erklärung wie und in welcher Form dieses Programm hilfreich sein kann*
	Monotony	14 (30)	*Es war immer die gleiche Aufgabe, mit der Zeit eintönig*

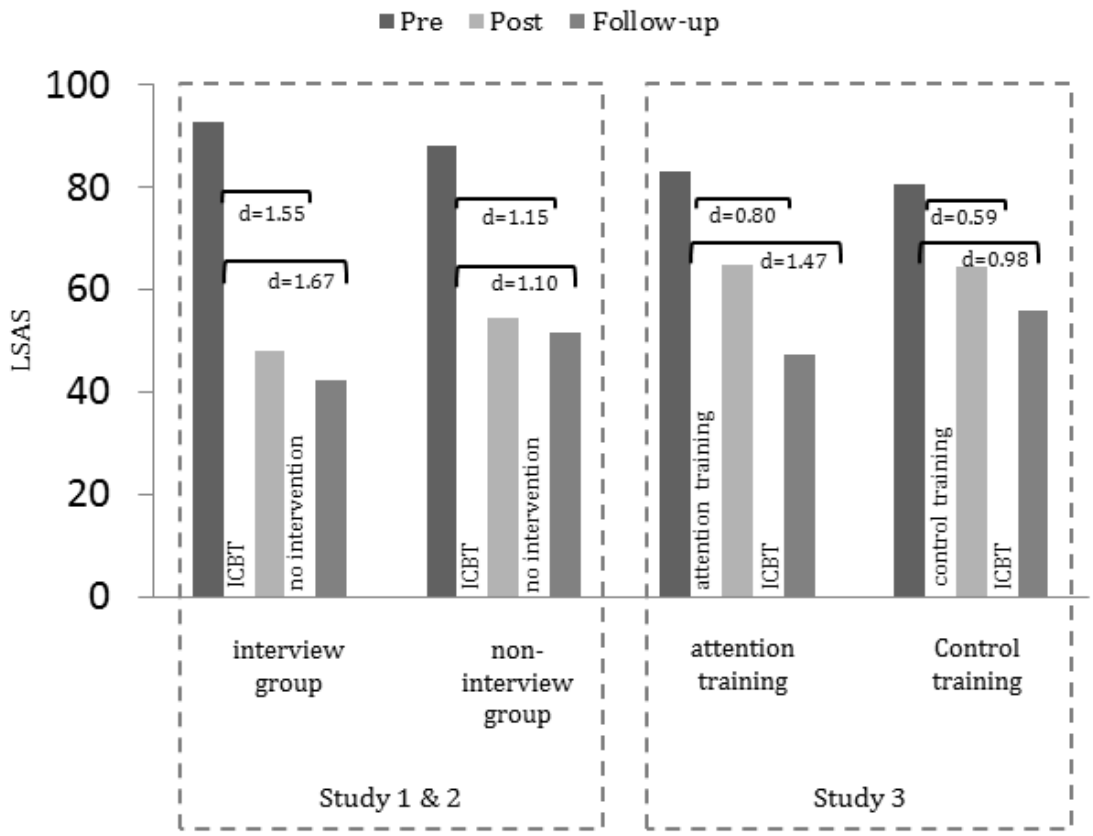

Figure 5.1: Means at pre-, post-, and follow-up-assessment in both RCTs

Table 5.3: Characteristics of participants in the present thesis and in a face-to-face trial

	Current thesis (*N*=177)	Lincoln et al. (2003) (*N*=217)
Mean age	36,8	33,7
% women	48	43
% higher education	67	63
% employed	59	60
% unemployed	11	13
% school/university	24	27
% former psychotherapy	40	66
% psychotropic medication	8	68
Mean (SD) SPS pre	37,21 (13,8)	38,6 (17,2)
Mean (SD) SIAS pre	52,45 (11,9)	40,4 (15,6)
Mean (SD) BDI pre	19,41 (11,0)	15,9 (10,7)
% any comorbid disorder	59	44

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Zusammenfassung

Die soziale Angststörung gehört zu den häufigsten psychischen Störungen. Im Mittelpunkt der Störung steht die übersteigerte Angst vor Bewertung oder Beschämung in sozialen Situationen. Die Behandlung im Rahmen der Kognitiven Verhaltenstherapie hat sich für Menschen mit sozialen Angststörungen bewährt. Die Behandlungsrate ist allerdings gering. Nur etwa 20-40 Prozent der Personen mit einer Sozialen Angststörung erhalten eine Behandlung. Dieser Kluft in der psychotherapeutischen Versorgung begegnen Internet-basierte Behandlungsprogramme.

Internet-basierte Selbsthilfeprogramme vereinen die Vorteile der hohen Erreichbarkeit, von niedrigen Kosten und einer geringen Hemmschwelle zur Behandlungsaufnahme. In einer Vielzahl randomisiert-kontrollierter Studien haben sich Internet-basierte Selbsthilfeprogramme als wirksam für die Behandlung sozialer Ängste erwiesen. Über Prädiktoren und Wirkmechanismen dieser Programme ist bisher wenig bekannt. Ein Wirkfaktor, der in der Internet-basierten Behandlung von Depressionen eine wichtige Rolle spielt, ist die Unterstützung durch eine Therapeutin. In der Behandlung sozialer Ängste scheint die therapeutische Unterstützung scheint jedoch weniger bedeutend. Direkte Vergleichsstudien von geleiteten und ungeleiteten Selbsthilfeprogrammen zeigten keine Unterschiede im Therapieerfolg. Die erste Studie der vorliegenden Dissertation weitet die Erkenntnisse über die Rolle von therapeutischer Unterstützung auf den diagnostischen Prozess aus. Bisher unterliefen alle Teilnehmer von (geleiteten oder ungeleiteten) Selbsthilfeprogrammen ein diagnostisches Interview. Die Hypothese der ersten Studie war, dass sich der kurze Kontakt zu einem Therapeuten im Rahmen eines diagnostischen Gesprächs positiv auf den Therapieverlauf auswirken könnte. Es

wurden zwei Gruppen von Personen mit sozialen Ängsten in einem randomisiert-kontrollierten Design miteinander verglichen. Die eine Gruppe erhielt vor Beginn des Selbsthilfeprogramms ein strukturiertes diagnostisches Interview, die andere Gruppe startete direkt mit dem Selbsthilfeprogramm. Das diagnostische Interview hatte keine Auswirkung auf die Veränderung der sozialen Ängste durch das Selbsthilfeprogramm. Die Teilnehmer beider Gruppen verbesserten sich bedeutsam in Hinblick auf ihre soziale Angstsymptomatik. Das diagnostische Interview führte jedoch zu einer positiven Veränderung der sekundären Outcome-Maße, wie Depressivität und allgemeine Symptombelastung. Auch die aktive Teilnahme am Selbsthilfeprogramm wurde von dem diagnostischen Gespräch positiv beeinflusst. Um weitere Faktoren zu erforschen, die Therapieverlauf und –Ergebnis beeinflussen, wurden in der zweiten Studie die Therapieerwartungen der Teilnehmerinnen näher untersucht. Dafür wurden die beiden Gruppen der ersten Studie zu einer Stichprobe zusammengefasst. Es zeigte sich, dass die Therapieerwartungen einen positiven Einfluss auf die Adhärenz und den Therapieerfolg hatten. Der Einfluss der anfänglichen Symptombelastung wurde dabei kontrolliert. Teilnehmer, die sich von dem Programm mehr Erfolg versprachen und den Behandlungsansatz als nachvollziehbar und seriös bewerteten, zeigten bessere Therapieerfolge als Teilnehmer mit weniger positiven Erwartungen.

Zusammengefasst deuten die Ergebnisse der ersten beiden Studien auf die wichtige Rolle von Therapieerwartungen und Therapieadhärenz hin. Die Adhärenz, nicht jedoch die Erwartungen, werden dabei positiv von einem diagnostischen Interview beeinflusst. Die ersten beiden Studien belegen außerdem die Wirksamkeit kognitiv-behavioraler Selbsthilfeprogramme. Wie in vorangehenden Studien zur Wirksamkeit Internet-basierter Interventionen, zeigte auch in den vorliegenden Studien eine große Anzahl der Teilnehmerinnen klinisch bedeutsame Verbesserungen. Es profitierten jedoch nicht alle

Teilnehmerinnen in ausreichendem Maße. Ein Weg, mit dem Nichtansprechen auf die Behandlungsprogramme umzugehen, ist die Erforschung von Prädiktoren und Wirkmechanismen. Ein anderer Weg ist die Untersuchung innovativer Ansätze. Therapeutische Ansätze aus dem Bereich der Cognitive Bias Modification haben das Potential, das Angebot verhaltenstherapeutischer Behandlungsprogramme zu erweitern. In der dritten Studie der vorliegenden Arbeit wurde die Wirksamkeit eines Aufmerksamkeitstrainings untersucht. Das Aufmerksamkeitstraining zielte auf die Veränderung der verzerrten Aufmerksamkeitslenkung auf sozial bedrohliche Reize ab, der in der Aufrechterhaltung sozialer Ängste eine tragende Rolle zugesprochen wird. Das Training und das Studiendesign waren angelehnt an Laborstudien, die erstaunlich positive Ergebnisse in der Reduktion sozialer Ängste erzielt hatten. Im Internet-basierten Setting war das Aufmerksamkeitstraining nicht wirksam. Gleich dem Kontrolltraining erzielte es nur moderate Veränderungen in den sozialen Ängsten. Auch konnte keine Veränderung im zentralen Wirkmechanismus des Trainings, der verzerrten Aufmerksamkeitslenkung, bei den Teilnehmern beobachtet werden.

Die drei Studien, die im Rahmen der vorliegenden Dissertationsschrift durchgeführt wurden, tragen zum Erkenntnisgewinn im Bereich der Internet-basierten Selbsthilfe bei. Sie bereichern unser Wissen über das, was wirksam ist (KVT-Selbsthilfe) und was nicht wirksam ist (Aufmerksamkeitstraining) und weisen auf primär notwendige (Erwartungen, Adhärenz) und weniger bedeutende Bausteine (diagnostisches Interview) dieser Therapieform hin. Damit tragen sie zur wachsenden Befundlage Internet-basierter Selbsthilfeprogramme bei, die in anderen europäischen Ländern bereits zur regelhaften Einführung dieser Interventionsform in die psychotherapeutische und psychosomatische Grundversorgung geführt hat.

Selbstständigkeitserklärung

Hiermit versichere ich, dass ich die vorgelegte Arbeit selbstständig verfasst habe und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt habe, sowie Zitate kenntlich gemacht habe.

Die Arbeit ist in keinem früheren Promotionsverfahren angenommen oder abgelehnt worden.

Berlin, den 22. März 2013

Johanna Böttcher