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A computer-based self-treatment for social phobia:

Development, evaluation and a controlled treatment study

2003

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Tag der mündlichen Prüfung: 31.03.2003

In loving memory of my parents...

ABSTRACT

Social phobia is one of the most prevalent and debilitating anxiety disorders. The main purpose of the present thesis was to develop and evaluate a computer-based self-treatment for social phobia within the framework of cognitive behavior therapy.

In the formative evaluation, the focus was to create a comprehensible program that could support the learning process. Multimedia and interactive features were applied according to recommendations from leading researchers, as well as feedback from participants (Ps). In the pilot study, it was demonstrated that the self-treatment could reduce social anxiety.

In the summative evaluation, a controlled treatment study generated a final judgement, showing that the self-treatment could lead to a clinically significant improvement in about 35% of the Ps working at the university with the self-treatment. In particular, the results indicated that older Ps with an onset age in the mid and the late adolescence were more likely to be successful, whereas Ps with severe forms of social phobia and depression were not. Aspects important to the learning process were investigate, showing that the use of external resources and high levels of intrinsic, rather than extrinsic motivation, were important to treatment outcome.

Results from an impromptu speech task showed that thoughts after the speech were associated with the level of social anxiety, rather than thoughts in anticipation of the speech or behavioral variables. Thus, the results lend support to the assumption that cognitive aspects play a crucial role in social phobia. In particular, post-event processing should be further investigated. Social support was also suggested to be further investigated, as well as the learning process during computer-based self-treatments.

Key words: self-treatments, social phobia, cognitive behavior therapy, computer-based learning, evaluation.

CONTENT

TABLES

FIGURES

ABBREVIATIONS

AFS	Questionnaire assessing specific computer attitudes regarding self-treatments
ANOVA	Analysis of variance
APA	American Psychiatric Association
APD	Avoidant Personality Disorder
BAT	Behavioral Assessment Test
BN	Questionnaire developed by Borkovec and Nau assessing expectancy and credibility of treatment
CAS	Questionnaire assessing a general computer attitude
CBGT	Cognitive Behavior Group Therapy
CBT	Cognitive Behavior Therapy
CSI	Clinically significant improvement
DSM	the Diagnostic and Statistical Manual of Mental Disorders
FNE	Fear of Negative Evaluation Questionnaire
KNT	Questionnaire assessing knowledge of social anxiety and its treatment
LRNV	Questionnaire assessing among others learning strategies
NML	Nijmegen Motivation List
PIU	Pathological Internet Use
Ps	Participants
PT-group	The group in the pilot study
SCID	Structured Clinical Interview for DSM
SCL	Symptom Check List
SE	Questionnaire assessing among others learning self-image and motivation
SIAS	the Social Interaction and Anxiety Scale
SST	Social Skills Training
SUDS	Subjective Units of Distress Scale
TU-group	The group working at the University with the self-treatment
VR	Virtual Reality
VRE	Virtual reality exposure
WTH-group	The group randomized to waitlist followed by treatment at home

ACKNOWLEDGEMENTS

1. INTRODUCTION

The introduction of well-structured treatment manuals in research on psychotherapy, once labeled a small revolution (Luborsky & DeRubeis, 1984), triggered off the development of self-treatments[1]. In addition, recent technological innovations have improved the way self-treatments can be presented and distributed. In the wake of these changes and with cost containment playing an important role in health care policy-making, self-treatments are gaining attention. Currently, there are self-treatments to be found for most major psychiatric disorders (Angenendt, 2000, pp. 599-604), some being offered as manuals and books, others as computer-based programs. In deed, self-treatments are a promising treatment alternative for some patients. However, this research field is still in its cradle. There are no clear-cut guidelines on how to develop, implement or evaluate self-treatments. In particular, this is true for computer-based self-treatments.

This thesis focuses on the development and evaluation of a computer-based self-treatment for socially anxious persons. The idea to produce an interactive multimedia program derived from previous clinical observations during research on traditional self-treatments (Öst, Stridh & Wolf, 1998). A multidisciplinary approach was adopted, including research on psychotherapy as well as research on computers and education. Finally, the self-treatment was tested in a controlled treatment study.

1.1. Social phobia and cognitive behavior therapy

1.1.1. Introduction

Even though experiencing fear is unpleasant for most people, this reaction can be appropriate and necessary in situations that are dangerous. The fear reaction is associated with a change of the person's physiological and mental state including an increase of heart rate and autonomic arousal. This so called fight-or-flight mechanism enables our body to function more effectively and is believed to have helped humans to survive in a dangerous world (Clark, 1993, pp. 52-55). However, when intense feelings of fear and anxiety repeatedly occur in situations that are not dangerous, there is a potential risk of developing an anxiety disorder. In particular, this is true for people that start to avoid or flee from these fear-evoking situations.

Social phobia (or social anxiety disorder) refers to a condition that is characterized by an excessive and persistent fear of negative evaluation by others during social interaction and/or performance in front of others. Initially, social phobia received little attention compared with other anxiety disorders (Liebowitz, Gorman, Fyer & Klein, 1985). In the last several years, however, an impressive research activity has been seen. The increased interest in social phobia is partly a result from the establishment of operationalized diagnostic criteria and the inclusion of social phobia in the Diagnostic and Statistical Manual of mental disorders in 1980 (DSM-III; American Psychiatric Association, 1980). The intensified research efforts have lead to a detailed picture of an often chronic and debilitating disorder (Liebowitz et al., 1985). Social phobics have been reported to experience significant impairment in occupational, educational, marital and social functioning. Not surprisingly, social phobics are over-represented among unmarried persons and high levels of social phobia are associated with a low socioeconomic status as well as a low level of education (Schneier, Johnson, Hornig, Liebowitz & Weissman, 1992). Not only has it

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[1] Many different concepts can be found in the literature referring to self-directed treatments. In this paper, the concept "self-treatment" will be used when referring to these treatments in general (see 1.2.2. Important concepts).

become evident that social phobia causes severe disruption in the lives of those affected, but also the costs for this prevalent disorder are high for society (Greenberg et al., 1999).

1.1.2. Symptomatology

According to Lang (1971), there are three components that are important when describing a phobic reaction; first, an intense physiological reaction typical for the fight-or-flight mechanism often occurs in fear-evoking situations, including palpitations, sweating and trembling. Anticipatory anxiety, referring to the anxiety that is present in anticipation of the fear-evoking situation, can also trigger these reactions (Wlazlo, 1995, p. 10). Second, the cognitive component of the phobic reaction refers to a person's beliefs, assumptions and expectations. The cognitive component is thought to play a crucial role in the development and maintenance of social fears and will therefore be described in detail (see below). Third, there is a behavioral component including behaviors aiming at regaining control over the situation or decreasing the level of anxiety such as the tendency to flee from difficult situations and to submit to avoidance behavior (Heckelman & Schneier, 1995, pp. 3-4). Safety behaviors and social skills are two other aspects of the behavioral component that have received attention in recent research studies and will therefore be described in more detail (see below).

1.1.2.1. A closer look at the cognitive component

In several studies, social phobics have reported more negative thoughts during social interaction compared with non-anxious and low-anxious persons, whereas no difference between these groups has been observed with regard to positive thoughts (Beidel, Turner & Dancu, 1985; Cacioppo, Glass & Merluzzi, 1979). In addition, negative self-statements seem to have a stronger relationship to psychopathology than positive self-statements (Glass, Merluzzi, Biever & Larsen, 1982). There is also evidence showing that concerns about making a bad impression on others occur more often in social phobics than in non-anxious persons or persons with other anxiety disorders (Heimberg, Hope, Rapee & Bruch, 1988). Moreover, social phobics report having negative expectations regarding their own ability to behave in an appropriate way in social situations (Lucock & Salkovskis, 1988; Stopa & Clark, 1993). It is not surprising that a decrease in negative thoughts has been found to be highly correlated with a decrease in social anxiety (Hofmann, 2000).

A cognitive process typical for social phobia is the increase in self-focused attention (Hofmann, 2000; Hope & Heimberg, 1988). In particular, it has been reported that social phobics show a high degree of public self-consciousness[2], referring to when the person is excessively focused on how one appears to others (Bruch, Gorsky, Collins & Berger, 1989). As a result of high levels of self-focused attention, there are limited attentional resources left for the person to focus on what is really going on in the situation. This lack of attention for important aspects of the situation may supply the social phobic with new evidence that he or she is not having the current situation under control. Thus, the increase of self-focused attention is a factor in maintaining negative beliefs and anxiety (Woody, Chambless & Glass, 1997). In accordance, a decrease in social anxiety is associated with a decrease in self-focused attention (Hofmann, 2000; Wells & Papageorgiou, 1998) as well as public self-consciousness (Lundh & Öst, 2001).

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[2] Public self-consciousness can be distinguished from private self-consciousness (Fenigstein, Scheier & Buss, 1975), the latter referring to when the attention is focussing on internal physiological and emotional changes.

It has also been observed that social phobics tend to allocate attention in such a way that social threats can be detected (Mathews & MacLeod, 1985; Mattia, Heimberg & Hope, 1993), i.e. the person is constantly on the look out for social threats so that he or she can react in time in a way judged as necessary by the person. In everyday life this can lead to difficulties since attentional resources are allocated to stimuli that are irrelevant when performing a necessary task for example at work. However, there are contrasting research findings to be found regarding distortions in attention (Heinrichs & Hofmann, 2001). In a recent study (Chen, Ehlers, Clark & Mansell, 2002), it was demonstrated that patients direct their attention away from faces (rather than towards faces with a bias for a certain facial expressions), suggesting that reduced processing of external social cues plays a role in social phobia.

Evidence has also been found for a recognition bias in social phobia. Lund and Öst (1996) demonstrated that social phobics have a bias for critical faces, whereas non-anxious subjects have a bias for accepting faces. In addition, social phobics were more likely to recognize a face, the more critical it had been rated. However, in a recent review of research on information processing in social phobia (Heinrichs & Hofmann, 2001), it was noted that there is weak evidence in support of a memory bias for socially threatening stimuli. Lund and Öst (1996) offer an explanation for the inconsistent findings. They suggest that methods using abstract entities such as verbal stimuli, allow for less control of the encoding process taking place in recognition tasks compared with methods using non-verbal stimuli. Accordingly, they recommend the use of concrete non-verbal stimuli such as faces rather than verbal stimuli in research on memory.

Another issue that has been investigated, is the way social phobics rate their own performance. There is convincing evidence that social phobics tend to use high standards when assessing their own performance. Consequently, they often underestimate their own performance in social situations. Rapee and Lim (1992) showed that social phobics rated their own performance less favorable than did objective raters. The discrepancy was significantly larger for social phobics than for controls. The negative self-evaluation, however, does not seem to coincide with a negative evaluation in general. Social phobics were as accurate as controls in rating other people's performance in social situations. In another study (Wallace & Alden, 1991), anxious persons reported to have expectations that their performance would match their own personal standard, however, they expected that the standards of the researchers would be much higher. In other words, they believed that they would fall short of what was (in their own eyes) expected from them. This discrepancy between personal standards and the believed standard of others was not reported by non-anxious persons. Alden, Bieling and Wallace (1994) found that social anxiety was associated with socially prescribed perfectionism in students, but not with self-oriented perfectionism. Thus, socially anxious students do not set high standards for themselves, however, they feel that others place high standards on their behaviors. A decrease in social anxiety has been reported to be associated with a decrease in perfectionism (Lundh & Öst, 2001).

The assumption that feelings and thoughts always give accurate information about the current situation, often causes problems for people with psychiatric conditions (Hautzinger, 2000, pp. 132-166). Such assumptions could partly explain why social fears persists, even though social phobics are exposed to social situations and perform well (according to objective observers). For example, when social phobics underestimate their own behavior and report thinking *"What I did, was not good enough",* the thought may in a sense function as conclusive evidence, convincing the

person that the performance was unsatisfactory and is likely to be negatively evaluated by others. Thus, social phobics risk getting caught in a vicious circle of underestimating their own performance, strengthening a negative self-image and triggering additional dysfunctional thoughts. In addition, this vicious circle can lead to behaviors that increase the risk of negative evaluation and rejection. Rachman (2000, pp. 166-167) reports that when feeling rejected and believing that they have failed, social phobics tend to behave in a socially less advantageous way, for example, looking unfriendly. This can, in turn, trigger unfriendly behavior in other people. Thus, dysfunctional thoughts and subsequent behaviors in social phobia may have a function of self-fulfilling prophecy.

The post-event processing is also thought to be of importance in the maintenance of negative beliefs and anxiety. It refers to the process of repeatedly evaluating and worrying about past experiences, comparing them to other experiences and during this analysis, focusing on those aspects that went wrong. Clark and Wells (1995, pp. 74-86) refer to this retrospective review in detail as conducting a "post mortem". They stress that this process could make social phobics even more distressed about negative experiences. Rachman, Grüter-Andrew and Shafran (2000) have developed a post-event processing questionnaire including questions such as:

- *After the event was over, did you find yourself thinking about it a lot?*
- *Did you try to resist thinking about the event?*
- *If you did think about the event over and over again, did your feelings about the event get worse or better?*

Rachman and colleagues have demonstrated that high post-event processing scores are associated with high levels of social anxiety. The recollections were reported to be recurrent and intrusive to the patients, not only increasing the level of anxiety, but also interfering with concentration.

In conclusion, there is clear evidence that social phobics and non-anxious persons differ in aspects of cognitive content as well as in cognitive process. In particular, social phobics report negative thoughts before, during and after social interaction more often than non-anxious persons. In addition, the information processing in social situations and post-event processing often hinder social phobics from functioning effectively and can lead to an increase in social anxiety.

1.1.2.2. A closer look at the behavioral component

When fear-evoking situations have to be endured, social phobics often submit to subtle forms of safety-behaviors. According to Salkovskis (1991), safety-behaviors aim at preventing a feared catastrophe and can be overt (a behavior) as well as covert (a cognitive act). For example, social phobics would grasp a glass tightly in order to prevent themselves from spilling out the content of the glass, assuming that this would be inappropriate and lead to a negative evaluation by others (Clark & Wells, 1995, pp. 73-86). Salkovskis (1991) suggests that safety-behaviors can explain why non-occurrence of a feared catastrophe does not lead to the questioning of dysfunctional thoughts. According to Salkovskis, the person believes that the only thing that saved him or her from the ultimate catastrophe, was the practicing of safety-behaviors. In contrast, staying in the feared situation without the use of the safety-behavior could lead the person to question his or her negative beliefs, for example, witnessing that other people do not pay any attention to an inappropriate behavior (spilling out the content of the glass). Even if the others saw what

happened, they might offer to help rather than to turn away and to think negatively about the person.

Not only are safety-behaviors preventing the person from questioning dysfunctional thoughts, but also Clark (1999) describes how safety-behaviors can cause situations that are similar to the feared situation. For example, wearing a jacket to hide underarm sweating can lead to increased sweating. Furthermore, safety-behaviors may catch more attention than the behavior that was originally viewed as inappropriate by the social phobic, for example, covering the face when blushing. In addition, Clark notes that the preoccupation with safety-behaviors can cause social phobics to behave in such a way that elicits negative reactions by others. When social phobics appear distant, this can be interpreted as dislike and trigger a less friendly behavior by the person interacting with the social phobic (Curtis & Miller, 1986). Wells and Salkovskis (1995) have demonstrated that exposure treatment of social phobia can be improved by including measures to decrease safety behaviors.

Another issue that has repeatedly been on debate in research on social phobia, is the role that social skills play. According to Rapee (1995, pp. 48-50), results are inconsistent on whether or not social phobics have deficient social skills. It has been reported that more severe forms of social fears show poorer social skills than less severe forms (Turner, Beidel & Townsley, 1992). However, even in those cases where reduced social skills are observed, the question remains open whether this is a case of skills deficiency or skill inhibition. The theory of skill inhibition refers to the assumptions that high levels of anxiety could prevent social phobics from performing skills that they in fact possess (Lucock & Salkovskis, 1988). In deed, there is empirical evidence that support this theory. Hill (1989) reports that shy and non-shy persons show no significant difference in knowledge of appropriate social skills. However, shy persons are less willing to use these skills and show less confidence in their own ability to perform these skills. Furthermore, Rapee and Lim (1992) demonstrate that fears of negative evaluation can persist in spite of good social skills (rated by objective observers). Finally, Wallace and Alden (1997) suggest that positive experiences do not automatically decrease level of anxiety or lead to a modification of dysfunctional thoughts. On the contrary, positive social events can release negative emotional states in social phobics and even trigger additional fears that others might expect even better performance in the future.

1.1.3. Diagnostic issues

The diagnosis of social phobia has been on debate since the introduction in the Diagnostic and Statistical Manual of mental disorders (DSM-III; American Psychiatric Association, 1980), resulting in several changes (for current diagnostic criteria, see Table 1.). A key issue has been, whether or not there are subtypes of social phobia and how to distinguish between them. Two subtypes have been suggested: generalized social phobia (defined by fears in most social situations) and non-generalized social phobia (defined by fears in a limited amount of social situations such as public speaking). Comparisons of subtypes show that persons with a generalized social phobia are more anxious and functionally impaired, they report an earlier onset age, show a higher degree of comorbidity and are more often single than non-generalized social phobics (Brown, Heimberg & Juster, 1995; Heimberg, Holt, Schneier, Spitzer & Liebowitz, 1993; Holt, Heimberg & Hope, 1992; Turner et al., 1992).

Another key diagnostic issue is the overlap between the generalized subtype of social phobia and avoidant personality disorder (APD). This is important with regard to theories of social phobia and personality disorders, diagnosis and assessment as

well as implementation of treatment interventions. APD is an Axis-II diagnosis in DSM-IV (APA, 1994), but with similar criteria to those of generalized social phobia (an Axis-I diagnosis). Consequently, it is difficult to distinguish between generalized social phobia and APD. Compared with generalized social phobia alone, persons that meet the criteria for APD have been reported to have more severe anxiety and impairment in functioning as well as a higher degree of comorbidity (Hope, Herbert & White, 1995; Turner et al., 1992). Nevertheless, growing evidence suggest that there is no qualitative distinction between the two diagnoses, APD simply represents the most severe form of social phobia (Hope et al., 1995). The fact that APD and generalized social phobia may not be conceptually distinct, is an important finding. Instead of developing new treatments for personality disorders, existing treatments for social phobia can be applied. Several studies have already shown that this may be a promising approach when dealing with APD (Alden, 1989; Hope et al., 1995; Renneberg, Goldstein, Phillips & Chambless, 1990).

Table 1. Diagnostic criteria for social phobia according to DSM-IV (APA, 1994).

A. A marked and persistent fear of one or more social or performance situations in which the person is exposed to unfamiliar people or to possible scrutiny of others. The individual fears that he or she will act in a way (or show anxiety symptoms) that will be humiliating or embarrassing. *Note:* In children, there must be evidence of the capacity for age-appropriate social relationships with familiar people and the anxiety must occur in peer settings, not just in interactions with adults.

B. Exposure to the feared social situation almost invariably provokes anxiety, which may take the form of a situationally bound or situationally predisposed Panic Attack. *Note:* In children, the anxiety may be expressed by crying, tantrums, freezing, or shrinking from social situations with unfamiliar people.

C. The person recognizes that the fear is excessive or unreasonable. *Note:* In children this feature may be absent.

D. The feared social or performance situations are avoided or else endured with intense anxiety or distress.

E. The avoidance, anxious anticipation, or distress in the feared situation (s) interferes significantly with the person's normal routine, occupational (academic) functioning, or social activities or relationships, or there is marked distress about having the phobia.

F. In individuals under age 18 years, the duration is at least 6 months

G. The fear of avoidance is not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medication condition and is not better accounted for by another mental disorder (e.g., Panic Disorder with or without Agoraphobia, Separation Anxiety Disorder, Body Dysmorphic Disorder, a Pervasive Developmental Disorder, or Schizoid Personality Disorder).

H. If a general medical condition or another mental disorder is present, the fear in Criterion A is unrelated to it, e.g. the fear is not of Stuttering, trembling in Parkinson's disease, or exhibiting abnormal eating behavior in Anorexia Nervosa or Bulimia Nervosa.

   Specify if generalized: if the fears include most social situations (also consider the additional diagnosis of Avoidant Personality Disorder).

Social phobia is a chronic and debilitating disorder, with more than 15% of social phobics reporting suicide thoughts and attempted suicide (Schneier et al., 1992). In an attempt to reflect the severity of social phobia and to distance it from specific phobias (a less severe condition), social anxiety disorder has been suggested as a more suitable term for this disorder (Liebowitz, Heimberg, Fresco, Travers & Stein, 2000). At the moment, social phobia as well as social anxiety disorder are suggested

in DSM-IV (APA, 1994). In recent publications, however, there seem to be a shift towards social anxiety disorder (see for example, Heimberg, 2002).

1.1.4. Prevalence, age of onset, gender and comorbidity

Social phobia has been identified as one of the most common psychiatric problem with a suggested lifetime prevalence in the United States of 13.3% (Kessler et al., 1994). In a recent Swedish study (Furmark et al., 1999), a point prevalence of 15.6% was reported. Based upon 43 epidemiological studies, Furmark (2002) estimates the lifetime prevalence of social phobia in Western countries to be about 7-13%. In general, more severe forms of social phobia have been the main focus for research (Furmark, 2002). Thus, less severe forms of social fears such as fear of public speaking may be even more common in the population and it can be assumed that social fears and phobia constitute an important public health concern.

Social phobia is a problem affecting men as well as women. In the general population the women-to-men ratio is approximately 3:2 (Chapman, Manuzza & Fyer, 1995; Kessler et al., 1994; Moutier & Stein, 1999). However, men seem to be more likely to seek treatment than women. It has been suggested that social phobia leads to negative consequences in everyday life that are more difficult to accept for men than for women (Mannuzza, Fyer, Liebowitz & Klein, 1990).

The age of onset for social phobia has been suggested to be between the mid and the late adolescence (Liebowitz et al., 1985; Turner, Beidel, Cooley, Woody & Messer, 1994). Retrospectively, however, some social phobics report having experienced social anxiety as long as they can remember. This is implicating that for some social phobics, the condition may have an earlier age of onset than previously assumed (Schneier et al., 1992). In particular, this is true for persons with severe forms of social phobia (Mannuzza, Schneier, Chapman & Liebowitz, 1995). Typically, social phobics report that their condition has developed gradually over a longer period of time. They have often been socially anxious for several years, before looking for treatment and it is not unusual for social phobics to seek treatment for other reasons than social anxiety such as depression (Wlazlo, 1995, p. 9). This finding emphasizes the importance of establishing diagnosis before starting a treatment.

Not only does social phobia have a high prevalence, but also social fears show a high degree of comorbidity with other psychiatric disorders, in particular with other anxiety disorders and depression (Schneier et al., 1992). It has also been reported that as many as 40% of social phobics fulfill the criteria for substance abuse disorders (Magee, Eaton, Wittchen, McGonagle & Kessler, 1996). In another study, 25% of social phobics had an alcohol problem (Weiller, Bisserbe, Boyer, Lepine & Lecrubier, 1996). It is believed that alcohol is used in an attempt to reduce the anxiety and increase the chances to cope with fear-evoking social situations. Alcohol is known to have a relaxing effect, making the anxious person less tense and distressed. However, Wilson (1988) points out that in some cases alcohol can have a reversed effect and increase the level of fear. This is especially true for the long term consequences, i.e. the fear increases the day after the alcohol consumption when aversive bodily reactions occur.

Avoiding social situations can also be the result of a medical illness such as stuttering, tremor, obesity and severe disfigurement (Heckelman & Schneier, 1995, p. 11). This phenomenon has been labeled a secondary social phobia (Liebowitz et al., 1985).

1.1.5. Cognitive behavior therapy for social phobia

1.1.5.1. Social skills training

Social fears were observed by practitioners long before the inclusion of social phobia in the Diagnostic and statistical manual of mental disorders (DSM-III; American Psychiatric Association, 1980). Early efforts to treat this condition focused on social skills training (SST). Ground-breaking work in this area was made in the 1970s and 1980s by Liberman and colleagues (Liberman, Mueser & Wallace, 1986), developing an SST for psychiatric patients with severe psychopathology. In a review of treatments for social phobia (Heimberg & Juster, 1995, p. 262), it was reported that SST often includes the following components: modeling, behavioral rehearsal, corrective feedback, social reinforcement, homework assignments and exposure methods.

In a study conducted by Wlazlo and colleagues (1995, pp. 54-57), social phobics received either SST or exposure. The results show that patients with primarily social anxiety could profit from exposure in vivo as well as from SST. Patients with primarily social skills deficiency could also profit from both treatment methods, however, they showed a tendency to improve more when receiving exposure treatment. This is a result in contrast to expectations. In generally, it is assumed that treatments aiming directly at a certain problem area (for example SST for patients with primarily skills deficiency) would produce better results than treatments that do not. Because of methodological shortcomings in Wlazlo's study (no randomizing of patients) as well as in other studies on SST, it is not possible to make any clear statements on the efficacy of SST for social phobics.

Two questions are important to clear in future research on social phobia and SST: (1) How do we distinguish between social skills deficiency and skills inhibition (see also 1.1.2.2. A closer look at the behavioral component), and (2) How do we distinguish between SST and exposure training? Theoretically, there are important differences between SST and exposure. In SST the acquisition of appropriate social skills is the aim, whereas in exposure treatment the aim is to confront the fear, i.e. socially inappropriate behavior could be necessary in order to create a fear-evoking situation where the person can be confronted with his or her anxiety and dysfunctional beliefs. However, there are also many similarities between SST and exposure training. For example, role-play in a SST group may have a similar function as exposure training.

In spite of these questions, SST is generally thought to be a valuable treatment intervention. Until more facts are known, a multi-component approach including social skills training has been suggested as the most optimal treatment option for severe cases of social phobia (Heimberg & Juster, 1995, pp. 298-305). There are already treatment packages that have been developed according to this recommendation (Turner et al., 1994).

1.1.5.2. Exposure training

There is overwhelming empirical support for exposure training in the treatment of anxiety disorders, for example, specific phobias (Emmelkamp & Felden, 1985; Öst, 1989a) and agoraphobia (Ghosh & Marks, 1987). In accordance with expectations, exposure training has also proven to be an effective intervention in the treatment of social phobia (Hofmann, 2000; Wlazlo, Schröder-Hartwig, Hand & Münchau, 1990). Importantly, exposure leads to change in behavioral as well as in cognitive components (Feske & Chambless, 1995; Hofmann, 2000; Wlazlo, 1995, pp. 54-57).

In research on anxiety disorders, it has been suggested that exposure can be carried out as a self-directed exposure without the support from a therapist (Ghosh & Marks, 1987). It has also been demonstrated that intense one-session exposure treatment can produce as good results as more spaced programs, this being true for group format as well as for individual format (Öst, 1989a; Öst et al., 1998).

Exposure in vivo refers to a treatment method where the patient should approach and stay in the fear-evoking situation until the phobic reaction decreases, then try to approach further and once more stay in the situation until the fear has diminished. Thus, the patient should learn to approach a feared situation, instead of fleeing or avoiding it. Furthermore, the patient should experience that the anxiety eventually decreases when he or she remains in the situation. Exposure can be carried out in vivo or in sensu, the latter referring to when the confrontation with the feared situation occurs imaginatively. According to Butler (1989, pp. 97-128), an exposure in vivo is believed to have a better effect than an exposure in sensu.

Wlazlo and colleagues (1990; 1992) have been successful in implementing an exposure in vivo treatment for social phobia, individual as well as group format. The treatment is being described as a standardized intensive short-term therapy. The treatment rationale is introduced to patients with eight essential aspects of learning how to cope with fear: risk taking, no avoidance or flight, allow for anxiety reaction, verification of reality, anxiety confrontation, learning new coping strategies, acceptance of an active role, no search for answers to why the problem has occurred. The overall aim is that the patients accept responsibility and strive at independence when learning how to deal with anxiety.

There are several difficulties when implementing exposure techniques for social phobia. To begin with, social situations are neither predictable nor repeatable. It is rarely the case that identical situations can be created where the patient can be gradually exposed to his or her fears and can remain in the situation for a long time in order to experience a decrease of anxiety. Wlazlo (1995, see introduction) suggests that there is a solution to this problem: A less prolonged exposure of social situations can be effective when a variety of similar situations are repeatedly performed. Another problem is that a patient participates in exposure training, but does not experience a decrease of anxiety. The reason may be that the patient is not able to truly participate in the exposure training due to depersonalization and dissociation. Several strategies have been suggested in order to overcome this internal avoidance in social situations, for example, patients should try to make eye-contact or exposure training can be combined with cognitive restructuring techniques (Butler, 1985).

Exposure treatments can be time-consuming for the therapist (and costly for the patient). To overcome this problem, there are a variety of exposure treatments that have been developed with computer technology. Virtual reality exposure (VRE) offers new possibilities for practitioners as well as for patients. Rothbaum and Hodges (1999) report that VRE can be an effective treatment in reducing fear of heights as well as the fear of flying. In VRE, patients wear a head-mounted display and are subsequently confronted with a three-dimensional virtual world. In this world, fear-evoking situations are presented with which the patient can interact. Rothbaum and Hodges suggest that the vividness of the virtual world may even create a more intense experience for the patient. A recent study (Emmelkamp et al., 2002) presents further evidence for the efficiency of VRE in the treatment of phobias. Interestingly, this research team used inexpensive hardware and software when developing their program. It remains to be seen, if these results can be replicated and if such programs can be successfully implemented in the treatment of more severe disorders such as generalized social phobia.

1.1.5.3. Anxiety-reduction strategies

Anxiety-reduction strategies are standard treatments for many practitioners when working with anxiety disorders. Applied relaxation (Öst, 1987) is an example of an anxiety-reduction strategy that is empirically supported. It is aiming at teaching patients to relax in 20-30 seconds. The relaxation can function as a coping strategy in feared situations when experiencing bodily symptoms. Applied relaxation contains the following components:

1. to recognize early signs of anxiety through self-monitoring exercises
2. progressive muscle relaxation alternating tension and relaxation of specific muscle groups
3. to relax to a cue word rather than the entire procedure of progressive muscle relaxation
4. to stay relaxed while being physically active
5. implementing relaxation skills in fear-evoking situations in role-plays and in exposure situations in everyday life

In the treatment of social phobia, the research findings regarding anxiety-reduction strategies are inconsistent. According to Heimberg and Juster (1995, pp. 299-300), further evaluation of anxiety-reduction strategies for social phobia is needed with methodological improvements in study design. For example, it is important to clearly distinguish between anxiety-reduction strategies and exposure training. When implementing relaxation skills in everyday life, the situation can be similar to that of an exposure training. Furthermore, the relaxation program offered in treatment studies must be comprehensive, credible and intensive, i.e. comparable to the other treatment conditions. Finally, it is unclear when relaxation is a help for the patient and when it has the function of a safety-behavior.

1.1.5.4. Cognitive techniques

There are several cognitive techniques that have been implemented in the treatment of social phobia, either as a single component or as a part of a multi-component approach. Originally, many of these techniques were developed for the treatment of depression, aiming at the modification of dysfunctional thoughts and beliefs, for example, questioning the patient's evidence for believing specific appraisals, collecting contrary evidence, labeling thinking errors and generating rational responses with relevant evidence (Hautzinger, 2000, pp. 132-166).

Clark and Wells (1995, pp. 86-90) developed a cognitive model for social phobia, including several treatment strategies. To begin with, the patient should be encouraged to describe recent episodes. With the help from these descriptions, the treatment rationale and the cognitive processes maintaining social fears can be introduced. Importantly, the patient should learn that safety behaviors (see 1.1.2.2. A closer look at the behavioral component) do not aid him or her in coping with socially difficult situations. The key safety behaviors and catastrophic beliefs as well as behavioral strategies in fear-evoking situations should be identified and intentional manipulations of safety behaviors[3] planned, aiming at disconfirmation of dysfunctional beliefs. One example would be to add a pause in a conversation rather than to speak quickly, when trying to conceal hesitancy. Patients should also shift from internally to externally focused processing of social situations, i.e. patients

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[3] An example: When making a long pause, the person may observe that the pause was not noticed, or when noticed, the others appreciated it, because it gave them time to think about what was said.

should learn to focus more on what is actually going on in the situation and observe the reactions from other people (video feedback is suggested as a useful technique to achieve this). Furthermore, predictions about negative evaluation by others are tested, including intentionally behaving in a way that the person falsely believes will lead to negative evaluation. Finally, patients often review their behavior after social situations, focusing on negative aspects. The conducting of a post-mortem (see 1.1.2.1. A closer look at the cognitive component) must be analyzed and modified as well as the assumptions leading to social situations being viewed as threatening.

When cognitive therapy was introduced, expectations were high. It was assumed that cognitive interventions would become the treatment-of-choice for social phobia, since cognitive techniques aim directly at changing those dysfunctional thoughts typical for social phobics. In addition, some of the problems that have been mentioned regarding exposure training, do not occur when implementing cognitive techniques (see above). However, in a review of eight articles comparing exposure treatment alone with a multi-component treatment (cognitive techniques and exposure), Feske and Chambless (1995) found no evidence that cognitive techniques boost treatment effects. Instead, exposure alone and the multi-component treatment show similar treatment efficiency. In fact, it has been suggested that cognitive restructuring can occur without cognitive interventions (Newman, Hofmann, Trabert & Roth, 1994).

1.1.5.5. Multi-component treatment packages

There are several treatment interventions that have proven to be effective for social phobia. However, there is still a need to maximize treatment efforts. In particular, this is true for the treatment of severe forms of social phobia. One attempt to do this, is by creating treatment packages with several treatment components. Some studies support this multi-component approach, in which exposure is often implemented in combination with other treatment components such as cognitive interventions (Mattick & Peters, 1988; Mattick, Peters & Clarke, 1989). Two meta-analyses (Feske & Chambless, 1995; Taylor, 1996), however, show that a single-component approach (exposure alone) is as good as a multi-component approach.

Feske and Chambless (1995) suggest that methodological shortcomings might influence research findings in such a way that the positive effects of additional cognitive components are not being identified. To begin with, many studies show a low power and there are serious problems concerning assessment. In particular, assessment of cognitive variables (Elting & Hope, 1995, pp. 251-252) and treatment quality (Butler, 1985) has proven to be difficult. An example is the widely used self-report questionnaire FNE, which has been criticized for measuring not only the fear of negative evaluation, but also the level of anxiety (see 5.2.2.2. Self-report questionnaires). With insufficient assessment methods of cognitive variables, it is unlikely that research studies can distinguish between treatment components that produce improvements in the cognitive variable, and those who do not (Heimberg, 1994). In addition, most of these treatment packages have been implemented in group format. However, cognitive interventions may need a more intense interaction between therapist and patient in order to improve treatment outcome. Thus, cognitive techniques could be more successful, when implemented individually.

In spite of inconsistent support for a multi-component approach, many researchers recommend such an approach for the treatment of social phobia (Feske & Chambless, 1995). In the following sections, some well-known multi-component treatment packages for social phobia will be presented.

An empirically validated multi-component treatment for social phobia is the cognitive-behavioral group therapy (CBGT) developed by Heimberg (1991). CBGT is a standardized group treatment with a combination of role-played exposure to fear-evoking situations, cognitive restructuring based on Beck's cognitive model (Beck & Emery, 1985) and homework assignments, aiming at in vivo exposure. The combination of behavioral and cognitive techniques allows for irrational thoughts to be challenged. Each patient uses SUDS[4] to indicate the level of anxiety during exposure training. Homework assignments are based on group activity and include written instructions for the implementation of cognitive techniques. Two therapists lead a group of six to eight patients, the treatment being spaced over 12 weeks with each session lasting for about three hours. Heimberg and colleagues have reported statistically significant improvement in about 75% of their patients (Heimberg, Dodge, Hope, Kennedy & Zollo, 1990). In addition, the results seem to remain stable five years after completed treatment (Heimberg, Salzman, Holt & Blendell, 1993). In a recent study, Heimberg and colleagues (Eng, Heimberg, Safren & Coles, 2001) report significant improvements at post-treatment assessment on the Quality of life inventory. Thus, Heimberg is responding to the adding interest in measuring more general variables in patients than level of anxiety or frequency of negative beliefs.

Clark and colleagues (described by Butler & Wells, 1995, pp. 316-331) have developed a cognitive treatment for social phobia similar to that of Heimberg. It may not have the same amount of empirical support as does Heimberg's treatment, but there are several aspects that make Clark's cognitive approach important to highlight. Clark goes one step further than others and tries to identify specific cognitive aspects of social phobia that might be of importance. In his treatment, there is a greater emphasis on self-focused attention, post-event processing and safety-behaviors (see 1.1.5.4. Cognitive techniques). In addition, he uses audio- and video-feedback in order to question dysfunctional thoughts. In an earlier study comparing a combination of exposure and cognitive restructuring with exposure alone and cognitive restructuring alone, the combination treatment condition was most effective (Mattick et al., 1989). Another combination between brief exposure and cognitive techniques with focus on the decrease of safety behaviors has been tested (Wells et al., 1995), producing improvements on anxiety levels as well as on beliefs in negative appraisals. The treatment proved to be more effective than a control condition comprising brief exposure and the presentation of a learning rationale focusing on habituation of anxiety during exposure.

Another treatment for social phobia that should be mentioned, is the social effectiveness training (SET). This is a multi-component treatment approach that has showed impressive results in the treatment of more severe forms of social phobia (Turner et al., 1994). In addition, the research findings indicate further improvements at a two year follow-up assessment (Turner, Beidel & Cooley-Quille, 1995). Treatment effects were significant across all dimensions with 84% of the patients completing the treatment showing a moderate or high endstate functioning at post-treatment. The treatment package includes four interrelated components: (1) education in group (presenting a general overview of the social phobia syndrome and educating the patients about the treatment), (2) social skills training in group (focusing on aspects such as social environment awareness, interpersonal skill enhancement, behavioral rehearsal, feedback and reinforcement), (3) individualized in vivo and/or imaginal exposure (flooding, terminated following a 50% reduction in

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[4] SUDS refers to a subjective units of distress scale which indicates a person's self-rated level of anxiety ranging from 0-100, where 100 is extreme high levels of anxiety and 0 no anxiety (Heimberg, 1991). The patients normally develop anchor-points for some standard SUDS: 0, 25, 50, 75 and 100.

within session reactivity, monitored physiologically and by patient ratings) and (4) programmed practice (therapist-directed exposure activities in the natural environment leading to self-conducted exposure by patient). The treatment package was implemented in a combined individual and group format, delivered over the course of 16 weeks.

In a series of Dutch studies from Emmelkamp and colleagues, another multi-component treatment package for social phobia was developed containing exposure in vivo, rational-emotive therapy[5] and social skills training. In one study (Mersch, 1995), this treatment package was compared with exposure alone. It was demonstrated that both treatments produced a comparable reduction in social anxiety.

A multi-component group treatment similar to Heimberg`s CBGT has been developed in Germany by Pfingsten and Hinsch (1991, pp. 56-74) including behavioral rehearsal with corrective feedback and cognitive restructuring, homework assignments and relaxation training spaced over seven weeks. Similar to Clark's cognitive therapy, an emphasis is put on video-feedback. After a behavioral rehearsal, the group looks at the video during which the successful aspects of the patient's performance are focused (first by the patient, followed by additional comments from the group). Each situation is once again rehearsed after setting goals for improvements of the relevant social skills. It has been suggested that this treatment package can improve not only the performance of social skills, but also psychological measures as well as the way the patients attribute success and failure (Pfingsten, 1987).

The treatments described above are mainly delivered in a group format. There are several advantages of group treatments for social phobia. To begin with, the group format offers a less costly alternative than individual treatment. Second, group treatment often offers emotional support for the patients since they learn that they are not alone with their problem (Butler, 1989). Third, the group participants can learn from each other in the therapy. Furthermore, the group itself is a social situation, thus offering fear-evoking situations and consequently a chance for in vivo exposure. Öst (1989a) has observed that some patients spontaneously function as a co-therapist in group therapy. This could foster independence, i.e. patients rely on each others rather than on a therapist. In addition, Öst suggested that co-therapists may learn something themselves in the process of helping others. Öst also noted that feedback from other patients may have a great influence on patients. The explanation for this may be that patients can identify with other patients to a greater extent than with a non-anxious therapist. According to Öst, teamwork is an important aspect of group therapy that should be emphasized by the therapist. Another advantage with the group format is that the patient makes a public commitment to change, something that may increase compliance. In addition, to watch other succeed may also increase the credibility for the treatment and strengthen patients' belief in that they themselves can succeed.

Even if the multi-component treatment packages described above show promising treatment effects, several questions remain to be answered. To begin with, it is often difficult to achieve a transfer of treatment gains in the treatment of severe forms of social phobia. It has been suggested that homework assignments are important for treatment outcome and transfer (Hope & Heimberg, 1993, p. 132). However, it is to a large extent unknown, what additional factors can encourage patients to practice new coping strategies in their everyday life. One possibility to collect more information

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[5] The rational emotive therapy is a cognitive therapy that was introduced by Ellis in the 1960s, resembling many aspects of the theories from Beck (Margraf, 2000, p. 609).

about this, is to investigate quality rather than quantity with regard to homework assignments. In other words, there is a need for more research on what patients with severe forms of social phobia need in addition to current treatment packages. A second question has been raised regarding what improvements are needed in order to achieve a meaningful change. It has been observed that some social phobics look for further treatment after having completed a first treatment (Scholing & Emmelkamp, 1996), thus remaining symptoms is disturbing everyday life for these patients. Third, the attrition reported at follow-up assessments raises the question, how the results change over time. According to Heimberg and Juster (1995, p. 304), a long-term maintenance of the treatment effect can be assumed for moderately impaired patients. However, it is still uncertain how the long-term maintenance for more severely impaired patients looks like.

1.1.5.6. Matching

In research on psychotherapy there has been several attempts to match treatment interventions with specific subgroups of patients, i.e. to choose a treatment option for the patient based on patient characteristics. In two studies on social phobia, Öst and colleagues (Jerremalm, Jansson & Öst, 1986; Öst, Jerremalm & Johansson, 1981) matched patients response patterns with treatment method. In both studies, the patients were divided into two groups based on the patients' reactions in a social interaction test. Subsequently, the patients in each group were randomly assigned to one of the two treatment conditions.

In the first study (Öst et al., 1981), patients with behavioral and physiological reactions were identified and subsequently offered either social skills training or applied relaxation training. Both treatment conditions consisted of 10-12 sessions that were distributed over three months. Patients in both treatment groups were encouraged to conduct homework assignments throughout the therapy. Both treatments yielded significant improvements. In addition, theories of matching found some support. Patients that received a treatment fitting their response pattern showed greater treatment effect (on some measures), compared with the patients receiving a non-fitting treatment.

In the second study (Jerremalm et al., 1986), patients with cognitive anxiety and patients with strong physiological reactions were identified and subsequently offered a cognitively-focused treatment, applied relaxation or were assigned to waitlist. It was observed that patients from both groups could profit equally from both treatment. Thus, the second study did not lend support to theories of matching based on patients' response pattern in social phobia. A serious problem with this study is that when the patients in the waitlist group were retested after four months, 25% of the patients had changed response pattern. It is suggested by the authors that these results are an indication that the measures of cognitive reactions were not valid and were therefore inappropriate as matching variables (Jerremalm et al., 1986). This study clearly demonstrates how difficult matching is.

Another research team carried out a similar study. In that study (Mersch, Emmelkamp, Bögels & van der Sleen, 1989), patients were identified as behavioral or cognitive reactors. Subsequently, 50% of the patients in each group was offered social skills training, whereas the remaining 50% was offered rational emotive therapy. The results at post-treatment assessment showed no support that matching can maximize treatment effects, nor did the results in a follow-up study (Mersch, Emmelkamp & Lips, 1991).

1.1.5.7. Summary

There are four main types of psychological interventions for social phobia: social skills training, exposure, anxiety-reduction strategies and cognitive techniques. It has been suggested that all these treatment components lead to improvements. Currently, most researchers try to maximize treatment outcome by developing multi-component treatment packages, even though there are contrasting research findings regarding whether or not this approach is superior to a single-component approach. Interestingly, exposure training alone has received strong empirical support. In spite of this, cognitive techniques are gaining much attention and the role of safety-behaviors in social phobia is being further investigated. Finally, matching has found only weak empirical support as a way to boost treatment outcome.

1.2.   Self-treatments

1.2.1. From manuals to self-treatments

Well-structured, informative and easy-to-follow manuals were initially developed in research on psychotherapy in order to facilitate controlled treatment studies where procedures have to be specified for methodological reasons (Dobson & Shaw, 1988; Kazdin, 1986). In addition, manuals became necessary because its detailed description of treatment goals was requested in applications for research fundings in the United States (Wilson, 1996). Self-treatments[6] could be described as a by-product and a further development of these well-structured research manuals. The main purpose of self-treatments is to describe treatment interventions in such a way that the reader can follow instructions and learn new coping strategies independently.

Manuals and self-treatments are often developed for a specific disorder rather than being universal. In general, they apply a multi-component rather than a single-component approach. The cognitive behavior therapy for eating disorders developed by Fairburn and colleagues (described by Wilson & Pike, 1993) is a representative example of a manual-based treatment. It is a short-term treatment intended for no more than 20 sessions over a period of five month. The manual specifies treatment rationale and focuses on a goal formulation. It comprises multiple techniques, including self-monitoring, education about body weight and the physical consequences of binge eating and purging, self-control strategies, modification of dietary patterns and content, exposure to anxiety-eliciting cues, problem-solving techniques and cognitive restructuring. Another example is the well-known manual-based treatment for panic disorder by Craske and Barlow (1993). The treatment contains four major components: basic information and education, somatic control exercises, interoceptive exposure to panic cues and in vivo exposure to situations associated with panic attacks. General information about the disorder and its treatment is often included in order to increase the level of motivation, create more realistic expectations, offer relief ("I am not alone"), increase the degree of acceptance ("This is a problem of mine"), and subsequently improve the compliance and decrease the drop-out rate (Angenendt, 2000, pp. 597-599).

Research manuals and self-treatments have received more attention and acknowledgement within cognitive behavior therapy (CBT) than within other therapies. There are four characteristics of CBT that have lead to this high degree of acceptance (Angenendt, 2000, pp. 597-598); first, CBT stresses the importance of treatments being transparent to patients. Therefore, informing patients about the disorder and about the treatment is an essential part of the therapeutic process. Second, patients are encouraged to be active, to encounter in problem-solving

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[6] For more details on the concept of self-treatments, see 1.2.2. Important concepts.

activities and to have a high degree of control in developing coping strategies. Third, CBT views therapy in general as a learning-relearning process. This approach fits nicely together with self-treatments that could in fact be described as self-regulated learning programs. Finally, CBT is well-structured itself and offers clear guidelines on its procedures, emphasizing the importance of empirical support. In summary, manuals and self-treatments match the characteristics of CBT by providing the patient with a well-structured treatment, containing general information and clear step-by-step instructions on how to learn new coping strategies. In addition, the patient is encouraged to take an active role in the treatment.

1.2.2. Important concepts

In this paper, the concept of self-treatment will be used when referring to self-directed psychological interventions in general. The concept of self-treatment was recently introduced in a review article by Marks (1999). Importantly, there is no link between this concept and the way of presentation[7] or distribution[8]. Instead, the concept of self-treatment is stressing the main characteristic: The patients themselves are directing the treatment intervention. Even when a self-treatment is a treatment adjunct within a therapist-directed treatment, the self-treatment represents a treatment component that the patients are conducting themselves. Nevertheless, there are a wide variety of other concepts that have been used in the literature, referring to self-treatments in general. Some comments regarding these concepts are worth mentioning.

Treatments directed by patients themselves aim at turning patients into experts in dealing with their own problems. Accordingly, the concepts of self-help treatment (for example, see Gould & Clum, 1993) and self-help program (for example see Carlbring, Westling, Ljungstrand, Ekselius & Andersson, 2001) can repeatedly be found in the literature. However, these concepts are problematic, since most treatments in cognitive behavior therapy could claim to be self-help treatments (including therapist-directed ones). After all, one of the main goals in cognitive behavior therapy is to teach patients new skills, which is the foundation for self-help. In other words, the acquisition of new skills enables patients to independently cope with future problems and help themselves in difficult situations.

Another concept that refers to self-directed treatments is bibliotherapy (for example, see Gould, Clum & Shapiro, 1993). Since manuals and books were for a long time dominating research on self-treatments, bibliotherapy (see Table 2) came to be a term used when referring not only to self-treatments distributed as manuals or books, but also to self-treatments in general. The concept of bibliotherapy is, however, unsuitable when referring to self-treatments in general. Today, self-treatments can be presented and distributed in many ways, for example, with the internet or a virtual reality program, offering unique features that go far beyond those of a book or a written manual (Rosenberg, 2001, pp. 28-29).

Computer therapy is another concept that was recently used when referring to a computer-based self-treatment (Newman, Consoli & Taylor, 1997). However, this concept brings certain difficulties with it, when including the word *therapy*. In research on psychotherapy, the word *therapy* usually implies that a therapeutic process takes

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[7] The way of presentation can include one or more modalities, and one or more channels of communication (see 1.2.4. Current issues).

[8] Self-treatments can be distributed in a wide variety of ways, for example as a manual, a book, a video, a touch-tone telephone program or a computer-based program, with or without an online connection (see Table 2).

Table 2. Different ways of presenting and distributing self-treatments, including definition of interactive level.

Concepts and interactive level	Characteristics
Non-interactive self-treatments	Patients can only decide when and where to work, i.e. they have little control over the learning process.
Bibliotherapy	Self-treatments distributed as manuals or books, containing mainly written material on paper, providing the patient with step-by-step instructions (for example Ghosh & Marks, 1987; Öst, Salkovskis & Hellström, 1991; Öst, Stridh & Wolf, 1998).
Videotherapy	Self-treatments distributed on video, often implementing symbolic modeling in combination with written or spoken instructions and with the aim to offer patients support in order to conduct exposure training (for example Öst, Stridh & Wolf, 1998).
Computer-based exposure	Exposure training, presenting the feared object on the screen.
Low-interactive self-treatments	Self-treatments that allow for the patient to influence the learning process in several ways such as using buttons or take advantage of help-functions. Importantly, multimedia does not automatically imply that the program is interactive (or to what degree). An interactive program does not necessarily have to contain multimedia.
Computer simulation	A situation is step-by-step (different alternatives) presented on screen (when→then structure). Computer simulation has been used in other areas, for example, when testing navigation systems, the calculation of financial processes and weather changes (Zimmer, 1997, p. 347).
Computer-based self-treatments	These programs contain mainly written text. The material is distributed by the use of a computer without an online connection (for example Carr, Marks & Ghosh, 1988; Ghosh & Marks, 1987; Roth, Taylor, Gruber & Moran, 2001).
Computer-driven telephone	Similar to above, but an interactive voice response is instead of written text.
Intherapy	A concept introduced by Emmelkamp and colleagues (Lange et al., 2000), referring to psychological interventions distributed via the internet, often with little or no face-to-face contact and mainly written material. Implementation can further limit the degree of learner control, for example, when patients can carry on to the next program-section first after having completed a certain test.
High-interactive self-treatments	Computer-based programs with a high level of interactive features that allow for the patients to influence many aspects of the learning process, often including multimedia and communication with online communities.
Computer-based self-treatments	Programs presenting a self-treatment by the use of (1) multimedia, (2) a high degree of interactive features such as system adaptability according to the characteristics and the actions of the user, and (3) connectedness with the possibility of constant upgrading, information sharing and the building of learning communities (no research found on such programs).
Virtual reality exposure	An example of artificial intelligence. By the use of a head-mounted display and special gloves, the patient can join a virtual reality and for example conduct an exposure treatment. Can be applied with patients that are too phobic for in vivo exposure, when the phobic situation is difficult to control or when exposure training without therapist-administration is needed (Emmelkamp et al., 2002).

place during the interaction between a patient and a therapist. The common factors of a therapeutic process are believed to influence the outcome in psychotherapy (Martin, Garske & Davis, 2000). Fischer, Jome and Atkinson (1998) suggest four common factors in psychotherapies that can account for a therapeutic effect: the existence of a specific relationship between the patient and the help-giver, a shared worldview, the patient's expectancy to receive help (specific settings can trigger such an expectancy) and interventions that both patient and help-giver believe in. While these common factors play an important role in all therapist-directed therapies, they are only present to a certain degree (or not present at all, depending on how one wishes to define *relationship*) in a self-treatment. Moreover, the influence exerted on the patient is presumably not as powerful in a self-treatment as in a therapist-directed treatment.

The concepts that have been suggested for specific forms of self-treatments are described in Table 2. The different self-treatments are structured according to their interactive level in order to highlight the fact that this feature will probably become predominant in future self-treatments.

1.2.3. Self-treatments for phobias[9]

Many books and manuals have been written on fear and anxiety. In 1978, *Living with fear* was first published. The book is written by Isaac Marks and is still considered a classic on the subject. In particular, the book offers a detailed description of self-administered exposure. In a controlled study (Ghosh & Marks, 1987), self-administered exposure proved to be an efficient treatment for agoraphobia, regardless of whether the instructions were obtained from a psychiatrist, Mark's book or a computer program. In the study, the patients received information on how to identify agoraphobic problems, practice self-exposure, keep records of their performance during exposure tasks and monitor reduction in panic level. Setbacks were also reflected upon as well as the recruiting of significant others as co-therapists. Ghosh and Marks conclude that self-administered exposure training may play an important role in all exposure treatment, in particular when referring to long-term effects.

In another study, Marks and colleagues (Carr, Marks & Ghosh, 1988) compared phobic patients that received a computer-based self-treatment during nine weeks of exposure training with phobic patients treated conventionally by a therapist. All patients showed similar improvements.

Öst and colleagues adapted Mark's self-treatment for spider phobic patients in Sweden. In accordance with earlier findings, the manualized self-treatment proved to be an efficient treatment for some patients (Hellström & Öst, 1995; Öst, Salkovskis & Hellström, 1991; Öst et al., 1998). However, while Ghosh and Marks (1987) reported an outcome with self-treatment equally to that of therapist-directed exposure, Öst and colleagues report that self-treatments cannot compete with therapist-directed treatments. In several studies on spider phobia, more than 80% of the patients treated individually and more than 70% of the patients treated in a group format were clinically significant improved at post-treatment and follow-up assessments, whereas only about 30% of the patients conducting a self-treatment fulfilled the criteria for clinically significant improvement (Öst et al., 1991; Öst et al., 1998).

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[9] The review is limited to studies on self-treatments for phobias. Even though social phobia is a more severe condition than for example specific phobias, exposure training is a principal treatment component for most phobias. Furthermore, the cognitive factor that receives much attention in social phobia, has received a growing amount of attention in other phobias as well (Thorpe & Salkovskis, 1995). A review of self-treatments for other anxiety disorders would go beyond the scope of this thesis.

In one of the studies conducted by Öst's research team (Hellström & Öst, 1995), different manuals were compared. It was demonstrated that a specific manual was generally more effective than a manual describing a general treatment for anxiety disorders. Moreover, the results suggested that patients working with the manual at the clinic scored higher than patients that had been working at home.

A problem with self-treatments has been high levels of attrition. In deed, in a study with 103 spider phobics, Öst and colleagues report that about 37% of the patients dropped out during the manual treatment (Öst et al., 1998). The manual that was used in this study contained about 30 pages of written text including general information, help to reflect upon diagnosis and exclusion criteria (suicidal thoughts), brief relaxation strategies, ways to question negative thoughts, exposure training for spider phobia and the main principles for maintaining treatment results. When being offered the manualized self-treatment, the patients reacted in different ways. Some patients showed appreciation, realizing that they could conduct the treatment at home. These patients often had difficulties coming to the clinic because of time restrictions, having small children at home or living far away. Many patients were, however, disappointed. These patients had expected contact with a therapist rather than a self-treatment. Even though a majority of patients expressed a high level of credibility for the treatment method and even expected a symptom relief when working with the manual, 37% of the participants decided to drop out of the treatment. The drop-outs were contacted by telephone. Some of the drop-outs reported having worked with the manual on their own, conducting some exposure training. In some cases, they had even experienced a decrease of the phobic reaction. On the contrary, there were also patients that reported never having worked with the manual. Thus, the traditional form of self-treatments based on written text may be attached to several problems related to acceptance of, motivation for and interest in the treatment, resulting in high levels of attrition.

It seems as though computers could be an interesting alternative when presenting self-treatments to patients. A computer-based self-treatment (presumably with a low interactive level) has been successfully implemented in the treatment of test anxiety (Buglione, DeVito & Mulloy, 1990) and phobic reactions (Al-Kubaisy et al., 1992). It has also been suggested that a multimedia computer program is highly accepted as a supportive measure by psychiatric inpatients as well as outpatients (Wright et al., 2002).

It has been suggested that palmtop computers can be used as a therapeutic adjunct in order to improve treatment outcome of therapist-directed treatments. In a study comparing a combination treatment condition (palmtop computer and an eight session group treatment) with a more intense group treatment (12 sessions), the results were equal first at follow-up assessment (Roth, Taylor, Gruber & Moran, 2001). Thus, it could be possible that patients who conduct a part of the treatment themselves, need more time than patients who receive support from therapists. A methodological problem with this study, however, is that it did not include a group receiving eight sessions group therapy alone. Therefore, it is unclear if the palmtop computer did influence treatment outcome or if the treatment effect is merely deriving from the eight sessions of group therapy.

Preliminary research findings show that virtual reality technologies can be effective in combination with cognitive behavioral therapy. In particular, virtual reality exposure (VRE) has successfully been applied in the treatment of claustrophobia (Botella, Villa, Perpina, Garcia-Palacios & Banos, 2000), panic disorder and social phobia (Wiederhold & Wiederhold, 2000), fear of flying (Rothbaum, Watson, Kessler & Hodges, 1996), and acrophobia (Emmelkamp et al., 2002; Rothbaum, Kooper,

Opdyke & Hodges, 1995). Furthermore, research findings indicate that VRE has a high acceptance with patients (Garcia-Palacios, Hoffman, Kwong, Tsai & Botella, 2001). Even though this would indicate that VRE can be effective in the treatment of phobias, there is a need for randomized controlled treatment studies comparing VRE with exposure in vivo and therapist-directed treatments, as well as with other self-treatments.

1.2.4. Current issues

1.2.4.1. Issues to be tackled in research on self-treatments

There are several issues that should be tackled in research on self-treatments. To begin with, it has been suggested (Angenendt, 2000, pp. 599-604) that the establishing of diagnosis needs more attention. In particular, this is true for self-treatments where therapists do not meet the patient or where the contact is brief. Insufficient diagnostic procedures could lead to a self-selection, meaning that the patients themselves decide what their problems are and what treatment they need. When a self-treatment is used by others than it was intended for, unwanted effects could occur. For example, a traumatized patient working with exposure without the necessary skills to cope with the situation, could become re-traumatized, a socially anxious person with an alcohol problem might be overwhelmed by the treatment and start to drink alcohol again, or suicidal thoughts could become stronger, when a depressed person with social fears runs into problems in a self-treatment. Another possibility when persons work with a self-treatment that was not intended for them, is no treatment effect at all. Patients might wrongly assume that there is no treatment for their problem. Subsequently, they do not look further for suitable treatment alternatives and run the risk of developing a chronic condition. Thus, sufficient diagnostic procedures should be developed for self-treatments in order to secure that self-selection does not occur.

A second issue which raises ethical considerations, is the high rate of attrition (Angenendt, 2000, pp. 599-604). More research is needed regarding why certain persons drop out of treatment, how they are influenced by the experience made and long-term effects. Furthermore, efficient methods have to be developed that can decrease the level of attrition. One way to handle the problem of attrition, has been to offer more extensive contact to a therapists. However, with more (expensive) therapist support, the advantages of a low-cost self-treatment are less obvious. A recent development is to increase the support by the use of online communication (Carlbring et al., 2001). This form of communication is not only fast and inexpensive, it can also be asynchronous, referring to when the parties communicating do not have to be present at the same time. In contrast to face-to-face communication, asynchronous communication allows each party to use as much time as he or she needs in order to write an answer. However, this way of communicating would exclude those persons that feel uncomfortable with written language. Another strategy to influence the drop-out rate is to divide the self-treatment into modules. In order to gain access to the next module, the patient has to send in assignments or report online to a contact person (Carlbring et al., 2001). Thus, the patient's curiosity ("I wonder what the next module looks like") is assumed to strengthen the motivation to continue the participation in the treatment. Also, this is a way to ensure that the patients have understood the material and are well prepared for the next treatment step. Importantly, it is possible to offer support to those patients that have difficulties to understand the material. However, this strategy goes against the recommendations made in educational research, where learner-control rather than

program-control is believed to be crucial in order to maximize adult learners' learning effect and increase their level of motivation (Cress, 1999).

Assessment of change is a topic that has to be tackled when the aim is to evaluate psychotherapy. Research on self-treatments is no exception to this rule (Angenendt, 2000, pp. 599-604). One of the most important questions with regard to this topic is whether or not self-report questionnaires should be used. On the one hand, questions regarding validity and reliability are raised when assessments rely mainly on self-report questionnaires and patients are only seen briefly on 2-3 occasions (Öst et al., 1998), or not seen at all (Ström, Pettersson & Andersson, 2000). On the other hand, assessments with self-report questionnaires and modern technologies without intensive face-to-face contact may have certain advantages. It has been suggested that communication over internet, without social cues influencing the patient, is more honest compared with face-to-face interaction (Palloff & Pratt, 1999, pp. 30-36).

Another question, related to assessment of change, is the long-term outcome of self-treatments. A lack of long-term follow-up assessments has been reported in research on self-treatments (Angenendt, 2000, pp. 599-604). These assessments are especially important, since self-treatments are assumed to be a low-intensive treatment, i.e. the change occurs at a slower pace compared with an intensive therapist-directed treatment. If this assumption is correct and data is mainly collected at a first post-treatment assessments, there is a high risk of dismissing effective treatments. Long-term follow-up assessments are also necessary in order to investigate whether or not relapse occurs.

An issue that is becoming more and more important, is the way self-treatments should or should not be implemented. Glasgow and Rosen (1978) described three ways of implementing self-treatments: without therapist support, with minimal contact to therapist or as a treatment adjunct within a therapist-directed therapy. As mentioned above, patients have also been offered contact with therapists without a traditional face-to-face communication. In recent studies, patients and therapists used e-mails (Carlbring et al., 2001; Murphy & Mitchell, 1998) or the telephone (Swinson, Fergus, Cox & Wickwire, 1995) to communicate. Other alternatives regarding implementation of self-treatments is to encourage a family member or the partner to act as co-therapists. Also, a self-treatment could be applied in combination with supportive medical treatment, or in combination with other supportive activities offered by local health care authorities. Furthermore, self-treatments can be used in the education and training of therapists and other professionals working with psychiatric patients.

Marks (1999) suggests three advantages with a minimal contact design compared with self-treatments that are implemented without contact to a therapist: (1) patients are more motivated, (2) they have someone to turn to, when running into problems, and (3) they are more likely to be adherent, when knowing that they will at some point talk to the therapist about the treatment process.

In deed, self-treatments can be implemented in a wide variety of ways. However, the question of generalization has not been answered, i.e. what happens to treatment outcome and attrition when the way of implementation is changed. It has been suggested that small changes from minimal contact designs to no therapist contact increase the degree of attrition rapidly (described by Angenendt & Stieglitz, 2000, pp. 252-253). Furthermore, Wilson (1996) points out that empirically developed manuals have been applied to research samples that often differ from patients in general. This is a problem relevant to research on self-treatment. In particular, patients with severe psychiatric conditions or patients with comorbid conditions are often excluded from controlled treatment studies. Therefore, it is unclear if self-treatments that have

empirical support for less severe conditions, can be implemented on patients with more severe conditions.

An issue currently on display is related to the multi-component approach to self-treatments. It has been suggested that simplified material only including basic information is easier for patients to cope with and to profit from, whereas complex and comprehensive self-treatments carry the risk of overwhelming patients (Angenendt, 2000, pp. 600-606). The idea that reduced complexity can boost learning effect and –transfer finds convincing empirical support in research on education (Mayer, Heiser & Lonn, 2001).

The search for a golden standard has just begun in research on self-treatments. Not only is there a lack of guidelines to assist patients and practitioners regarding how to choose and implement a self-treatment, but also program developers do not know how to develop and evaluate self-treatments. However, as a first step to improve the current situation, some guidelines have been suggested (Angenendt & Stieglitz, 2000, p. 245-252), first, patients with severe psychiatric conditions such as severe depression or schizophrenia should not start a self-treatment. These patients may have a reduced information processing as well as insufficient abilities to gain initiative, which makes self-regulated learning difficult. Furthermore, self-treatments should not be used when the therapist is not acquainted with the self-treatment, or when the quality of the self-treatment is not high enough. Finally, patients that report having difficulties coping with written materials, a low degree of treatment motivation or earlier treatment failures, should not start with a self-treatment.

It could also be important to acknowledge early indications made by the patient self that the self-treatment might becoming too complex for him or her, or to investigate what kind of experience that the patient has already made with self-regulated learning.

Marks (1999) raises another question regarding research on self-treatments: When comparing a single component treatment (for example group therapy) with a treatment condition combining two treatment components (group therapy and self-treatment), does the additional treatment attention result in the improved treatment effect or the added treatment component (the self-treatment). Accordingly, research on self-treatments should compare treatment conditions that offer a similar amount of treatment attention.

In research on self-treatment, it may not be so important to predict who will be able to work with the self-treatment and who will run into problems. Instead, it is essential to try to identify from the start: Who will ask for help, when running into problems, and who won't. The patients are in a sense left on their own when conducting a self-treatment. Compared with therapist-directed treatments, a self-treatment does not offer a safety-net that fall into place when the treatment does not run according to plans. Research on distance educational programs has demonstrated that, compared with successful learners, poor learners show a tendency not to take advantage of help that is offered for students when having difficulties (Cress, 1999). The question of help-seeking behaviors has yet to be addressed in research on self-treatments. In particular, attention should be given to the identification of predictors for help-seeking behaviors and the development of methods that can encourage users to ask for help.

In summary, there are several issues that need to be tackled in research on self-treatments. It is important to improve diagnostic procedures and assessment methods. It is also a demand for guidelines regarding how to develop and implement self-treatments, how to decrease the level of attrition and where the balance should be between learner-control and system-control. When looking at all these difficult issues regarding research on self-treatments, a legitimate question is: Is it

worthwhile? Do we really need self-treatments? In the following sections, several pros and cons for self-treatments will be described.

1.2.4.2. Advantages with self-treatments

Cost containment and quality assurance play an important role in today's health care policy. Therefore, there are demands for inexpensive, well-structured, time-limited and empirically supported treatments (Härter, Stieglitz & Berger, 2000, pp. 1006-1008). Some self-treatments meet these demands and are therefore gaining attention.

Not only is the focus in the health care sector on treatments with certain characteristics, but also the way that we plan treatment interventions is being re-assessed. A trend is currently the stepped care design, referring to when the first treatment offered to a patient should be the least restrictive one with low costs and/or few side-effects, whereas the second treatment step is associated with a higher degree of intensity and costs (Davison, 2000). A less intensive treatment is always implemented before introducing a more intensive treatment. Self-treatments could constitute a first step in stepped care designs. However, it is important to agree upon how long a patient has to work unsuccessfully with the self-treatment, before the therapist should switch to the next treatment step. When waiting too long, it could decrease the patient's level of motivation regarding further treatment interventions. It is also unclear, how motivated psychiatric patients would be to conduct a less intensive treatment, knowing that more intensive ones with therapist contact are in line.

There are several advantages that have been suggested for the use of self-treatments within therapist-directed treatments (Angenendt & Stieglitz, 2000, p. 246), first, patients could deepen their understanding when spending additional time and energy on topics that have already been discussed in the therapy session. A self-treatment could also aid patients in preparing for therapy sessions. This might be of importance in the treatment of social phobia, where many treatment packages today are offered in a group format, creating a situation that is sure to be fear-evoking and difficult for the patients. High levels of tension and even dissociation could prevent patients from being active and learning during the treatment session. The possibility to prepare before a group session (as well as before an individual session) could facilitate the learning process and make it possible for the patient to become more active. In deed, prior knowledge is one factor that can improve learning effect (Schnotz, 2002). Increased understanding may, in turn, increase the credibility for the treatment. Second, a self-treatment could function as a supportive measure both when patients carry out home-work assignments between therapy sessions, and when working with a maintenance program after completing a therapy. Thus, the self-treatment can provide the patient with information and it can support the patient with instructions before, during (with the help of a palm-top computer) or after the training in order to improve performance. Third, capacities can be set free for other interventions. For example, when the patient can conduct exposure training with guidance from a self-treatment, the therapist must not be present and valuable time can be saved. Instead, therapists can help the patient to deal with other important problems that cannot be handled with self-treatments.

Another advantage with self-treatments is the focus on well-defined personal goals and a high level of control for the patient in the process of change. This could enable the person to develop a stronger sense of control and self-confidence, which could subsequently be helpful in overcoming problems in the future (Angenendt, 2000, pp.

598-602). In accordance, self-treatments pose a small risk for patients becoming dependent on other people (in particular on a therapist), as might be the case for therapist-directed treatments. In turn, this may facilitate the generalization of the treatment outcome.

Research on education has demonstrated that when classroom training is conducted in combination with a self-regulated program, the role of the teacher changes from an all-knowing person standing in front of the pupils, to a supportive and guiding person that is standing on the side, ready to assist the learner when needed (Rosenberg, 2001, pp. 120-121). It remains to be seen, whether or not the role of the therapist will change in a similar way when a self-treatment is implemented together with a therapist-directed treatment. Such a change could lead to a further increase of the learner control, with an active patient taking additional responsibility for the learning process and the process of change.

Another important advantage with self-treatments is the high degree of accessibility (Angenendt, 2000, p. 600). For some patients, a standard psychotherapy with weekly sessions at the therapist's office is impossible (Oravec, 2000). There are several reasons for having no access to standard psychotherapy, for example, living isolated, no financial means, private or professional obstacles, time restrictions or no experienced therapist available.

With the spread of empirically supported self-treatments, often including an informative-educational section, psychiatric disorders and their treatments could become better known to the public (Angenendt, 2000, pp. 598-599). Improving attitudes towards psychiatric disorder in society may increase the likelihood that people look for help right away, when noticing that they have a problem. It is well known that many patients live with psychiatric conditions for years without seeking treatment, eventually struggling with a chronic condition (Magee et al., 1996). In general, younger individuals and men are two groups that seem more reluctant than others to look for professional help (Mojtabai, Olfson & Mechanic, 2002).

Furthermore, self-treatments could contribute to the building of a supportive social context for the patient, when offering a possibility for family and friends to learn more about the disorder and treatment strategies. In particular, feelings of guilt and shame could be reduced, when a clarification is possible regarding development and maintenance of psychiatric disorders.

There are also advantages to be found within the education and professional training of therapists. Self-treatments and manuals are easy to grasp and can assist in spreading research findings and describing a treatment method. Wilson (1996) suggests that manuals are likely to broaden therapists' repertoire of treatment skills and even encourage an eclectic approach to psychotherapy. Furthermore, he describes several studies implicating that practitioners with limited clinical experience are no less effective when working with well-structured manuals than experienced practitioners. In addition, Wilson argues that empirically supported manuals offer a superior approach to assessment and therapy compared with individual clinical judgement. In fact, when following a manual, a greater assurance is provided that important issues will be dealt with systematically such as rationale and treatment goals specification, outlining treatment procedures and providing feedback about progress. Many of these arguments could be true for manuals as well as for self-treatments. For example, patients that have more responsibility and are trained in self-management, can work together with the therapist in order to increase the overall treatment quality and avoid mistakes.

Manuals as well as self-treatments could be useful in research on psychotherapy. For example, in comparative research on social phobia, many studies have failed to

demonstrate a difference in treatment outcome. It is unclear whether or not there is a difference in outcome that the assessment methods, however, are unable to detect. Another explanation for these research findings, is that the treatment conditions share to many similarities, i.e. there is no difference between the treatment conditions (see 1.1.5. Cognitive behavior therapy for social phobia). Self-treatments offer well-structured and standardized treatment procedures, which is important in order to solve such methodological problems. In addition, when using a computer-based self-treatment, an identical treatment can be offered to all patients, i.e. therapist adherence is not an issue anymore. A computer-program can even report, how long each patient has worked with each treatment section. When using such program features, it is possible to analyze how the patients implement the treatment, leading to the observed change.

Self-treatments also offer a way to evaluate a specific treatment component without the influence of common factors (see 1.2.2. Important concepts). Common factors are shared to some degree by all forms of therapist-directed psychotherapy and refer to those factors that play an important role when patients and therapists meet such as empathy and the quality of the working alliance (Martin et al., 2000). The factors influence treatment outcome in therapist-directed psychotherapies.

In summary, there are several advantages with the use of self-treatments. Self-treatments meet demands that the health care sector places on treatments today. There are also many advantages, when self-treatments are used within a therapist-directed treatment. They are accessible, could improve attitudes towards psychiatric disorders, increase social support for patients and may be useful in education of therapists as well as in research on psychotherapy.

1.2.4.3. Criticism of and disadvantages with self-treatments

There are several aspects of self-treatments that have been criticized. Some elements of this criticism, focusing on research on self-treatments, have already been mentioned (see 1.2.4.1. Issues to be tackled in research on self-treatments). These aspects can be summarized as follows:

- The multi-component approach currently dominating the development of self-treatments may produce self-treatments that are too complex, leaving patients overwhelmed.
- It is unclear, to what extent research findings can be generalized, for example, when implementing a self-treatment in a no contact program instead of a minimal contact program.
- Insufficient diagnostic procedures lead to a high risk of self-selection. When patients work with a treatment that was not intended for them, it could cause side-effects or no effect at all - both raising ethical considerations.
- High levels of attrition in research studies are problematic for ethical as well as methodological reasons.
- It is unclear, how to investigate and encourage help-seeking behaviors in the implementation of self-treatments.
- There are difficulties assessing the level of change and understanding whether or not the change is meaningful to the patient, in particular, long-term change.
- There is a lack of clear-cut guidelines for the development, implementation and evaluation of self-treatments.

The following section contains additional elements of criticism about self-treatments that have been suggested by different researchers.

According to Wilson (1996), manuals have been criticized for simplifying psychological interventions in psychotherapy. It has even been stated that manuals are conceptually at odds with fundamental principles of cognitive behavior therapy for not focusing on assessment, case formulation and behavior analysis. A behavior analysis includes the identification of controlling variables that maintain patients' problems. Such an analysis is irreplaceable in order to determine whether or not a patient is in need of non-obvious interventions. In deed, when applying manuals and self-treatments, the standard treatment is described and non-obvious interventions are less likely to be suggested.

It has been suggested that well-structured manuals pose a restriction on therapists' clinical artistry. This criticism could apply to self-treatment as well. When a self-treatment is encouraging the patient to train a standard treatment technique, it may be difficult for the therapist to convince the patient that a non-conventional treatment strategy is needed.

Wilson (1996) also notes that manuals are said to promote particular schools of psychological therapy. For reasons already described (see 1.2.1 From manuals to self-treatments), cognitive behavior therapy is, in deed, the theoretical foundation for many manuals and self-treatments.

An advantage of self-treatments that has been mentioned, is the spreading of information about psychiatric disorders and the possibility to improve attitudes in the general population (Angenendt, 2000, pp. 598-599). However, both optimism and concerns should be expressed with regard to this topic. The reason is that many self-treatments are not empirically supported. Thus, these treatments could contain false information or give inadequate instructions. The consequences of false information being spread at a fast pace, could be a burden to practitioners and patients as well as to the entire health sector.

It has been demonstrated that a high level of compliance is associated with a positive treatment outcome. In particular, when the compliance is assessed by the therapist or by independent raters (Schmidt & Woolaway-Bickel, 2000). The issue of non-compliance in psychotherapy, i.e. lack of agreement between patient behavior and treatment instructions, is relevant to both therapist-directed treatments, as well as self-treatments. However, in self-treatments there is often no intensive contact with a therapist that can assist the patient in reflecting on compliance. Subsequently, it would be difficult to introduce strategies in order to improve compliance.

It is assumed that reaching out to other people, participating in face-to-face communications and finding social support are all important aspects when regaining a balance in life. However, self-treatments may encourage the person to retreat and avoid asking for support in difficult situations. Thus, self-treatments may pose a risk that persons become isolated, which could add weight to their problems. In the treatment of social phobia, this argument is more relevant than ever, since the treatment is supposed to focus on social fears and strategies to overcome them. Working with a self-treatment, could make the person less available for social interactions and practice, which is a prerequisite for change in social fears.

1.2.5. New trends

1.2.5.1. The technological development and its implications

The rapid development of technology in the last two decades has changed our society in many ways. The quotation from Riva et al. (2001) highlights the influence that these changes have had on psychotherapy:

> *Many of us grew up with the naive assumption that couches are the best used therapeutic tools in psychotherapy. But tools for psychotherapy are evolving in a much more complex environment than a designer's chaise lounge (p. 449).*

In deed, our environment is becoming more and more complex. Online communication and information output continuously take place at a speed that was virtually inconceivable 20 years ago. The increase of complexity has lead to a lifelong learning process. Since the need to learn has changed and increased, learning cannot only take place in traditional institutions (with teachers navigating and controlling the learning process). Learning in class-room settings is expensive and not flexible enough. Therefore, self-regulated learning[10] has become a necessity and learning per se has become an important issue.

The newly awakened interest in learning may be valuable and lead to information on how self-treatments can be improved. Even though the aim of a self-treatment is clearly more complex than the aim of a learning program such as a program teaching the user English, there are also many similarities. Issues regarding how we present information in a comprehensible way, increase level of motivation and reinforce effective learning strategies are relevant for the development of both computer-based learning programs and computer-based self-treatments. Consequently, a multidisciplinary approach is necessary in order to identify potential improvements regarding self-regulated learning and computer-based self-treatments. For example, research on e-learning[11], computer-based training, program evaluation and educational research are areas of interest.

Not only are technological innovations improving the way that self-treatments can be presented and implemented, but also the users' expectations are changing. A computer program that is being developed today needs to be sophisticated, look professional and contain advanced multimedia and interactive elements. In addition, it is becoming necessary to include entertaining elements in order to satisfy the user. Technology alone and well thought through instructions will not do the trick anymore. Regardless of what type of program the user is working with, it has to be fun. In other words, the technological development has lead to computer science, entertainment and educational research becoming closely linked. Thus, when developing a learning program or a self-treatment, entertaining elements should probably be included in order to increase motivation for and credibility in the treatment. Edutainment is a concept deriving from a combination of two words: education and entertainment (Klimsa, 1995, p. 26-42), referring to this trend.

Humor plays an important role in entertainment. It is also a well-known phenomenon in psychotherapy, even though, it was not always taken seriously.

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[10] Self-regulated learning is referring to a learning process where the person can influence important decisions such as if, when, what, how and with what goal he or she should learn. In self-regulated learning, persons would (on their own) plan, initiate and regulate their learning process (Weinert, 1982, p. 102).

[11] The internet workability is the essential element in e-learning. The focus is on a broad view of learning including instant updating, distribution direct to the end-user, sharing of information and building a learning community (Rosenberg, 2001, pp. 21-29).

Nevertheless, humor is believed to be useful in cognitive (Beck, Rush, Shaw & Emery, 1981, p. 109) as well as behavior therapy (Ventis, Higbee & Murdock, 2001). Haig (1986) suggests several constructive aspects of humor in psychotherapy. Importantly for research on social phobia, anxiety levels can be reduced and emotions may be expressed easier with the use of humor. Self-observing capacities can also be improved, since people have to *take a step back* and distance themselves from the situation when using humor. Thus, humor can assist the person in coming to terms with difficult situations and frustration.

Research findings are inconsistent regarding whether or not humor enhances or distracts memory capacities (Berg & Lippman, 2001). In a recent study on memory for cartoons (Schmidt, 2002), students demonstrated a good recall of humorous cartoons, however, it occurred at the expense of recall regarding non-humorous cartoons. In other words, when humor is being used to gain attention to a certain program section, the risk is that non-humorous sections are given less attention by the user. In addition, it is still largely unknown how humor influences learning processes.

Humor could be introduced through the use of exaggerations, understatements, paradox and absurdity (Salameh, 1987, pp. 195-238). However, it is important to keep in mind that humor is not automatically appreciated by the user. When the humor in a self-treatment is not appreciated or accepted, it could lead to a reduction in both credibility and motivation for the self-treatment. Thus, humor should be used with caution.

In summary, the world is becoming increasingly complex and there is a need for a lifelong learning process in order to keep up with the constant changes. In particular, the focus of attention is currently on self-regulated learning. Self-treatments represent an example of self-regulated learning. Self-treatments can be improved when making use of technological innovations and applying the edutainment approach. In particular, humor could help social phobics to cope with anxiety and tension, as well as to distance themselves from difficult situations and focus attention on important program sections while working with a self-treatment.

1.2.5.2. A closer look at multimedia and interactive computers

When looking at many of the computer-based self-treatments that have been presented so far, they are often nothing more than a treatment manual in the shape of a computer program. In a book about e-learning, Rosenberg (2001) makes a remark that fits well with this observation:

> *The first thing we do with a new technology is try to deliver the same material in the same way we used to deliver it in the older technology (p. 47).*

In other words, so far we have not done a good job in taking advantage of the possibilities that are incorporated in modern computer technologies. When developing a computer-based self-treatment, it is important to answer the following two questions:

- *What can computers really do?*
- *Why do we want to use computers in a self-treatment?*

These questions are important, since the computer with its multimedia components and interactive features should only be the means to deliver information, not the goal itself. The following sections will be an attempt to answer the first question. The

second question is the focus in 1.2.5.3. Potential advantages with interactive multimedia programs. When describing multimedia, Elsom-Cook (2001, pp. 1-30) presents three interrelated terms:

- Modality: The sensory channels being available to humans such as the auditory or visual modality.
- Channel of communication: The way we encode within a modality such as the difference between hearing a voice, music and sound effects, or seeing written words, images and diagrams.
- Medium: A set of coordinated channels spanning one or more modalities which have come to be referred to as a unitary whole and which possess a cross-channel language of interpretation[12].

The medium film, for example, utilizes several channels of communication (watching written words, images, as well as hearing spoken words, music and sound effects) across two modalities (auditory and visual). Multimedia, as presented in personal computers, is the combination of a variety of communication channels and modalities. In interactive multimedia, there are currently being improvements made with regard to input and output channels. Not only visual and auditive modalities are integrated, but also the tactile modality is gaining attention (see Figure 1). In spite of these technological innovations, multimedia can never make a bad computer program good. However, it can emphasize important aspects of the program.

It is important to distinguish between multimedia and hypermedia[13], i.e. interactive multimedia. There was multimedia long before the personal computer had reached its widespread use that can be seen today. For example, the television (two modalities and several channels of communication) could be described as a multimedia system (Elsom-Cook, 2001, pp. 1-30). Thus, there are multimedia systems that are non-interactive, and there could be interactive programs without multimedia. Multimedia programs and interactive features are not inseparable concepts.

An interactive system is complex, referring to a process with a reciprocal interaction between two or more agents (Elsom-Cook, 2001, pp. 1-8). Each agent is assumed to have intentions and goals, triggering actions that aim at changing the state of the other agent. Intentions and goals are characteristics earlier attributed only to humans and some higher animals. Nevertheless, nowadays there are computer systems that can act as agents. Thus, these systems are capable of developing intentions and goals, as well as acting in accordance with these goals. Interactive programs are designed to involve the user in the exchange of information and program processes while the computer is operating.

A user-centered design dominates the development of computer software today. The main focus is not on solving a problem, but on building a system that can solve a problem in a way that is understandable to the users, i.e. using suitable modalities and channels of communication, appropriate level of content as well as the right way of presentation. In addition, the program content has to be authentic to the user. In other words, the content has to be believable and allowing for the user to identify with it (Rosenberg, 2001, pp. 43).

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[12] A cross-channel language of interpretation is a language which combines information received on two or more channels of communication to interpret the meaning in a manner not possible with either channel alone (Elsom-Cook, 2001, pp. 1-15).

[13] The concept of hypermedia results from the combination of hypertext and multimedia. Hypertext refers to when the content is divided into small units that are connected electronically with each other within a network. The user has access to all these information units and can decide how, when and in what order he or she wants to access the information (Tergan, 1997, pp. 123-124).
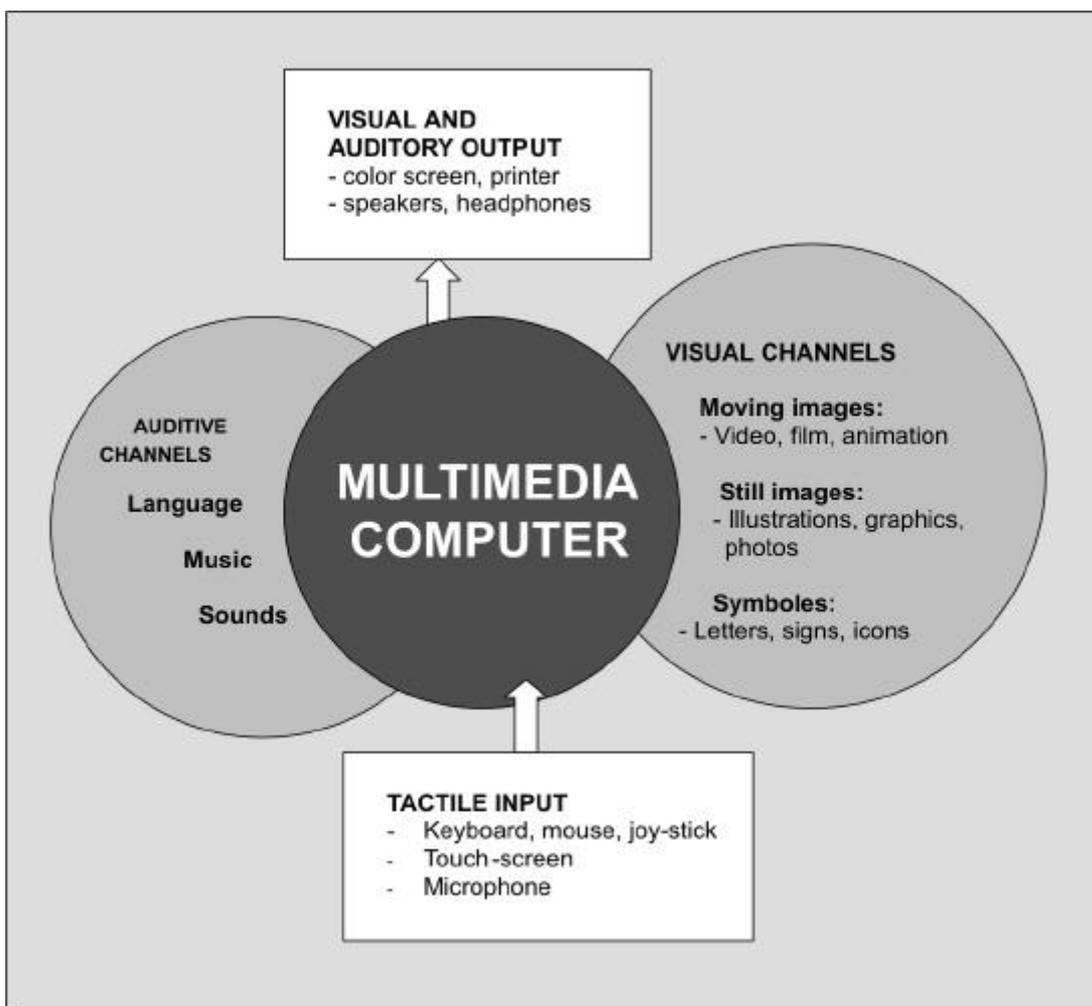
Figure 1. Multimedia features as described by Bauer (1997, p. 378).

When wanting to understand the users, several types of knowledge (see Table 3) could be important. Knowledge about the users is a prerequisite for the development of user-friendly programs. In addition, knowledge about other relevant parties should be investigated. In the case of self-treatments, political and professional organizations, therapists, patients, interest groups and the ones paying for the treatment could be of importance. This is sometimes referred to as a stakeholder analysis (Elsom-Cook, 2001, pp. 265-269). With sufficient knowledge, the following aspects can be improved: level of usability, learnability and accessibility, level of control for the patient, content and presentation. The knowledge could be acquired by searching in the literature for information about the users and other parties or using methods such as questionnaires and interviews. Users-to-be could also be asked to participate in tests and observations.

An adapted (customized) system is described by Elsom-Cook (2001, pp. 99-104) as a variation of the user-centered design, in which several versions of the system are available, each corresponding to a specific user profile. To present a system in more than one way is particularly important when it is a heterogeneous user group, an example is programs presented in different languages. When using such a system in a self-treatment, the user could log in as either a patient, a therapist, a significant other (family member, the partner or a close friend of the patient) or people with other professions in contact with the target group. The difficulty with this approach is to set the criteria for each profile.

A further development of the user-centered design, described by Elsom-Cook (2001, pp. 99-104), is the adaptive system. Based on the interaction taking place between the user and the system, these systems build a representation of the users' knowledge and make use of this representation in order to adapt appropriately during

Table 3. User knowledge important to investigate in the development of computer-based self-treatments (adapted from Elsom-Cook, 2001, p 97).

	Three different kinds of user knowledge		
Time aspect	Cognitive knowledge	Conative knowledge	Affective knowledge
Background	What users know	Users' desires in life	How users feel
Foreground	Knowledge users gain from a self-treatment	Users' purpose interacting with the self-treatment	How users feel when using the self-treatment

interaction. For example, when a user repeatedly shows interest in one section of the program or repeatedly uses a certain function, the computer program should adapt accordingly and automatically present the section or function of interest. Another way to adapt described by Elsom-Cook, would be to pose questions during interaction: *Do you prefer to..* (conative knowledge), or *How bored are you?* (affective knowledge). The program should adjust the interaction according to the user's input such as shifting to a help function or change the speed of interaction. The different forms of knowledge that are important to investigate when developing a self-treatment, are described in Table 3. In particular, the learner's prior knowledge is currently gaining much attention in educational research and is believed to influence the learning process (Schnotz, 2002).

A trend in research on psychotherapy is to match patients with treatments, aiming at maximizing treatment efforts (see 1.1.5. Cognitive behavior therapy for social phobia). Assuming that no single treatment can be effective for all persons with a certain diagnose, modern self-treatments offer new possibilities for matching. Originally, the matching process takes place before the patient starts to work with a treatment, where certain patient characteristics are matched with specific treatment components. Adaptive self-treatments, however, interact and adapt according to patients' needs and actions as described above. This could be said to be a matching process that is taking place parallel with the patient's learning process. Adaptive systems represent an example of artificial intelligence[14], thus, even though this approach has a great potential, it is currently technical difficult to achieve.

When developing an interactive multimedia program, it is helpful to reflect on what kind of content should be included into the program. There are three types of content: information about relevant topics (knowledge), instructions and examples in order to support and encourage training, and direct step-by-step instructions in order to support performance in the situation (see Table 4). Performance support in a self-treatment could be implemented with the help of a palm-top computer or in virtual reality environments.

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[14] Artificial intelligence (AI) refers to systems that have some human qualities such as the ability to understand languages, to solve problems and to learn (Cambridge international dictionary of English, 1995).

In summary, an interactive multimedia self-treatment could interact with and adapt according to the characteristics and actions of the user while the program is running. Different communication channels and modalities could be used when presenting knowledge, instructions for training or performance support.

Table 4. A description of different types of content in a self-treatment (adapted from Rosenberg, 2001, p. 77).

	Three different types of content in a self-treatment		
Characteristics	Training	Knowledge Management	Performance Support
Purpose?	Instruct	Inform	Guide performance directly
How will the user learn?	Program dictates	User determines how	The task defines how, learning is secondary to performance
Goal	Transfer skills and knowledge to users (the user learns what to do and why)	To be a resource to users (the user can get the information that can help him or her to do it)	To assist performance or do it completely (the users do not need to know how, system assists in doing it)
Example	Teaching skills	Accessing information in preparation for an exposure training	A tool to help carrying out an exposure training
Program	CD-ROM with multimedia and interactive features	Accessing online program with constant updates	A palmtop computer assisting during tasks

1.2.5.3. Potential advantages with interactive multimedia programs

As already mentioned, it is important that technological innovations are only the means to create the best self-treatment possible, not the goal itself. Therefore, it is crucial to reflect upon the advantages with a computer-based self-treatment compared with a traditional self-treatment. The following section will do just that.

Owing to recent improvements in speed and memory, the personal computer has the technology to deliver sound (music, voices, sound applications) and pictures (graphics, images, video and animation) in addition to written text. The advantages of multimedia for learning programs seem obvious: the involvement of several modalities is believed to improve our information processing, i.e. we can learn better with multimedia systems than with other systems or programs using only one modality such as a program consisting of solely written text. Ricci and Beal (2002) presented a computer-based story to 6-7 year old children. There were four forms of presentation: radio (the children only heard the narration), television (an audiovisual presentation), interactive media (interaction with animated areas of the screen) and non-interactive media (watching other children interact with animated areas of the screen). The radio-like group consistently recalled and comprehended poorly. The results regarding recollection and comprehension were equally good for the interactive media group, the non-interactive media group and the television group. Thus, these findings suggest that programs comprising audiovisual media is better than audio alone. However, it is important to point out that research findings in this area are somewhat inconclusive, which has made it difficult to define a set of guidelines for the development of self-treatments.

As mentioned before (see above), adaptive systems offer the advantage of presenting the content in accordance with the patient's input and needs (see Table 5) with regard to modality, channel of communication and level of complexity. This might be of great importance for patients with a high level of anxiety, where the information

Table 5. Examples of how a program can adapt according to users' input.

Input from the user	Program adapting to the input	Comments
Tired (ask users how they are doing)	Intensified support such as suggestions, how to solve a task and where to go to in the program.	A higher level of system control is necessary when the user reports being tired and not feeling good.
High level of tension (ask users to rate their level of tension)	Presentations mainly with the modality channel of communication that the user can at the time perceive the best, or prefers.	High levels of anxiety lead to a reduction of information processing abilities, thus additional support and adaptation is necessary
High level of depression (ask users to fill out a brief questionnaire, assessing the level of depression)	Short sections of information presented or the user is asked to do tasks that do not demand a high level of concentration for a long time.	Depression is well-known to be associated with restrictions on mental functioning such as the ability to concentrate.
Low level of motivation (ask users to fill out a brief questionnaire, assessing the level of motivation)	Intensified efforts to (1) increase level of motivation by stressing advantages with the program and goal formulation, (2) regain the attention by presenting sections that are entertaining and encourage exploration.	A low level of motivation is known to be associated with poor performance.
Poor performance (when the user fails to solve tasks, the program should react, an assessment test could also assess preferred level of complexity)	When the user is performing well, difficult tasks can be presented in the program, for users that have problems solving a task, or do not perform well on assessment test, easier tasks could be presented in the program and information on how the user contacts supportive persons.	It is more likely that a user will not solve the following task, when the previous task could not be solved. The risk for failure increases, when the amount of failed tasks increase. The level of motivation is assumed to be negatively influenced by failure.
Users on medication (ask for information on current medication)	Similar actions possible as when users are reporting being tired or depressed (see above).	Medications can lead to reductions in information processing abilities. Thus, users on medication might need more support than normally.

processing may be reduced. In deed, research findings indicate that there is impairment in information processing in patients with posttraumatic stress disorder (Buckley, Blanchard & Neill, 2000). In social phobia, an increase of anxiety has been associated with reduced processing (Chen et al., 2002).

It could also be possible that users in general prefer certain modalities and/or channels of communication. If this is the case, the learning process could be maximized and the level of motivation increased, if the program adapts to the user's preference.

The use of multimedia can improve not only understanding and learning, but these program features are also known to catch the attention and to keep people interested in a way that more traditional presentation forms could not (Ballstaedt, 1997, S. 199-268). In particular, this may be true for multimedia sections that are created in accordance with the edutainment approach (see also 1.2.5.1. The technological development and its implications).

The learning process is complex, thus, combining several channels of communication such as an image and a written text does not always support the learning process. A general rule is that the channels of communication should be connected. For example, when presenting a text and a picture at the same time, the picture would only then improve the understanding of the text, when it gives the same message to the user as does the text. On the contrary, when the relationship is not clear and the picture is decorational, it may confuse the user rather than deepen the understanding. In a comprehensive review of pictorial research, Carney and Levin (2002) conclude that representational (mirror part of the text), organizational (provide the reader with a structural framework), interpretational (help to clarify difficult text sections) and transformational (include aspects to enhance memory of text content) pictures are supportive in the learning process. In particular, transformational pictures can boost the learning effect. The combination of different channels of communication is a program feature that can be applied in both multimedia programs, as well as in traditional publishing and printing. In spite of this, it is true to say that interactive multimedia offers a faster and more exact work with a wider variety of possibilities, allowing for more experimenting. In addition, the creative process as well as the distribution of colorful material is less expensive in computers compared with the printing industry.

Angenendt and Stieglitz (2000, p. 246) suggest that capacities can be set free for other interventions when self-treatments are used within a therapist-directed therapy. Interestingly, educational research has demonstrated that computer-based instruction can reduce the teacher-time needed for instructions (Kulik & Kulik, 1991). These results offer some support that computer-based self-treatments could also reduce the time needed by the therapist, and in turn, set capacities free for other interventions.

In the study described above (Ricci & Beal, 2002), the interactive element did not seem to boost learning effects. However, it is widely believed that interactive elements in computer-based programs do support the learning process in adult learners (see 1.2.6. Factors influencing users when working with a self-treatment). To begin with, interactive programs allow for the user to control many aspects of the learning process, which has been found to be a critical factor in adult learning (Cress, 1999). Also, in interactive programs, feedback can be given in accordance with user actions. In turn, this feedback can boost information retrieval and encourage active participation (Kulik & Kulik, 1988; Wright et al, 2002). Feedback could also encourage the users to reflect upon learning behaviors and improve their abilities to regulate their learning behavior.

Not only has the software improved in recent years, but also the technological development has brought new and/or improved hardware. Marks (1999) notes that palmtop computers can be used during the assessment and the screening phase as well as during the treatment phase. For example, this hand-held computer could support and encourage patients while conducting exposure training, even beyond the time-limits of the therapy session. The computer can be prompting the use of cognitive behavioral strategies and improve adherence. It would also make it possible for patients to record their reactions in fear-evoking situations in a fast and easy way. This could provide patients as well as therapists with valuable information, since the

data is collected in the patient's natural environment (Newman, Consoli & Taylor, 1999). Subsequently, the data obtained can be down-loaded and analyzed in a personal computer. One problem with the use of palmtop computers is that they could be embarrassing to use in public for some patients (Marks, 1999).

Initially, treatment manuals were an aid for researchers when conducting controlled treatment studies. Computer-based self-treatments (on both desktop and palmtop computers) could also aid researchers. First, they can present the treatment components in the same way to all patients. This is important in comparative research, where effects of uncontrolled or unknown variables must be minimized. Furthermore, in self-treatments there could be program features incorporated, so that patients can be assessed, observed and tested at the same time as they are working with the self-treatment. This has been made possible with so called logfiles and screen capturing (see 1.2.8. The evaluation of computer-based self-treatments), with which data can be collected in a faster and safer way. Thus, assuming that the patient is informed and accepts these program features, treatment and evaluation could occur simultaneously, and research could take place without burdening the patients with additional tasks or questions. Moreover, the patients can become feedback from the research activities, helping them to better understand how they behave and why.

In accordance with learning theories, reinforcing components can be built into a computer program such as praising words or rewarding music when a task has been performed correctly. In computer games, there is often a reward to be found, for example, users are allowed to enter a higher dimension of the virtual reality (VR), after having completed a task in a lower dimension of the VR, or the user is declared winner of the game.

We can store a huge amount of material in computers. In spite of this, the user does not become overwhelmed, when the content is well-structured and presented in small chunks. When including a huge amount of information, we assure that there is something for everyone. It is not the aim that each user should look at all the information. On the contrary, comprehensive computer programs can be referred to as a library. Rosenberg (2001, pp. 43-49) stresses the importance of organizing material in such a way that all programs can be useful to the user after the initial use such as offering search functions. Online programs offer additional advantages. The user can retrieve and down-load information in a fast pace, and a continuous update is possible. Palloff and Pratt (1999; pp. 144-158) suggest that not only the information, but also the program itself can continuously be improved.

The forming of an online learning community is referring to active interaction between people that support each other, knowledge storage and information sharing, a feeling of connectedness and belonging (Palloff & Pratt, 1999, pp. 21-32). The forming of an online community is believed to decrease the negative effects of online anonymity and social isolation. Another aspect that is important when developing an online program is responsiveness, i.e. an online community that has been formed can only continue to exist when the members quickly respond to each other and all members are respected. Collaborative learning refers to interaction between the members of an online community, with the aim to facilitate learning and to reach goals relevant to the members (Pallof & Pratt, 1999, pp. 110-128). Abrami (2001) suggests that in student-student interaction (rather than student-instructor interaction), collaborative behaviors among learners could include an exchange of information and course material or a meaningful dialogue. Abrami notes that when a positive interdependence exist, the students are positively influenced by each others' success and they have a sense of responsibility to help others in the community. This

so called connectedness is an aspect that is expected to play an essential role in future computer-based programs, organizations and companies as well as in education and professional training (Rosenberg, 2001, pp. 3-17).

It has already been mentioned that inexpensive online communication has been used in order to increase the contact between therapists and patients in the implementation of self-treatments. The advantage is that socially anxious persons can open themselves to a greater extent in internet communication, where there are no visible social cues such as sex, age, social status and educational level that can intimidate the person into a withdrawal or into being less open and honest (Bergvik et al., 2002). It may be that people are less concerned and worried about what others think in online communication, i.e. the stakes to communicate seem smaller. In particular, in situations where patients are supposed to disclose sensitive information (Marks, 1999), or where feelings of shame are present (Barak, 1999). Furthermore, McKenna and Bargh (1999) suggest that when communicating online, the person can experiment with different aspects of the personality and show sides of oneself that is not possible in the real world without negative consequences.

For people with a hectic lifestyle, online communication may be the only solution in order to hold social relationships. In a study on online self-treatment for patients with recurrent headache (Ström et al., 2000), asynchronous communication was viewed as a convenient solution for many of the patients. In asynchronous communication (for example e-mails), the two parties communicating are not present at the same time as is the case in synchronous communication (for example face-to-face communication). Asynchronous communicating allows for more time to reflect on what to say and it is easier to ensure that all voices are heard (Palloff & Pratt, 1999, pp. 46-58).

For severe cases of social phobia, online communication can be the first step to make contact. It may be the only possibility in which the patients are able to communicate. When positive experiences are made during online communication, this could carry over to face-to-face interactions. In other words, online communication could improve self-confidence. Especially, this could be true for people that have made few positive experiences in face-to-face social interaction. It has also been reported that many relationships that are formed on the internet, are brought into the off-line world, i.e. people take steps to meet internet friends in person, to talk to them on the phone, and sometimes, romantic relationships are developed (McKenna & Bargh, 1999).

Interestingly, people communicating online are about to create new communication skills such as expressing emotions with the help of symbols and certain words, for example, we can say something about the mood we are in when using the so called smiley[15] or with action words such as "giggle" (Döring, 1999). Not only does online communication influence the way we express ourselves, but also it influences the communication structure. For instance, persons participating in social interaction online can decide whether or not they want to be a invisible observer, a passive participant, a main actor or an actor taking the initiative to the interaction (Döring, 1997, p. 325).

In educational research, there has been a debate on so called key skills, referring to general thinking and learning skills that are essential to most people in work and in private life (McAvinia & Oliver, 2002). It could be argued that users working with a computer-based self-treatment have the chance to improve not only the specific skills needed in order to overcome their psychological problems, but also to improve key

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[15] The smiley can express happy feelings → :o) ;o) :-) :))) or sad ones → :(

skills preparing the person to be lifelong learners in a computer-oriented information society.

Finally, a high acceptance rate has been reported for patients working with a computer-based self-treatment (Wright et al., 2002). Moreover, over 80% of students with fear of spiders report to be more interested in conducting an exposure treatment with the use of a virtual reality program compared with in vivo exposure (Garcia-Palacios et al., 2001).

In summary, interactive multimedia programs have gained much attention among users, developers and researchers for its ability to rapidly collect, process and present huge amount of material in a flexible and entertaining way. It is assumed that these new program features can increase motivation, as well as support learning and understanding. In particular, the possibilities offered by online programs is believed to influence the future with regard to how we communicate, learn and handle information. However, research evidence is inconsistent on exactly what aspects of multimedia and interactive elements are important. Thus, further research is clearly needed.

1.2.5.4. Criticism and potential disadvantages with interactive multimedia

There are, in deed, many interesting and innovating features offered in interactive multimedia programs. However, just because a certain feature is viewed as being interesting or entertaining, this does not mean that it automatically supports the learning process. The danger with a new technology that makes so much possible, is that there is little reflection on what is necessary and reasonable for the program that is being developed. An important question is whether or not it is true, that less is more. Are interactive multimedia programs getting too complex?

Preliminary results have been presented that lend support to the hypothesis that complex multimedia programs can affect the learning process negatively. It is assumed that users have to devote time and resources to learn both the program structure and the content (Parlangeli & Bagnara, 1999). Also, presenting too much material can distract or overwhelm the user (Mayer et al., 2001). A relevant concept is the so called split-attention-effect, offering an explanation of why users have difficulties to integrate multiple data in complex multimedia programs (Weidenmann, 1997, S. 65-71). With regard to the development of self-treatments, reduction of complexity has been suggested as important in order to keep patients from becoming overwhelmed (Angenendt, 2000, pp. 600-606). Rosenberg (2001) uses Meyer's law to pinpoint this dilemma for program developers:

It is a simple task to make things complex,
but a complex task to make them simple (p. 106).

The technical innovations that are accessible and affordable today, give a promise of new self-treatments that are better than the old ones. However, even though the software and the hardware are there, somebody still needs to find the time to develop new programs and to redesign old material for computer presentation. The risk is that this somebody will in most cases not show up, since most practitioners and researchers lack the time to develop such a program. When the computer science is turning too complex, the accessibility and affordability are only superficial. Thus, an interactive multimedia program of high quality could only be developed by professional computer experts which would in turn lead to high developing costs for a self-treatment and subsequently to high costs for the consumers.

McAvinia and Oliver (2002) suggest that it is unclear if the computer technology, with its great potential, will turn out to be anything else but text-dominated computer programs with links to different internet sites on the subject. In addition, they state that it is unknown if complex computer programs could ever make such contributions (for example saved therapist time and effort) that would justify the attention they are currently receiving. A return-on-investment analysis is therefore important when evaluating future computer-based self-treatments.

Furthermore, even though many people could be reached with an online version of a self-treatment, it is unlikely that a program could be developed that would be suitable for different people and different subgroups, with different backgrounds and characteristics. Instead, it is more likely that each patient group needs a self-treatment developed according to its specific needs. When producing a program for a small audience, the resources that are available are limited and so are the technical innovations.

Even though it is believed that multimedia contributes to learning, the empirical evidence so far is inconclusive (Klimsa, 1995, pp. 96-105). The complex processes surrounding understanding and learning, retrieving of information, as well as the high complexity of interactive multimedia programs and the rapid development of new program characteristics, make it difficult to form a golden standard for multimedia pedagogy. A study by Palmiter and Elkerton (1993) demonstrates the difficulties when dealing with complex processes as well as with complex programs. In their study, an animated demonstration produced superior learning effect and -transfer in learners studying computer-based tasks compared with text-only learners. Thus, the results seem to support multimedia use in teaching students computer-based tasks. However, seven days later when repeating the task without instructions, text-only learners performed faster than the group having received animated demonstration. Palmiter and Elkerton suggest that the reason for the disappointing long-term learning transfer in the animated-demonstration-learners was due to the fact that they had initially mimicked the animated demonstration rather than understanding, learning and reflecting on it. The study highlights the difficulties in this research area and the importance of looking at long-term learning effects.

Another source for criticism is the statement that multimedia can catch the attention of and increases the level of interest in users. In particular, the entertaining aspects of multimedia programs are popular with the younger audience. However, this does not necessarily imply that the initial attention holds on. It may be true that more patients are curious and begin a multimedia self-treatment. However, it remains to be seen whether or not the level of attrition decreases and more patients complete multimedia self-treatments compared with traditional self-treatments.

It has repeatedly been argued that it could lead to further isolation when a person chooses to spend time with a computer program, rather than with other human beings. In deed, there is new evidence suggesting that internet use can become pathological. Young (described in Hall & Parsons, 2001) introduced the concept of pathologic internet use (PIU), referring to a state of constant preoccupation with internet that can lead to an increased tension when not online, the ignoring of family and work due to the time and effort spend online, and additional physical complaints.

The lack of social context cues in online communication, the anonymity and the feeling of being less committed to what one says, can lead to an online communication where people react in a more unreflecting way. It is believed that this could have negative consequences for social encounters and for the building of intimate relationships in the long run (Kiesler, Siegel & McGuire, 1984; Pallof & Pratt, 1999, p. 33-45).

Baur (2000) suggests that the use of the internet and e-mails in health care will change the patients-physicians relationship into a provider-consumer relationship. The potential risks with this development are: a lack of confidentiality when medical information is transmitted via the internet, a low level of quality regarding online health information[16], and the exclusion of people that have no direct access to the internet or have high levels of computer anxiety (see below). A way to partly overcome the problem with lack of security and confidentiality is to inform the patients about this risk and recommend the use of a free online e-mail services that automatically encrypts messages when communicating online (Carlbring et al., 2001).

There are also difficulties with regard to technical aspects. No computer program is perfect, thus, software and hardware can contain shortcomings that place limitations on the application of the program. Most programs today do not represent an advanced adaptive computer program with elements of artificial intelligence. Therefore, these programs lack flexibility and cannot be innovative when confronted with a new and unexpected problem, i.e. they are unable to deal with problems not foreseen by or unknown to the program developers (Marks, 1999). Such shortcomings may result in users being in need of unexpected and extensive support.

Even when software and hardware are technically perfect, it offers little information on the quality of the self-treatment itself. A problem could be that self-treatments that are looking good, might be bad. Thus, guidelines how to rate computer-based self-treatments are crucial for both practitioners and patients.

There are user-characteristics such as computer attitudes that might be important to investigate when implementing a computer-based self-treatment. The concept of computerphobia (or technophobia) has been introduced, referring to high levels of anxiety that are associated with computers and technology (Rosen, Sears & Weil, 1993). Both computer anxiety and interest for computers are important aspects of the computer attitude. There are research findings indicating that a high level of computer interest can boost performance (Clarke & Chambers, 1989), whereas students with a high level of computer anxiety perform poorly on computer related tasks (Marcoulides, 1988). In addition, a decrease in computer anxiety in students was associated with a lower drop-out rate in a university course (Rosen et al., 1993). Thus, when patients working with a self-treatment report high levels of computer anxiety and show little interest in computers, there may be an increased risk of treatment failure and attrition. A way to overcome low levels of computer literacy[17] and high levels of computer anxiety is to offer technical support to patients while working with a self treatment (Carlbring et al., 2001). Another way would be to offer a brief introductory course into computer usage before the patients start the self-treatment. In deed, familiarization[18] with computers has been suggested as a mean to reduce computer anxiety (Kulik & Kulik, 1991; Morrow, Prell & McElroy, 1986). In addition, Loyd and Loyd (1985) observed that a high amount of computer experience is associated with positive computer attitudes.

The spreading of information takes place much faster with online self-treatments, than with traditional self-treatments such as bibliotherapies. Even if this can be

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[16] A lack of information or false information would subsequently stop the patient from meeting the physician as an equal, the ultimate goal in a provider-consumer relationship (Baur, 2000).
[17] Computer literacy refers to the person's knowledge of how to use computers (Cambridge international dictionary of English, 1995).
[18] The concept of familiarization refers to the assumption that increased computer use leads to a decrease of computer anxiety.

advantageous when the information is of high quality, concerns have been presented regarding the risk of false information being spread rapidly (see 1.2.4. Current issues). When a book is to be released, a long process takes place including many reviews of the material before printing and publishing. The distribution needs additional time and calls for financial investments. There is often a communication and negotiation taking place between an author and a publishing company. This process offers an important threshold that might hinder self-treatments with a questionable level of quality to reach the public. Computer-based programs can often not be stopped with such thresholds. The entire process of publishing and distribution can take place in a couple of seconds via the internet. Furthermore, several parties are not necessarily included into the decision process, but a single person can handle it alone. Also, the distribution of information via the internet has become inexpensive. The results from a review of information about depression on the internet conducted by Lissman and Boehnlein (2001), show that these concerns are justified. Lissman and Boehnlein used ten major internet search machines (search: "depression" and "treatment") and reported that only about 50% of the 178 sites found mentioned diagnostic criteria and recommended treatment interventions (medication, psychotherapy or professional consultation). In particular, for-profit sites scored worse in the evaluation than non-profit sites.

Contrary to false information being spread rapidly, there has also been suggested that the internet contributes to true information disappearing (Kotamraju, 1999). The time cycles are much shorter online, data construction as well as data destruction occur with the same speed today. With regard to self-treatments and online patient information, this could mean that the information found is inconsistent and the patients receive contradictive information. In addition, it is difficult to track down a specific piece of information, once it has been taken off the internet. The librarian helping us out at the library has no equivalent in cyberspace.

Wilson (1996) points out that empirically supported manuals have been applied to research samples which differ from patients in general (for example patients with comorbidity and high levels of depression are often excluded from research studies), i.e. the question is whether or not research results can be generalized to the patients that practitioners meet. A similar problem exists in research on learning and computer pedagogy, that is, can research findings from studies relying on data from college students be applied when developing new computer-based self-treatments for another target group. People with a low level of education could differ on several aspects compared with college students. For example, they could be less used to working with written material and feeling less comfortable to be in situations demanding self-regulated learning. In addition, they may have less computer experience and a lower level of computer literacy. Thus, instead of eliminating the differences in access to treatment among people from privileged backgrounds compared with people from unprivileged ones, technology could lead to new physical and psychological barriers (Abrami, 2001). Not only is this an ethical problem, but also program developers are in trouble when developing computer-based self-treatments based on research findings that are not relevant to the users that the treatment is intended for.

In summary, it has been suggested that interactive multimedia programs are becoming too complex and overwhelm users. Also, it is unlikely that the advantages with such a program justify the high costs and the time needed for the development. So far, there is no conclusive evidence indicating which interactive aspects or elements of multimedia might improve learning. Accordingly, there are no guidelines describing how practitioners and patients should select a self-treatment. Internet use

is also problematic. It has been reported that online communication often is unreflected, false information can be rapidly spread and true information disappears too fast. In addition, confidentiality is a problem and internet use can become pathological. High levels of computer anxiety can also be a problem.

1.2.6. Factors influencing users when working with a self-treatment

Learning has become an important issue in society. In spite of this, it is a somewhat confusing picture that has been presented with regard to the definition and assessment of learning behaviors. In particular, it is disputed whether or not learning behaviors have a trait or a state character. In this paper, two main concepts will be used in the discussion on learning behaviors: Learning strategy (see Figure 2) is a concept referring to overt and covert activities by which the user tries to facilitate the learning process with regard to acquisition, storage and retrieval according to demands in the situation (Kardash & Amlund, 1991), learning style is a concept referring to behaviors with a more stable trait character compared with learning strategies, reaching across many situations (Pask, 1976). Thus, learning styles are less influenced by situational factors, whereas learning strategies can be changed (see Figure 2). For instance, in a computer-based self-treatment it would be possible to include program features that support certain learning strategies in order to boost performance. However, this does not imply that the user's learning style has changed. On the contrary, it may be that once supporting features are not present anymore, the user returns to old habits.

Biggs (1978) introduced three approaches to learning that have gained much attention in educational research: a deep approach (emphasizing the importance of meaning and understanding), a surface approach (focusing on reproduction without reflection), and an achievement approach to learning (focusing on competition and achievement).

According to a recent study by Warr and Downing (2000) there are cognitive, behavioral and self-regulatory learning strategies of importance (see Figure 2). They have suggested that cognitive strategies include rehearsal (reproduction of information without reflection) as well as organization and elaboration (identifying key issues and connecting new information with previously existing knowledge). Interpersonal help-seeking, help-seeking by the use of literature and practical application (trying it out in practice) belong to behavioral strategies. Finally, Warr and Downing refer to emotion control (aiming at retaining concentration in spite of anxiety), motivation control (aiming at retaining motivation and attention in spite of limited interest), and comprehension monitoring (strategies to assess learning effect and regulatory behaviors in need) as self-regulatory strategies. The learning strategies presented by Warr and Downing are similar to those that have been found in earlier research, for example, in connection with the development of the MSLQ[19] (Pintrich, Smith, Garcia and McKeachie, 1993).

In a German study, Cress and Friedrich (2000) assessed the learning strategies in 724 adult distance learning students with the use of an adapted version of MSLQ. The study identified four types of learners, each type showing a unique combination of learner characteristics: elaboration learners (with a deep approach to learning), rehearsal learners (with a surface approach to learning), minmax learners (representing students that learn with limited efforts and time invested and still

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[19] The MSLQ is a well-known questionnaire assessing learning strategies and -motivation including three groups of strategies: metacognitive, cognitive and resource management strategies (Pintrich et al., 1993).

demonstrate high academic achievements), and minimum learners[20] (students with neither structure, nor success in their learning efforts). Cress and Friedrich note that elaboration learners and minmax learners showed a higher learning success, a higher level of previous existing knowledge and a weaker tendency to drop out of the distance education program compared with the rehearsal and the minimum learners. Elaboration learners invested more time and effort than minmax learners in order to reach their academic achievements. The rehearsal learners invested much time and effort in learning, but showed weak results. The minimum learners invested little time and effort, and showed poor academic achievements.
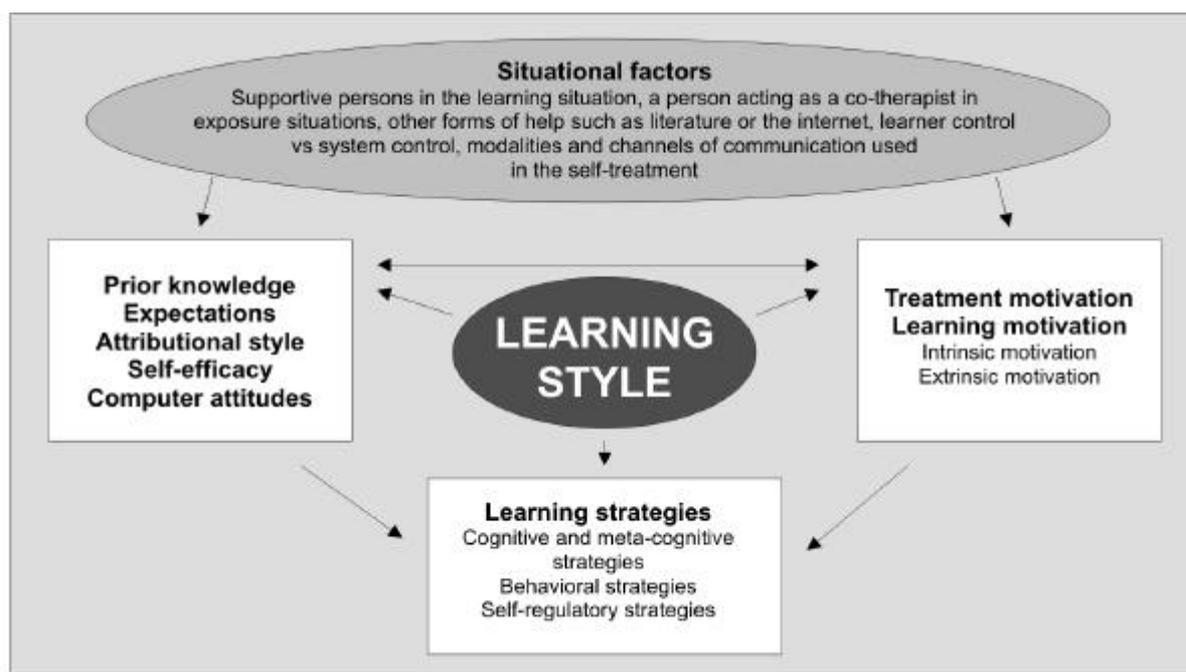
Figure 2. Personal and situational factors influencing self-regulated learning with a computer-based self-treatment (adapted from Cress, 1999, p. 27).

Cress and Friedrich also report on the learner types and their association with motivation. Intrinsic motivation refers to when students simply learn because it leads to personal satisfaction and when they want to increase their understanding of different aspects of the reality. Extrinsic motivation refers to when students that are driven by rewards or expectations that something positive will come as a consequence. The minimum learners reported low levels on both intrinsic and extrinsic motivation. Rehearsal learners, however, were extrinsic motivated but intrinsic less motivated. Minmax learners were intrinsic but not extrinsic motivated, whereas elaboration learners demonstrated the highest level of intrinsic motivation. The study by Cress and Friedrich shows many similarities with other research findings on learning strategies, that is, a high level of motivation and a use of metacognitive learning strategies are associated with a high academic performance (Pintrich et al., 1993).

It has also been demonstrated that negative affect, in particular anxiety, intervenes in the learning process. For example, shy persons can be more effective learners when working with interactive computer programs at home rather than being in a class-room setting with fear-evoking face-to-face interactions (Pallof & Pratt, 1999,

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[20] Undirected learning strategies (Vermunt, 1996) is a concept that might be referring to a similar learning behavior as the minimum learners in Cress' study.

p. 8). It has also been suggested that test anxiety is a condition that can hinder students in achieving their goals. In accordance. reduced test anxiety is associated with improvements of academic performance (Buglione et al., 1990).

In addition to cognitive abilities, the learner's prior knowledge is known to influence the learning process (Schnotz, 2002). This highlights the fact that a thorough user analysis, identifying the prior knowledge of the user group, is important.

When working with a computer-based self-treatment, the person is participating in a self-regulated learning process (see Figure 2). According to Weinert (1982, p. 102), self-regulated learning refers to when people learn independently and can influence the learning process to a high degree, for example, if, what, when, how and with what goal they are learning. Thus, self-regulated learning can offer a high level of learner control rather than system control. A high level of learner control is assumed to better fit a person with a deep approach than somebody with a surface approach to learning. The reason for this is that a person with a deep approach would be able to show initiative (being intrinsic motivated) and flexibility (mastering many different learning strategies and investing much time and effort when implementing them) in the learning situation. Lottmann (2000, p. 154-155) also suggests that a high level of learner control is to recommend for adult learners, since they often have a clear perception of why they are learning and what they need. Thus, when adult learners interact with a computer-based self-treatment, they could make sure that their needs are met and their goals are reached.

Cress (1999) summarizes some points made in the literature on how adult learners differ from younger learners, which lend some support to Lottman's recommendation. First, adult learners are much more experienced with regard to learning situations. For example, they have often completed some sort of education or training program in which learning activities occurred. Second, Cress stresses that adult learners possess a high level of prior knowledge. Third, adult learners have an idea about what kind of learner they are (a learner identity), i.e. they have formed an opinion on what strategies are appropriate in a particular situation. These experiences can aid adults when striving to learn effectively. Even though a high level of learner control could be a program feature that is easily accepted by adult learners, comparative research studies on learner control vs system control are contradictory, suggesting that there might be other factors that have a greater impact on learning effects than level of control (Bates, Holton & Seyler, 1996). In particular, user characteristics may play a prominent role, overshadowing the effects of learner and/or system control.

A high level of learner control does demand a great deal from the learners. Not only do learners need to reflect upon their learning process, but also they must conduct regulating activities, aiming at improving their performance. For instance, students noticing that they are not able to recall the content of a certain section in a book, would have to change their learning strategies accordingly. The learners could, for example, go back and repeat the material or make a summary. Learning programs that try to support such learning strategies could, for example, add questions about the key issues at the end of each chapter in order to encourage the learner to assess the learning effect.

There are, without doubt, students who cannot profit from too much independence. In deed, it has been demonstrated that a computer-based program that is suitable to learners using a deep or a surface approach to learning, might be unsuitable to those using an undirected strategy (Sankaran & Bui, 2001). This result highlights the need for computer programs that can adapt to the needs and characteristics of the users in order to boost performance, offering more support and structure to users with undirected learning strategies and less support to independent and self-regulating

students. Detailed learning objectives, reviews, step-by-step instructions for assignments, learning reinforcers and sample questions are suggested as support for learners with undirected learning strategies (Sankaran & Bui, 2001). In addition, the program could assess the learning effect for the learner, adding learning tasks in order to boost performance when necessary.

The way that learners attribute success and failure is also a factor that influences the learning process. Locus of control (see Figure 2) is a concept that was introduced by J. B. Rotter (described by Hjelle & Ziegler, 1981, pp. 138-140), referring to a general set of beliefs about life including expectancies and assumptions about responsibility for good and bad events. Based on experience and observation, conclusions are drawn about the extent to which good and bad outcomes are controlled by our own actions or by uncontrollable outside factors.

Internal locus of control is defined by a generalized belief that the control lies in one's own actions, thus the person can act in order to maximize the possibility of good outcomes and minimize the possibility of bad outcomes. Accordingly, the assumption is that skill, hard work and taking responsibility will pay off.

External locus of control refers to a generalized belief that life's outcomes are determined by external factors such as luck, fate or powerful others. Since the person has no influence over such factors, he or she is helpless. There is convincing support that internality is positively related to success in situations where school performance and achievement has been in focus (Findley & Cooper, 1983).

According to the learned helplessness theory (Peterson & Seligman, 1984), learners that attribute failure to stable internal causes, could develop a passive behavior in learning situations, whereas attributions to learnable skills may foster an active and flexible learner with a high level of self-esteem.

The perceived ability is another concept that has gained much attention and is assumed to play a role in learning. Bandura (1977) introduced the concept of self-efficacy, referring to a theory on how expectancies and beliefs about one's own ability to achieve goals can influence behavior. In general, self-efficacy can predict the behavior in fear-evoking situations. There is empirical support for this theory (Öst, Ferebee & Furmark, 1997; Öst et al., 1998). A high level of self-efficacy correlates with a low level of anxiety and inhibition. According to Bandura, all psychological interventions should aim at an increase in the level of self-efficacy. In accordance, it could be important to assess the level of self-efficacy in learners and reflect on whether or not they are able to work with a self-treatment, before starting with such a treatment.

In summary, there are personal factors that may influence the learning process during a computer-based self-treatment such as learning style and strategies, level of motivation, as well as self-efficacy, attitudes, expectations and attributional style. In addition, there are situational factors influencing the outcome such as system vs learner control, the option of a helping person or help by the use of literature accessible. The personal and situational factors influencing learning strategies during self-regulated learning in a computer-based self-treatment are described in Figure 2.

1.2.7. The development of computer-based self-treatments

The focus in the development of computer programs is currently on a user-centered design (see 1.2.5. New trends), aiming at creating user-friendly programs. In order to achieve such a program, there are several aspects that are important. The development of a computer-based self-treatment is outlined in Table 6 and Figure 3.

An important aspect of the developing process, is the continuous evaluation (see 1.2.8. The evaluation of computer-based self-treatments). In this paper, these

processes are described in different sections. However, it should be pointed out that the developing process cannot always be clearly distinguished from the evaluation. In particular, this is true when the developing process itself is being evaluated.

There is an urgent need for guidelines regarding development of self-treatments. When describing the current state on the understanding of complex learning, Abrami (2001) concludes that the research that could lead to such guidelines is often inconclusive, sometimes contradictive and burdened with many methodological problems. In spite of this gloomy picture, preliminary guidelines can be suggested based on reviews of the literature. In this section of the paper, a set of concrete guidelines regarding technical features and the program presentation are to be found (see Table 7). These guidelines have been adapted to the specific needs in the development of self-treatments, based on the review of the literature from Park and Hannafin (1993). The guidelines suggested by Park and Hannafin are similar to those suggested by other authors with regard to complex learning with new technologies (Carney & Levin, 2002; Ballstaedt, 1997; Mautone & Mayer, 2001; Mayer & Moreno, 2002).

1.2.8. The evaluation of computer-based self-treatments

The overall aim with an evaluation is to secure a high level of quality, acceptance[21] and efficiency through a systematic collection and analysis of data in the development and implementation of products (Tergan, 2000, pp. 22-26). Evaluation is described as a process in which something is tested in order to see whether or not the original targets have been met (see Figure 3). The learning process, -effect and -transfer[22] are important issues in the evaluation of educational software (Mandl & Reinmann-Rothmeier, 2000, pp. 89-105). These issues are likely to play an important role in future evaluations of self-treatments.

The evaluation can be formative, referring to the intention of identifying potential improvements, or summative, which produces a final judgement on met targets such as a controlled treatment study. A somewhat different approach to the definition of formative and summative evaluation was presented by Harvey (as quoted in George & Cowan, 1999):

When the cook tastes the soup, it is formative evaluation;
when the dinner guest tastes the soup, it is summative evaluation (p. 1.).

However, the distinction between formative and summative evaluation is often not as clear-cut as is here suggested. On the contrary, the evaluation process is in many cases a balance between formative and summative intentions (George & Cowan, 1999, pp. 16-18). In the development of computer-based self-treatments, formative intentions are important, since there is a constant urge to improve computer programs in order to stay competitive. It is probably necessary to repeatedly reflect on several issues and guidelines (see Table 6 and 7), in order to meet user expectations and to adapt according to new research findings. At the same time, summative intentions must not be forgotten, for example, in order to show that the self-treatment is worth buying, using or investing in. Palloff and Pratt (1999; pp. 144-158) stress the importance of not only evaluating the interface and the content of a learning program, but also the technology itself: its functionality and user-friendliness.

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[21] Acceptance refers to the user's degree of satisfaction with the program (Tergan, 2000, p. 42).
[22] Learning transfer refers to when users learn a certain content, integrate it with previous knowledge and implement this new knowledge with actions in everyday life (Mandl & Reinmann-Rothmeier, 2000, pp. 89-105).

Table 6. Six issues to reflect on in the developing process and the evaluation of a computer-based self-treatment.

SIX ISSUES WITH COMMENTS

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1. Main goals [c]
    → Description on what is to be achieved
    → This description should be defined and redefined in accordance with the result from document analyses, interviews and questionnaires.
2. Analysis of needs
    Analysis of patient needs and knowledge [b c]
    → Collecting information necessary when developing a self-treatment such as finding out more about the condition and its treatments, patient characteristics, needs and wishes by the use of interviews, questionnaires and documentation analysis. Important questions are:
        "What do they know"
        "What do they want to know"
    Stakeholder analysis [e]
    → Stakeholders are those with an interest in, or who is affected by the development and the implementation of the self-treatment such as parties paying for the treatment, politicians and law-makers, interest groups or professional organizations.
3. Analysis of resources
    Time [a c]
    → "Time is money": How much time do I have to develop the self-treatment?
    → When do I plan to conduct a formative and summative evaluation?
    → Are so called milestones (checkpoints) necessary in order to assure that the time-schedule is kept when developing the program.
    Costs [c]
    → What resources do I have for the development?
    → How do I intend to use them?
    → Who is doing what and what does it cost?
4. Hardware and software [a]
    → What computer software and hardware do I want for the development of the self-treatment (for example:
        - Director[23]
        - Toolbook[24]
        - Authorware[25]
    → For what hardware and software should the finished self-treatment be optimized? This issue is closely connected with analysis of resources.
5. Guidelines for technical aspects of the program [d]
    → Developing guidelines for technical aspects of the program: the program should contain no program errors, be easy to operate and navigate, logical and provide the user with an overview. The ultimate goal is to develop a user-friendly program.
6. Guidelines for the program presentation [d]
    → Since a constantly changing screen design might confuse the user, there should be guidelines aiming at a uniform product, i.e. the same thing is done in the same way in different contexts, in order to offer support to the learning process and to encourage the use of learning strategies.

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[a] = described by Klimsa (1995, p. 87)
[b] = described by Tergan (2000, p. 29)
[c] = described by Elsom-Cook (2001, pp. 319-336)
[d] = described by Park and Hannafin (1993)
[e] = described by Elsom-Cook (2001, pp. 265-269)

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[23] Director is a software for producing computer-based interactive multimedia products. Director is built up in a similar way as a film with a stage, a score and casts.
[24] Toolbook is a software for producing similar products as Director, however, it has the same structure as a book and the user is working with so called objects.
[25] Authorware is a similar software as Toolbook and Director, however, the structure is a flowchart.

Table 7. Empirically rooted principles and their implications for the design of a computer-based self-treatment (adapted from Park & Hannafin, 1993).

PRINCIPLES AND THEIR IMPLICATIONS

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1. Related prior knowledge
   → Information should be chosen and structured to accommodate differences in prior knowledge.
2. New knowledge should be integrated with existing knowledge
   → Build in aids that prompt users to select, organize and integrate new knowledge, for example summaries or helping to discriminate important content such as headings.
3. Learning is influenced by how information is organized
   → Each text segment should represent a unit and show consistency. For example, colors, signals and symbols can have an informational function.
4. The organization of information needs to adapt
   → Program segments need to be connected, so that the program can adapt to users.
5. Knowledge utility improves when understanding deepens
   → Encourage critical reflection, for example, the users can raise questions or draw inferences.
6. Unfamiliar concepts should be related to familiar concepts
   → Familiar metaphors can be used to explain complex concepts.
7. Knowledge should be represented in semantic and imaginal formats
   → Presentation of information is better memorized when visual, verbal and tactile stimuli are paired, provided that they complement each other.
8. Learning improves as the amount of invested mental effort increases
   → Highlighting can be used to show that something is important, or the user can be supported in making predictions related to the content.
9. Learning improves as the competition for similar cognitive resources decreases
   → Memorizing unfamiliar information is associated with intensive cognitive processes. Thus, familiar referents decreases risk of cognitive overload by presentations of unfamiliar information.
10. Transfer improves when knowledge is situated in authentic contexts
    → Anchor knowledge in authentic, meaningful and relevant contexts, i.e. real-life contexts.
11. Knowledge flexibility increases as the number of perspectives increases
    → Complex concepts are often oversimplified, which interferes with understanding. Flexibility is needed through multiple perspectives and cross-reference knowledge.
12. Understanding improves as the activities are more integrative
    → Provide organizing activities for information already reviewed, rather than the acquisition of specific details (knowledge of details improves as instructional activities are more explicit).
13. Feedback improves intended learning
    → Feedback can reinforce, elaborate and clarify information.
14. Shifts in attention improve the learning of related concepts
    → Important concepts should be more detectable, for example, through highlighting key terms, change of color or use of prompting devices (arrows).
15. Learners become confused when procedures are complex, insufficient or inconsistent
    → Clearly defined procedures for navigating and supporting activities should be offered.
16. Visual representations of content and structure improves the user's understanding
    → Provide concepts map to indicate interrelation-ships among concepts, and hypermaps to indicate the user's location in the program navigation. Other possibilities are visual metaphors.
17. Individuals vary widely in their need for guidance
    → Cognitive overload is a well-known problem. Since users react differently to complexity, it is important to provide them with tactical, instructional and procedural assistance.
18. Learning systems are most efficient when they adapt to relevant individual differences
    → Programs must adapt, for example, pay attention to differences in the rate of progress.
19. Metacognitive demands are greater for loosely structured than highly structured learning
    → User-centered systems require a greater capacity for self-regulation. Prompts and self-check activities aid the user to monitor comprehension and to reflect upon learning strategies used.
20. System features should be self-evident, logically organized, accessible, readily deployed
    → Minimize the complexity of interface and investment of cognitive resources in system use.
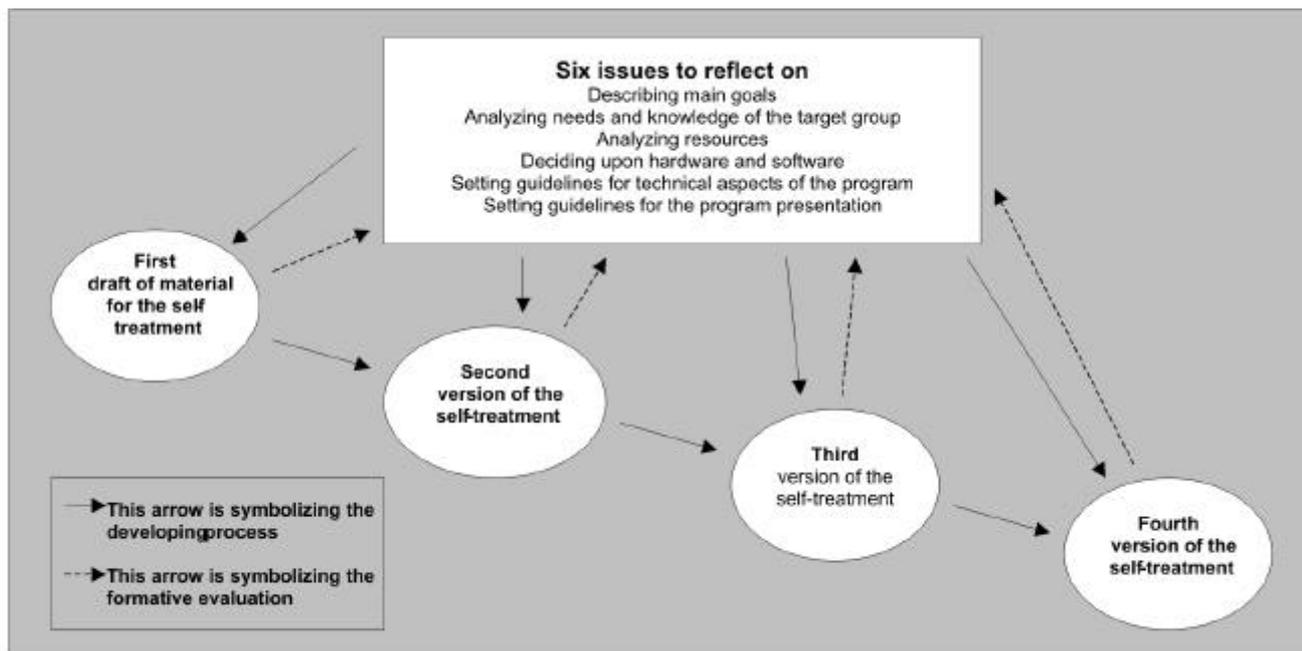
Figure 3. A flow-chart describing the developing process and the formative evaluation of a computer-based self-treatment.

When conducting a formative evaluation, the methods chosen should bring rapid and relevant information on which improvements are necessary (Tergan, 2000, p. 25). The results should also be summarized, so that strengths as well as weaknesses appear (George & Cowan, 1999, pp. 14-16), i.e. to know what is working out for the user is as important as to know where the difficulties are. In accordance with the principles of user-centered designs (see 1.2.5. New trends), users should be involved in a formative evaluation. For instance, they can be told how their feedback was interpreted and what changes in the program that will be undertaken. This can, in turn, initiate a dialogue between developers and users essential to the developing process. In fact, a trend in research on evaluation is to recognize the user as an expert (Mandl & Reinmann-Rothmeier, 2000, pp. 89-91).

The formative evaluation can be conducted by the program developers themselves or by persons that have not been a part of the developing process of the program. According to Tergan (2000, pp. 27-29), the advantage with developers themselves taking part in the evaluation, is that they know the program and its background well. However, the disadvantage is that they often fail to stay objective. When non-developers conduct the evaluation, the advantage is that they can distance themselves from the program, but they often fail to bring with them the expertise that the developers have.

To incorporate experts into the evaluation is becoming more popular. According to Schenkel (2000, pp. 60-65), the use of checklists or criteria catalogues (see Table 8) is often a part of the expert evaluation and has several advantages: It can be conducted without experts and/or developers investing much time or effort. In addition, it leads to rapid as well as concrete suggestions on how to improve the program. Experts can assess the program while conducting a task that is typical for the program, working with a selection of program pages, or while focusing on specific characteristics.

However, the use of criteria catalogues has been heavily criticized (Fricke, 2000, pp. 75-81), first, it is not clear if there are any general criteria that are associated with a high learning effect independent of program and users. In fact, when the aim is to make a statement about the program quality, it has been suggested that the evaluation must take place in the situation where the program is implemented (Zimmer & Psaralidis, 2000, pp. 263-289). Second, an inter-rater reliability has seldom been demonstrated for criteria catalogues and the validity of the method has also been questioned[26] (Fricke, 2000, pp. 75-81). Schott (2000) notes that there are other shortcomings with this method, for example, criteria catalogues are not deeply rooted in theories of educational research. Furthermore, they do not produce an overall picture of the program, but focus on separate aspects. Also, there is often a focus on technical program aspects. The advantages and disadvantages of using checklists are similar to those of criteria catalogues.

There are two ways to counterbalance the disadvantages; the expert evaluation should be used in combination with other forms of evaluation and the checklist/criteria catalogue should be adapted to the needs and the aims of the particular evaluation that is to be conducted (Fricke, 2000, pp. 83-84). Another attempt to deal with the disadvantages of checklists and criteria catalogues has been to develop new and more flexible ones, based on relevant psychological theories, aiming at producing a comprehensive picture of the software program being evaluated.

One example is the evaluation program "ELISE" (described by Schott, 2000, pp. 115-123), which offers an evaluation method for educational multimedia software. ELISE contains six sub-modules that focus on program structure, detail analysis, learning processes and a comprehensive assessment of the program.

A European collaboration resulted in yet another example called "MEDA" (described by Meier, 2000, pp. 164-189). MEDA is specialized on the evaluation of educational multimedia software. The program consists of about 299 (Yes-No) questions divided into 47 criteria, which belong to one of three main areas: development, implementation and sales/distribution. When using MEDA, evaluators have the basis from which they can select those questions that are relevant to their evaluation. The purpose is not that all questions should be used. The computer version consists of about 600 questions with a filter helping the evaluator to select the most appropriate questions. MEDA offers a comprehensive and flexible evaluation method that goes into detail and can rapidly identify shortcomings in educational software. However, it is difficult to get to know and lacks criteria to assess specific multimedia aspects as well as self-regulating behaviors (Meier, 2000, pp. 164-189). Evaluators may have to be trained before working with an applied version of MEDA, which could increase costs and time needed.

It has been suggested that everyone participating in an evaluation should reflect upon the importance of quality. This process can be encouraged in several ways, for example, all participants (users, experts and co-developers) could be contacted personally by the researcher rather than with the use of written information, information relevant to the evaluation could be distributed to the participants and discussion groups could be organized (Mandl & Reinmann-Rothmeier, 2000, pp. 89-105).

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[26] Many criteria that can be evaluated are less important to the learning process, whereas those criteria that are believed to be important, are more difficult to evaluate (Fricke, 2000, pp. 83-84). For example, it is questionable whether or not an expert can assess the following aspects: is the content relevant and understandable to the user, is the navigation easy to survey and operate, and are there enough self-regulating elements (Lottmann, 2000, pp. 138-144).

Table 8. Different methods to obtain data in a formative evaluation and the time set for the implementation, adapted for computer-based self-treatments.

METHODS, DESCRIPTION AND COMMENTS FOR FORMATIVE EVALUATION

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1. Before working with the treatment
   Interviews [e b g], questionnaires [e b] and observation [e]
   Self-confidence survey [a]
   → An indication on the confidence in relation to skills users bring with them
   Dynamic list of questions [a]
   → A list with the questions a user has before working with the program.
2. While working with the treatment
   Observations [a b] or records of learning behavior [b f]
   → Record of learning: detailed description of users' learning behaviors according to set standards.
   Talk-aloud protocols [a f] or comments while working [a]
   → While working, the user talks aloud about thoughts and feelings, or gives comments.
   Journals [a b] or diary [a]
   → Journals emphasize reflection, diary emphasizing what was viewed as important
   Logfiles [a b f g] and screen capturing [f]
   → A factual and precisely computer-based detailed record of what the user has been doing.
3. After working with the treatment
   Critical incident technique [a f]
   → Asking the users to recall times during the work when they felt pleased and displeased...
   Interpersonal process recall [a] or journals [a b]
   → Videotapes or journals, afterwards the user is watching/reading and recalling reactions
   Concept mapping [a]
   → Ask user after working with the program, to summarize what was learnt, what was important.
   Pre- and post-testing [a] and/or analyzing test results [a]
   → Assessing a variable before and after working, objective person analyzing results
   Reflections after having finished a program [a]
   → After finishing a program, users are asked to recall the five main points and summarize
   Checklist [b d] and criteria catalogue [c]
   → Experts rating the program according to questions or criteria.
   Questionnaires [a b g]
   Interviews [a b g]
   Letter of advice to future users [a] or delphi techniques [a]
   → The users work out a letter for future users or writes down weaknesses and strengths.
   Closing session [a g]
   → A conversation where user and developers can exchange experiences.
   Open group discussions [a b g] or discussions according to stop-start-continue [a]
   → Discussions in group: open or on what activities should stop, start and continue in the program.

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[a] = described by George and Cowan (1999, pp. 37-56)
[b] = described by Tergan (2000, pp. 22-50)
[c] = described by Fricke (2000, pp. 75-81)
[d] = described by Schenkel (2000, pp. 52-74)
[e] = described by Mandl & Reinmann-Rothmeier (2000, pp. 89-99)
[f] = described by Freibichler (2000, pp. 304-326)
[g] = described by Owston (2000)

In addition to checklists and criteria catalogues, there are other methods available in a formative evaluation, aiming at obtaining information on reactions and reflections from users (see Table 6). These methods can focus on the users before working with the program, during the experience or after having completed the session. Since there are no guidelines on how to conduct a formative evaluation of a computer-based self-treatment, it is necessary to devote enough time to reflect on these methods. The methods chosen should be affordable and suitable with regard to the

self-treatment, users, aims of the evaluation and the people participating in the evaluation. It has been demonstrated (Owston, 2000) that it is important to combine different forms of evaluation methods, so called methodological triangulation (Patrick & Middleton, 2002). For example, in order to become a comprehensive picture of the program-user interaction, interviews and observations (qualitative methods) can be used in combination with log files (quantitative method).

For the summative evaluation, many of the methods used in the formative evaluation (see Table 6) can be applied. However, it is an emphasis on quantitative rather than qualitative methods. Therefore, different types of tests are often included in a summative evaluation such as a behavioral assessment test (focusing on behavioral aspects of the learning transfer) or a recall test (focusing on memory) in addition to interviews, observations and questionnaires (Tergan, 2000, pp. 29-37).

A summative evaluation of a self-treatment could be equivalent to a controlled treatment study, where the aim is to demonstrate whether or not the computer program has influenced the person in a positive way. A comparison is made between pre-treatment and post-treatment assessments. Interestingly, this data could be relevant to a formative evaluation as well, for example, a disappointing result would surely lead to changes in the program. Again, showing how difficult it is to draw the line between formative and summative evaluations.

Finally, in an evaluation of a self-treatment, the financial efficiency should also be evaluated, conducting a return-on-investment analysis. This aspect of the evaluation has become very important within the health care sector.

1.3. Conclusion

When new technologies are introduced, there are often many unanswered questions and at the same time much interest in how life can be improved by the use of these new technologies. So far, this has certainly been the case for interactive multimedia. Many new computer-based programs have been developed for a variety of thinkable and unthinkable areas. In addition, an impressive amount of research has recently been published on human-computer-interaction and computer-based learning. It is still largely unclear, however, what particular interactive multimedia elements improve understanding, learning, motivation and acceptance. In spite of this, it is generally believed that the advantages outweigh the disadvantages.

A growing interest in the new technologies can also be seen in the field of psychology. In deed, the development of computer-based treatment interventions is relevant in a society with cost containment and cut-backs in the health care sector. In particular, computer-based self-treatments may play an important role in future stepped care designs as a separate treatment intervention or as a treatment adjunct. Currently, preliminary guidelines are being suggested regarding how to develop, implement and evaluate computer-based self-treatments.

Social phobia is an often chronic and debilitating disorder, characterized by persistent fear of negative evaluation by others during social interaction. In particular, negative and dysfunctional thoughts, post-event processing and safety behaviors are believed to influence the development and maintenance of social phobia. Therapist-directed multi-component treatment packages are often being offered to patients. However, these treatments are far from being perfect. In particular, the more severe cases of social phobia have difficulties understanding, learning and implementing new coping strategies in a way that produces a meaningful change. A computer-based self-treatment could offer an important stepping stone when maximizing treatment efforts.

2. GENERAL AIM OF THE STUDY

The general aim of this paper was to develop and evaluate a computer-based self-treatment for socially anxious persons within the framework of cognitive behavior therapy.

In particular, the aim of the formative evaluation was to develop guidelines and content for the first versions of the self-treatment. Among others, it was based on the literature analysis, suggestions from both the target group and experts, and the subsequent target group analysis. Finally, a pilot study was planned in order to generate preliminary data on treatment outcome.

The summative evaluation was conducted as a controlled treatment study, expected to generate a final judgement on treatment outcome. The self-treatment was implemented as a minimal-contact program. The focus was on a variety of variables relevant to social phobia. In addition, variables relevant to the learning process were investigate in order to shed some light on how the participants work with the self-treatment and what they actually learn. The specific aims are listed at the beginning of each section, describing the studies in more detail.

3. THE DEVELOPMENT AND THE FORMATIVE EVALUATION OF A SELF-TREATMENT: THE FIRST PHASE

3.1. Introduction and aim

In the initial phases of developing and evaluating a computer-based self-treatment, there are several issues that repeatedly need to be defined and redefined (see Table 6). In turn, the result of this process influences the further development of the self-treatment (see Figure 3). The specific aims of the first phase of the formative evaluation was to answer the following questions:

1. What is the aim with the self-treatment?
2. What needs does the target group (socially anxious persons) have?
   (a) What does the target group already know?
   (b) What kind of information and treatment does this target group request?
   (c) How does it wish to be informed (person-to-person, written text, interactive-multimedia, via internet or telephone)?
   (d) Are there any characteristics of the target group relevant to the development (learning behavior, depression, anxiety)?
3. What resources are available for the development of the self-treatment?
4. What hardware and software are suitable?
5. What guidelines regarding technical aspects and presentation are suitable?

3.2. Method

3.2.1. Participants
Two socially anxious persons volunteered (they had heard about the project from friends) to participate in the evaluation of the self-treatment. The participants (Ps) went through a semi-structured interview (see Appendix I) to ascertain that they fulfilled the following criteria: (1) be socially anxious, (2) have no heart- or lung disease that are contraindications for exposure training, and (3) have no other psychiatric problems requiring immediate treatment such as suicidal thoughts. The Ps, both women between the age of 25-40, were married. One woman was working

full-time (having a university degree), whereas the other one was working part-time (having finished high-school followed by professional training). They both reported having had social fears for more than one year with the onset in early-middle adolescence. At the time of the participation, several aspects of normal life were being affected by the fears.

In addition, a group of experts was formed for the first phase of the formative evaluation consisting of two persons with a background in multimedia production and two psychologists. These experts had between 3-15 years of experience in their field. They were asked to participate since they were known to be experienced and/or interested in social phobia or multimedia production.

3.2.2. Assessments

3.2.2.1. The screening interview

All participants (Ps) in the formative evaluation participated in a screening process with a semi-structured interview including about 30 questions (see Appendix I). The interview lasted approximately one hour. The interview was partly based on DSM-IV (APA, 1994) criteria for social phobia.

It also contained questions about thoughts, bodily reactions and behavior in social situations, onset and duration of social phobia, experiences that might have lead to the onset, family and education, degree of handicap that the person experienced as a result from the social phobia, other psychiatric, social or physiological problems (in particular, depressive symptoms), social support, ongoing treatments, expectations from the participation, as well as a question regarding use of alcohol, medication and drugs. The Ps were also encouraged to describe their condition and their current living situation with their own words.

3.2.2.2. The unstructured interview

Unstructured interviews (duration 1-2 hours long) were conducted by the author focusing on what material should be included into a computer-based self-treatment and how it should be presented.

3.2.3. Design and procedure

During the initial phases of a developing process, the focus is often on qualitative methods. It is important to remain open-minded and gather relevant information in order to form a concept for the computer-based self-treatment. In accordance, unstructured interviews were conducted with the socially anxious persons after a brief screening interview. Interviews were also conducted with the experts. In addition, relevant research findings, other self-treatments, patient information materials, multimedia products, web-based programs and web-sites were investigated. During this process, other important questions were also reflected upon such as main goals of the self-treatment, analysis of resources, hardware and software (see Table 6).

Because of financial limitations, there was no stakeholder analysis conducted (see 1.2.7. The development of computer-based self-treatments), only the target group (socially anxious persons) was in focus.

All socially anxious persons were informed about the research project and asked to sign an informed consent form. It included information on the project and the requirements for a participation. In addition, it contained a statement that participants' anonymity was guaranteed and that the participation was on a voluntary basis, i.e. the Ps could at any time quit their participation (see Appendix I).

3.3. Results

Based on the results from the qualitative methods, the answers to the questions listed in the beginning were set accordingly (the different results were generally consistent and are therefore presented together):

1. *What is the aim with the self-treatment?*
    - To inform about the specific target group that the self-treatment was developed for, important issues and contraindications.
    - To develop a self-treatment that can inform users about social phobia and its treatment alternatives: background on social fears (physiological, behavioral and cognitive components), onset, prevalence, treatment and outcome.
    - To assist users in the acquisition of skills that can reduce anxiety.
    - To apply a multi-component approach.
    - To suggest how to maintain treatment gains after the treatment.
2. *What needs and wishes does the target group have?*
    (a) What does the target group already know?
    - The group generally knows much about social skills, but less about dysfunctional thoughts and exposure training.
    (b) What kind of information and treatment does target group request?
    - Strategies to cope with fear (exposure training), methods to question dysfunctional thoughts, relaxation training and social skills.
    - Extensive information about the disorder and its treatment alternatives.
    (c) How does it wish to be informed (person-to-person, written text, interactive-multimedia, via internet or telephone)?
    - Interactive multimedia program found acceptance among participants.
    - A minimal contact design (rather than no contact and intensive therapist contact, the latter associated with social anxiety) found support.
    - Organize material step-by-step, give specific and concrete examples
    - To offer knowledge, as well as step-by-step instructions for training and aids for performance in the situation (mainly with worksheets that have been used when working with the self-treatment).
    (d) Are there any characteristics of the target group relevant to the development of information material?
    - Support the learning effect by: offering examples, tasks to complete and worksheets to reflect on different topics, use images, pictures and auditive text in order to facilitate learning
    - Support the learning transfer: encouraging users to do homework.
    - In order to improve computer attitudes, instructions on how to use the computer program.
    - Humor was viewed as important, aiming at increasing motivation, gaining attention and decreasing anxiety and tension.
3. *What resources are available for the development of the self-treatment?*
    - An analysis of resources showed that the project had about two years of time for the developing and the evaluation process (researcher salary is about $60 000 per year). Costs for computer software were to be limited to about $ 1000 and voice recordings about $1500.
4. *What hardware and software are suitable?*
    - It was decided that Macromedia Director would be used to develop the self-treatment, since the program is fairly inexpensive for universities and offers a logical tool for multimedia development.

5. Guidelines regarding technical aspects and presentation?
- The guidelines chosen were not only viewed as being important, they were also affordable and accessible to the research team (see Table 9 and Table 7). In general, the Ps seemed to agree to these guidelines.

Table 9. The guidelines applied in the development of a self-treatment for social phobia, adapted from Park and Hannafin (1993).

GUIDELINES AND EXAMPLES FROM THE SELF-TREATMENT

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1. Related prior knowledge
    → The content was described, using everyday situations.
2. New knowledge becomes increasingly meaningful when integrated with existing knowledge.
    → Aids to discriminate between more and less important content such as headings, colors, signs...
    → Sections built on the content from previous sections, integrating known material with new one.
3. Learning is influenced by how information is organized
    → Same guidelines were used for the whole program.
    → The program was divided into an introduction and a treatment section.
    → The treatment section was divided into treatment steps
    → Interactive features were connecting different program sections with each other
4. Knowledge utility improves as processing and understanding deepen.
    → Critical reflection was encouraged, for example, the users could raise questions or draw inferences, try out simulation tasks, were encouraged to conduct observations.
    → No difficult concepts, but familiar ones were used describing complex psychological processes.
5. Learning improves when knowledge is represented in semantic and imaginal formats.
    → Information was presented with visual and auditive (narrative text) modalities. Only pictures that were associated with the text was used. Written text was limited as much as possible.
6. Learning improves as the amount of invested mental effort increases.
    → Important sections were highlighted with suggestions on how to work with the program.
7. Feedback improves intended learning.
    → Feedback was given on questionnaires being filled out or tasks in the program.
8. Shifts in attention improve the learning of related concepts.
    → Attention was supported by color, symbols and structure of content, as well as humor.
9. Metacognitive demands are smaller for highly structured learning environments.
    → Self-check activities were included in order to assess if one has understood the content.

3.4. Discussion

Researchers and computer experts have increasingly emphasized the importance of analyzing the target group and collecting information about users knowledge and needs when developing computer programs (Elsom-Cook, 2001, p 83-101; Schnotz, 2002). In the development and the evaluation of a computer-based self-treatment for social phobia, qualitative methods were used in order to investigate such questions. The aim was to generate content for the self-treatment, as well as to define guidelines for technical aspects and presentation.

The results from the first phase of the formative evaluation showed that there was a demand among users and experts for extensive information about social phobia and its different treatment alternatives. Furthermore, there was strong support for an entertaining and easy-to-understand presentation. A clear structure with step-by-step instructions was also viewed as important. In addition, the content should be related to everyday life and include concrete examples. In general, the results showed a high degree of acceptance regarding the interactive multimedia format and the possibility to work independently with the self-treatment (so called self-regulated learning).

These results are in accordance with current research, where a multi-component approach is generally applied in manuals and self-treatments (Angenendt, 2000, pp. 600-606), a high rate of acceptance is often found among patients (Ström et al., 2000; Wright et al., 2002), edutainment is a concept that is gaining importance in the development of computer programs (Klimsa, 1995, p. 26-42), and self-regulated learning has been suggested to be a good match for adult learners (Cress, 1999).

The guidelines for technical aspects and presentation suggested by Park and Hannafin (1993) were adapted for the specific self-treatment, based on the results from analyses of literature and target group (see Table 9). The adapted guidelines aimed at supporting the learning process and were generally in accordance with recommendations from other researchers: New content should be related to prior knowledge (Schnotz, 2002), visual and auditive modalities should be integrated (Carney & Levin, 2002), signaling should be used such as headings (Mautone & Mayer, 2001), organization and reflection should be encouraged (Mayer, 1984), no difficult or unnecessary words used, since more mental efforts are available for learning, when the material is not too complex (Ballstaedt, 1997, pp. 15-16.).

There are several limitations of the first phase in the formative evaluation that need to be mentioned. First, the socially anxious persons participating were not included in an extensive diagnostic process. In fact, it is likely that they were less anxious than the majority of the persons fulfilling the criteria for social phobia. In accordance, the suggestions that they made with regard to the self-treatment might not apply to severe cases of social phobia. Second, there were limited resources available for this phase of the formative evaluation. Therefore, the time set for the investigation of the target group was short and there was no possibility to conduct a stakeholder analysis, which focuses on persons other than the users, law-makers or interest groups that might be of importance to the self-treatment (see Table 6). Some aspects of these limitations were counterbalanced by the second phase of the formative evaluation and by the pilot study, where additional experts and a larger group of persons fulfilling the criteria for social phobia participated. Nevertheless, future research should include a stakeholder analysis. In particular, the paying part in today's health care system is a powerful factor to investigate. To add such information to the developing process could increase not only the quality of the self-treatment, but also it could facilitate the subsequent dissemination of the self-treatment. Finally, it is important to point out that the guidelines suggested (see Table 9), remained somewhat abstract. It was difficult to truly assess the value of them at the early stage of the development. For future research, it might be valuable to carry out pilot studies on these guidelines before implementing them in the self-treatment. The reason that this could be important is that the same guidelines are not likely to be suitable for all target groups.

4.   THE DEVELOPMENT AND THE FORMATIVE EVALUATION OF A SELF-TREATMENT: THE SECOND PHASE

4.1.   Introduction and aim

In the second phase of the development and the evaluation of the computer-based self-treatment, the same issues were reflected on as in the first phase. However, many of the guidelines and ideas that had been generated during the first phase, were now implemented and built into the computer program. Thus, when looking at the computer-based self-treatment, the following question was focused:

1. What changes and improvements are necessary in existing material?
2. What additional material should be built into the program?
3. Are there any guidelines that should be changed or improved?

4.2.   Method

4.2.1. Participants

The participants from the first phase of the formative evaluation remained in the second phase. In addition, two additional psychologists joined the group of experts. The experts did all have several years of experience in the field of psychotherapy or multimedia production.

4.2.2. Assessments

4.2.2.1.   During the self-treatment

Similar to the first phase of the formative evaluation, qualitative methods were mainly used. In particular, participating observation was conducted and diary writing encouraged during the work with the program.

4.2.2.2.   After the self-treatment

After the work with the self-treatment, a closing (unstructured) interview was conducted. This interview focused on the material that was in the program and necessary improvements, reflections and questions after having worked with the self-treatment. Questions that were still unanswered and recommendations for future patients working with the self-treatment were also recorded.

4.2.3. Design and procedure

All participants (Ps) had access to the material for about four weeks. They wrote down comments (diary) while working with the material alone. There were no questions in order to encourage spontaneous reflections and reactions. The socially anxious persons also agreed to work with the CD-ROM during participating observation at the beginning and at the end of these four weeks. All Ps were interviewed by the author at the end of this time period. All Ps could decide themselves where and when to work with the material. Interviews were conducted with all Ps after having worked with the material.

4.3.   Results

Based on the results from the qualitative methods, the answers to the questions listed in the beginning were set accordingly (the suggestions from the socially anxious persons and from the experts were consistent and are therefore presented together):

1. *What changes and improvements are necessary in existing material?*
    -   Errors were identified in the text and corrected.
    -   Text sections were identified that were inconclusive, unclear or contradictive to the Ps and necessary improvements were carried out in these sections.
    -   The amount of text was in some cases still viewed as being overwhelming. In accordance, some sections were reduced.

2. What additional material should be built into the program?
- Addition information was asked for with regard to the treatment background, social phobia and different treatment alternatives. In particular, information about methods to decrease anxiety and to overcome avoidance behavior, methods to cope with dysfunctional thoughts, information about relaxation and social skills training.
- More examples from Susanne and Walter.
- More examples how to work with the worksheets

3. Are there any guidelines that should be changed?
- The guidelines (see Table 9) received overall support, for example...
  a. The cartoons and the humor were reported to be entertaining and motivating to further work with the program.
  b. Examples from everyday life made the content understandable.
  c. Positive feedback was especially received for the two case studies "Walter" and "Susanne" that had been included (a man and a woman accompanying the user throughout the program with examples on how he or she had overcome difficulties in dealing with social fears).
  d. A woman called "Trixie", representing an assistant that could offer the users help, was viewed as being supportive.
  e. Strong support was found for the interactive features in the program, allowing users to skip between sections and work with the program in a flexible way. It was even suggested that this program feature could be more emphasized with additional buttons connecting program sections with each other.

After improvements and changes according to the feedback from the Ps, the program contained the following sections (see also Figure 4. and 5.), including about 250 pictures and 500 sites:

➢ Start menu:
  - CD-ROM structure
  - Recommendations how to work with the program, for example, schedule when to work with the program, plan to work on days where the person does not have much stress, to work at least one hour with the program each session
➢ Introduction menu:
  - General information about fear and anxiety, social fears and phobia
  - Background regarding cognitive behavior therapy and exposure training
➢ Treatment menu including eight treatment steps (see below)
➢ The maintenance program
  - A closing section with suggestions similar to those in the maintenance program described by Öst (1989b)
➢ Homework assignments
  - A section describing homework assignments focusing observation and reflection of social situations.
  - The Ps were encouraged to select a homework assignment, since the program automatically presented this program section before ending the program.
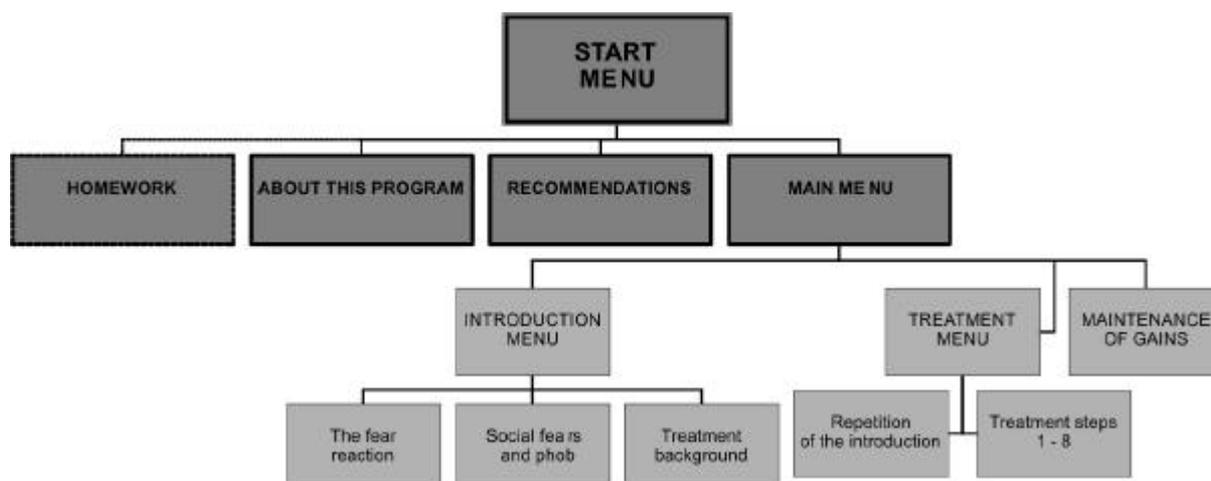
Figure 4. A description of the main sections in the self-treatment.
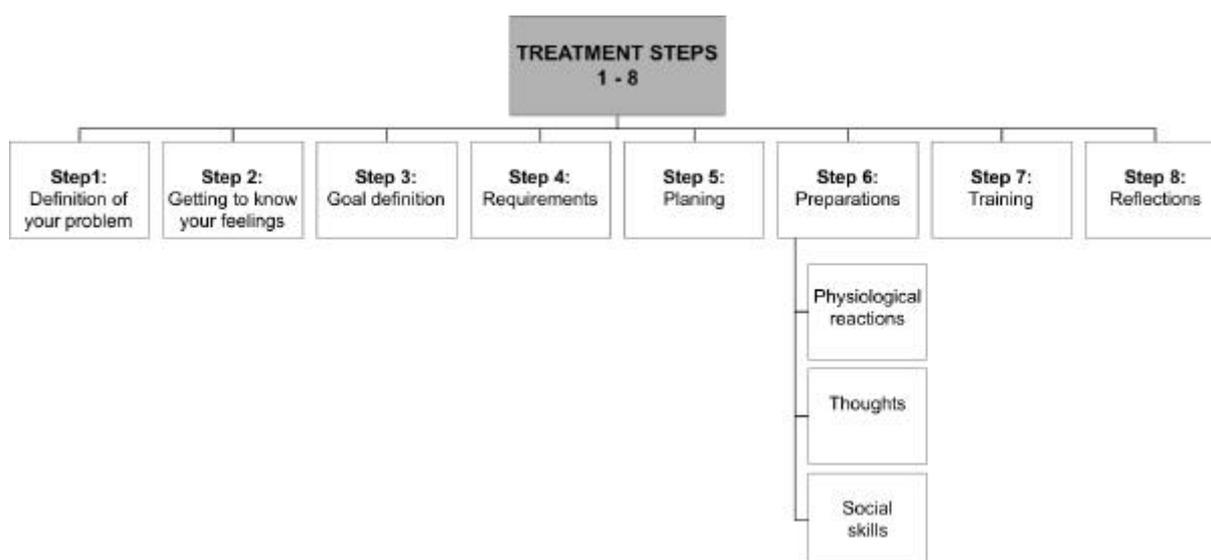
Figure 5. A description of the different treatment steps in the self-treatment.

The eight treatment steps are as follows:

1. Description of the problem
   - Emphasizing the importance of describing a problem in detail, using concrete rather than abstract descriptions.
2. Self-rating of emotions (SUDS)
   - When working with exposure, it is necessary to be able to assess ones emotions, i.e. to discriminate between low, middle and strong anxiety. Without such anchor points, it is difficult to tell, whether or not the treatment is helping and the level of anxiety is reduced.

3. Description of the treatment goal
   - Realistic and concrete treatment goals are crucial, it must also be possible to assess, whether or not they have been achieved.
4. Requirements when working with a self-treatment
   - This section would have been the first one, hadn't the participants had a screening interview before starting with the treatment.
   - In this section, several important factors are dealt with regarding the participation in a self-treatment. In particular, contraindications such as high levels of depression, practical difficulties, level of motivation and credibility, help-seeking behaviors and difficulties in self-treatments, vulnerability and treatment expectations, medication. Also, suggestions for how to influence these aspects are presented, for example, increase the level of motivation or actions necessary when being on medication or having practical problems working with the self-treatment.
5. How to reach the goal (planing)
   - This section deals with how the road to success may look like, i.e. each participant must reflect on how he or she can get to the goal, what would it look like in detail.
6. Preparations and training
   - Three main components: strategies to question dysfunctional thoughts, relaxation techniques, strategies to reflect on social skills.
   - It is the most comprehensive section and contains much information, organized in sub-menus. It is thought to have a similar function as a library, where information about most topics can be found, relevant when conducting exposure training (the means to get to the goal).
   - The strategies to reflect on social skills were not given much place, since it has been suggested that social phobics do not have skills deficiency.
7. Putting new skills into practice
   - In this section, the most important guidelines are to be found regarding exposure training.
8. Reflecting on the experience
   - Here are some topics to reflect on after an exposure training and how the training can be continued or improved. How the participants can go on and what actions are necessary with regard to outcome.

The treatment section of the program was at large an adaptation of the exposure training suggested by Marks (1978), however, with more emphasis on cognitive interventions, problem solving and social skills.

4.4. Discussion

While the first phase of the formative evaluation focused on generating content and defining guidelines (based on among others the analysis of the target group), the second phase focused on implementing these ideas and guidelines. The aim was to find suggestions for further improvements of guidelines and existing material in the self-treatment, as well as to generate ideas for additional material.

The results were based on qualitative methods and offered support for the main components developed for the program (general information, exposure training, cognitive techniques, relaxation and reflection on social skills). In accordance,

there is strong empirical support for exposure training in research on social phobia (Taylor, 1996). Furthermore, there are studies showing that cognitive techniques can be effective (Mattick et al., 1989). It has also been suggested that general information can be of value to patients in patient booklets and manuals (Angenendt, 2000, pp. 597-599). In contrast, there is inconclusive empirical evidence regarding relaxation and social skills training. Nevertheless, the Ps viewed these components as important. Needless to say, further research should try to clarify the importance of relaxation and social skills training in the treatment of social fears and phobia.

The results in the second phase of the evaluation led to a program navigation containing five main sections: start menu, introduction menu, treatment menu with eight treatment steps, the maintenance program and homework assignments. In particular, the step-by-step structure in the treatment section was viewed as helpful. Research findings offer support for such a program structure. First, a step-by-step structure is well known to most people, i.e. there is no need for an explanation in order to know that step one is followed by step two and three. Thus, the amount of invested mental effort in such a program structure is relatively small and cognitive capacities remain available for the learning process (Mautone & Mayer, 2001). Another advantage with step-by-step structures is that it is likely that users follow the suggested route (first step one, than step two, followed by step three). Therefore, when presenting new material in a treatment step, it can be based on material that is already familiar to the user from previous treatment steps. It has repeatedly been suggested that new knowledge should be associated with existing knowledge in order to facilitate the learning process (Park & Hannafin, 1993).

There was an overall support for interactive features, allowing users to skip between different program sections and making use of submenus to gain access to sections with more detailed information. These results were expected. Interactive features allow the user to influence the way in which he or she works with the self-treatment, something that is essential in self-regulated learning. Even though the research findings with regard to interactive features are inconsistent, it is generally believed that the learning effect can be improved, when the interactive features are used wisely. In addition, high acceptance levels have been observed for interactive self-treatments (Carlbring et al., 2001). Further research should specifically focus on programs with high interactive levels and so called connectedness[27], aspects that are expected to play an essential role in future computer-based programs and e-learning (Rosenberg, 2001, pp. 3-17).

There was also an overall support for the three persons that repeatedly showed up in the self-treatment. "Walter" and "Susanne" represented socially anxious persons and "Trixie" represented an assistant, all three offering help and suggestions through out the program. This result was expected, since it has been suggested that the use of animated pedagogical agents, using gesture and gaze to direct the learner to focus their attention on relevant program sections, can support understanding and learning in computer-based programs (Atkinson, 2002; Moreno, Mayer, Spires & Lester, 2001). It should be pointed out that the pedagogic agents that were used in the self-treatment, were technically not very advanced. In spite of this, the Ps reported that they were helpful.

When comparing the results from the first phase of the formative evaluation with the results from the second phase, it appears as if similar aspects of the self-treatment were emphasized. In fact, the suggestions for improvements and the ideas

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[27] Connectedness refers to program features that are available in programs with an online connection (for more details, see 1.2.5.3. Potential advantages with interactive multimedia programs).

for new material that were generated in the second phase, were consistent with the results in the first phase.

A methodological problem with the second phase of the formative evaluation is that the participants (Ps) were also a part of the first phase of the evaluation. On the one hand, this could lead to a lack of objectivity in the evaluation. On the other hand, the Ps gained valuable insight into the development process and the self-treatment due to their participation in the first phase. This insight could be advantageous for the evaluation. In research on evaluation, it is well-known that there are both advantages and disadvantages with evaluations conducted by persons that have previously been a part of the program development (Tergan, 2000, pp. 27-29). Leading researchers have suggested that a way to handle the problem with objectivity in such a situation, is to include experts into the evaluation who have no previous experience with the program being evaluated (Schenkel, 2000, pp. 60-65). In accordance, new experts were invited to participate in the second phase (and in the pilot study). Thus, the second phase of the evaluation generated suggestions for improvements from Ps with, as well as without extensive knowledge about the self-treatment. Nevertheless, this problem highlights the need for golden standards with regard to future evaluations of computer-based self-treatments.

5. COMPLETING THE FORMATIVE EVALUATION: A PILOT STUDY

5.1. Introduction and aim

The final phase of the formative evaluation was conducted as a pilot study, aiming at collecting preliminary data regarding treatment outcome. In accordance with previous phases in the formative evaluation, the aim was also to identify suggestions for further improvements viewed as necessary in the self-treatment. In order to achieve this, a new group of socially anxious persons and experts was offered a third version of the self-treatment. Qualitative (questions 5-6, see below) as well as quantitative methods (questions 1-4, see below) were applied. The pilot study was addressing the following questions:

1. Is there a learning effect after working with the self-treatment:
   - knowledge of social fears and psychological treatment alternatives including social skills, cognitive techniques and exposure training, recognition of pictures from the program vs distractor items and recall of topics associated with the pictures presented in the memory test
2. Is there a reduction in variables relevant to social phobia after work with self-treatment:
   - social anxiety and fears of negative evaluation
3. Is there a reduction in other important variables after work with self-treatment:
   - Depression, general anxiety and phobic anxiety
4. After working with the self-treatment, is there an increase in:
   - computer attitudes, credibility and expectancy of the treatment and treatment motivation
5. Feedback and improvements suggested regarding existing program material?
   - Participants (the diary, the closing interview and participating observations)
   - Experts(criteria catalogue and personal communication)
6. Feedback and improvements suggested regarding additional material?
   - Participants (the diary, the closing interview and participating observations)
   - Experts(criteria catalogue and personal communication)

5.2.   Method

5.2.1. Participants

Socially anxious persons were recruited through flyers and posters about the research project on self-treatments at the University of Tübingen in the southwest of Germany. Information about the pilot study was also distributed at university locations. There were 25 persons who wanted more information about the project. After a short telephone-screening of inclusion criteria, three persons were referred elsewhere (not being social phobic) and four persons declared that they could not participate, since the project would be too time-consuming. There were 18 persons who went through the semi-structured screening-interview to ascertain that they fulfilled the following criteria:

1. DSM-IV criteria for social phobia (APA, 1994)
2. A minimum of one year duration of the disorder
3. Be between 18-65 years of age
4. Be willing to participate in the project for at least six weeks, and in additional post-treatment assessment
5. Have no heart- or lung disease that are contraindications for exposure
6. Have no other psychiatric problems requiring immediate treatment such as suicidal thoughts.
7. No current pharmacological or psychological treatments

Three persons did not fulfill the inclusion criteria (other psychiatric disorder in more need of treatment) and were referred elsewhere. Three other persons were offered the chance to work with the self-treatment during participating observation[28]. These three men were all between the age of 25-40, two were working or studying full-time, whereas one was unemployed at the time of the study. One of the men was married and two were living alone. Two of the men reported having had social fears as long as they can remember and one reported the onset in adulthood after an accident followed by stuttering as well as restrictions in bodily and cognitive functioning, i.e. representing a case of a so called secondary social phobia (see 1.1.4. Prevalence, age of onset, gender and comorbidity).

Twelve persons received social phobia as their primary diagnosis and started the pilot study. The participants (Ps) had an average age of 28.7 years (SD = 8.6; range 20-46), four Ps (33.3%) were men and eight were (66.7%) women. The average age at which the social phobia began was 8.67 years (SD = 3.8; range 6-18). Accordingly, the average duration of the social fears was 20 years (SD = 10.3; range 8-40). Eight Ps (67%) were unmarried, two (17%) were married or living together with a steady partner and two were divorced. All Ps were working or studying fulltime. One participant (8%) reported having completed a professional training after compulsory school, three (25%) had finished high-school and eight (67%) had a university degree. Four Ps (33%) fulfilled the criteria for another psychiatric disorder (other anxiety disorder, dysthymia or eating disorder). Three persons (25%) had already been in psychotherapy because of their social fear, whereas the remaining nine (75%) Ps had had no previous contact with mental health institutions or therapists. Those Ps that had already been in treatment, had ended the previous treatment at

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[28] These three persons were offered to work with the self-treatment in cooperation with the author. Suicidal thoughts are exclusions criteria for working independently with a self-treatment. A participating observation allowed the author to give additional support to these participants at the same time as valuable information about difficulties and advantages in the program could be collected.

least one year before applying to the present project. Two Ps (17%) reported having three or more person with whom they could speak about private matters, persons that could be supportive during the work with the self-treatment. Two other Ps said that they had one or two people that they trust, whereas three Ps (25%) reported having only one person that could be considered when in need of support during the self-treatment. Finally, five Ps (42%) had nobody who could assist them during the self-treatment and with whom they could talk about private matters.

A new group of experts was formed for the third phase of the formative evaluation, consisting of five persons with a professional background in psychology, two persons with a professional background in multimedia production and two persons working as teachers. One psychologist (post-doc) had about five years of experience in the field, three (doctoral students) had 2-3 years of experience. The remaining psychologist was a graduate student with special interest in the project. All psychologists had extensive knowledge of cognitive behavior therapy. All other experts had between 5-15 years of experience in their field. The persons participating as experts had either contacted the university themselves after hearing about the project, or they were asked to participate (being a part of the staff at the university). None of these persons had participated in the previous expert group. Not having been involved in the development of the self-treatment was viewed as important in order for these experts to increase their ability to stay objective during the third phase of the formative evaluation.

5.2.2. Assessments

The screening interviews and the distribution of self-report questionnaires were performed equally by the author and by an undergraduate student (who had not been involved in the development of the self-treatment). The psychometric information on the self-report questionnaires in the formative evaluation is to be found in Table 10.

5.2.2.1. The screening interview

The same semi-structured interview was used as in the first phase of the formative evaluation (see 3.2.2.1. The screening interview).

5.2.2.2. Self-report questionnaires

In order to assess social anxiety, the Social Interaction and Anxiety Scale (SIAS; Mattick & Clarke, 1998; Stangier, Heidenreich, Berardi, Golbs & Hoyer, 1999) was used. This is a questionnaire that has proven to be useful in research on social phobia (Heimberg, Mueller, Holt, Hope & Liebowitz, 1992; Mattick & Clarke, 1998). The cut-off score for SIAS is 24 in Germany, differentiating between the normal population and socially anxious persons (Stangier et al., 1999).

In order to measure dysfunctional thoughts, the Fear of Negative Evaluation (FNE) in a German version (Vormbrock & Neuser, 1983) was used, originally developed by Watson & Friend (1969). This questionnaire has been criticized for not being a pure measure of cognition (including items like: *I become tense and jittery if I know someone is sizing me up*) and showing treatment effect, even when the evaluated treatment does not directly target cognitions, i.e. a change in FNE may reflect changes in cognition as well as in anxiety (Heimberg, 1994). It has also been stated, that FNE is not able to discriminate between anxiety disorder groups (Peters, 2000). In spite of the criticism, however, there are several reasons for including FNE in the study. First, there seems to be no suitable alternative available for measuring cognitions in social phobia (Elting & Hope, 1995). Second, FNE is one of the most widely used measures in anglo-american treatment studies (Vormbrock & Neuser,

1983), appearing in app. 50% of the studies on social phobia (Heimberg, 1994). Thus, in order to be able to compare treatment outcome with studies from other research units, the use of similar assessment techniques is necessary. Third, the FNE has excellent inter-item reliabilities and test-retest reliabilities (Elting & Hope, 1995). Finally, some improvements of the questionnaire have already been made in the German version. The true-false format was changed into a 1-5 Likert-type rating format which may be more sensitive to change, an improvement also suggested by Heimberg (1994). Holt and colleagues (quoted in McNeil, Ries & Turk, 1995, p. 207) reported an average of 25.7 (SD=5.3) for social phobics and 15.5 (SD=8.0) for controls. However, these results were obtained with the American version of the FNE.

The participants (Ps) also filled out the German version of the Symptom Check List (SCL-90-R; Derogatis, Lipman & Covi, 1973; Franke, 1995) which is a general complaint list and has been proven to be useful in clinical settings as well as in research on psychotherapy. The following nine subscales were included in the study: interpersonal sensitivity (scale 3), depression (scale 4), anxiety (scale 5) and phobic anxiety (scale 7).

After finishing the introductional section in the self-treatment, the Ps were instructed to fill out the Nijmegen Motivation List (NML), developed by a Dutch researcher (Keijsers, 1994) with the purpose of assessing the level of treatment motivation in research on behavior therapy. The questionnaire has been used as a prognostic instrument in treatment studies (Hellström & Öst, 1996; Keijsers, 1994; Öst et al., 1998). Even though the results from earlier studies were inconclusive and further research is necessary in order to assess the value of this instrument, the questions seem relevant to an evaluation of a computer-based self-treatment. It was originally a twelve item self-report questionnaire in which the Ps rate how characteristic each statement is for the respondent (*not at all* to *completely*). Three factors were identified: (1) the willingness to participate, (2) the level of distress due to the symptoms, and (3) the pressure exerted on the patients by other people. A total score was calculated in this study, as in an earlier study investigating traditional self-treatments (Öst et al., 1998). Since the three factors mentioned earlier received little support in Keijsers´ study (1994), they were not taken into consideration. An English version of NML was adapted in order to fit the needs of an evaluation of a self-treatment with social phobics in German (for more details on the items, see Appendix I). One item was excluded *(Actually, I embarked upon therapy on the insistence of other people),* since the relationship between this statement and the level of motivation is not quite clear. On the one hand, the insistence of other people could suggest that the person self is not motivation for the treatment. On the other hand, pressure exerted on the patient by other people could increase the level of distress and correspondingly the level of motivation (Keijsers, 1994). In addition, social phobics seldom speak about their anxiety with others and often report having few intimate friends, i.e. there may be few people that could influence the social phobic in such a way.

Together with the NML, the Ps also filled out a questionnaire (BN) assessing the level of credibility and expectancy, originally developed by Borkovec and Nau (1972). The BN is a questionnaire that has proven to be useful in research on psychotherapy (Hellström & Öst, 1996; Nau, Caputo & Borkovec, 1974; Öst et al., 1998). An English version was translated into German and adapted to the evaluation of a self-treatment. Self-treatment was not used in the translation, but instead the word program was referring to the computer-based self-treatment. Program was assumed to be a word

used in everyday life for computer-based programs, whereas self-treatment is an unknown concept to must Ps (for more details on the items, see Appendix I).

A new questionnaire (KNT) was developed containing 15 questions about cognitive behavior therapy, social skills and anxiety disorders. It was assumed that a majority of the Ps would not know the answers to these questions when joining the study. Furthermore, it was assumed that a person would score better on this knowledge test after having worked with the self-treatment, since the answers to all questions were to be found on the CD-ROM. The self-report questionnaire was one of many attempts in the study to assess learning effect (for more details on the items, see Appendix I). A majority of the items contained negatively worded statements (reversed items), with a *not true* being the correct answer. This created difficulties for the Ps, when using a Likert-type rating format. For this reason, the questionnaire was changed from a Likert-type rating format into a true-false format at the beginning of the formative evaluation in order to avoid further confusion. A true-false format may be less sensitive to change than a Likert-type format. The risk, however, for Ps filling out the questionnaire in an incorrect way would have been high with a Likert-type rating format.

With the purpose of assessing computer attitudes, the Ps filled out a questionnaire (AFS) with ten statements that was developed for this study. The items were selected based on earlier research on computers and education, stressing the importance of the following factors: knowledge about and earlier experience of computers (Holt & Crocker, 2000), attitudes and feelings towards computers (Francis, Zaacov & Jones, 2000; Loyd & Loyd, 1985). Clinical experience with anxious persons also influenced the selection. The AFS contained normal and reversed items, including cognitive, affective and behavior aspects (for more details on the items, see Appendix I).

Table 10. Psychometric information on self-report questionnaires in the formative evaluation.

Questionnaires	Number of items	Format[a]	Scoring[b]	Reversed items	Range[c]
SIAS	20	L-T (0-4)	BidS	5, 9, 11	0-80
FNE	20	L-T (0-3)	BidS	4, 7, 11, 12, 15, 17	0-60
SCL-90-R:		L-T (0-4)			
Interpersonal sensitivity	9		UniS		0-36
Depression	13		UniS		0-52
Anxiety	10		UniS		0-40
Phobic anxiety	7		UniS		0-28
NML	11	L-T (0-3)	BidS	5, 9, 10, 11	0-33
BN:		L-T (1-10)			
Expectancy	2		UniS		2-20
Credibility	2		UniS		2-20
KNT	15	T-F	BidS	1, 2, 3, 6, 8, 9, 10, 12, 13	0-15
AFS	10	L-T (0-4)	BidS	3, 5, 6, 11, 12	0-40

[a] L-T indicates a Likert-type scale; numerals in parentheses refer to the range of choices on the scale. T-F indicates a true-false scale.
[b] In unidirectional scoring (UniS), all items are worded in such a way that endorsing them indicates a higher degree. With bidirectional scoring (BidS), some items suggest a high degree, while others indicate a low degree, i.e. these scores must be reversed before doing statistical calculations.
[c] Range indicates the theoretically possible lowest and highest scores.

5.2.2.3. The diary

The participants (Ps) in the pilot study were asked to write down comments on their work with the CD-ROM on a form called *the diary.* The form did not contain specific questions, instead there was space for the Ps to write down comments spontaneously. However, the Ps were asked to note with which section of the self-treatment they had been working, before writing down comments. Also, there were four aspects of the self-treatment that were highlighted at the top of the form: content, navigation, interface and worksheets. The diary was returned anonymously.

5.2.2.4. The criteria catalogue for the expert group

The criteria catalogue for the expert group contained 136 items (see Appendix II) and was based on a criteria catalogue called MEDA that was developed by researchers from five European countries (Meier, 2000, pp. 164-189). MEDA contains about 300 questions from which the relevant questions are sorted out and combined in accordance with evaluation aims (see 1.2.8. The evaluation of computer-based self-treatments), i.e. it allows for a rapid development of a criteria catalogue evaluating the most important aspects of a computer program.

In the criteria catalogue that was developed for the present study, about 48% of the original questions were adapted and subsequently included in the new criteria catalogue. There were 21 items to technical aspects and navigation, 37 items regarding content, 27 items regarding layout, ten items regarding how the self-treatment could be implemented and five items regarding the overall quality of the CD-ROM. Seventeen items were investigating the experts' assessment of the program regarding learning effect and –strategies, additional 13 items investigated how the experts themselves had worked with the self-treatment (for how long at a time, total time, with which part did they work the most, what will they remember the most and comments on the questionnaire itself). There were also several opportunities given to the experts to comment on parts of the self-treatment (open questions). In addition, there were six items regarding the background of the expert filling out the questionnaire (profession, years of experience, knowledge of cognitive behavior therapy, experience with multimedia programs, frequency in working with computers). The experts returned the questionnaire anonymously.

The criteria catalogue was developed according to recommendations in the literature aiming at counterbalancing the disadvantages with a criteria catalogue (see 1.2.8. The evaluation of computer-based self-treatments); first, the criteria catalogue was adapted according to evaluation aims. Second, the adapted catalogue was applied in combination with many other evaluation methods in order to get a comprehensive picture of the self-treatment (methodological triangulation).

5.2.2.5. Memory test

A memory test on CD-ROM was developed with the purpose of assessing the ability to recognize pictures from the CD-ROM program. In accordance with Lundh and Öst's (1996) recommendations, this memory test used non-verbal stimuli (see 1.1.2.1. A closer look at the cognitive component). The test contained eight pictures originating from the introduction, eight pictures originating from the treatment section and eight pictures functioning as distractor items. All items were rated on a 2-point scale:

1. *Yes, I have definitely seen this picture in the CD-ROM program, or*
2. *No, I have not seen this picture or I do not know.*

In addition, the Ps were asked to try to recall and retell what content that had been presented together with the pictures in the self-treatment that they recognized. During the memory test, the pictures were presented without the text and the background that had occurred together with the picture in the self-treatment. Many of these pictures were cartoon figures in different situations. Most pictures did look similar, thus, the memory test was a difficult task, considering that the program contained over 250 pictures spread over about 500 sites with different backgrounds and texts.

The Ps were allowed to look briefly at the pictures, they were asked to react spontaneously and not spend a long time debating with themselves. They were instructed to say *yes* only when they were absolutely certain to have seen the picture in the program. It was made clear that it was not expected that the Ps could recognize all pictures, since the program contained a huge amount of pictures and each participant would not have looked at all sections of the program[29]. For each task, the Ps attained one point for recognizing a picture and no points, when not recognizing the picture. For the recalling-retelling task, each picture had previously been given three main words as being important when describing the context. The Ps attained one point when mentioning one or more of these words while describing the context in which the picture had been presented. No points were given, when not being able to describe the context or describing it otherwise. The test lasted about 20-25 minutes.

5.2.2.6. Closing interview with the participants

At the post-treatment assessment the participants (Ps) were given an opportunity to give concluding feedback regarding the self-treatment as well as the participation itself (in the evaluation) in a closing semi-structured interview lasting about 30 minutes (see Appendix I). The interview contained about 30 questions focusing on: learning strategies, difficulties, program errors, positive feedback, level of difficulty, reaction regarding navigation, humor and animations, layout, examples and instructions in the program, as well as suggestions how to improve the self-treatment and reflection on how to retain treatment gains.

5.2.3. Design and procedure

Those participants (Ps) volunteering for the pilot study were contacted and a date was scheduled for a screening interview for those fulfilling the criteria for a participation. Three of the self-report questionnaires (SIAS, FNE and SCL-90-R) assessing anxiety, negative thoughts and depression were sent out. The Ps returned the self-report questionnaires when coming to the screening interview. They signed an informed consent form similar to the one in the first phase of the formative evaluation, including information about the project, the requirements for a participation, guarantee of anonymity, participation on a voluntary basis, i.e. the Ps can at any time quit their participation (see Appendix I). In addition, the Ps filled out two additional questionnaires (regarding their attitude towards computers and their knowledge about the treatment, social anxiety and skills). The Ps were finally offered a short introduction to computers. The Ps signed up for two sessions per week, each session lasting one hour, for a maximum of six weeks. They started one week after

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[29] The reason for this instruction was to lower the degree of anxiety being elicited, when asking socially anxious persons to do a test. Test anxiety is known to decrease performance in test situations, i.e. a high degree of anxiety could lead to test results that reflect a reduced learning effect compared with the actual learning effect (see 1.2.6. Potential factors influencing patients during work with a self-treatment).

the screening interview and the pre-treatment assessment. The twelve Ps worked independently with the self-treatment. The computer with the self-treatment was in a bureau at the university where the Ps could work undisturbed.

The Ps were encouraged to write down comments on the diary. Each participant was asked to return a diary at least two times. The purpose of this form of feedback was to find out more about how the Ps had worked with the self-treatment, their spontaneous reactions and reflections, without further influence or prompts.

The pilot project had a minimum requirement of four hours of work with the self-treatment (not disclosed to the Ps) in order to say that the treatment had been given a fair chance. After finishing the introduction (knowing more about the self-treatment), the Ps filled out two additional questionnaires regarding their level of motivation, as well as the expectancy and credibility of the treatment.

At the post-treatment assessment, the Ps repeated the same measure as in the pre-treatment assessment and participated in a memory test. Finally, the Ps were given an opportunity to give concluding feedback regarding the self-treatment and reflect on how they had been working with the self-treatment in a closing semi-structured interview (see Appendix I). Three self-report questionnaires (SIAS, FNE and SCL) were sent out 3-4 months later as a follow-up assessment.

All Ps in the pilot study were offered a supportive session with the author after the sixth treatment step in the program. The reason for this was to encourage the Ps to seek help when needed. This session focused on what they had done so far in the program, what they were planning to do and how they wanted to do that (always referring to the self-treatment in these discussion, i.e. not adding material that was not included in the self-treatment). This session did also give hints regarding what had been difficult for the Ps, what was viewed as especially important and what had been helpful to the Ps in the program.

The experts were all contacted personally by the researcher. Furthermore, they were asked to read the chapter on social phobia in a well-known German book presenting a description on the disorders as well as treatment suggestions and a case study (Reinecker, 1995). This was done in order to encourage experts to reflect upon the importance of quality and to assure that they knew enough about the target group to carry out the evaluation of the program. The experts had about three weeks to look at the material (a chapter from a book, project information and worksheets) and at the self-treatment. The experts were instructed to fill out the comprehensive criteria catalogue while working with the self-treatment. There were no guidelines on how they had to work with the program. Those experts wanting to give concluding personal feedback or suggestions in addition to the questionnaire, could do so at any time.

5.2.4. Treatment

An improved version of the computer-based self-treatment was used in the pilot study. A description of this treatment is to be found elsewhere (see 4.3. Results), where the results from the developing process and the formative evaluation are accounted for.

5.2.5. Statistical analyses

The statistical analyses were performed by means of the SPSS for windows, version 10, supplied by SPSS Inc. (2000). Parametric methods (dependent t-test) were used for the continuous variables in order to investigate treatment outcome in the pilot study.

5.3. Results

Fifteen participants (Ps) started the self-treatment in the pilot study, three Ps working with the self-treatment partly during participating observation. Four Ps (26.7%) dropped out during the treatment phase, thus, eight Ps completed the treatment phase and participated in the post-treatment assessment[30]. Three of the dropouts said that the participation was too time-consuming and one person said that the self-treatment had contained no new material (this person had already been in psychotherapy over several years prior to the participation). The dropout occurred at the beginning of the participation. There was no dropout in the expert group. In general, the Ps reported having a positive attitude towards the formative evaluation. Most Ps appreciated the possibility to influence the program, even though it was associated with additional work. In particular, the direct feedback on what influence a specific suggestion would have on the program seemed to increase motivation for participation. According to dropouts, the evaluation itself was not the main reason for them to drop out of the treatment. A summary of the results are described below according to the questions listed in the introduction.

1. Is there a learning effect after working with the self-treatment?
    The results showed that there was no significant change in knowledge of social fears and its treatment (see KNT in Figure 7). With regard to the memory test (see Figure 6), the results showed a much lower recognition rate for pictures functioning as distractor items (38%), compared with pictures from the introduction (82%) and the treatment section (86%). No Ps could recall the program content associated with distractor items. In contrast, the Ps could gave a correct account for the content being presented together with about 29-30% of the pictures originating from the introduction and the treatment section (for more details, see Appendix II).
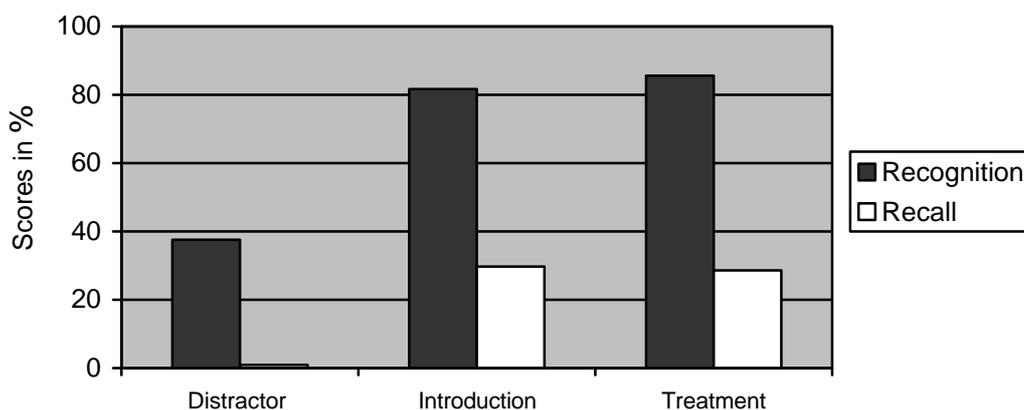
Figure 6. Results from the memory test in the pilot study, showing rate of recognition of pictures and recall of program content associated with the pictures.

2-4. Are there changes in relevant variables after working with the self-treatment?
    There was a significant reduction in social fears and in fears of negative evaluation. In addition, a tendency was observed for a reduction in phobic anxiety and

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[30] The attrition was high for the follow-up assessment. Only three of the eight persons completing the treatment returned the self-report questionnaires, therefore this data was not analyzed.

depression. There was no significant change in general anxiety. Furthermore, a tendency was observed for an increase in credibility and expectancy of treatment. There was no significant change for treatment motivation (see Figure 7). The results are described in detail elsewhere (see Appendix II).
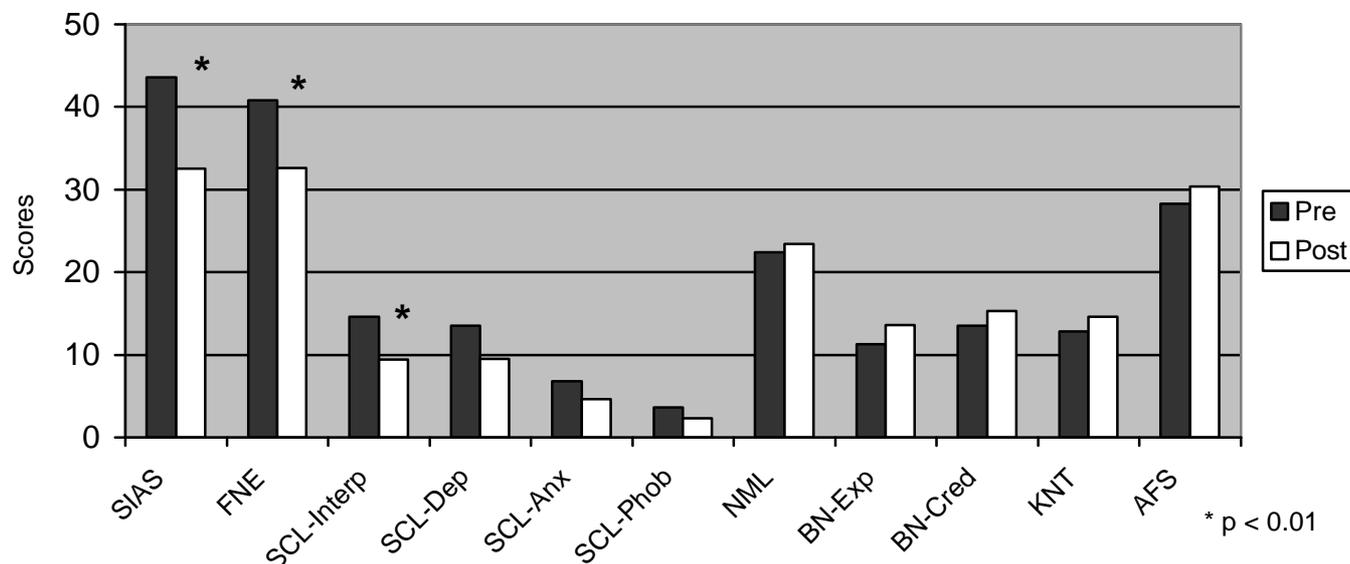
Figure 7. Means and *t*-tests on various self-report questionnaires at pre- and post-treatment assessments in the pilot study.

5. What feedback was given and what improvements were suggested with regard to existing material?

Feedback and suggested improvements from the Ps were received on both the diary forms and in the closing interview from all participants that completed the self-treatment. There were about seventy diary-forms returned from the participants, with 30% of the suggestions referring to the introduction of the self-treatment and 50% referring to the treatment section. The remaining 20% referred to more general issues regarding, for example, navigation, cartoons or the narrative text. In addition, information was collected during participating observations. In general, there was a focus on the following areas:

- Minor errors in the text were identified.
- The content was reported to be of high quality, the information being easy to understand for most Ps. In accordance, during the participating observations, it seemed as though the content was comprehensible to most users.
- The way of presentation was in general viewed as successful, increasing understanding, as well as motivation and credibility for the treatment. In particular, the cartoons and the animations were appreciated.
- The contrast text-background was suggested to be stronger in order to improve readability.
- It was also suggested that some of the worksheets should be improved, for example, offering more place for notes and examples from the self-treatment regarding how to solve particular tasks.
- More examples with regard to the homework assignments, in particular, such examples that could be noted on the worksheet.

- The narrative text (three different voices were presented in the program: one for each of the persons describing how they could overcome their fears, and one voice reading more general sections of information) also seemed to be entertaining and supportive to the Ps, facilitating comprehension and concentration. However, the narrative text should be spoken without accent.
- Finally, for some participants the diagnosis of social phobia triggered negative feelings. Thus, a suggestion was made to use a more general concept when referring to the disorder, i.e. social fears.

The feedback from the expert group and the criteria catalogues could be summarized as followed: the program was described as entertaining and the two examples of social phobia ("Walter" and "Susanne") were viewed as being helpful. The text was easy to understand, even to a point where it could become a problem for users used to work with text that may have higher demands regarding complexity. Furthermore, some technical problems needed to be improved. In particular, the navigation should become more advanced in order to allow for a user to skip faster between sections. It was also emphasized that the program needs to offer more support in self-regulatory behaviors such as summaries, tests after each section and training tasks. It was also pointed out that the narrative text must be better synchronized with the text presented on screen.

6. What feedback was given and what improvements were suggested with regard to additional material?

The suggestions from Ps for additional material based on the diary forms, the closing interview and the participating observations included the following aspects:

- Program recommendations should be available on most program frames ("where to go from here"). In accordance, during the participating observation, it was noted that for some Ps, there was a need for more structure and clearer instructions on where to start and where to go in the self-treatment.
- More information on each treatment section regarding structure and characteristics was viewed as important, for example, information on the length of the program section, calculated time needed for the section, the location of the section in the program.
- The planning and preparation of an exposure training (treatment step 5 and 6) was viewed as being the most difficult, but also the most helpful sections in order to overcome social fears. Accordingly, these treatment sections should be extended with more supportive features such as examples and training tasks.
- In addition, it was suggested to develop tests to check understanding and learning, in particular with regard to the treatment section. These tests should be an option, that is, nothing that the Ps need to do in order to be able to get to the next session in the program.

The feedback from the expert group focused on the need to offer a wider variety of text sections, presenting different degrees of complexity in the program. The current version was generally presenting a simplified text with a low degree of complexity, which could be frustrating to some users. In addition, suggestions were made to improve the navigation and increase its complexity allowing for users to skip between sections to a greater extent, print material from the program and improve speed.

5.4. Discussion

In contrast with the previous phases of the formative evaluation, the pilot study was aiming at collecting both preliminary data regarding treatment outcome and further suggestions for potential improvements of the self-treatment. Thus, the pilot study was an example of how an evaluation can generate a comprehensive picture of a self-treatment by balancing formative and summative intentions (George & Cowan, 1999, pp. 16-18). In order to achieve this, both qualitative and quantitative methods were applied in accordance with the principles of methodological triangulation (Patrick & Middleton, 2002) and there were 24 persons (social phobics and experts) new to the project that were invited to participate.

The results showed support for a learning effect based on recognition of pictures and recall of program content. In addition, there were improvements on several relevant variables after working with the self-treatment. In particular, there was a significant reduction in levels of social anxiety and fear of negative evaluation. Thus, these preliminary results gave enough support for the self-treatment to justify a further development and evaluation, important from an ethical point of view before implementing the self-treatment on a larger sample.

The qualitative methods in the pilot study generated many suggestions: Improvements of worksheets and correction of minor errors in program text, additional concrete examples with regard to exposure training and optional sections offering more detailed information. The self-treatment underwent several changes, even though the program structure remained the same as in the previous version (see 4.3. Results). In general, the suggestions made on the diary forms fit well together with the information collected in completing interviews and during participating observations. Furthermore, the suggestions from the participants (Ps) were at large consistent with the suggestions from the expert group. Finally, many suggestions made in the pilot study were comparable to the ones in previous phases of the evaluation. Since different persons, phases in the evaluation and evaluation methods generated comparable suggestions, it was concluded that the suggestions were reasonable.

In spite of the similarities described above, there were also differences worth mentioning. The results from the pilot study strongly emphasized two aspects that had received less attention in previous phases of the evaluation: (1) aspects important to self-regulated learning and (2) technical aspects of the self-treatment. For example, it was viewed as important to include more information to users about the computer program itself, as well as more tasks and tests to allow for a self-control of learning effect. In addition, there were suggestions to better synchronize the narrative (spoken) text, to improve program speed and to increase the contrast in written text. There were also demands for a more complex navigation. It is important to reflect on why a greater emphasis was placed on these two aspects in the pilot study. One possible explanation is that these aspects were previously neglected due to a lack of objectivity (for more details, see 4.4. Discussion). It might also be explained by the fact that new evaluation methods were applied. In deed, most suggestions regarding complex technical aspects and many of the suggestions regarding self-regulated learning originated from the criteria catalogue. On the one hand, this may suggest that criteria catalogues aid experts in not overlooking important aspects. On the other hand, the use of criteria catalogues has been criticized for not generating an overall picture, but instead focusing on separate aspects such as technical aspects (Schott, 2000). How can these aspects of using criteria catalogues be reconciled?

In this study, the criteria catalogue was adapted to the needs and the aims of the self-treatment, as well as applied together with a variety of other evaluation methods (methodological triangulation). These are two attempts to counterbalance the disadvantages with criteria catalogues that have been recommended in the literature (Fricke, 2000, pp. 83-84). Nevertheless, the much-debated use of criteria catalogues will not be solved in this paper. For future evaluations of self-treatments, it may be valuable to include a criteria catalogue specifically developed for computer-based self-treatments. A standardized criteria catalogue for self-treatments would allow for comparisons of quality, which could certainly be important to the paying part, as well as to researchers, clinicians and patients.

There were several suggestions made for complex technical improvements (see above). However, many of them could not be carried out in the short time and with the limited resources that were available between the pilot study and the controlled treatment study. Thus, technical innovations that are available from at theoretical point of view, are not always accessible and affordable to the researcher. In future evaluations of computer-based self-treatments, it may be advantageous to inform Ps and experts about which technical improvements that are out of reach. The reason that this was not done in the present evaluation is that such suggestions can restrict and influence the attention of the users while working with the self-treatment.

Not only technical aspects were emphasized more in the results of the pilot study, compared with previous phases of the evaluation. In addition, many suggestions were referring to aspects of self-regulated learning. One explanation for this could be that the Ps were focused on their own performance and the learning process in the pilot study, knowing that their performance would be assessed. Even the experts could have been more under pressure, since they were asked to answer complex questions in a criteria catalogue. In previous phases of the formative evaluation, the development and the evaluation of the program had been in focus, not the performance of the Ps.

It is important to point out that the Ps reported not finding the evaluation burdening. On the contrary, many Ps reported feeling important and increasingly motivated, knowing that they could influence the development of the program. In particular, receiving feedback regarding the actions that specific suggestions had triggered, was appreciated by some Ps. Thus, to treat Ps as experts and to agree to reciprocal feedback can bring several advantages to the evaluation, as well as to the Ps. Not only can the motivation increase, it has also been suggested that the participation in an evaluation could improve the learning effect. In other words, the reflection that is encouraged in methods of evaluation, could support Ps the learning process (Tergan, 2000, pp. 22-50). In accordance, leading researchers in this field emphasize that users should be recognized as experts in the evaluation process (Mandl & Reinmann-Rothmeier, 2000, pp. 89-91).

6. THE SUMMATIVE EVALUATION: A CONTROLLED TREATMENT STUDY

6.1. Introduction and aim

The summative evaluation was conducted as a controlled treatment study and was assumed to generate a final judgement on the effectiveness of the improved version of the self-treatment for social phobia. In particular, the focus was on the learning process, the learning effect and changes on various variables relevant to social phobia. In order to achieve this, a new group of socially anxious persons was randomized (self-treatment at the university vs waitlist). After being 5-6 weeks on the

waitlist, the Ps were offered to work with the self-treatment at home. In contrast with the formative evaluation, quantitative rather than qualitative methods were used. In particular, additional self-report questionnaires were introduced and a behavioral assessment test was developed. The specific aims of the controlled treatment study was to investigate the following questions:

1. Is there a difference between the two groups (treatment at university vs waitlist followed by treatment at home) with regard to background data and baseline variables at pre-treatment assessment?
2. Is there a difference between pre-treatment and post-waitlist scores in the waitlist condition with regard to the following variables:
   - social anxiety and fears of negative evaluation
   - depression
   - anxiety in general
   - phobic anxiety
3. Is there a difference in measures relevant to the learning process between the two groups (treatment at university vs treatment at home)?
4. Is there a learning effect after working with the self-treatment? In particular, is there a difference between the two groups (same as above) on these variables:
   - knowledge of social fears and its treatment
   - recognition of pictures from the program vs distractor items
   - recall topics associated with the pictures
5. Is there a reduction in variables relevant to social phobia after working with the self-treatment? In particular, is there a difference between the two groups (same as above) with regard to change on these variables:
   - social anxiety
   - fears of negative evaluation
   - other dysfunctional thoughts
6. Is there a reduction in other important variables after working with the self-treatment? In particular, is there a difference between the two groups (same as above) with regard to change on these variables:
   - depression
   - general anxiety
   - phobic anxiety
7. Is there an increase in the variables listed below after working with the self-treatment? In particular, is there a difference between the two groups (same as above) with regard to change on these variables:
   - computer attitudes
   - credibility and expectancy of the treatment
   - treatment motivation
8. Is there a change from post-treatment to follow-up assessment?
9. Are the Ps clinically significant improved after working with the self-treatment? Are they improved at the university and at home?
10. Is there a difference between responders and non-responders with regard to background data, baseline variables and measures relevant to the learning process?
11. How was the change with regard to cognitive, affective and behavioral scores when comparing pre- and post-treatment for the following three groups: fulfilling no SCI-criterion, 1-2 and 3-4 criteria?
12. Is there a difference between completers and drop-outs with regard to background data and baseline variables at pre-treatment assessment?

6.2. Method

6.2.1. Participants

The participants (Ps) for the controlled study were recruited through an article about the project in a local newspaper in Tübingen in Germany, a radio broadcasted interview with the author and information sent out to all institutes at the University of Tübingen via the intranet. There were 105 persons who wanted more information about the project (see Figure 8). After a short telephone-screening of inclusion criteria, 14 persons were referred to literature on social skills training (ten not being social phobic, but wanting social skills training and four being interested because of working with socially anxious persons), 17 persons declared that a participation would be too time-consuming. Eight persons had no access to a computer and could therefore not participate in the project. These persons were informed about other treatment alternatives. One person was referred elsewhere because of psychiatric problems requiring immediate treatment. Nine persons were already undergoing psychological treatment because of social fears. Self-report questionnaires were sent out to 56 persons and a date for a first appointment was scheduled. The following criteria set the conditions for a participation in the study:

    a. DSM-IV criteria for social phobia (APA, 1994)
    b. A minimum of one year duration of the disorder
    a. Be between 18-65 years of age
    b. SIAS cut-off score 24[31]
    c. Be incapable of carrying out the behavioral test or carrying it out with a phobic reactions (dysfunctional thoughts and/or physiological reactions).
    d. Be willing to participate in the project for at least six weeks, and the following post-treatment and follow-up assessments
    e. Have no heart- or lung diseases that are contraindications for exposure training
    f. Have no other psychiatric problems requiring immediate treatment such as suicidal thoughts.
    g. No current pharmacological or ongoing psychological treatments

After the screening process, additional 16 persons were excluded from further participation: four persons turned out to be in psychological treatment, five persons received a major depression, agoraphobia or anorexia nervosa as their primary diagnosis in need of treatment and were referred elsewhere, three persons decided that the participation would be too time-consuming, one person did not want to participate in the pre-treatment assessment, and three persons were capable of carrying out the behavioral assessment test without a phobic reaction (they were over-qualified for a participation). Forty persons received social phobia as their primary diagnosis and started the study (see Figure 8).

Fifty-five percent of the Ps were female. The average age of the Ps was 34.9 years (SD=9.2; range 18-65). A majority of the Ps were unmarried (52.5%), whereas 37.5% were married and 10% divorced. A majority (67.5%) of the Ps worked full-time, whereas 15% worked part-time, 12.5% were housewives and 5% had an early

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[31] The cut-off score for SIAS, differentiating social phobics from healthy normals, has been suggested by Stangier et al. (1999) to be 24 for Germany (M = 14.7; SD = 8.6). This score is lower than the score of 34 (M = 19.9; SD = 14.2) that has been suggested for the American version of SIAS (Heimberg et al., 1992).

retirement pension because of social anxiety and depression. The Ps reported an onset age of 10.6 years (SD=7.6; range 6-25) for their social fears. Thus, the duration was about 24 years (SD=11; range 2-50). Fifty percent of the Ps had a university degree, whereas 20% had finished high-school, 25% had finished a professional training after compulsory school. In Germany, many people finish compulsory school and than start an apprenticeship where they participate in a professional training in combination with theoretical education. Five percent had started to work after compulsory school. According to the SCID, 55% of the Ps had comorbidity, primarily other anxiety disorders and dysthymia. Some patients (32.5%) had previously been in treatment because of their social fears. Those having been in treatment, had stopped that treatment at least one year before starting the participation in the present project. Finally, 25% of the Ps reported having three or more persons with whom they could talk to about their problems, 32.5% reported having 1-2 persons, whereas 30% said that they had only one person. The remaining 12.5% reported having nobody to talk to.

6.2.2. Design and procedure

In the controlled treatment study, the participants (Ps) were randomized into two groups: one group was offered to work with the self-treatment at the university (similar to the pilot study in the formative evaluation), the other group was referred to a waitlist for 5-6 weeks and was subsequently offered to work with the self-treatment at home for a maximum of six weeks after a post-waitlist assessment. Similar to the pilot study, all Ps were offered a supportive session with the author after the sixths treatment step in the program in order to encourage help-seeking behaviors. In addition, all Ps were offered an introduction to computers in order to decrease negative attitudes towards computers and to minimize risk for future technical difficulties. Finally, in order to decrease the level of attrition and increase the level of treatment motivation, a workshop would be offered to everyone who had participated in the follow-up assessments. The aim was to give additional help and support.

At the first appointment, a comprehensive screening process was conducted with a diagnostic interview (SCID), two additional questionnaires assessing attitudes towards computers and one questionnaire assessing their knowledge of social anxiety, cognitive behavior therapy and social skills. The Ps were also given more detailed information about the project. In addition, all Ps were asked to participate in a behavioral assessment test (BAT), aiming at presenting a more comprehensive picture of the change compared with self-report questionnaires alone. The Ps received written information about the purpose and the procedure of the BAT. The task was to hold an impromptu speech (a speech without planing) for ten minutes. The Ps were encourage to do their best and try to speak at least for three minutes. They were, however, also informed that they could interrupt the test at any moment when feeling a significant degree of distress. As in other studies using the speech task (Harvey, Clark, Ehlers & Rapee, 2000), it was emphasized that the performance would be recorded on video. It was also pointed out that the quality of the speech would subsequently be rated by research assistance. There was no audience in the room (the room being ca 15 m^2) apart from one person who would operate the video camera. All Ps had three minutes to decide whether or not to speak about one, two or three of the following five subjects: my hobby, aggressive dogs, environmental pollution, today's children and to be a millionaire. The Ps were asked to answer written questions before the task, at the interruption of the task and after the BAT. All Ps included in the study were asked to sign a similar form of consent as in the formative evaluation (see Appendix I).

The Ps in the study worked independently with the self-treatment. The Ps at the university signed up for two sessions per week, each session lasting one hour, for a maximum of six weeks. The computer with the self-treatment was in a bureau at the university, where the Ps could work undisturbed. The Ps working at home received the self-treatment with additional worksheets and technical information by mail after having filled out and returned the questionnaires in the post-waitlist assessment (SIAS, FNE and SCL).

All Ps were encourage to contact the author should they encounter unexpected problems while working with the self-treatment or having technical questions regarding the computer. After finishing the introduction (when knowing more about the content and the purpose of the CD-ROM program), all Ps filled out and returned two additional questionnaires (regarding treatment motivation, expectancy and credibility of the treatment). After working six weeks with the self-treatment, a date was scheduled for the post-treatment assessment which included all questionnaires from the pre-treatment assessment, the BAT and two additional questionnaires (LRNV and SE) assessing variables important to the learning process. The Ps were also asked to participate in a memory test (same as in the formative evaluation). Finally, the Ps had a chance to give feedback regarding the self-treatment in a closing interview and in a questionnaire[32]. The follow-up assessment took place 3-4 months after the post-treatment assessment. Three self-report questionnaires were for this purpose sent out (SIAS, FNE and SCL).

6.2.3. Assessments

The screening interview was performed by the author. The distribution of questionnaires and tests was performed mainly by the author and partly by an additional postgraduate student (who had not been involved in the development of the CD-ROM). All questionnaires and the memory test from the formative evaluation, were also used in the controlled treatment study (see 5.2.2. Assessments).

6.2.3.1. The screening interview

The screening process included a structured diagnostic interview (SCID; Spitzer, Williams, Gibbon & First, 1992; Wittchen, Wunderlich, Gruschwitz & Zaudig, 1997) based on DSM-IV (APA, 1994) criteria for psychiatric disorders. In addition, questions about the social phobia taken from the semi-structured screening interview used in the formative evaluation (see Appendix I) were asked after completing the diagnostic interview.

6.2.3.2. Self-report questionnaires

In addition to the self-report questionnaires used in the formative evaluation, three additional questionnaires (see Table 11) were included in the controlled study.

There were two self-report questionnaires (LRNV and SE) assessing factors important to the learning process in adults. The questionnaires were to a large extent adaptations of *Aktivitäten beim Lernen* and *Selbsteinschätzung*, two German questionnaires published by Cress, Friedrich and Linke (1996). These questionnaires have been used in research on self-regulated learning and distance learning programs, showing a high degree of reliability and an acceptable degree of factor validity (Cress, 1999, pp. 158-160).

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[32] This questionnaire was resembling the criteria catalogue. However, it will not be described in detail and the results from the questionnaire will not be accounted for in this paper, since the purpose with the summative evaluation in this paper was primarily to conduct a final evaluation of the self-treatment and not an evaluation aiming at new suggestions for improvements.

LRNV is a shortened version of LIST (Wild, Schiefele & Winteler, 1992), which is the German version of MSLQ, developed by Pintrich et al. (1993). Eight items with high factor loadings from two additional subscales viewed as important for a self-treatment were selected from LIST and included in LRNV: external resources and concentration. All these items were adapted to fit into a study with socially anxious persons working with a self-treatment (see Appendix I).

The main purpose of the LRNV was to assess the learning strategies being used by the Ps while working with the self-treatment. The questionnaire contains the following variables:

1. cognitive learning strategies:
   - *organization* (two items: identifying chief arguments and principal elements of the material, structuring the material, finding clues to other material already known to the person, connecting new material with material already represented in the long-term memory)
   - *elaboration* (five items: analyzing the material in a critical way)
   - *repetition* (two items: trying to memorize the material for example reading a certain section once again and repeating important words)
2. meta-cognition (three items: planing[33], supervising and controlling learning behavior and achievements[34], regulating and adapting[35])
3. internal resources[36]:
   - *concentration and attention* (two items)
   - *time-management* (two items)
4. external resources (six items: study environment, help-seeking behavior and literature to support learning efforts)

The SE questionnaire (see Appendix I) was an assessment of expectations and self-perception with regard to learning achievements including the following variables:

1. self-rated learning competence (five items, referring to the person's own assessment of how well he or she can study independently)
2. achievement expectation (four items, referring to the person's own assessment of how likely it is for him or her to be successful)
3. intrinsic motivation and efforts (four items, to what extent persons learn simply because they find it enjoyable, interesting or exciting)
4. extrinsic motivation (three items, to what extent persons learn because of external rewards)
5. self-perception (three items, referring to attributional style and self-esteem)
6. self-regulation and control (two items, concerning the person's ability to learn independently and without the need of external control and pressure)

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[33] An example: How do I go about to learn this material the best way. What strategies would be effective? What parts of the material are important for me?

[34] An example: Am I really learning, that what I was originally planning to learn. Are my strategies working? I ask myself questions or try to explain a certain problem to a friend, in order to evaluate my achievement so far.

[35] An example: When noticing that the material was more difficult than originally assumed, I adapt my learn behavior. For example I start to work more intense with the material or I read the text at a slower pace than usually.

[36] The items from "internal motivation" were added to "internal resources", since Cress (1999) reported that it is difficult to differentiate internal motivation from items referring to internal resources, i.e 32 was the max score on "internal resources".

Table 11. Psychometric information on additional self-report questionnaires in the summative evaluation.

Questionnaire	Number of items	Format[a]	Scoring[b]	Reversed items	Range[c]
LRNV		L-T (0-4)			
Cognitive learning strategies					
Organization	2		UniS		0-8
Elaboration	5		UniS		0-20
Review	2		UniS		0-8
Meta-cognition	3		BidS	17	0-12
Internal Resources					
Concentration-attention	2		BidS	23, 27	0-8
Time-management	2		UniS		0-8
External Resources	6		UniS		0-24
SE		L-T (0-4)			
Self-image as learner:					
Self-rated competence	5		BidS	6, 7, 16	0-20
Achievement expectation	4		BidS	15	0-16
Self-perception	3		BidS	14	0-12
Intrinsic Motivation	4		UniS		0-16
Extrinsic Motivation	3		UniS		0-12
Self-regulation	2		BidS	1, 18	0-8
CAS	11	L-T (0-4)	BidS	1, 2, 3, 5, 6, 8	0-44

[a] L-T indicates a Likert-type scale; numerals in parentheses refer to the range of choices on the scale. T-F indicates a true-false scale.
[b] In unidirectional scoring (UniS), all items are worded in such a way that endorsing them indicates a higher degree. With bidirectional scoring (BidS), some items suggest a high degree, while others indicate a low degree, i.e. these scores must be reversed before doing statistical calculations.
[c] Range indicates the theoretically possible lowest and highest scores.

Finally, the Computer Attitude Scale (CAS; Francis et al., 2000; Loyd & Loyd, 1985) was included as a general measure on computer attitudes, whereas AFS (already included in the formative evaluation) assessed specific computer attitudes, relevant to social phobia and self-treatments. The original version of the CAS contained 40 items. It was decided that a shortened version of the CAS would be developed in order to minimize the amount of items that Ps had to answer in the study. The CAS contains four subscales: anxiety, confidence, liking and usefulness in work. Two items from the subscale usefulness in work (Loyd & Loyd, 1985) and three items from each of the remaining subscales were selected according to factor loadings in a recent studies (Francis et al., 2000). The shortened version of CAS contained eleven items from four subscales, nine items having high factor loadings (ranging from 0.74 – 0.82). The factor loadings for the remaining two items from the subscale usefulness in work are not known. The CAS contained normal and reversed items, including both cognitive, affective and behavior aspects (for more details, see Appendix I).

6.2.3.3. Behavioral Assessment Test (BAT)

In the summative evaluation, a BAT was added to the assessment methods. The purpose was to assess the avoidance behavior, anxiety experienced as well as dysfunctional thoughts in a fear-evoking situation. The speech task has shown to have a good test-retest reliability and to be useful in research on social phobia (Beidel, Turner, Jacob & Cooley, 1989; Harvey et al., 2000; Turner, Beidel, Wolff, Spaulding & Jacob, 1996).

After having read information, the Ps answered questions (including both affective and cognitive variables, focusing on both expectations, self-efficacy and social skills performance), using a scale ranging from 0-100 (0 = not at all and 100 = extremely):

1. *Rate your anxiety at this moment after just having found out about the behavioral test* (i.e. anticipated anxiety).
2. *How difficult do you think that this task will be?*
3. *How sure are you that you have the social skills that are required for this task?*
4. *How likely is it that you will perform these skills while carrying out the task?*

At speech interruption, the Ps answered the questions (affective and cognitive variables, as well as self-report on physiological variables):

5. *Rate your anxiety at this moment.*
6. *Which physiological reactions did you have and how strong was the reaction?*
7. *How embarrassing was this situation for you?*

After answering these questions, the Ps were allowed a resting period for about three minutes, than they were asked to answer (affective and cognitive variables with focus on the rating of the own performance and task difficulty):

8. *Rate your anxiety at this moment after having been resting.*
9. *How difficult do you think that this task is now*?
10. *How satisfied are you with your performance?*

6.2.4. Clinically significant improvement

According to Jacobson, Follette and Revenstorf (1984), it is important to look closer at treatment improvements in research on psychotherapy. Not only must the change achieved from pre- to post-treatment assessment be statistically reliable, but the participants must fall within the range of a normal group or outside the range of the patient group at the post-treatment assessment (defined as M +/- 2 SD in the direction of functionality). The clinically significant improvement was based on:

1. Social Interaction and Anxiety Scale (SIAS)
2. Fear on Negative Evaluation Scale (FNE)
3. Self-rated anxiety at task interruption in the BAT (SUDS ranging from 0-100)
4. Self-rated satisfaction with the own performance after task (0-100)

The Ps could achieve a score for clinically significant improvement ranging from 0-4, four points representing a maximum degree of change. The aim was to include several important aspects of social phobia and to present a comprehensive picture of the change, including affective as well as cognitive measures, general assessments of social anxiety from self-report questionnaires as well as self-reported scores in the specific situation of the BAT. Clinical ratings of the participants were not included as has been the case in earlier studies by Öst and colleagues (for example Öst et al., 1998). In this study, there were no financial resources for clinical ratings being made by a blind rater. The researchers involved in the project had all been part of the developing process of the self-treatment. Thus, because of methodological reasons they could not conduct a clinical rating of the Ps.

The cut-off score for SIAS, differentiating social phobics from healthy normals, has been suggested by Stangier et al. (1999) to be 24 for Germany. Thus, participants

with a higher score than 24 on SIAS were not considered to be clinically significant improved (change must be at least 9[37]).

The cut-off score for FNE was based on the pre-treatment assessment data from the 40 participants. The data from the 40 participants indicates a cut-off score of 23 (M=40.9; SD=9.0), i.e. participants with scores higher than 23 were not considered to be clinically significant improvement on this criterion (change must be at least 9[37]).

Öst and colleagues (Hellström & Öst, 1995; Öst, 1996; Öst et al., 1997; Öst et al., 1991) have suggested that 42 is the cut-off score for the self-rated level of anxiety when interrupting the task in a BAT (change must be 10). In accordance, Ps with a higher self-rated level of anxiety than 42 were not considered to be clinically significant improvement on this criterion. Öst and colleagues calculated this score on 174 spider phobics. So far, it has not been demonstrated that this cut-off score can be applied for other groups of phobics and in different BATs. Nevertheless, the use of the score in this study is based on the assumption that a phobic reaction carries general characteristics, regardless of who is reacting with increased anxiety (a spider phobic or a social phobic) and the task (touching a spider or holding a speech). It should be pointed out that this score can be problematic, since Ps performing better at post-treatment assessment (approaching the fear-evoking situation to a greater extent) may show increased levels of anxiety compared with the pre-treatment assessment. If this was the case, the self-rated anticipatory anxiety would be used instead.

Direction of functionality for the self-rated satisfaction with the own performance is accordingly: the higher the score, the more satisfied with the own performance. This is a measure of the cognitive component of phobic reactions. Obtained two minutes after interrupting the task, it is trying to capture aspects of post-event processing (see 1.1.2.1. A closer look at the cognitive component). Based on the pre-treatment data from the 40 participants (M=34.1; SD=24.2), a cut-off score of 58 was suggested, i.e. participants with a lower score than 58 were not considered to be clinically significant improvement. This is a less conservative measure, representing a change of only one SD. Two SD (83) was considered a high score, even for non-social phobic persons.

6.2.4. Treatment

An improved version of the computer-based self-treatment was used in the controlled treatment study, based on the results from the formative evaluation. A comprehensive description of this treatment is to be found in 4.3. Results and 5.3. Results. In addition, examples taken from the self-treatment and worksheets are to be found in Appendix III.

6.2.5. Statistical analyses

Similar to the formative evaluation, the statistical analyses were performed by means of the SPSS for windows, version 10, supplied by SPSS Inc. (2000). The discrete variables were analyzed with non-parametric methods (chi-square test). Parametric methods (*t*-test, analysis of variance) were used for the continuous variables in order to investigate treatment outcome, comparing means of groups as well as repeated measures (time) and interaction (group x time).

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[37] This represents one SD. Two SD was not applied, since that would have been problematic to use with the Ps that had relatively low scores at pre-treatment assessments.

6.2.6. Ethical considerations

The ethical considerations that applied for the formative as well as for the summative evaluation followed the guidelines for research that the University of Tübingen has defined. Importantly, the study design emphasizes that all participants in the project should be offered treatment and therapist contact.

6.3.   Results

The number of participants (Ps) who showed interest in the project, started the treatment, participated in assessments, were clinically significant improved at post-treatment assessment or dropped out are presented in Figure 8. A total of nine Ps (22.5%) dropped out during the treatment. Three of the nine dropouts came from the group working with the treatment at the university (TU), thus, 15% of the Ps in this group did not complete the treatment (see Figure 8). Two of these dropouts did not think the treatment could give enough support to overcome social fears. Another participant reported not having enough time to complete the treatment.
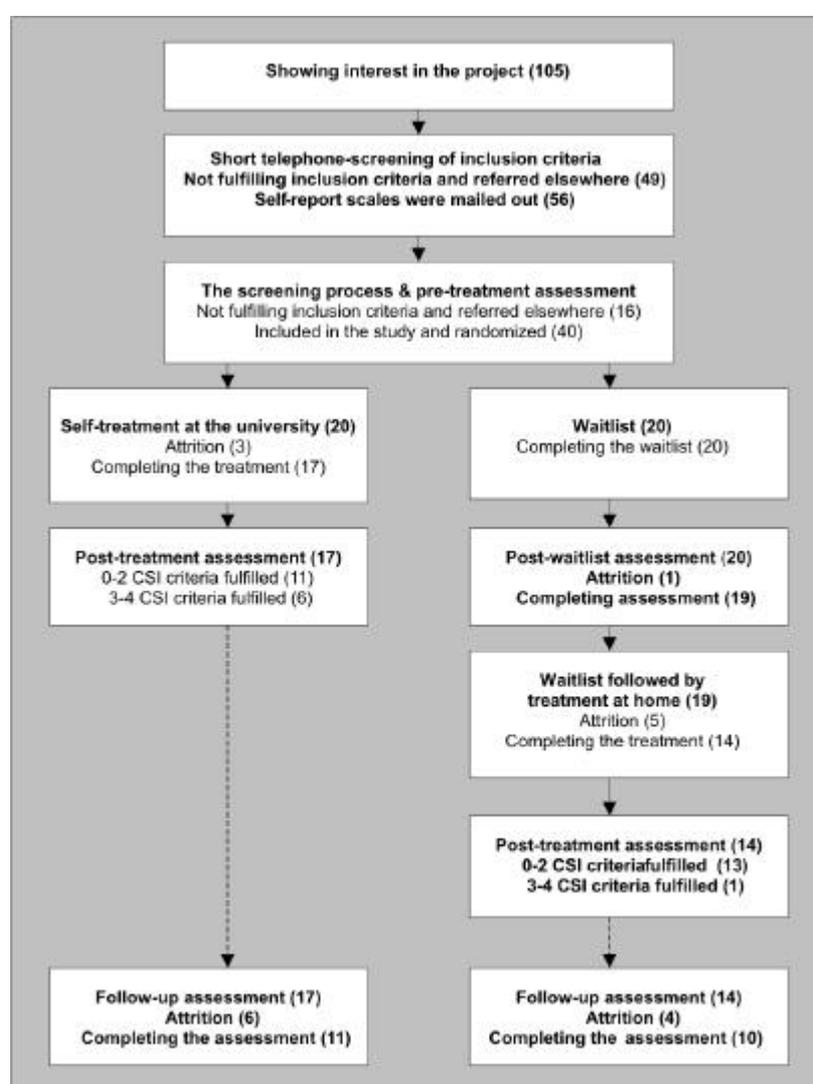
Figure 8. A flow-chart describing participation, attrition and clinically significant improved (CSI) participants in the two groups (figures in parentheses indicating the number of participants).

Six Ps (30%) in the waitlist group followed by treatment at home (WTH) dropped out (see Figure 8). One dropout could not be reached for a comment. Four Ps answered that they did not have enough time for the participation. One person started family therapy during the waitlist period, which was an exclusion criterion for further participation. Additional ten Ps (32%) of those completing the self-treatment, sex coming from the TU-group and four from the WTH-group, could not be reached for the follow-up assessment (see Figure 8).

1. Is there a difference in baseline- and background data (TU vs WTH)?

In order to investigate this question, chi-square tests or one-way ANOVAs were calculated on background data. The results showed that there were significant differences in marital status. In the group working with the self-treatment at the university (TU), 50% of the Ps were married, compared with 25% of the Ps assigned to waitlist followed by treatment at home (WTH). In accordance, more Ps in the WTH-group (75%) were living alone compared with the TU-group (50%). Remaining background data showed no significant differences (for details, see Appendix II).

One-way ANOVAs were also calculated on baseline variables (Means and SDs at pre-treatment assessment for all questionnaires are to be found in Table 12). There was a significant difference found between the two groups on CAS, which is assessing computer attitudes. The WTH-group showed a more positive attitude towards computers compared with the TU-group.

Furthermore, there was a tendency that the TU-group had a longer speech duration on the BAT, compared with the WTH-group. The Ps in the TU-group could speak for about 59.2% (SD=33.3) of the 10 minutes, whereas the Ps in the WTH-group only managed to complete 38.9% (SD=27.5) of the 10-minutes task. The TU-group did have higher SUDS before and during the task, but lower after the task compared with the WTH-group. However, these differences were not significant. There were no other significant differences found (for more details on the BAT, see Table 13).

In summary, the TU-group and the WTH-group appeared to be comparable on most background- and baseline data. In particular, there were no significant group differences on scores for social anxiety or dysfunctional thoughts, except for the speech duration.

2. Is there a difference between pre-treatment and post-waitlist scores?

A comparison with *t*-test was conducted using scores from pre-treatment and post-waitlist assessments for the WTH-group, aiming at investigating whether or not a change had taken place during the waitlist period. The results showed that there were no significant differences between scores from the two assessments (see Table 12).

3. Is there a difference in variables important to the learning process (TU vs WTH)?

There were no significant group differences on these variables (see Figure 9). In contrast, the Ps reported to use learning strategies to the same extent, to have a comparable level of motivation, self-image and self-regulation/need of control (for details, see Appendix II). Furthermore, the Ps in the TU-group were observed to have spent an average of 9-10 hours with the self-treatment, while the Ps in the WTH-group reported to have worked 7-8 hours. The Ps in the WTH-group seemed to differ to a greater extent within the group on how much time they had devoted to the self-treatment. No objective data was available for the WTH-group, therefore no statistical calculations were made.
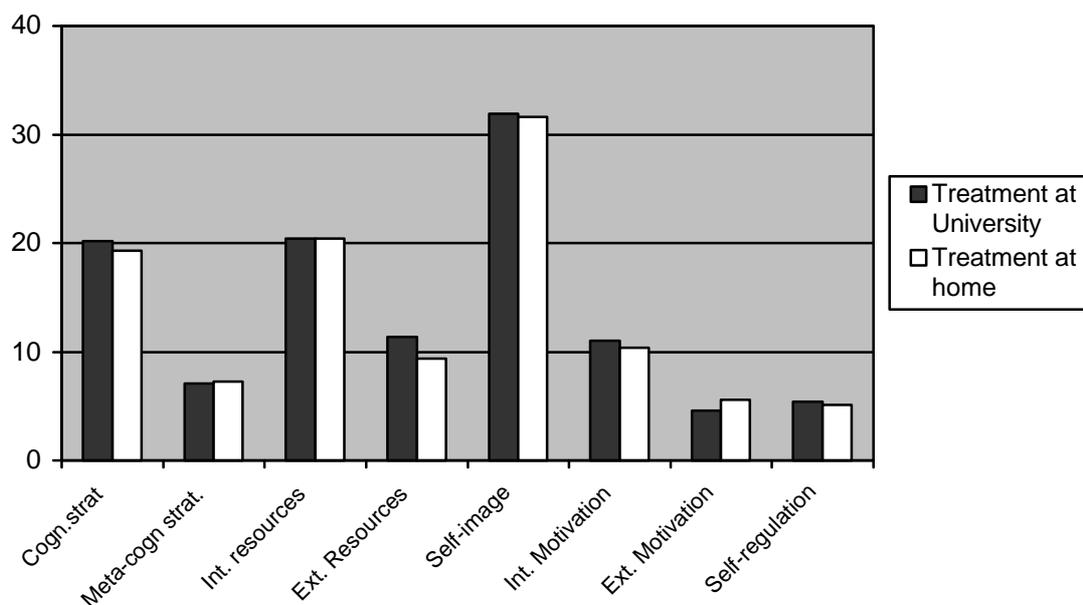
Figure 9. Results for both groups in the controlled treatment study on variables relevant to the learning process: learning strategies (cognitive and meta-cognitive strategies, internal and external resources) self-image as learner, internal and external motivation and self-regulation/need of control.

4. Is there a learning effect after working with the self-treatment? In particular, is there a difference between the two groups (TU vs WTH)?

When looking closer at the learning effect, the results showed that there was a small but significant increase for both groups in KNT-scores (see Table 12), assessing knowledge of social phobia and its treatments. There were no group differences.

Results from the memory test (see Figure 10) showed a lower recognition rate for distractor items compared with items from the introduction and the treatment section. Furthermore, no Ps could recall the content associated with the distractor items. In contrast, the Ps could give a correct account for the content associated with pictures in the introduction and in the treatment section in about 21-41% of the cases. There were no significant differences between the two groups (for details, see Appendix II).

5. Is there a reduction in variables relevant to social phobia? In particular, is there a difference between the two groups (TU vs WTH) with regard to: social anxiety, fears of negative evaluation and other dysfunctional thoughts

The two-way ANOVAs yielded significant time effects on all measures assessing social anxiety (comparing pre- and post-treatment scores). In addition, the scores changed in the direction of functionality (see Table 12). However, there were no significant group differences observed.

In addition, the data from the behavioral assessment test (BAT) was used to investigate the treatment outcome (see Table 13). All measures before the speech, at the point of interruption and after the speech changed significantly in the direction of functionality, i.e. a reduction in the affective variable as well as in dysfunctional thoughts and self-rated physiological reactions were observed at the post-treatment assessment. However, there were no significant group differences.

Table 12. Means, SDs, *t*-tests and ANOVAs on self-report questionnaires for the two groups at pre- and post-treatment (Post-T), post-waitlist (Post-W) and follow-up (F-up) assessments.

Measures		A	Treatment at university		Waitlist followed by treatment at home		ANOVA	
			Means	SD	Means	SD		
SIAS		Pre	42.4	12.7	42.4	08.8	G:	00.48
		Post-W	-	-	42.6	09.5	T:	45.30***
		Post-T	31.7	16.1	34.7	09.9	I:	00.01
		F-up	31.5 [b]	13.8	30.6 [b]	11.1		
FNE		Pre	41.2	11.9	40.7	07.8	G:	00.01
		Post-W	-	-	40.3	07.1	T:	26.73***
		Post-T	33.3	12.5	32.9	06.9	I:	00.01
		F-up	28.6 [b]	12.4	31.2 [b]	09.0		
SCL-90-R	*Int.sensitivity*	Pre	15.7	06.4	15.0	04.6	G:	00.01
		Post-W	-	-	15.2	05.6	T:	47.98***
		Post-T	09.1	05.4	09.9	05.6	I:	01.44
		F-up	10.2	04.4	09.5	06.1		
	Depression	Pre	16.8	11.7	16.9	05.4	G:	00.81
		Post-W	-	-	18.5	07.2	T:	12.99**
		Post-T	09.4	07.7	13.5	07.5	I:	01.23
		F-up	09.6	07.4	12.0	07.4		
	Anxiety	Pre	10.9	05.1	09.5	04.4	G:	01.79
		Post-W	-	-	09.5	05.1	T:	25.12***
		Post-T	06.5	04.2	05.4	03.1	I:	00.71
		F-up	06.7	04.2	05.1	03.2		
	Phobic anxiety	Pre	04.7	03.4	04.4	02.8	G:	00.98
		Post-W	-	-	04.8	03.5	T:	14.52**
		Post-T	02.4	03.0	02.6	03.2	I:	00.12
		F-up	03.4	03.2	02.5	03.2		
NML		Pre	24.2	02.8	24.2	02.4	G:	00.48
		Post	23.9	02.9	22.9	02.4	T:	03.12
							I:	01.27
BN	*Expectancy*	Pre	13.9	03.6	13.2	03.5	G:	02.08
		Post	15.5	02.3	13.1	03.3	T:	03.20
							I:	03.81
	Credibility	Pre	16.1	03.2	15.2	03.4	G:	02.74
		Post	17.9	02.4	15.7	02.9	T:	04.52 [tend.]
							I:	01.47
KNT		Pre	12.7	01.5	12.1	02.2	G:	00.82
		Post	14.9	01.3	14.4	01.5	T:	21.51***
							I:	00.01
AFS		Pre	24.6	05.5	27.1	05.7	G:	00.58
		Post	26.4	05.7	26.7	05.2	T:	01.05
							I:	02.74
CAS		Pre	32.4	05.6	36.1	02.3	G:	03.53
		Post	33.7	06.1	35.4	01.9	T:	01.59
							I:	02.42

[tend.] $p < 0.05$, * $p < 0.01$, ** $p < 0.001$, *** $p < 0.0001$. A = Assessment, G = Group, T = Time, I = Interaction in the ANOVA comparing the groups' pre- and post-treatment assessment scores.
A superscript on the post-waitlist mean indicates a significant difference from the pre-treatment based on *t*-test, and a superscript on the follow-up mean indicates a significant difference from the post-treatment assessment based on repeated measures ANOVA:
[a] = $p<0.05$, [b] = $p<0.01$, [c] = $p<0.001$, [d] = $p<0.0001$.
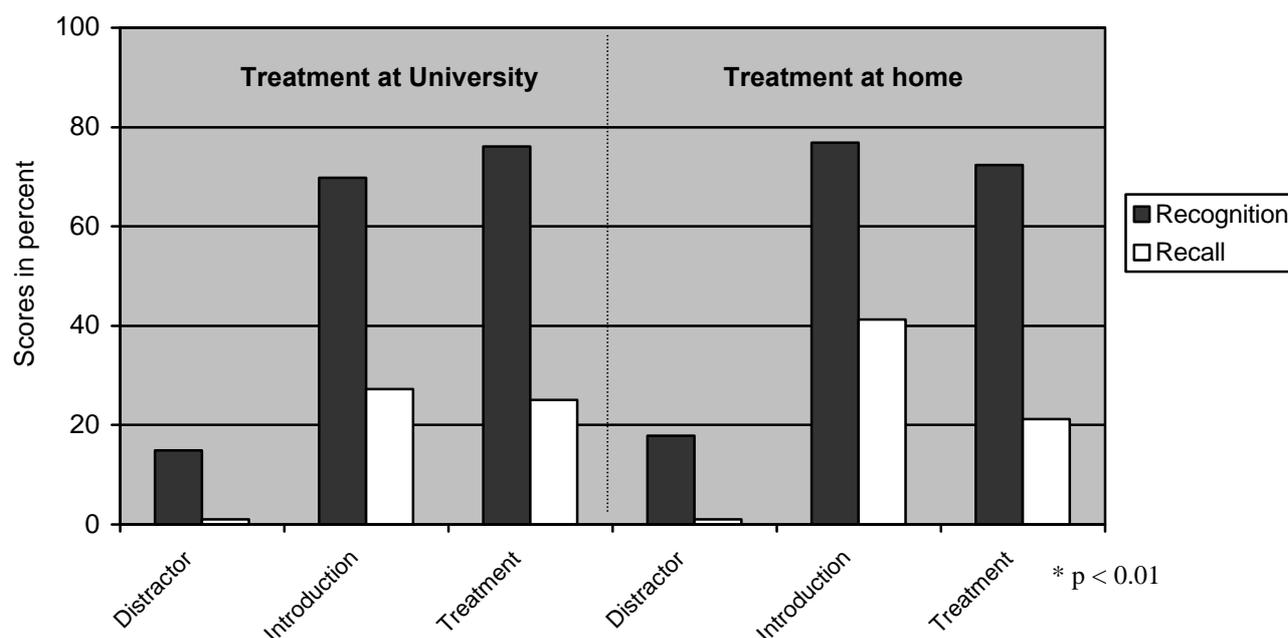
Figure 10. Results from the memory test for both groups in the controlled treatment study, showing the rate of recognition of pictures and recall of program content associated with the pictures.

6. Is there a reduction in other important variables after working with the self-treatment? In particular, is there a difference between the two groups (TU vs WTH) with regard to change on: depression, general anxiety and phobic anxiety?

There was a significant reduction in depression, general anxiety and phobic anxiety at post-treatment compared with pre-treatment assessment. However, there were no significant group differences observed (see Table 12).

7. Is there an increase after working with the self-treatment with regard to computer attitudes, credibility and expectancy of the treatment and treatment motivation? In particular, is there a group difference (TU vs WTH)?

The results showed that there was a tendency for an increase in credibility of the treatment at the post-treatment assessment, but there were no significant group differences. With regard to motivation, expectancy and computer attitudes, there was no significant change compared with scores from the pre-treatment assessment (see Table 12).

8. Is there a change from post-treatment to follow-up assessment? In particular, is there a group difference (TU vs WTH)?

There was a significant reduction on scores for both the SIAS- and FNE-questionnaire when comparing post-treatment scores with follow-up assessment scores (see Figure 11). However, there was no group difference. In addition, there were no significant changes on the SCL.

Table 13. Means, SDs and ANOVAs on variables in the behavioral assessment test for both groups in the controlled treatment study, at pre- and post-treatment assessments.

Measures	A	Treatment at university Means	SD	Waitlist followed by treatment at home Means	SD	ANOVA [d]	
Anticipatory variables							
SUDS before the task	Pre	72.7	24.8	68.2	18.9	G:	00.01
	Post	45.9	28.4	51.8	21.8	T:	26.09***
						I:	01.49
How difficult is the task rated	Pre	72.1	23.7	68.9	21.0	G:	00.72
	Post	54.1	30.8	61.8	24.9	T:	11.59*
						I:	02.15
Expecting to possess skills needed	Pre	52.1	26.6	50.4	25.6	G:	00.60
	Post	65.9	24.3	54.6	24.5	T:	06.23*
						I:	01.73
Expecting to perform skills needed	Pre	50.9	22.9	43.6	21.3	G:	01.84
	Post	63.5	26.9	49.6	19.0	T:	11.71*
						I:	01.44
MDT before speech	Pre	55.9	22.5	58.2	20.8	G:	00.77
	Post	41.6	25.0	52.6	19.8	T:	13.41**
						I:	02.53
Variables from task interruption point							
Duration of speech in % [e]	Pre	59.2	33.3	38.9	27.5	G:	03.00
	Post	72.8	34.5	56.2	28.2	T:	16.47***
						I:	00.24
SUDS	Pre	75.6	20.0	72.9	19.0	G:	00.18
	Post	50.9	33.4	47.1	22.6	T:	28.20***
						I:	00.01
Bodily reactions	Pre	80.0	22.0	67.9	28.7	G:	00.73
	Post	51.8	35.3	48.9	26.5	T:	18.90***
						I:	00.74
Variables after the speech							
How embarrassing was the task	Pre	52.4	24.2	59.6	27.5	G:	01.08
	Post	28.2	29.7	38.6	24.9	T:	24.22***
						I:	00.11
How difficult is the task rated now	Pre	60.6	26.3	66.4	31.8	G:	00.46
	Post	39.7	30.5	47.1	30.7	T:	19.53***
						I:	00.03
How content with own performance	Pre	37.4	26.2	24.3	16.5	G:	01.89
	Post	65.0	25.6	57.9	24.9	T:	46.54***
						I:	00.44
SUDS two minutes after speech	Pre	39.7	27.8	45.7	23.9	G:	00.02
	Post	28.5	24.8	25.0	24.1	T:	12.93**
						I:	01.16
MDT after speech	Pre	56.6	23.3	63.1	28.5	G:	00.78
	Post	34.1	28.7	42.9	26.3	T:	25.06***
						I:	00.08

[tend.] $p < 0.05$, * $p < 0.01$, ** $p < 0.001$, *** $p < 0.0001$. A = Assessment. G = Group, T = Time, I = Interaction factor in the ANOVA. MDT = Mean of dysfunctional thoughts.
[e] 100% is here referring to a speech 600 seconds (10 minutes) long. The scores have been changed into percent in order to allow for a comparison with the scores of the cognitive- and the behavioral component in the BAT (rated 0-100).
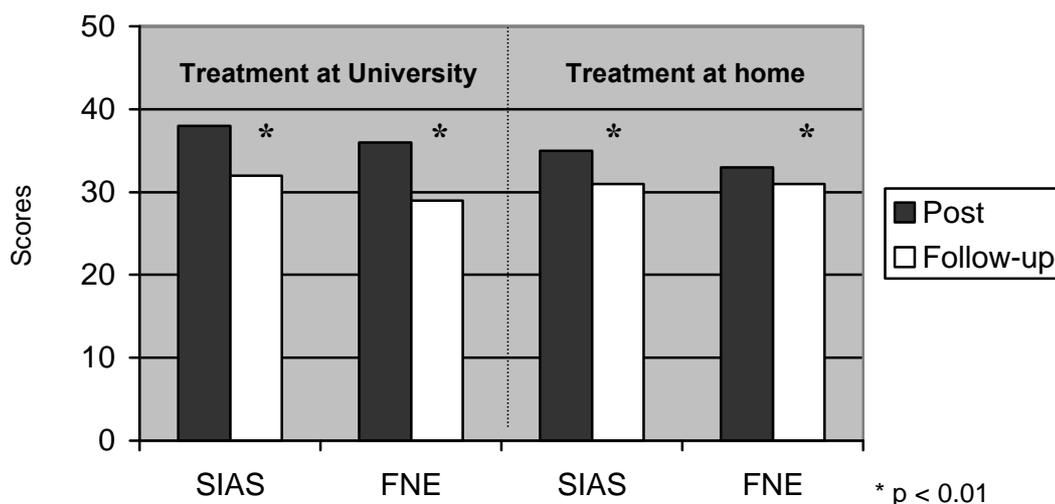
Figure 11. Means on SIAS and FNE at post-treatment and follow-up
assessments for the Ps completing the follow-up assessment.

9. Are the Ps clinically significant improved after working with the self-treatment? Are they improved at the university and at home?

In order to investigate whether or not the self-treatment leads to clinically significant improvements (CSI), the Ps were given a score between 0-4 depending on how many CSI-criteria that they fulfilled at the post-treatment assessment (see 6.2.4. Clinically significant improvement). Fifteen (48%) of the Ps in the controlled treatment study fulfilled 1-2 criteria and seven (23%) fulfilled 3-4 criteria at the post-treatment assessment, whereas a total of nine Ps (29%) fulfilled no CSI-criterion.

In Figure 12, the two groups are presented according to CSI-criteria fulfilled by the Ps. The majority of Ps in both groups fulfilled 1-2 CSI-criteria. There were more Ps fulfilling 3-4 criteria in the TU-group, compared with the WTH-group. It is important to point out that there are restrictions on the statistical calculations because of the small number of Ps in each group.

There was only a small number of Ps who returned the questionnaires at the follow-up assessment. One participant had changed from fulfilling one CSI-criterion at the post-treatment assessment to fulfilling no criterion at the follow-up assessment (only referring to scores from SIAS and FNE). In contrast, three Ps fulfilled an additional CSI-criterion at the follow-up assessment compared with the post-treatment assessment and the remaining Ps maintained their CSI-scores based on SIAS and FNE. The mean scores from SIAS and FNE at post-treatment assessment for the two groups were higher without the dropouts than with the dropouts.

10. Is there a difference between responders and non-responders with regard to measures relevant to the learning process, background- and baseline data?

One-way ANOVAs showed that the groups fulfilling no criterion, 1-2 and 3-4 criteria did differ on some variables. The results are accounted for in detail in Appendix II. The following section is a summary of the significant differences and the results from the memory test, LRNV and SE with a focus on the group fulfilling no criterion (non-responders) vs the group fulfilling 3-4 criteria (responders).

The responders were significantly older than the non-responders. The responders' average age was 44.6 yr (SD=11.5), whereas the non-responders had an average age of 29.2 yr (SD=8.4). There was also a tendency for an earlier onset
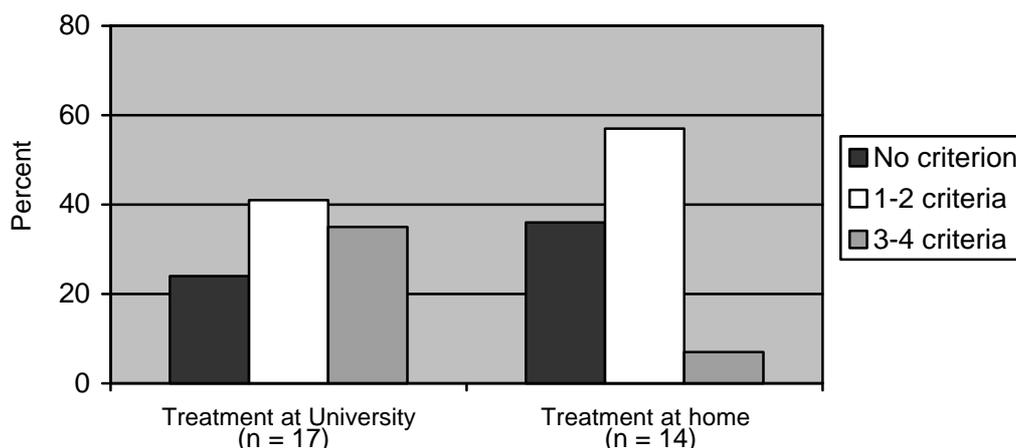
Figure 12. The percentage of participants that fulfill 0-4 criteria for clinically significant improvement in the two groups at post-treatment assessment.

in the group with non-responders. Their average age at which the phobia began was 7.7 yr (SD=2.5), whereas the responders reported an average onset age of 13.4 yr (SD=8.2). Furthermore, a tendency was found with regard to marital status. A majority of the responders (71%) were married, whereas only 56% of the non-responders were living with somebody. A tendency was also found with regard to previous treatment. A majority (71%) of the responders had already been in treatment, whereas only 23% of the non-responders had been in treatment before participating in the present study.

Interestingly, there were no significant differences on SIAS and FNE. However, the non-responders had significantly stronger dysfunctional thoughts after the speech task and a lower level of content, a tendency for shorter speeches and higher levels of self-rated anxiety, compared with responders (see Figure 13). On interpersonal sensibility (SCL), there was also a tendency found for lower scores in the group with responders. Their average score was 13.7 (SD=7.0), compared with 18.8 (SD=4.8) in the group with non-responders. Finally, there was a tendency for higher levels of depression in the group with non-responders with the mean 23.2 (SD=6.3), whereas 14.1 (SD=10.2) was the mean for responders (for details see Appendix II).
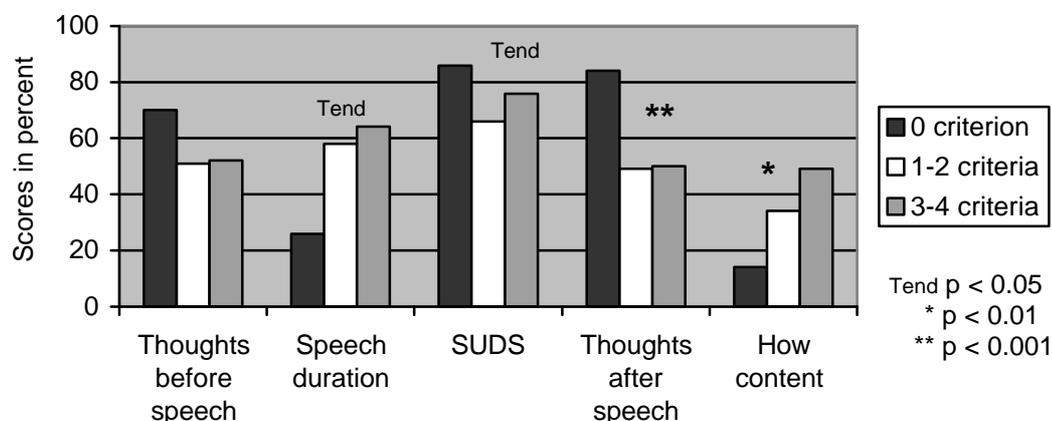

Figure 13. Means, SDs and ANOVAs on variables in the behavioral assessment test at the pre-treatment assessment for the groups fulfilling 0 criterion, 1-2 and 3-4 criteria on the post-assessment test.

The responders reported having used significantly more external resources. The mean was 7.6 (SD=2.9), compared with 14.0 (SD=4.3) for the non-responders. In addition, the responders had also a significantly lower external motivation with the mean 2.4 (SD=1.7), compared with 4.4. (SD=2.3) for the non-responders. On all other variables, the responders reported higher scores than the non-responders. However, these group differences were not significant. In the memory test, the non-responders could recall introduction-content to a higher degree than responders, whereas responders could recall treatment-content to a higher degree than non-responders. However, these differences were not significant.

11. *How was the change with regard to cognitive, affective and behavioral aspects when comparing pre- and post-treatment scores for Ps fulfilling no CSI-criterion, 1-2 and 3-4 criteria?*

Figure 14-16 visualize how the Ps in the three groups (fulfilling no CSI-criterion, 1-2 criteria and 3-4 criteria) changed with regard to cognitive, affective and behavioral scores in the BAT at pre- and post-treatment assessments.

The results from the group with Ps fulfilling no CSI-criterion showed that the scores for dysfunctional thoughts before the speech and the speech duration almost remained the same from pre- to post-treatment assessment. However, there was a decrease of dysfunctional thoughts after the speech, so that these thoughts almost reached the level of the thoughts before the speech at the post-treatment assessment, although originally much higher. The self-rated anxiety at speech interruption showed a similar pattern of change. Furthermore, the results showed an extremely low level of how content the Ps were with their own performance after the speech task at the pre-treatment assessment. Even though there was almost no change in speech duration, the Ps reported to be more content with their performance at the post-treatment assessment. In other words, the change in thoughts after the speech seemed stronger than the change in speech duration (see Figure 14). Contrasting the results from the other two groups (see Figure 15-16), the thoughts after the speech showed higher score than the thoughts before the speech at the pre-treatment assessment.
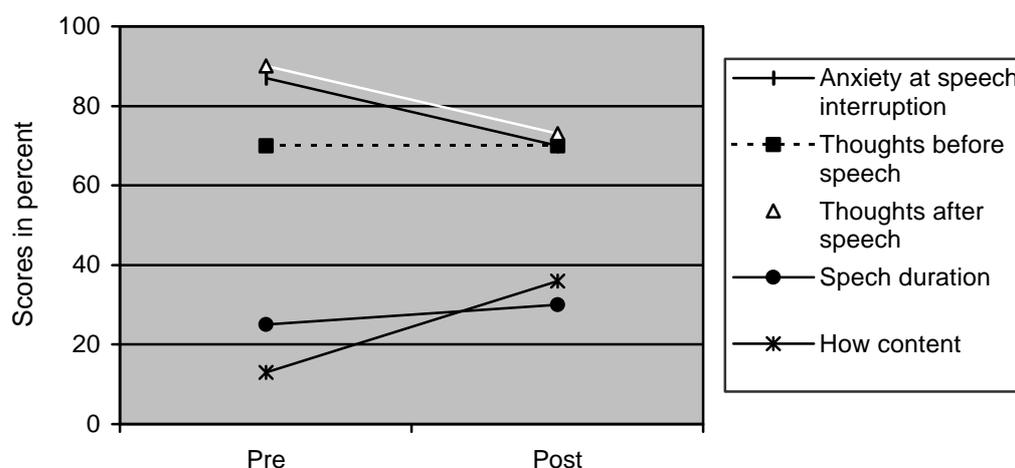
Figure 14. Means on cognitive, affective and behavioral items from the BAT at pre- and post-treatment assessment for the participants fulfilling no criterion for clinically significant improvement.

In accordance with the results from the previous group, Figure 15 shows that the thoughts before the speech remained almost unchanged. In addition, the anxiety at speech interruption and dysfunctional thoughts after the speech decreased. Also, it seems as though the change in how content the Ps were with their own performance were stronger (in the direction of functionality) than the change in speech duration. In contrast to above, speech duration increased.
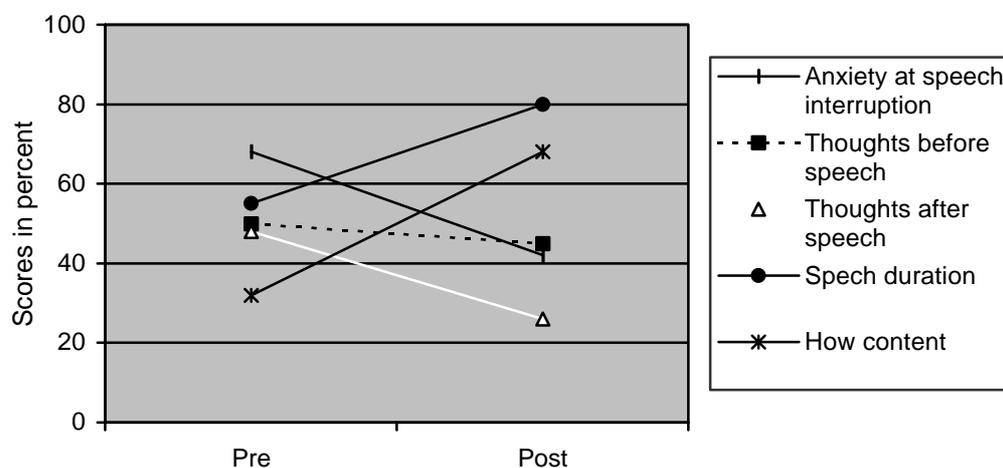
Figure 15. Means on cognitive, affective and behavioral items from the BAT at pre- and post-treatment assessment for the participants fulfilling 1-2 criteria for clinically significant improvement.

In accordance with the two previous groups, Figure 16 shows that the Ps in the group fulfilling 3-4 criteria had a reduction in thoughts after the speech and an increase in how content they were that seemed stronger than the increase in speech duration. The anxiety at interruption was also reduced. Interestingly, there were still Ps that did not perform the entire speech (100%=10 minutes long). In contrast to previous groups, the thoughts before speech were also reduced. However, the reduction of anxiety at speech interruption was still stronger.
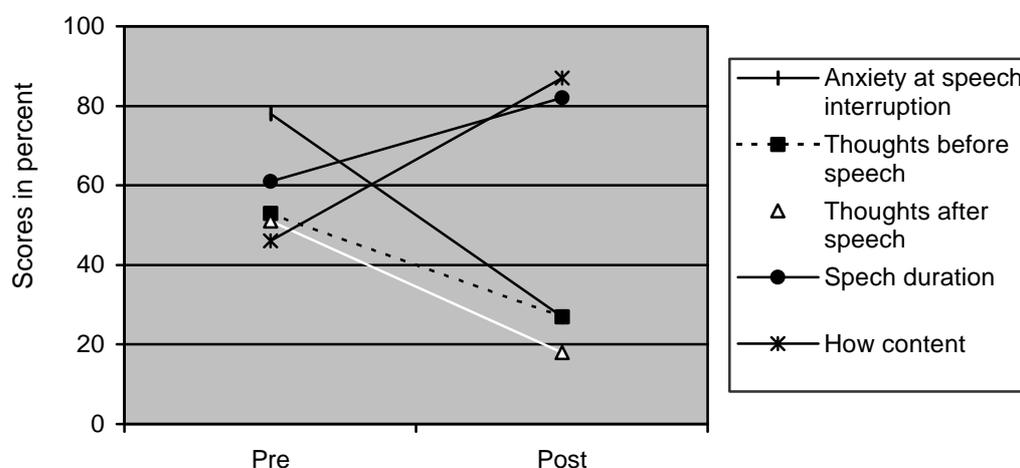

Figure 16. Means on cognitive, affective and behavioral items from the BAT at pre- and post-treatment assessment for the participants fulfilling 3-4 criteria for clinically significant improvement.

12. *Is there a difference between completers and drop-outs with regard to background- and baseline data at pre-treatment assessment?*

The completers were younger than the drop-outs and showed higher scores on some of the measures of social anxiety and depression. Their speech duration was also longer and the self-rated anxiety (SUDS) at speech interruption higher, compared with the drop-outs. However, these differences were not significant.

There was a significant tendency for an earlier onset in the group that completed the participation in the study (for details, see Appendix II). Their average age at onset was 9.2 (SD=5.1), whereas the average onset age for drop outs was 15.4 (SD=12.1). It is important to point out that the drop-out group only contained nine Ps, thus, the results must be interpreted with caution.

6.4.   Discussion

The discussion is structured according to the questions listed in the introduction:

1. *Is there a difference in baseline- and background data (TU vs WTH)?*

A prerequisite when evaluating treatment outcome is that the two groups are comparable at pre-treatment assessment. The results from background data and self-report questionnaires showed that there were no significant pre-treatment differences between the two groups, with the exception of marital status and computer attitudes. Fifty percent of the participants (Ps) in the TU-group reported being married, whereas only 25% in the WTH-group. Furthermore, the WTH-group showed a more positive attitude towards computers, compared with the TU-group

One way to interpret a difference in marital status is that those who live with a partner, may receive stronger social support during the self-treatment, compared with those who live alone. A partner could, for example, help in solving practical problems, encourage reflection on treatment content or offer support during exposure training. In accordance, the lack of social support was reported to be a hindrance[38] for the Ps in an earlier study on self-treatments (Öst et al., 1998). In the present study, however, there were no significant differences between the groups when looking at the question focusing on social support. On the contrary, a majority of Ps (55-60%) in both groups stated that they had one person or more with whom they could talk to about their problems and the treatment. Thus, there is no evidence suggesting that the difference in marital status is associated with a difference in social support.

It is important to point out that the role of social support needs to be investigated in greater detail in future studies on self-treatments. In particular, it might be valuable to use standardized questionnaires and to collect information from another person who knows the social phobic. The reason is that questions regarding social support may be associated with feelings of shame (when admitting having no close friends). Consequently, the information received from the Ps themselves in the present study could be inaccurate, for example, overestimating the number of friends. It could also be of importance to focus on what function the relationship has with regard to the social anxiety. When supportive persons encourage the social phobic to avoid social situations and act in such a way that the negative consequences of the social phobia are limited, the support is a factor maintaining the social anxiety. In conclusion, it is important to further investigate social support, since it could not only boost treatment effect, but it could also maintain social anxiety.

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[38] Spider phobics reported having problems to conduct exposure training without the help from non-anxiuos persons to find spiders and to keep the spiders at home during the treatment period.

As mentioned above, there was a significant group difference on the CAS-questionnaire, with a more positive general computer attitude in the WTH-group, compared with the TU-group. Questions have been raised regarding computer attitudes and their influence on treatment outcome. In deed, it has been suggested that positive computer attitudes are associated with successful outcome on computer-related tasks (Marcoulides, 1988) and a reduction in the level of attrition (Rosen et al., 1993). As a preventive measure in the present paper, the Ps were offered an introduction to computers and a brief demonstration of how to work with the self-treatment. Research on computer attitudes supports this approach, suggesting that familiarization with computers can improve computer attitudes (Kulik & Kulik, 1991; Prell & McElroy, 1986). In accordance with recent studies on computer-based self-treatments (Carlbring et al., 2001), technical support was also offered to Ps during the entire treatment period.

It is important to point out that a certain self-selection may have occurred in the present study. In general, persons who applied for participation had already had some positive experience with computers. Thus, the present paper is unable to shed any light upon how persons with no experience with computers or with high levels of computer anxiety could work with and benefit from a computer-based self-treatment.

Finally, there was a significant tendency for longer speeches in the TU-group, compared with the WTH-group in the behavioral assessment test (BAT). This result could be suggesting that the Ps in the TU-group were less socially anxious, compared with the WTH-group. However, the self-report questionnaires did not show any significant group differences. In addition, the other group differences on remaining BAT items were not significant. One possible explanation could be that the speech duration in the BAT (without audience) is a measure on the specific avoidance behavior in the BAT, rather than a measure of general social anxiety or avoidance behavior. It is unclear whether or not such a difference would influence the implementation of the self-treatment and its outcome, where social interaction was emphasized rather than performance similar to the BAT. However, to clarify such issues in future studies, an additional BAT with a social interaction task would be recommended, as well as an objective rating of the quality of the speech.

2. Is there a difference between pre-treatment and post-waitlist scores for WTH?

When evaluating a treatment in a controlled treatment study, it is important to be able to show that the treatment condition led to a change on relevant variables, whereas the waitlist condition did not. In deed, the results in the present study showed that the anxiety did not change during the waitlist period. These results were expected and are in accordance with other research findings, suggesting that social phobia is a chronic disorder (Liebowitz et al., 1985), which generally does not improve without treatment when looking across a short period of time.

3. Is there a difference in variables important to the learning process (TU vs WTH)?

There were no significant group differences on variables important to the learning process. In fact, the scores for meta-cognitive strategies, internal resources, self-image as learner and self-regulation/need of control were almost identical. These results are somewhat surprising. Situational factors are generally viewed as being important and are believed to influence many aspects of the learning process. Since the situational factors differed between the TU and the WTH-group, a difference in variables relevant to the learning process was expected. One possible interpretation of the results is that there are other factors influencing the learning process that are more influential than situational factors. In deed, user characteristics have been

suggested to play a crucial role in the learning process (Bates, Holton & Seyler, 1996), for example, attributional style has been found to influence academic performance (Findley & Cooper, 1983).

There are several methodological limitations that should be mentioned with regard to these results. First, the level of attrition was higher in the WTH-group than in the TU-group and it is unknown what learning strategies or level of learning motivation that the dropouts had. Thus, there could have been a difference between the groups that could not be identified due to the high level of attrition. Second, retrospective measures of the learning process are associated with certain problems due to limitations on memory and a low ability to conduct self-observations in a complex learning situation. In addition, variables related to learning processes may change across the treatment period, for example, learning a content and training exposure may trigger different learning processes. Thus, it may be impossible to report an overall picture of the learning process. An attempt to handle this problem in the present study was to adapt the LRNV- and the SE-questionnaires to the specific self-treatment. It has been suggested that an adapted version can give the Ps a frame-of-reference when filling out the questionnaires (Schmit, Ryan, Stierwalt and Powell, 1995). In future research, it is recommended to use self-report questionnaires following a specific session in order to assure that the same reference point is considered by the Ps. In addition to retrospective measures, learning behaviors should also be observed in the learning situation. Methods such as observations, interviews and the use of logfiles (see Table 8) could add valuable information. Some of these methods have already been applied in qualitative research. However, standardized methods should be developed and made available to quantitative research, allowing for comparisons between self-treatments.

Finally, observations of the TU-group and reports from both groups indicate that the TU-group devoted somewhat more time to the self-treatment. Also, there were greater differences within the WTH-group, compared with the TU-group. The latter was expected, since these Ps could decide themselves how to work with the self-treatment, whereas the Ps in the TU-group had certain guidelines. It is unclear if the time spent with the self-treatment was an important factor influencing treatment outcome. There was no objective data available on the WTH-group or on aspects such as how the total amount of treatment time was distributed (one-session or multiple sessions), how much time was set aside for each program section and how the quality of time was rated. Interestingly, research findings show that the most successful students in self-regulated learning are not always the ones investing maximum hours. On the contrary, some students invest long hours without being successful, while others are successful, investing little time (Cress, 1999). In accordance, it has been shown that investing more time in psychological treatments does not always generate a better outcome (Öst, 1989a). In future studies, the use of logfiles could offer answers to some of the questions that are raised on this issue.

4. Is there a learning effect? Is there a group difference (TU vs WTH)?

The results from the KNT-questionnaire offered some support for a learning effect, showing a significant increase in knowledge of social fears and its treatments at the post-treatment assessment. In addition, the results from the memory test showed that the Ps could recall and retell the content that was associated with a certain picture in about 21-41% of the cases. There were no significant group differences found.

The memory test was viewed as a difficult task for the Ps, since the self-treatment included over 250 pictures and the memory test presented only a small part of these pictures. In addition, the pictures were presented without background or text, looking

somewhat different than in the program. Therefore, the results were acceptable for Ps that had only been working for six weeks with the self-treatment. The fact that about 15-18% of the distractor items were recognized suggests that the Ps had difficulties in differentiating between pictures, adding some evidence to the assumption that the memory test was difficult. This result may also indicate that too many pictures were used in the self-treatment, distracting the Ps. Another way to interpret these results is that the Ps reported recognizing pictures to a high degree in order to please the research assistance. Nevertheless, there were no Ps that could account for the content associated with the distractor items, indicating that the results from the recall and retell tasks in the memory test could better assess the learning effect. In deed, only recognizing a picture does not necessarily imply that the person has a meaningful understanding of the message that the picture carried.

5-6. Is there a reduction in variables relevant to social phobia, depression and general anxiety), is there a group difference (TU vs WTH)?

The results were expected, showing significant improvements on all measures assessing social anxiety, general anxiety and phobic anxiety. The results also showed a reduction in depression. This result is somewhat surprising, since a reduction of depression was not the aim of the self-treatment. One way to explain this result is that for some Ps, the high level of depression was a reaction to the problems associated with social phobia. Thus, a reduced social anxiety could lead to a reduction in the level of depression. Another way to interpret the result is that the cognitive techniques described in the program could reduce depression, since they are comparable to the cognitive techniques used to treat depression.

It is somewhat surprising that there were no significant group differences on the variable described above. In another study on self-treatments, it was suggested that self-treatments can generate different outcomes depending on if the Ps work with the self-treatment at the clinic or at home (Hellström & Öst, 1995). It is important to point out that the value of self-treatments would increase if the treatment effect remains the same, regardless of where the self-treatment is implemented. Treatment at home is a way of implementation that offers the highest degree of accessibility and affordability. In particular, when the self-treatment is distributed online.

7. Is there an increase in computer attitudes, credibility, expectancy and motivation? Is there a group difference (TU vs WTH)?

The results showed a tendency for an increase in credibility at the post-treatment assessment. However, no other variables showed a significant change and there were no group differences. Thus, the results indicate that a computer-based self-treatment can maintain scores on these important variables. Since the questionnaires were adapted to the self-treatment, it is not possible to compare the scores with other studies. Thus, the present paper does not give any answers to the question if computer-based self-treatment can generate higher levels of credibility, expectancy and motivation than traditional forms of self-treatments.

8. Is there a change from post-treatment to follow-up assessment?

There was a significant reduction in scores on SIAS and FNE at the follow-up assessment. Thus, the results showed evidence for a further improvement of treatment gains 3-4 months after completing the self-treatment. These results were expected, since self-treatment are low-intensive and some treatment gains are likely to show up first at follow-up assessments. Current research on social phobia has demonstrated that treatment gains are maintained or improved at follow-up

assessments (Heimberg et al., 1993). At least, this has been suggested to be true for mild and moderate cases of social phobia (Heimberg & Juster, 1995, p. 304.).

In spite of these promising results, there are several limitations that should be mentioned. First, there was no BAT conducted at the follow-up assessment. Second, the results were somewhat inconclusive, since there was no significant change observed on the SCL. A third limitation was that nobody contacted the Ps in person at the follow-up assessment. On the one hand, only relying on self-report questionnaires could be problematic. On the other hand, recent research on online communication suggests that the lack of visible social cues, present in face-to-face communication, can improve the degree of honesty in answers (Bergvik et al., 2002). This could also be true when applying self-report questionnaires, regardless of how they are sent out (postal vs internet). Finally, a serious limitation was the high level of attrition, raising questions regarding the dropouts. If the dropouts were the less successful Ps, the treatment gains could have been overestimated in the present paper. However, when looking closer at the group mean at the post-treatment assessment with vs without the dropouts, it seems as though Ps with lower levels of social phobia at the post-treatment assessment decided not to participate in the follow-up assessment. It is possible that a decrease of social anxiety leads to reduced motivation for a participation in a follow-up assessment. To further investigate changes at the follow-up assessment, a larger sample is necessary and the follow-up period should be longer.

As mentioned above, follow-up assessments are especially important in research on low-intensive self-treatments. A criticism of the present paper is that there were not enough efforts put into the follow-up assessment. However, since much of the resources were put into the development of the computer-based self-treatment, it was not possible to add measures to the follow-up assessment. This situation highlights the problems that can occur when developing high-cost computer programs, possibly limiting the impact of these programs in future research.

9. Are the Ps clinically significant improved after working with the self-treatment?

In the present study, 48% of the entire sample fulfilled 1-2 CSI-criteria and 23% fulfilled 3-4 criteria, whereas 29% of the entire sample fulfilled no criterion. At first, these results may seem disappointing. It has been reported that therapist-directed treatments for social phobia such as Heimberg's cognitive behavior group therapy produce a clinically significant improvement in about 75% of the patients at post-treatment assessment (Heimberg et al., 1990). Even a treatment for more severe forms of social phobia has demonstrated that about 80% of the patients showed a moderate or high endstate functioning after the treatment (Turner et al., 1994).

Nevertheless, the results in the present paper were expected. Previous studies on Mark's manualized self-treatment report that about 30% of the patients were clinically significant improved, compared with 70-90% of the patients that received a therapist-directed treatment (Öst et al., 1991; Öst et al., 1998). Even 30% may be a number difficult to reach for the present study, since the studies reporting 30% were investigating a less severe disorder (spider phobia). In addition, the treatment period in the present paper was short. The Ps were only allowed to work for six weeks with the self-treatment[39]. As comparison, the two treatments mentioned above run for 12-16 weeks. Thus, the level of clinically significant improved Ps in the present study is acceptable. In particular, this is true for the short-term treatment effect.

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[39] The short treatment period was aiming at putting pressure on the Ps to start right away with the self-treatment, in turn, decrease the risk for attrition and improve the possibility for feedback on how the Ps had been working with the self-treatment.

When looking at the group working at the university (TU), 35% of the Ps fulfilled 3-4 CSI-criteria, i.e. these results are better than expected. In contrast, only 7% of the Ps in the group working at home (WTH) reached the same level at the post-treatment assessment. This result indicates that the TU-group was far more successful in reducing their social anxiety. However, it seems as though many Ps improved in the WTH-group too, even though these Ps fulfilled 1-2, rather than 3-4 criteria. It is likely that there is no qualitative difference between working at home and working at the university with the self-treatment. Instead, the difference is that the process of change takes a slower pace when working at home. In addition, the somewhat higher scores on some BAT items for the WTH-group at pre-treatment assessment could have influenced the outcome. Nevertheless, only a follow-up assessment over 1-2 years can give a clear answer to these questions.

Finally, it is important to keep in mind that the CSI-scores applied in this study were not easy to fulfill. There were scores from both self-report questionnaires and from the BAT. In addition, cognitive, affective as well as behavioral aspects were included. Thus, an overall strong change was required in order to fulfill the criteria.

10. Is there a difference between responders and non-responders?

The results showed a significant difference between responders (fulfilling 3-4 criteria) and non-responders (fulfilling no criterion): The responders were older, had lower dysfunctional thoughts after the speech task in the BAT and reported a higher level of content with their own speech performance. Furthermore, many of the remaining variables (self-report questionnaires and BAT) did indicate that the non-responders represented a more severe form of social phobia at the pre-treatment assessment, even if these differences were not significant. In addition, there was a tendency found that the non-responders reported an earlier onset, which has been reported to be associated with more severe forms of social phobia (Heimberg et al., 1993). One way to interpret these results is that Ps with more severe forms of social phobia are less likely to benefit from a self-treatment. In particular, this risk is high for younger people. Interestingly, the cognitive items after the speech task in the BAT seem to better differentiate between responders and non-responders, compared with other measures on social phobia.

Age seems to be an important factor when differentiating between non-responders and responders. In accordance, age is believed to influence learning. It has been suggested that adult learners have a clear perception on why they are learning and what they need in order to reach their goals (Lottmann, 2000, p. 154-155). It is also possible that older people have more experience and a higher level of prior knowledge, which has been demonstrated to influence learning in a positive way (Schnotz, 2002). Thus, older persons may have several advantages, compared with younger persons, when conducting self-regulated learning with a self-treatment.

In addition, responders reported having used external resources more than non-responders. This result is expected. In fact, research findings suggest that unsuccessful learners tend to be less likely to seek help (even though they need it), whereas successful learners may accept assistance that is offered (Cress, 1999). In other words, there is a risk that assistance offered to Ps working with a self-treatment could increase the distance between responders and non-responders. This result highlights the importance of investigating help-seeking behaviors in research on self-treatments and to develop methods to encourage such behavior. It is evident that the methods used in the present paper (supportive session, technical support, workshop) were not sufficient. For future research, it could also be helpful to investigate and analyze learning strategies in more detail. In the present paper, there was a general

score calculated for cognitive- and meta-cognitive learning strategies. However, specific strategies may be used differently within these two groups, influencing the treatment outcome.

Furthermore, non-responders showed a significantly higher level of external motivation than responders. In contrast, the responders had a higher level of intrinsic motivation, even though this was not a significant group difference. In accordance, research findings have demonstrated that successful learners often have a high level of intrinsic motivation, whereas extrinsic motivation seems to be more important to unsuccessful learners (Cress & Friedrich, 2000). However, the research findings on this issue are not conclusive and it could be assumed that even if intrinsic motivation is associated with better performance than extrinsic motivation, an extrinsic motivation for a self-treatment would be better than no motivation at all.

It should be pointed out that while the learning motivation showed group differences, the treatment motivation did not. Therefore, a recommendation for future assessments of treatment motivation is to differentiate between intrinsic and extrinsic motivation. In other words, the NML-questionnaire has its limitations, since it does not acknowledge the different functions that these two forms of motivation can have.

Even though there were no significant differences on remaining LRNV- and SE-items, it is interesting to notice that the responders scored higher on all items. This could indicate that the non-responders represented a less structured type of learners, with undirected strategies. The results from the memory test support this theory, since non-responders could recall introduction-content to a higher degree than responders, whereas responders could recall treatment-content to a higher degree than non-responders. Needless to say, the treatment section was the most important one for a treatment effect, where the main treatment components were described.

Finally, it seems as though a majority of the responders had already some experience from psychological treatments. Importantly, all Ps with treatment experience had interrupted these treatments at least one year before starting the participation in the present study. Thus, it can be assumed that the treatment effect was triggered by the self-treatment, rather than by the previous treatment. It should also be pointed out that a majority of the previous treatments were less intensive treatments such as relaxation training or short-term social skills training. Nevertheless, previous treatment experience could have facilitated the transfer of treatment gains in the present study. This Ps could have been more used to reflect on their problems, knew more about their problem in a way that did not show up in the KNT-questionnaire, or were simply more motivated (having looked for treatment on several occasions). In future studies, it is necessary to clear how previous treatment experience influences self-regulated learning with a self-treatment.

11. How was the pattern of change for Ps fulfilling no criterion, 1-2 and 3-4 criteria?

As expected, the non-responders showed overall small changes. Interestingly, the improvements that did occur were observed in the dysfunctional thoughts after the speech and the self-rating of how content the person was. The self-rated anxiety at speech interruption also showed a comparable reduction. In contrast, dysfunctional thoughts before the speech, as well as the speech duration remained more or less unchanged. These results lend some support to the assumption that cognitive changes can occur in spite of no behavioral changes. In accordance, research findings have emphasized that the performance itself play a less important role in the phobic reaction. On the contrary, how the person rates his or her own performance is crucial to the phobic reaction (Rapee & Lim, 1992). Another way to interpret the improvement on some cognitive aspects for the group fulfilling no criterion is that the

Ps were more content with their performance at the post-treatment assessments after performing a speech that was qualitatively better than the first one. Since the video recordings have not been rated by a blind rater, this paper will not be able to answer that question.

Contrasting the results from the other two groups (see Figure 15-16), the thoughts after the speech showed a much higher score than the thoughts before the speech at the pre-treatment assessment. In addition, they remained somewhat higher at the post-treatment assessment, suggesting that the thoughts after the speech play a role in high levels of social anxiety.

The results from the Ps fulfilling 1-2 criteria showed that thoughts before the speech remained more or less unchanged from pre- to post-treatment assessment, in spite of strong changes in the remaining variables. One way to interpret this result is that thoughts before the speech are resistant to change, since they represent a more *normal* way to react. That is, even non-anxious persons can become nervous before a difficult situation. However, non-anxious persons do not remain nervous afterwards and continue to think about the event for a long time as do social phobics. In other words, when wanting to reduce social anxiety, it is primarily important to improve thoughts after the situation, rather than thoughts that occur in anticipation of the situation. However, in order to clear the questions raised regarding the role of thoughts before the speech, the BAT had to be implemented with non-anxious, as well as socially anxious persons.

Finally, the Ps fulfilling 3-4 criteria showed a similar pattern as the group fulfilling 1-2 criteria, but the changes were stronger (in direction of functionality). The fact that the pattern of change seems to be comparable between these two groups could indicate that the Ps in both groups should be identified as responders, even if the Ps in the group fulfilling only 1-2 criteria are showing a smaller change or change at a slower pace. Once again, the cognitive aspects after interrupting the speech seem to be more important to change in social anxiety than the thoughts before the speech. Also, how content a person is with the own performance seems to change more than the speech duration. In contrast to the other two groups, the thoughts before the speech did also decrease, even though the change is smaller than in self-rated anxiety at speech interruption or thoughts after speech.

12. Is there a difference between completers and dropouts?

There was a tendency that completers had an earlier onset. They also had higher scores on SIAS, even though these group differences were not significant. The results from the FNE and the BAT were inconclusive and did not show any significant group differences. These results are difficult to interpret. It could be possible that social phobics with a reported earlier onset and a somewhat higher social anxiety are more motivated to learn how to handle their problem and stay in treatment, but have more difficulties in reaching their goals. As mentioned before, the Ps fulfilling no criterion and 1-2 criteria showed an earlier onset, compared with the Ps fulfilling 3-4 criteria. Another interpretation is that a self-selection did take place, so that the completers of the present study could represent a subgroup of social phobics that share these charateristics. It is also possible that the small sample size and the restrictions on the statistical calculations generated chance findings. More than anything else, the result highlights how difficult it is to try to differentiate between completers and dropouts based on background- and baseline data. In accordance, previous studies have reported similar inconclusive results (Turner et al., 1996). In a recent prediction study, it was suggested that treatment processes and outcome

early in the treatment should be investigated, rather than background- and baseline data (Scholing & Emmelkamp, 1999).

7. GENERAL DISCUSSION

7.1. The formative evaluation

To conclude, the formative evaluation resulted in a multi-component computer-based self-treatment that contained interactive and multimedia elements. The feedback from participants (Ps) gave support to the adapted version of the guidelines suggested by Park and Hannafin (1993). The general aim was to apply these guidelines in order to keep the content from becoming too complex. In this way, more mental efforts would be available to the Ps for learning. The self-treatments that were tested in the pilot study and in the controlled treatment study both contained the same program components (general information, exposure training, cognitive techniques, relaxation and reflection on social skills) and program sections (start menu, introduction menu, treatment menu with eight treatment steps, the maintenance program and homework assignments).

With regard to aspects of the formative evaluation itself, the results indicated that it is important to gather information about the target group in order to be able to create a self-treatment that meets the needs of the users. In addition, qualitative and quantitative evaluation methods should be included in the evaluation, as well as persons with different backgrounds and experiences. Moreover, Ps should be recognized as experts in order to improve and intensify the communication between developers and Ps, as well as to prevent the Ps from feeling burdened by their participation. In deed, the results indicated that the treatment outcome was not negatively influenced by the focus on the evaluation process.

Finally, the results from the pilot study in the formative evaluation indicated that there was a learning effect after working with the self-treatment. In addition, the results demonstrated that the self-treatment could lead to a reduction in social anxiety and offered enough support to carry on with the improvements of the self-treatment and to test it on a larger sample.

7.2. The summative evaluation

To conclude, the controlled treatment study in the summative evaluation showed that both the group working at the university (TU) with the self-treatment and the group working at home (WTH) improved significantly on self-report questionnaires relevant to social phobia, whereas there was no change for Ps during the waitlist period. In addition, there were significant improvements on other variables (depression, general anxiety and general phobic anxiety), as well as on all items on the behavioral assessment test (BAT). Importantly, the effects were maintained or furthered at the follow-up assessment. There were no significant group effects or group by time interactions.

About 48% of the entire sample fulfilled 1-2 criteria for clinically significant improvement at the post-treatment assessment and 23% fulfilled 3-4 criteria, whereas 29% fulfilled no criterion. A large majority of the Ps fulfilling 3-4 criteria were to be found in the TU-group, whereas the WTH-group had a narrow majority of the Ps fulfilling no criterion. A majority of the Ps fulfilling 1-2 criteria were also to be found in the WTH-group.

The results from the TU-group showed that it is possible to produce treatment gains with a self-treatment for social phobia that are somewhat stronger than the 30% clinically significant improved patients that has been found in other studies on self-treatments (Öst et al., 1991; Öst et al., 1998). In deed, with regard to the severity of the disorder and the short treatment duration, it is a surprisingly strong result. These results indicate that a minimal contact design including one supportive session and assistance in drawing up a schedule of when (times, days and duration) and where to work with the self-treatment, may boost treatment outcome and decrease level of attrition. Furthermore, older Ps with an onset age in the mid and the late adolescence were more likely to be successful with the self-treatment, whereas severe forms of social anxiety or depression could be a contraindication for a self-treatment.

Interestingly, the BAT was conducted without an audience. Thus, it demanded few additional resources from the research project. In spite of this, the BAT could produce much valuable data in addition to the self-report questionnaires. The results even indicate that the BAT may be more sensitive to change and may be better in differentiating between subgroups than self-report questionnaires. Several BAT items did show a strong significant improvement or group difference, where self-report questionnaires did not or only showed a tendency. In addition, the items from the BAT could add data on different variables: affective, cognitive, behavioral and self-reported bodily reactions. In particular, the BAT items could present a complex picture of the cognitive variable and its changes in social phobia, focusing on thoughts both before the speech, at speech interruption and two minutes after the speech. This could prove to be of importance, since several shortcomings have been brought forward regarding FNE, the most widely used questionnaire to assess cognitive variables (Heimberg, 1994).

Finally, the results from the BAT offered support to the assumption that cognitive variables play an important role in social phobia. In particular, dysfunctional thoughts after the speech and how content the person was with the own performance seemed to be associated with affective variables and with the reduction in social anxiety. In accordance, it has been suggested that post-event processing may play a crucial role in social phobia, stressing not only the dysfunctional thoughts after the speech, but also the recurrence and intrusion of such thoughts (Rachman et al., 2000).

7.3. Comparing the pilot study and the controlled treatment study

When comparing the group in the pilot study (PT) with the two groups in the controlled treatment study, there are some differences and similarities worth mentioning. Compared with the PT-group, the group working at the university (TU) and the group working at home (WTH) had higher scores on treatment motivation, credibility and expectations at pre-treatment assessment. The scores remained higher at post-treatment assessment on most of these measures. In particular, this was the case in the TU-group. One reason for these results could be that the Ps in the controlled treatment study knew that the self-treatment had already been evaluated and improved in the pilot study. In addition, the focus on suggestions for improvements in the pilot study could have influenced the Ps to focus on errors, problems and shortcomings in the self-treatment. This could have reduced levels of treatment motivation, credibility in and expectancy from the treatment.

In contrast to the variables above, the PT-group had higher scores for computer attitudes. This result was not surprising, since a majority of the Ps in the pilot study were university students. Some of the Ps were even specializing in computer science. There is research evidence suggesting that a high amount of computer

experience is associated with positive computer attitudes (Loyd & Loyd, 1985). Interestingly, even though the PT-group had a more positive computer attitude and the highest degree of Ps with a university degree, these Ps did not seem to perform much better in the memory test than the Ps in the TU-group. In deed, the self-treatment was designed to be comprehensible to most people, i.e. somebody with a university degree should not necessarily have an advantage when working with the self-treatment.

Furthermore, the Ps in the PT-group were somewhat younger and reported an average onset age of 8.6 years. It has been suggested that some social phobics may have an earlier onset than previously assumed, especially persons with severe forms of social phobia (Mannuzza et al., 1995). However, even though the PT-group reported an earlier onset, the scores on SIAS and FNE were almost identical with the scores from the TU- and the WTH-group at the pre-treatment assessment.

As many as 42% of the Ps in the PT-group said that they had no one to talk to, compared with only 10-15% in the TU- and the WTH-group. In spite of this difference in social support, the treatment gains were comparable in the three groups. This somewhat inconclusive result highlights the needs for further research on the influence of social support of self-treatments.

When comparing the scores on speech duration at pre-treatment assessment with other studies using the impromptu speech task (with an audience consisting of three research assistants), the TU-group performed somewhat better (about 6 minutes long) and the WTH-group somewhat poorer (about 4 minutes long), compared with an average of about 5 minutes long speeches for patients with generalized social phobia (Turner et al., 1994). Furthermore, the Ps in the two samples had an average score of about 42-44 on the SIAS at the pre-treatment assessment. The mean score for social phobics in Germany (with a severity rating of 5.7, range 1-8) was reported to be 46.0 on the SIAS (Fehm & Margraf, 2002), whereas the cut-off score for SIAS has been suggested to be 24 in Germany (Stangier et al., 1999). In conclusion, it seems as though the Ps in the formative evaluation were comparable to the Ps in the controlled treatment study on most variables. Both samples clearly differed from non-anxious persons and were comparable to other samples of social phobics. However, they represented a moderate, rather than a severe form of social phobia. In general, both samples showed a reduction in social anxiety at the post-treatment assessment. The Ps in the two groups working at the university, however, seemed to improve more than the group working at home. It should be pointed out that the average score for SIAS for the three groups remained above the cut-off score, differentiating between socially anxious and non-anxious persons. In spite of this, many Ps reported that the change was meaningful to them. In future research, factors such as meaningful change and quality of life should therefore be given more attention.

It has been suggested that computer-based programs have a high ability to catch the user's attention (Ballstaedt, 1997, S. 199-268). In deed, all of the dropouts that could be reached in the present study reported having worked with most sections of the self-treatment. This result is contrasting earlier findings on traditional self-treatments, where some patients did not really give the self-treatment a chance (Öst et al., 1998). In addition, no Ps refused to enter the randomly assigned treatments, which has been the case in previous studies on social phobia (Turner et al., 1996). Thus, the present paper does offer some support to the assumption that computer-based self-treatments may catch the users' interest and attention to a higher degree than traditional self-treatments, and that social phobics are willing to start a self-treatment, viewing it as a low-risk treatment, not being constantly scrutinized by a therapist or by other members in a group therapy.

Finally, the results showed that the improvements of the self-treatment that took place between the pilot study and the controlled treatment study were not powerful enough to change the treatment outcome in a fundamental way. This was not surprising, since the two versions of the self-treatment shared more similarities than there were differences.

7.4. Limitations

In addition to the limitations that have been discussed in previous discussions, some general limitations of the present paper should be mentioned. To begin with, a majority of the research studies on computer attitudes, education and learning have been carried out on young, non-anxious students. In addition, many of the guidelines that have been suggested for interactive multimedia programs are based on studies that have investigated the learning of cause-and-effect relations such as an airplane take-off or a lightning formation. Thus, it is unclear whether or not these results can be generalized to a computer-based self-treatment for socially anxious persons. In deed, there was a high degree of acceptance regarding the guidelines that were used in the present paper. However, just because the user finds something *nice* or *helpful*, does not necessarily imply that it supports the learning process. The situation becomes even more complicated when considering that the technological development leads to constant changes regarding software and hardware, influencing the guidelines for the development of computer programs.

An attempt to handle this and other problems in the present study was to develop evaluation methods and self-report questionnaires that could give additional information on what guidelines could be suitable and how the program content should look like. Since there are no such methods or questionnaires already developed and standardized for self-treatments, the ones used in the present paper were taken from other research areas such as research on education, computer science and evaluation. In order to better fit the aims and needs of the present paper and give the participants (Ps) a frame-of-reference, these methods and questionnaires were often shortened and/or adapted. As a result, the reliability and validity of these measures are unclear. In addition, there are limited possibilities to compare the results with other studies. For future studies, there is a need for standardized questionnaires and tests that allow for comparisons between self-treatments. Important to researchers, as well as to clinicians and patients.

In particular, the KNT-questionnaire seems to have serious shortcomings, containing many questions that Ps could answer already at the pre-treatment assessment. Thus, there was a ceiling effect, not allowing for much change at the post-treatment assessment. It is important to point out that the high scores on the KNT also add support to the assumption that social phobics in general know much about how to behave in social situations, even though they tend not to make use of this knowledge (Hill, 1989).

The multidisciplinary approach that was adopted in the present paper brings additional limitations with it. Many variables were investigated based on findings from other research fields. However, with a high amount of variables being investigated, there are limited resources available to focus on each variable. For example, the learning effect was assessed with the KNT-questionnaire and a memory test based on pictures. However, there are many additional ways to evaluate the learning effect that could have been applied in order to generate a more comprehensive picture. The reason for focusing on so many variables was that there is little known about self-regulated learning with a self-treatments, the processes that influence a

meaningful understanding of the treatment and subsequent treatment outcome. In particular, this is true for computer-based self-treatment. The present paper could be described as a first step, trying to identify what variables should be investigated in future studies, and how.

It has been suggested that about 14% of social phobics drop out of treatment studies (Turner et al., 1996). In the present paper, the level of attrition is higher. In the PT-group, there were about 27% of the Ps that dropped out of treatment. In accordance, about 30% of the Ps in the WTH-group were dropouts. In a previous study on traditional self-treatments, the level of attrition was reported to be about 37% (Öst et al., 1998). In contrast, only 15% dropped out of the treatment in the TU-group. In conclusion, the results from the TU-group showed that it is possible to keep the level of attrition low in a minimal contact design. However, the present paper is unable to generate conclusive evidence regarding what factors might have influenced the level of attrition. Even though the overall level of attrition was somewhat lower than in the previous study mentioned above, the sample size in the present paper was small and there are limitations to the statistical calculations, i.e. the results that have been reported must be viewed with caution.

Another serious limitation is that the author self, who developed the self-treatment, was involved in the summative evaluation. In the formative evaluation there are many advantages with having the developers participating. However, in the summative evaluation this could be a problem because of lack of objectivity. A way to overcome this problem was to include self-report questionnaires, memory test as well as data from the BAT, where the influence from the author on the results was limited. Importantly, the treatment was conducted by the Ps themselves and not by any of the research assistants or by the author.

Finally, this paper produced no evidence on whether or not self-treatments are cost effective and how they can be implemented online. In deed, these are two of the most important questions for future self-treatments. However, it was beyond the scope of the present paper to focus on these aspects. Nevertheless, many of the suggestions that have been made in this paper, are relevant to the question of affordability. In addition, many suggestions can most likely be generalized to computer-based self-treatments with an online connection.

8. CONCLUDING REMARKS

- A computer-based self-treatment for social phobia seems to have a high degree of acceptance. In particular, the level of attrition appears to be somewhat lower than for traditional self-treatments, dropouts tend to work with the self-treatment for some time (rather than to quit right away at the beginning) and there has been a low level of refusals (to enter the treatment) reported, compared with other behavioral treatments.

- A computer-based self-treatment can reduce social anxiety. About 35% of the participants showed strong improvements after six weeks of treatment at the university, whereas 24-36% showed small or no improvements.

- In particular, a self-treatment could be suitable for persons that are older, have an onset age in the mid and the late adolescence and do not have severe forms of social anxiety or depression.

- The results lend support to the assumption that the learning effect as such and learning behaviors are important to investigate with regard to self-treatment. In particular, responders could recall more from the most important program section, whereas non-responders recalled more from less important sections. Thus, in self-treatments it could be important to be able to decide what sections are important and to be able to ask for help when running into difficulties, i.e. help-seeking behaviors and social support may also be of importance. In addition, persons with an intrinsic, rather than extrinsic motivation are more likely to be successful with a self-treatment.

- The reduction of social anxiety seems to be associated with a reduction in dysfunctional thoughts. In particular, thoughts that occur after a certain situation, rather than thoughts that occur in anticipation of the situation. Interestingly, the thoughts after the situation and how content a person is with his or her performance may change, even if the performance itself does not.

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APPENDIX

Appendix I: Interviews and assessment material

Appendix II: Results in detail

Appendix III: The self-treatment

SEMI-STRUCTURED INTERVIEW

1. Präsentation...Fragen?
2. Kurze Info über das Interview (Dauer des Interviews!)...Fragen?
3. Kurze Info über das Projekt...Fragen?

A. Allgemeine Fragen

4. Alter
5. Beruf
6. Tätigkeit (Vollzeit, Teilzeit, arbeitslos, Erziehungsurlaub)
7. Schulbildung
8. Zivilstand (verheiratet, single)
9. Geschlecht

B. Spezifische Fragen

10. Erzählen Sie bitte, in welchen Situationen Sie sich unsicher fühlen...

An Hand einer typischen Situation:
11. Wie stark ist in dieser Situation Ihre Unsicherheit (0-100%)?
12. Wie oft (immer, sehr oft, manchmal, selten, nie)
    - Schwitzen
    - Erröten
    - Zittern
    - häufiger Harndrang
    - Herzklopfen
    - Eigenes Beispiel
13. Welche Gedanken haben Sie vor der Situation?
14. Welche Gedanken haben Sie in der Situation (Kontrolle zu verlieren oder Angst zu sterben)?
15. Welche Gedanken haben Sie nach der Situation?
16. Was wäre das Schlimmste, was in solchen Situationen passieren könnte (Katastrophenged.)?
17. Wie gehen Sie mit Ihrer Unsicherheit um (Copingstrategien)?
18. Trinken Sie regelmäßig Alkohol? Wenn ja, was, wieviel und wie oft? Um Angst zu vermindern?
19. Nehmen Sie regelmäßig Medikamente oder Beruhigungsmittel? Wenn ja, welche, wieviel, wie oft?
20. Benutzen Sie Drogen? Wenn ja, was, wieviel und wie oft?
21. Wann, glauben Sie, hat Ihre Unsicherheiten angefangen?
22. Ist zu dieser Zeit etwas außergewöhnliches passiert?
    A. traumatische Erfahrung (hat Ihre Unsicherheit mit einer Situation zu tun, in der etwas furchterregendes passiert ist?)...
    B. Information (haben Sie im Fernsehen gesehen oder von Verwandten und Bekannten gehört, dass diese Situationen gefährlich sein könnten?)
    C. Modell (haben Sie selbst jemanden beobachtet, der Angst in solchen Situationen bekommen hat? Gibt es ähnliche Probleme bei anderen Mitglieder Ihrer Familie?)
        Duration?
23. Welche Auswirkungen hat dieses Problem beruflich für Sie (gibt es z.B. irgendetwas, was Sie nicht machen können aber wollten?)?   0 1 2 3 4 5 6 7 8
24. Welche Auswirkungen hat dieses Problem privat für Sie (gibt es z.B. irgend etwas, was Sie nicht machen können aber wollten?)?   0 1 2 3 4 5 6 7 8
25. Haben Sie an anderen Programmen, Trainings oder Therapien bezüglich Ihrer Unsicherheiten teilgenommen (Wenn ja, was haben Sie gemacht und wann war das?)?
26. Haben Sie irgendwelche andere Beschwerden oder Probleme, die Ihr Leben stark beeinflussen? (z.B. sind Sie depressiv oder haben Sie körperliche Krankheiten wie Herz- oder Atemwegs-beschwerden?)?
27. Erzählen Sie bitte ein bisschen über die Personen in Ihrem Leben, mit denen Sie eng befreundet sind oder zu denen Sie volles Vertrauen haben?
28. Möchten Sie mit dem Programm allein arbeiten oder würden Sie Hilfe benutzen? ...hätten Sie jemanden mit denen Sie eng befreundet sind oder zu denen Sie volles Vertrauen haben, Personen, die Ihnen während des Programms behilflich sein könnten?
29. Wie reagieren die Personen, die von Ihrer Unsicherheit wissen?
30. Erfüllt die/der Pat. Inklusionskriterien?

INFORMATION UND EINWILLIGUNG

Ein Selbsthilfeprogramm durch CD-ROM soll erprobt werden. Grundlage dieses Programmes ist der kognitive-verhaltenstherapeutische Ansatz zur Überwindung von sozialer Unsicherheit und Verbesserung der sozialen Kompetenz. Die Teilnahme fängt mit einem Interview an. Wichtig für Sie zu wissen:

- Alle Ihre Antworten werden selbstverständlich vertraulich behandelt und werden nur als Teil von Gruppenwerten in Forschungsberichten präsentiert.
- Die Teilnahme ist freiwillig, d.h. Sie können das Programm zu jeder Zeit abbrechen, ohne dass es für Sie negative Auswirkungen hat.

Voraussetzungen für eine Teilnahme:

- Sie sind bereit im Rahmen des wissenschaftlichen Forschungsprojekts, dieses Selbsthilfeprogramm durchzuführen. Die Teilnehmer werden in zwei Gruppen aufgeteilt (Zufallsprinzip!):
  Gruppe A → 6 Wochen lang 2 mal pro Woche in die Christophstr. 2 kommen
  und mit der CD-ROM arbeiten
  Gruppe B → 5 Wochen lang warten, Fragebögen noch einmal ausfüllen und
  danach mit der CD-ROM 6 Wochen lang, zu Hause arbeiten
- Sie sind bereit, Fragebögen vor und nach der Arbeit mit der CD-ROM auszufüllen.
- Sie wissen, dass Sie keine Krankheiten (z.B. Herz- oder Atemwegsbeschwerden) haben, die Ihre Teilnahme verhindern könnten. Wenn nein, möchten wir, dass Sie die Frage vor Ihrer Teilnahme mit Ihrem Hausarzt klären.
- Sie sind bereit, von Ihren Erfahrungen mit der CD-ROM zu berichten.
- Wollen Sie Ihre Teilnahme abbrechen, setzen Sie sich bitte mit Frau Martina Wolf oder Herrn Prof. Dr. Hautzinger in Verbindung.

Ich bin mit dem Ablauf und den Teilnahmebedingungen einverstanden...

Datum: _ _ _ _ _ _ _ _   Name: _

Unterschrift: _

Wie können wir Sie erreichen?

Adresse:

E-Mail Adresse:

Telefon:

Handy:

SELF-REPORT QUESTIONNAIRES IN DETAIL

- **The NML-items:**
  - *My insecurity in social situations makes me profoundly unhappy.*
  - *Despite my insecurity I can function well in daily life.*
  - *I will do anything to get rid of my insecurity.*
  - *Because of my insecurity I cannot meet a number of essential commitments.*
  - *Because of my insecurity a number of people is extra nice to me.*
  - *I expect to benefit more from the self-help program if I take an active part in it.*
  - *I keep my appointments regarding the program, no matter what.*
  - *I'm not very optimistic about the outcome of the program I'm about to follow.*
  - *Actually, I think that my insecurity has a physical cause.*
  - *The cause of my insecurity lies primarily in my living conditions.*
  - *I'm known as someone who perseveres.*

- **The BN-items:**
  - *How logical does this type of program seem to you?* (Credibility)
  - *How confident would you be in recommending this program to an anxious friend?* (Credibility)
  - *How confident are you that this program will be successful?* (Expectancy)
  - *How successful do you feel this program will be in decreasing your insecurity?* (Expectancy)

- **The KNT-items:**
  - *I do not think, that I can influence my fears (in social situations).*
  - *Social fears is a seldom problem.*
  - *When feeling anxious in a situation, one should leave the situation as soon as possible.*
  - *The physiological anxiety reactions are not dangerous.*
  - *I can learn by observing others.*
  - *To be happier, is a concrete and realistic aim.*
  - *Using my thoughts, I can influence my insecurity.*
  - *The physiological anxiety reactions can only be understood as negative.*
  - *While working with the program, one could generally expect a rapid decrease of insecurity.*
  - *When a person judges a certain situation as dangerous, it can almost always be taken for granted, that the situation really is dangerous for the person.*
  - *Eye-contact is an important social skill.*
  - *Pauses in a conversation are signs, that conversation is not running well,mostly embarrassing.*
  - *In a conversation, the words are more important than the body language.*
  - *When learning something new, one should try to take small steps.*
  - *When wanting to learn how to deal with social fears, one must challenge the fears.*

- **The AFS-items:**
  - *I know a lot about computers.*
  - *I work weekly or more often with computers.*
  - *I have already had negative experiences with computers.*
  - *Computers do not scare me at all.*
  - *I have never worked with a computer-based learning program.*
  - *Working with a computer makes me nervous.*
  - *I would feel comfortable working with a computer.*
  - *When there is a problem with the computer that I can't solve, I would stop.*
  - *I am not the type to work well with computers.*
  - *I have a lot of self-confidence when it comes to working with computers.*

- **The CAS-items:**
  - *Computers make me feel uneasy and confused.* (Anxiety)
  - *I get a thinking feeling when I think of trying to use a computer.* (Anxiety)
  - *I would feel at ease in a computer class.* (Anxiety)
  - *I do not think I could handle a computer course.* (Confidence)
  - *I could get good grades in computer courses.* (Confidence)
  - *I think using a computer would be very hard for me.* (Confidence)
  - *I would like working with computers.* (Liking)
  - *I think working with computers would be enjoyable and stimulating.* (Liking)
  - *Figuring out computer problems does not appeal to me.* (Liking)
  - *I'll need a firm mastery of computers for my future work.* (Usefulness in work)
  - *I can't think of any way that I will use computers in my career.* (Usefulness in work)

- **The LRNV-items**
  - *Wenn ich meine Leiter ausprobiere, halte ich mich an einen Zeitplan: Wann genau werde ich mit welcher Stufe versuchen.*
  - *Das, was ich im Programm anschaue, prüfe ich kritisch.*
  - *Ich arbeite so lange mit dem Programm, bis ich mir sicher bin, die Leiter erfolgreich ausprobieren zu können.*
  - *Beim Ausprobieren der Leiter, überlege ich im Voraus, was ich machen möchte und wie ich es mache.*
  - *Beim Ausprobieren der Leiter, lerne ich meine Strategien (z.B wie man mit negativen Gedanken oder physiologischen Reaktionen umgehen kann) möglichst auswendig.*
  - *Ich plane auf lange Zeit voraus, wann ich welche Stufen (in der Leiter) ausprobieren möchte.*
  - *Ich bearbeite zusätzliche Aufgaben im Programm (wenn welche angeboten werden), um zu sehen, ob ich den Stoff verstanden habe oder nicht.*
  - *Ich denke mir eigene Beispiele zu bestimmten Inhalten aus.*
  - *Ich denke über Alternativen zu den Behauptungen im Programm nach.*
  - *Ich fertige eine Gliederung an, die die Struktur des Stoffs wiedergibt.*
  - *Ich gehe manche Programmabschnitte häufig durch, um möglichst viel auswendig zu lernen*
  - *Ich stelle mir Fragen zum Stoff, um sicherzugehen, dass ich alles verstanden habe.*
  - *Ich erstelle kurze Zusammenfassungen mit den Hauptideen.*
  - *Wenn ich einen schwierigen Abschnitt durchschaue, passe ich meine Vorgehensweise den höheren Anforderungen an (z.B. durch langsameres Lesen und Wiederholungen).*
  - *Ich strenge mich auch dann an, wenn mir der Stoff überhaupt nicht liegt.*
  - *Ich versuche, den Programmstoff mit dem zu verbinden, was ich schon weiß.*
  - *Ich überlege mir selten, in welcher Reihenfolge ich den Stoff durcharbeite.*
  - *Ich versuche, neue Begriffe und Strategien auf mir bereits bekannte Begriffe und Vorgehensweisen zu beziehen.*
  - *Ich versuche herauszufinden, welche Programmabschnitte ich noch ungenügend verstanden habe.*
  - *Vor dem Anschauen eines Abschnitts überlege ich mir, welche Vorgehensweise, die die effektivste für mich ist.*
  - *Wenn ich nicht verstehe, wie ich die Leiter aufstelle, halte ich meine Fragen fest und gehe relevante Programmabschnitte noch einmal daraufhin durch.*
  - *Fehlende Informationen suche ich mir aus verschiedenen Quellen zusammen (z.B. Zeitungen, Bücher oder Internet).*
  - *Ich ertappe mich dabei, dass ich während der Arbeit mit dem Programm mit meinen Gedanken ganz woanders bin.*
  - *Der Arbeitsplatz (wo der Rechner steht) ist so gestaltet, dass ich alles schnell finden kann.*
  - *Ich bespreche Teile des Programmstoffs mit Personen, zu denen ich Vertrauen habe.*
  - *Ich suche nach weiterführende Literatur, wenn mir bestimmte Inhalte noch nicht ganz klar sind.*
  - *Beim Ausprobieren meiner Leiter bin ich unkonzentriert*
  - *Die wichtigsten Hilfsmittel (z.B. einen Zettel mit Strategien oder ein Arbeitsblatt) habe ich griffbereit bei mir dabei, wenn ich meine Leiter in der Stadt ausprobiere.*
  - *Meine Leiter probiere ich zusammen mit einem Freund aus.*

- **the SE-items**
  - *Am besten arbeite ich mit dem Selbsthilfeprogramm, wenn mir jemand sagt, wie ich vorgehen soll*
  - *Wenn ich mich genügend anstrenge, verstehen ich jeden Stoff.*
  - *Wenn ich die Schwierigkeit meiner Leiter mit meinen Fähigkeiten vergleiche, denke ich, dass ich die Leiter gut meistern werde.*
  - *Ich arbeite gerne mit einem Programm, das mich wirklich herausfordert, so dass ich Neues kennenlerne.*
  - *Es befriedigt mich am meisten, wenn ich versuche, den Inhalt des Programms möglichst genau zu verstehen.*
  - *Wenn ich mit einem Selbsthilfeprogramm arbeite, benötige ich oft Hilfe.*
  - *Ich habe häufig Probleme, mich zu motivieren, mit dem Programm weiter zu arbeiten.*
  - *Wenn ich mit dem Programm arbeite, ist das Endergebnis das Wichtigste für mich.*
  - *Ob ich mit dem Program erfolgreich sein werde, liegt nur an mir alleine.*
  - *Ich bin sicher, dass ich den gesamten Stoff dieses Programms verstehe.*
  - *Ich kann sehr gut mit einem Selbsthilfeprogramm arbeiten.*

- *Ich möchte meine Leiter ausprobieren, weil es wichtig ist, anderen meine neuen Fähigkeiten zu demonstrieren.*
- *Wenn ich die Möglichkeit habe, Programmabschnitt selbst auszuwählen, bevorzuge ich solche, von denen ich viel lernen kann, auch wenn sie für das Endergebnis nicht so wichtig sind.*
- *Wenn ich einen Programmabschnitt nicht verstehe, denke ich manchmal, dass ich nicht genügend begabt bin.*
- *Wenn ich mit dem Programm Erfolg haben will, brauche ich Glück.*
- *Es fällt mir schwer, im Umgang mit dem Programm, realistische Ziele zu setzen.*
- *Ich weiß, wie ich vorgehen muss, um mein Ziel, das ich einmal gesetzt habe, auch wirklich zu erreichen.*
- *Um mich wirklich mit dem Programm auseinanderzusetzen, benötige ich den Druck von außen.*
- *Ich bin davon überzeugt, dass ich das Programm erfolgreich beenden kann.*
- *Ich arbeite oft ziellos mit dem Programm.*
- *Ich möchte gerne eine größere Verbesserung meiner Unsicherheit erreichen, als die meisten anderen Teilnehmer im Projekt.*

ABSCHLUSSINTERVIEW – FORMATIVE EVALUATION

1. Welche Erwartungen hatten Sie am Anfang an das Programm?
2. Welches Ziel hatten Sie am Anfang mit Ihrer Teilnahme?
    -   Haben Sie Ihrer Meinung nach, Ihr Ziel erreicht?
    -   Wieviel Stunden pro Woche (einschl. der Computersitzungen) haben Sie sich mit
    -   der vermittelten Thematik beschäftigt?
    -   Wieviel Schritte haben Sie bis heute von ihrer Leiter ausprobieren können?
    -   Wie ging es Ihnen dabei?
    -   Wie wahrscheinlich ist es, daß Sie die restlichen Schritte in den nächsten 3
    -   Monaten ausprobieren?
3. Wie war es, in einer Evaluation teilzunehmen?
4. Hätten Sie auch allein zu Hause mit der CD-ROM arbeiten können?
5. Um mit der CD-ROM besser klarzukommen... Hätten Sie mehr Unterstützung gebraucht?
6. Meinen Sie, dass Programme wie diese CD-ROM eine Existenzberechtigung haben? Warum sollte man mit dem Programm arbeiten?
7. Wenn man eine CD-ROM entwickelt, sollte man zuerst überlegen, welche Zielgruppe man hat. Ist die CD für die Zielgruppe „soziale unsichere" geeignet? Warum/warum nicht?
8. Wir haben als Ziel, dass Personen soziale Unsicherheit mit Hilfe der CD-ROM abbauen können. Ist das, Ihrer Meinung nach, ein realistisches Ziel?
9. Welche Voraussetzungen braucht man, meinen Sie, um Erfolg mit dem Programm zu haben?
10. Wie haben Sie mit den Teilen der CD-ROM gearbeitet (reihenfolge), schätzen Sie die Schwierigkeit ein (0-10)?
11. Wie sollte man arbeiten –> Lernstrategier, Ihre Tipps?
12. Haben Sie je Teile wiederholt?
13. Wie ist die Interaktivität ?
14. Welcher Teil, meinen Sie, war der Wichtigste?
15. Gibt es Teile, die überflüssig sind?
16. Gibt es Teile, die fehlen?
17. Wie ist die Navigation – hatten Sie je selbst Probleme?
18. Haben Sie Programmfunktionen vermisst?
19. Haben Sie jemanden gehabt, der Ihnen während der Arbeit geholfen hat z.B mit Hausaufgaben oder mit der Leiter (Co-Therapeut)?
20. Haben Sie den Teil Hausaufgaben angeschaut? Wie oft?
21. Haben Sie Hausaufgaben gemacht? Wie oft?
    Wie ist es gelaufen? Hat es etwas gebracht?
22. Wie war der Text (Vokabel)?
23. Wie waren die Bilder und Beispiele, Oberfläche?
24. Wie waren Susanne und Walter als Beispiele?
25. Wie war der Sound/Ton?
26. Wie war die Farben?
27. Wie waren die Arbeitsblätter?

THE CRITERIA CATALOGUE – THE RESULTS IN %
(Open questions and their answers are excluded for practical reasons)

Teil A - Voraussetzungen und Vorkenntnisse

1. In welchem Beruf/Bereich sind Sie tätig?
   Psychologe 56%   Lehrer/Sprachexperten 22%   Computer 22%

2. Kennen Sie sich im Bereich „Kognitive Verhaltenstherapie" und „Exposition in vivo" schon aus?

Sie kennen sich überhaupt nicht aus				Sie kennen sich sehr gut aus
23%	33%	0%	33%	11%

3. Haben Sie bereits Erfahrungen mit Selbsthilfeprogrammen oder Lernsoftware gemacht?
   Ja 33%   Nein 67%

4. Wie gut kennen Sie sich mit Computer aus?

Sie kennen sich überhaupt nicht aus				Sie kennen sich sehr gut aus
44%	33%	0%	23%	0%

5. Wie oft arbeiten Sie mit Computer?

überhaupt nicht	wenig	monatlich	wöchentlich	täglich
22%	0%	78%	0%	0%

6. Hatten irgendwelche Erwartungen an die CD-ROM sich bereits gebildet, als Sie mit der CD-ROM anfangen wollten?   Ja 22%   Nein 78%

Nach dem Sie das Programm angeschaut haben...

Teil B1 – Programmtechnische Analyse

7. Hatten Sie programmtechnische Probleme?

Startprobleme	Ja 11%	Nein 89%
Tonprobleme	Ja 0%	Nein 100%
Probleme bei den Eingaben	Ja 0%	Nein 100%
Absturz	Ja 22%	Nein 78%

8. Wie war die Navigation/die Bedienung des Programms?

Benutzer-freundlich	11%	34%	44%	11%	0%	nicht Benutzer-freundlich
logisch	34%	44%	11%	11%	0%	unlogisch
fehlerfrei	11%	56%	22%	0%	11%	fehlerhaft
einheitlich	33%	44%	0%	0%	23%	nicht einheitlich
verständliche Symbolverw.	34%	33%	0%	33%	0%	keine verständliche Symbolverwendung

9. Haben Sie während der Arbeit mit der CD-ROM die Orientierung darüber verloren, wo Sie sich im Programm befinden?   Ja 33%   Nein 67%

10. Fehlen Programmfunktionen im Programm?   Ja 78%   Nein 22%

11. Kann der Anwender allgemein den Ablauf des Programm ausreichend beeinflussen?
    Ja 100% Nein 0%

einen Abschnitt überspringen	Ja 100%	Nein 0%
Abschnitte wiederholen	Ja 100%	Nein 0%
Das Programm selbst beenden	Ja 89%	Nein 11%
Bearbeitungszeit selbst bestimmen	Ja 78%	Nein 22%
Informationsmenge ändern	Ja 67%	Nein 33%
Fehler bei Eingaben löschen oder korrigieren	Ja 89%	Nein 11%
Mit Hilfe von Menüs bestimmte Teile wählen	Ja 89%	Nein 11%
Pause machen	Ja 67%	Nein 33%

Teil B2 – Inhalt und didaktische Gestaltung

13. War der Programmstoff Ihnen bereits bekannt? Ja 56% teilweise 33% Nein 11%

14. Wie war der Inhalt?

informativ	33%	0%	67%	0%	0%	nicht informativ
unterhaltsam	33%	56%	0%	11%	0%	nicht unterhaltsam
realitätsnah	33%	56%	0%	11%	0%	nicht realitätsnah
relevant	78%	0%	22%	0%	0%	nicht relevant
verständlich	78%	0%	22%	0%	0%	unverständlich
auf dem neuesten Stand	40%	40%	0%	20%	0%	veraltet
zu umfangreich	22%	22%	0%	12%	44%	umfangreich genug
hat eine klare struktur	56%	22%	0%	22%	0%	hat keine klare struktur
wichtige Punkte werden betont	22%	56%	0%	22%	0%	wichtige Punkte werden nicht betont
präzis	56%	33%	0%	11%	0%	ungenau

15. Haben die Inhalte des Programms Sie zum Mitdenken angeregt? Ja 89% Nein 11%

16. Wie waren die Beispiele im Programm?

informativ	38%	0%	62%	0%	0%	nicht informativ
unterhaltsam	50%	38%	0%	12%	0%	nicht unterhaltsam
realitätsnah	38%	24%	0%	38%	0%	nicht realitätsnah
relevant	76%	12%	0%	12%	0%	nicht relevant
verständlich	76%	12%	0%	12%	0%	unverständlich
hilfreich	63%	12%	0%	25%	0%	nicht hilfreich
zu wenig	12%	12%	39%	12%	25%	genügend

17. Waren Susanne und Walter nützliche Erfahrungsberichte? Ja 89% Nein 11%

18. Nach der Bearbeitung der ersten Programmteile, ist man auf das gesamte Programm neugierig geworden? Ja 100% Nein 0%

19. Wie waren die Übungen/Aufgaben?

gelungen	44%	44%	0%	12%	0%	nicht gelungen
realitätsnah	22%	56%	11%	11%	0%	nicht realitätsnah
relevant	22%	67%	0%	11%	0%	nicht relevant
verständlich	44%	0%	56%	0%	0%	unverständlich
zu wenig	11%	0%	11%	34%	44%	genügend
realisierbar	34%	34%	0%	32%	0%	nicht realisierbar

20. Gibt es Programmteile oder einzelne Seiten, die wichtiger als andere Teile/Bilder sind? Ja 56% Nein 44%

21. Gibt es Programmteile oder einzelne Seiten, die überflüssig sind? Ja 0% Nein 100%

22. Fehlen Programmpunkte, Bilder oder Beispiele? Ja 33% Nein 67%

23. Bietet das Programm genügend Möglichkeiten an, sich aktiv mit dem Inhalt auseinanderzusetzen? Ja 44% Nein 56%

24. Wie sind die Arbeitsblätter?

gelungen	Ja 100%	Nein 0%
genügend (Arbeitsblätter für das Programm)	Ja 78%	Nein 22%
kompliziert	Ja 22%	Nein 78%
überschaubar	Ja 100%	Nein 0%
realisierbar	Ja 89%	Nein 11%
einheitlich	Ja 100%	Nein 0%

Teil B3 – Oberfläche (Graphik, Text, Farbe, Ton usw.)

25. Wie war der Text?

deutlich	78%	0%	11%	11%	0%	schwierig zu lesen
überschaubar	78%	0%	22%	0%	0%	zu viel Text auf einer Seite
wichtige Worte durch Größe oder Farbe betont	23%	44%	0%	33%	0%	wichtige Worte nicht betont
Fehler in der Rechtschreibung	11%	45%	11%	22%	11%	keine Fehler in der Rechtschreibung
einheitlich	56%	22%	11%	11%	0%	nicht einheitlich

26. Wie waren die Bilder?

informativ	56%	22%	11%	11%	0%	nicht informativ
unterhaltsam	56%	33%	0%	11%	0%	nicht unterhaltsam
realitätsnah	45%	33%	0%	22%	0%	nicht realitätsnah
relevant	33%	45%	11%	11%	0%	nicht relevant
verständlich	56%	0%	44%	0%	0%	unverständlich
einheitlich	33%	56%	0%	11%	0%	nicht einheitlich
zu wenig	11%	0%	22%	67%	0%	genügend
in Überein-Stimmung mit dem Text	56%	0%	44%	0%	0%	nicht in Überein-Stimmung mit dem Text
angemessen placiert	44%	44%	0%	11%	0%	nicht angemessen placiert

27. Haben die Bilder zu einem besseren Verständnis des Programmstoffs verhelfen können?

Ja 89% Nein 11%

28. Ist die Bildschirmeinteilung allgemein übersichtlich? Ja 88% Nein 12%

29. Ist das Seiten-Layout allgemein ansprechend? Ja 89% Nein 11%

30. Ist die Farbgestaltung allgemein angenehm? Ja 89% Nein 11%

31. Wird die Farbe verwendet, um Aufmerksamkeit auf das zu lenken, was wichtig ist?

Ja 78% Nein 22%

32. Besteht eine ausreichende Abwechslung bei den Bildschirmseiten?

Ja 89% Nein 11%

33. Wie erläutern die gesprochenen Kommentare den geschriebenen Text?

sehr schlecht	0%	22%	56%	22%	0%	sehr gut

34. Wie ist die Tonaufnahme (die Stimmen von z.B. Susanne, Walter)?

informativ	38%	38%	12%	12%	0%	nicht informativ
unterhaltsam	50%	0%	50%	0%	0%	nicht unterhaltsam
realitätsnah	25%	25%	38%	12%	0%	nicht realitätsnah
verständlich	25%	40%	0%	35%	0%	unverständlich
hilfreich	40%	35%	0%	25%	0%	nicht hilfreich
schwer zu verstehen	0%	38%	12%	50%	0%	leicht zu verstehen

Test B4 - Implementation

35. Braucht man irgend welche Vorkenntnisse, um mit der CD-ROM klarzukommen?

Ja 11% Nein 89%

36. Wie meinen Sie, könnte man die CD-ROM einsetzen?

Als Zusatzbehandlung „für zu Hause" in einer Therapeuten-unterstützen Behandlung	Ja 100%	Nein 0%
Als Selbstbehandlung mit zusätzlichem Therapeutenkontakt, telefonisch oder über Internet	Ja 78%	Nein 22%
Als Selbstbehandlung ohne weitere Hilfe oder Kontakt	Ja 44%	Nein 56%

Als Selbstbehandlung mit zusätzlich 1-2 Sitzungen
beim Therapeuten   Ja 100% Nein 0%
Als Selbstbehandlung, die Klienten arbeiten in Gruppen   Ja 75% Nein 25%

38. Braucht man zusätzliches Printmaterial?   Ja 44% Nein 56%

39. Lässt sich die CD-ROM flexibel einsätzen (sowohl bei Personen mit generalizierter und ausgeprägter Angst als auch bei Personen, die ein mehr abgegrenzte und unkompliziertere Unsicherheit haben)?   Ja 33% Nein 67%

40. Lässt sich die CD-ROM auch für andere Angststörungen einsätzen (z.B Agoraphobie, Tierphobien oder Blutphobie)?   Ja 67% Nein 33%

Teil B5 - Bewertung

41. Ist die CD-ROM allgemein gelungen geworden?   Ja 100% Nein 0%

42. Ist die CD-ROM allgemein unterhaltsam gewesen?   Ja 100% Nein 0%

43. Hat die CD-ROM Ihre anfänglichen Erwartungen erfüllt?   Ja 78% Nein 22%

44. Meinen Sie, dass man mit Hilfe der CD-ROM das Programmziel „soziale Unsicherheit abbauen" erreichen kann?   Ja 89% Nein 11%

45. Würden Sie diese CD-ROM weiter empfehlen?   Ja 100% Nein 0%

Teil B6 – Lerneffekt und Lernstrategien

46. Haben Sie nach der Bearbeitung des Programms das Gefühl, etwas Neues gelernt zu haben?
                                                             Ja 56% Nein 44%

47. Kann man den eigenen Lernerfolg im Programm überprüfen?   Ja 88% Nein 12%

48. Ist es sinnvoll, wenn es um dieses Programm „Abbau sozialer Unsicherheit" geht, den Lernerfolg zu überprüfen?   Ja 100% Nein 0%

49. Welche Lernstrategien kommen im Programm vor?
      Lernstrategien, die den Langzeitgedächtnis dienen   Ja 100% Nein 0%
      Lernstrategien, die die Integration der neuen Informationen
      in die Vorkenntnisse fördern   Ja 89% Nein 11%
      Wichtige Kenntnisse werden in ausreichend großem
      Abstand präsentiert   Ja 78% Nein 22%
      Wiederholungen   Ja 89% Nein 11%
      Differenziertes Feedback (Feedback sieht unterschiedlich
      aus für die Teilnehmer)   Ja 25% Nein 75%
      Interessenweckende Strategien, man informiert was und wozu
      gelernt wird   Ja 89% Nein 11%
      Entdeckendes Lernen   Ja 67% Nein 33%
      Lernende auf Sequenzen verweisen (Gegensatz zu oben) Ja 100% Nein 0%
      Passen die Strategien zu den erwarteten Fähigkeiten
      der Zielgruppe   Ja 100% Nein 0%
      Feedback und Verstärkung   Ja 33% Nein 67%
      Durch Indikatoren, Farbe o.ä. werden Aufmerksamkeit
      erhalten bei z.B. wichtigen Programmpunkten   Ja 100% Nein 0%

50. Vermissen Sie irgendwelche Lernstrategien?   Ja 22% Nein 78%

51. Bot die CD-ROM allgemein genügend Möglichkeiten zum flexiblen selbstgesteuerten Vorgehen?
                                                             Ja 100% Nein 0%

52. Ist es realistisch zu erwarten, dass Personen, die mit dem Programm gearbeitet haben, ihre Lernergebnisse umsetzen können?   Ja 78% Nein 22%

Teil B7 - Abschluss

53. Werden die Hauptpunkte im Programm deutlich genug hervorgehoben?

    Ja 89%   Nein 11%

54. Werden die Voraussetzungen der Teilnahme im Programm überprüft?

    Ja 89% Nein 11%

55. Ist eine Überprüfung sinnvoll?   Ja 100% Nein 0%

56. Erscheint Ihnen der vorgeschlagene zeitliche Umfang (2 Mal pro Woche, 6 Wochen lang)
    angemessen?   Ja 89%   Nein 11%

57. Wie oft haben Sie mit der CD-ROM gearbeitet?   Mean = 2 Stunden (SD = 1)

58. Wie lange insgesamt haben Sie mit der CD-ROM gearbeitet?   Mean = 3 Stunden (SD = 1)

59. Haben Sie länger mit einem bestimmen Teil gearbeitet als mit anderen, oder haben Sie Teile
    wiederholt?   Ja 22%   Nein 78%

60. Gibt es einen roten Faden im Programm, der die unterschiedlichen Programmteile
    zusammenbindet?   Ja 100% Nein 0%

61. Gibt das Programm allgemein genügend Hilfe/Unterstützung, wenn Teilnehmer Schwierigkeiten
    haben, Aufgaben zu erledigen?   Ja 67%   Nein 33%

62. Halten Sie das Programm allgemein für praxisbezogen und alltagsnah?

    Ja 100% Nein 0%

63. Wird das Programm in Erinnerung bleiben?   Ja 89%   Nein 11%

64. Waren die Hausaufgaben sinnvoll, relevant und realisierbar?   Ja 100% Nein 0%

Table I. Means and SDs from the memory test at the post-treatment assessment for Ps in the pilot study.

Measures	M	SD
Recognition of picture (%) in the memory test		
Distractor items	37.6	20.1
Introductory section	81.6	13.3
Treatment section	85.6	13.9
Recall of topic (%) in the memory test		
Distractor items	0	0
Introductory section	29.8	34.1
Treatment section	28.6	40.0

Table II. Dependent *t*-tests, means and SDs at pre- and post-treatment assessments on self-report questionnaires in the pilot study.

Measures	Assessment	M	SD	*t*-value
SIAS	Pre	43.6	14.0	
	Post	32.5	10.1	3.8*
FNE	Pre	40.8	8.0	
	Post	32.6	9.4	3.3*
SCL-90-R				
Interp. sensitivity	Pre	14.6	8.6	
	Post	9.4	6.7	3.9*
Depression	Pre	13.5	9.0	
	Post	9.5	7.3	2.4 tend.
Anxiety	Pre	6.8	5.1	
	Post	4.6	5.3	1.9
Phobic anxiety	Pre	3.6	3.7	
	Post	2.3	2.8	2.4 tend.
NML	Pre	22.4	2.6	
	Post	23.4	1.9	- 1.7
BN				
Expectancy	Pre	11.3	2.6	
	Post	13.6	2.3	- 2.9 tend.
Credibility	Pre	13.5	1.9	
	Post	15.3	2.4	- 2.6 tend.
KNT	Pre	12.8	2.9	
	Post	14.6	1.1	- 0.1
AFS	Pre	28.3	4.0	
	Post	30.4	3.4	- 1.1

tend. p < 0.05 * p < 0.01, ** p < 0.001, *** p < 0.0001

Table III. Means, SDs and statistical calculations on background data for the two groups in the controlled treatment study.

Variables		Treatment at university (n = 20)	Waitlist followed by treatment at home (n = 20)	χ^2 and ANOVA
Gender	*Females*	12 (60%)	10 (50%)	0.10
	Males	8 (40%)	10 (50%)	
Marital Status	*Married*	10 (50%)	5 (25%)	8.15*
	Unmarried	7 (35%)	14 (70%)	
	Divorced	3 (15%)	1 (5%)	
Occupational status	*Full-time*	12 (60%)	15 (75%)	5.95
	Part-time	4 (20%)	2 (10%)	
	Unemployed	-	-	
	Housewife	2 (10%)	3 (15%)	
	Retired	2 (10%)	-	
Education	*Compulsory school*	-	2 (10%)	6.70
	Professional train.	5 (25%)	5 (25%)	
	High-school	6 (30%)	2 (10%)	
	University	9 (45%)	11 (55%)	
Presence of Comorb.		13 (65%)	9 (45%)	1.62
Have been in treatment		7 (35%)	6 (30%)	0.11
Social support	*Three or more pers.*	5 (25%)	5 (25%)	0.28
	One to two persons	7 (35%)	6 (30%)	
	One person	6 (30%)	6 (30%)	
	Nobody	2 (10%)	3 (15%)	
Age		36.8 (SD = 12.0)	33.0 (SD = 6.4)	1.61
Age of onset		10.0 (SD = 7.0)	11.2 (SD = 8.2)	0.23
Duration		26.8 (SD = 13.3)	21.8 (SD = 8.9)	1.98

tend. $p < 0.05$, * $p < 0.01$, ** $p < 0.001$, *** $p < 0.0001$.

Table IV. Means, SDs and one-way ANOVAs on scores from the memory test, LRNV and SE for both groups in the controlled treatment study.

Measures	Treatment at university		Waitlist followed by treatment at home		
	Means	SD	Means	SD	ANOVA
Recognition of picture (%)					
Distractor items	14.9	17.9	17.9	17.5	0.22
Introductory section	69.8	20.9	76.9	21.8	0.85
Treatment section	76.1	22.4	72.4	20.7	0.23
Recall of topic (%)					
Distractor items	0	0	0	0	-
Introductory section	27.3	29.1	41.2	29.6	1.73
Treatment section	25.1	35.1	21.2	31.0	0.10
Learning strategies (LRNV)					
Cognitive strategies	20.2	4.6	19.3	6.1	0.22
Meta-cognition	7.1	2.6	7.3	1.9	0.04
Internal Resources	20.4	3.0	20.4	3.1	0.00
External Resources	11.4	4.6	9.4	4.0	1.73
Common variables in learning (SE)					
Self-image as learner	31.9	4.8	31.6	5.8	0.01
Intrinsic Motivation	11.0	2.6	10.4	2.7	0.30
Extrinsic Motivation	4.6	3.0	5.6	2.9	0.47
Need of control	5.4	1.7	5.1	1.6	0.12

[tend.] $p < 0.05$, * $p < 0.01$, ** $p < 0.001$, *** $p < 0.0001$.

Table V. Means, SDs and statistical calculations for the Ps fulfilling no criterion (non-responders), 1-2 or 3-4 criteria (responders) for clinically significant improvement on background- and baseline data at the pre-treatment assessment.

Variables		No criterion (n=9)	1-2 criteria (n=15)	3-4 criteria (n=7)	χ^2 and ANOVA
Age		29.2 (8.4)	32.1 (7.2)	44.6 (11.5)	7.00*
Onset		7.7 (2.5)	8.1 (3.4)	13.4 (8.2)	3.80 tend.
Duration		21.6 (8.6)	24.0 (8.8)	31.1 (17.2)	1.57
Marital Status	*Married*	5 (56%)	5 (33%)	5 (71%)	9.24 tend.
	Unmarried	4 (44%)	9 (60%)	-	
	Divorced	-	1 (7%)	2 (29%)	
Education	*Compulsory school*	2 (23%)	1 (7%)	-	5.95
	Professional train.	1 (11%)	2 (13%)	3 (43%)	
	High-school	3 (33%)	4 (27%)	1 (14%)	
	University	3 (33%)	8 (53%)	3 (43%)	
Presence of Comorbidity		4 (44%)	8 (53%)	6 (86%)	3.02
Have been in treatment		2 (23%)	3 (20%)	5 (71%)	6.36 tend.

tend. $p < 0.05$, * $p < 0.01$, ** $p < 0.001$, *** $p < 0.0001$.

Table VI. Means, SDs and ANOVAs on a variety of measures at the pre-treatment assessment for the Ps fulfilling no criterion (non-responders), 1-2 or 3-4 criteria (responders) for clinically significant improvement.

Measures	No criterion (n=9) Means	SD	1-2 criteria (n=15) Means	SD	3-4 criteria (n=7) Means	SD	ANOVA
SIAS	49.8	10.8	42.5	8.7	38.1	12.3	2.76
FNE	45.8	8.7	39.3	8.3	39.0	14.6	1.37
SCL *Interp. sensitivity*	18.8	4.8	13.7	3.5	13.7	7.0	3.62 [tend.]
Depression	23.2	6.3	14.7	9.1	14.1	10.2	3.20 [tend.]
Anxiety	12.0	4.2	9.5	5.0	7.9	3.8	1.72
Phobic anxiety	5.9	3.6	3.8	2.9	4.4	3.2	1.22
NML	24.1	2.6	24.2	2.9	24.1	2.2	1.00
BN *Expectations*	11.7	3.5	14.2	2.6	14.7	4.5	2.12
Credibility	14.3	3.6	16.1	2.6	16.6	3.8	1.18
AFS	26.9	4.8	25.5	6.8	24.9	4.2	0.28
CAS	35.2	3.7	34.0	5.3	32.6	5.1	0.59
BAT *MDT before speech*	70.4	14.3	51.2	24.5	51.9	15.3	2.83
Speech duration in %[b]	25.8	18.8	58.3	32.2	63.6	31.1	4.60 [tend.]
SUDS at interruption	86.1	15.4	66.3	18.7	76.4	18.9	3.52 [tend.]
MDT after the speech	84.2	10.0	49.3	24.6	49.7	20.7	9.13**
How content	14.4	08.8	33.7	18.2	48.6	31.3	5.95*
Memory test *Introd., recog.*	75.1	18.8	74.9	24.3	66.4	18.7	0.42
Introd., recall	41.8	28.6	32.7	32.8	25.0	25.0	0.63
Treat., recog.	72.7	18.4	77.1	17.9	70.9	32.4	0.24
Treat., recall	13.4	29.0	23.4	33.8	35.9	35.7	0.91
LRNV *Meta-cog. strat.*	6.6	1.5	7.0	2.7	8.4	1.7	1.56
Cognitive strat.	18.7	6.2	19.4	5.5	22.0	2.9	0.86
Ext. Resources	7.6	2.9	10.6	4.1	14.0	4.3	5.57*
Int. Resources	19.4	4.0	20.1	2.4	22.4	2.0	2.35
SE *Intrin. motivation*	10.2	2.9	10.6	2.8	12.0	1.6	0.76
Extrin. motivation	4.4	2.3	6.8	2.5	2.4	1.7	6.81*
Self-reg/Need of control	4.4	1.5	5.6	1.7	5.8	1.3	1.48
Self-image	28.9	5.3	33.2	4.7	32.6	4.7	1.82

[tend.] p < 0.05, * p < 0.01, ** p < 0.001, *** p < 0.0001.
MDT = Mean of dysfunctional thoughts before or after the speech.
[a] In Germany, many people finish compulsory school and than start an apprenticeship where they participate in a professional training in combination with theoretical education, aiming at a specific profession.
[b] 100% is here referring to a speech 600 seconds (10 minutes) long. The scores have been changed into percent in order to allow for a comparison between the scores of the cognitive components (rated 0-100) and the behavioral component in the BAT.

Table VII. Means, SDs and statistical calculations for dropouts and completers on background- and baseline data at the pre-treatment assessment.

Variables		Dropouts (n = 9)	Completers (n = 31)	χ^2 and ANOVA
Marital Status	*Married*	3 (33%)	14 (45%)	0.40
	Unmarried	5 (56%)	14 (45%)	
	Divorced	1 (11%)	3 (10%)	
Education	*Compulsory school*	1 (11%)	3 (10%)	3.01
	Professional training [b]	2 (22%)	6 (19%)	
	High-school	0	8 (26%)	
	University	6 (67%)	14 (45%)	
Social support	*Three or more persons*	3 (34%)	7 (23%)	1.81
	One to two persons	2 (22%)	11 (35%)	
	One person	2 (22%)	10 (32%)	
	Nobody	2 (22%)	3 (10%)	
Age		37.7 (7.3)	34.1 (10.2)	0.97
Onset		15.4 (12.1)	9.2 (5.1)	5.35 [tend.]
Duration		22.1 (12.5)	24.9 (11.3)	0.41
SIAS		39.0 (7.5)	43.6 (10.8)	1.44
FNE		40.1 (7.4)	41.0 (10.2)	0.07
SCL-90-R	*Interpersonal sensitivity*	14.4 (6.0)	15.2 (5.2)	0.12
	Depression	13.6 (6.2)	17.1 (9.3)	1.12
	Anxiety	9.4 (4.8)	9.9 (4.7)	0.06
	Phobic anxiety	4.2 (2.3)	4.6 (3.2)	0.08
BAT	*MDT [a] before speech*	60.4 (17.8)	56.9 (21.43)	0.20
	Speech duration in % [c]	35.6 (17.4)	50.1 (32.0)	1.68
	SUDS at interruption	68.9 (19.7)	74.4 (19.3)	0.56
	MDT [a] after speech	57.8 (24.3)	59.5 (25.6)	0.03
NML		23.4 (3.4)	24.2 (2.6)	0.46
BN	*Expectancy*	13.4 (4.3)	13.6 (3.5)	0.01
	Credibility	14.9 (3.2)	15.7 (3.2)	0.42
AFS		23.7 (6.2)	25.7 (5.6)	0.91
CAS		33.6 (4.4)	34.0 (4.8)	0.07

[tend.] $p < 0.05$, * $p < 0.01$, ** $p < 0.001$, *** $p < 0.0001$.

[a] MDT = Mean of dysfunctional thoughts.

[b] In Germany, many people finish compulsory school and than start an apprenticeship where they participate in a professional training in combination with theoretical education, aiming at a specific profession.

[c] 100% is here referring to a speech 600 seconds (10 minutes) long. The scores have been changed into percent in order to allow for a comparison between the scores of the cognitive components (rated 0-100) and the behavioral component in the BAT.

Figure 17. Background on phobias, frame 1.

Figure 18. Background on phobias, frame 2.
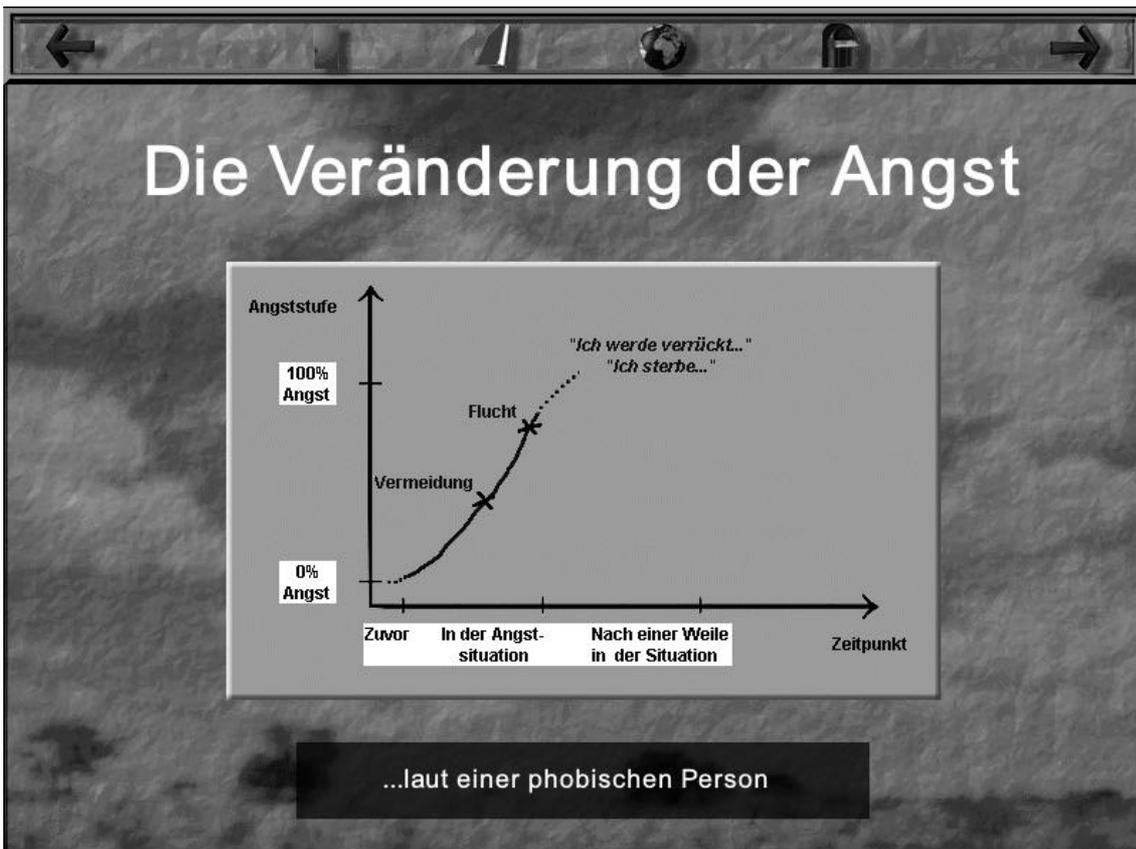
Figure 23. Background on phobias, frame 10.

Figure 24. Background on phobias, frame 11 (animation).

Figure 35. Social phobia, frame 12.

Figure 36. Background on treatments, frame 3.

Figure 39. Background on treatments, frame 9.

Figure 40. Background on treatments, frame 11.

Figure 69. Treatment step 2, frame 6.
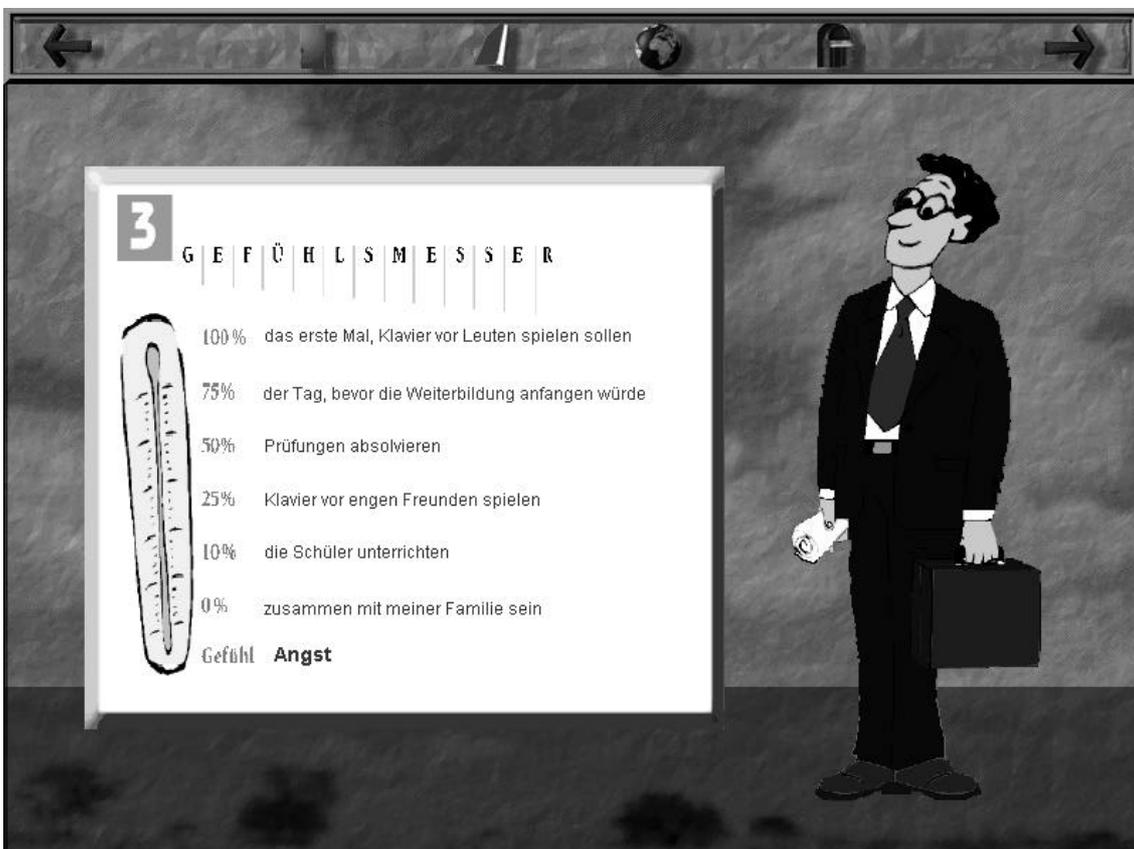
Figure 70. Treatment step 2, frame 7.

Figure 79. Treatment step 3, frame 10.

Figure 80. Treatment step 3, frame 14.

Figure 93. Treatment step 4, frame 32.
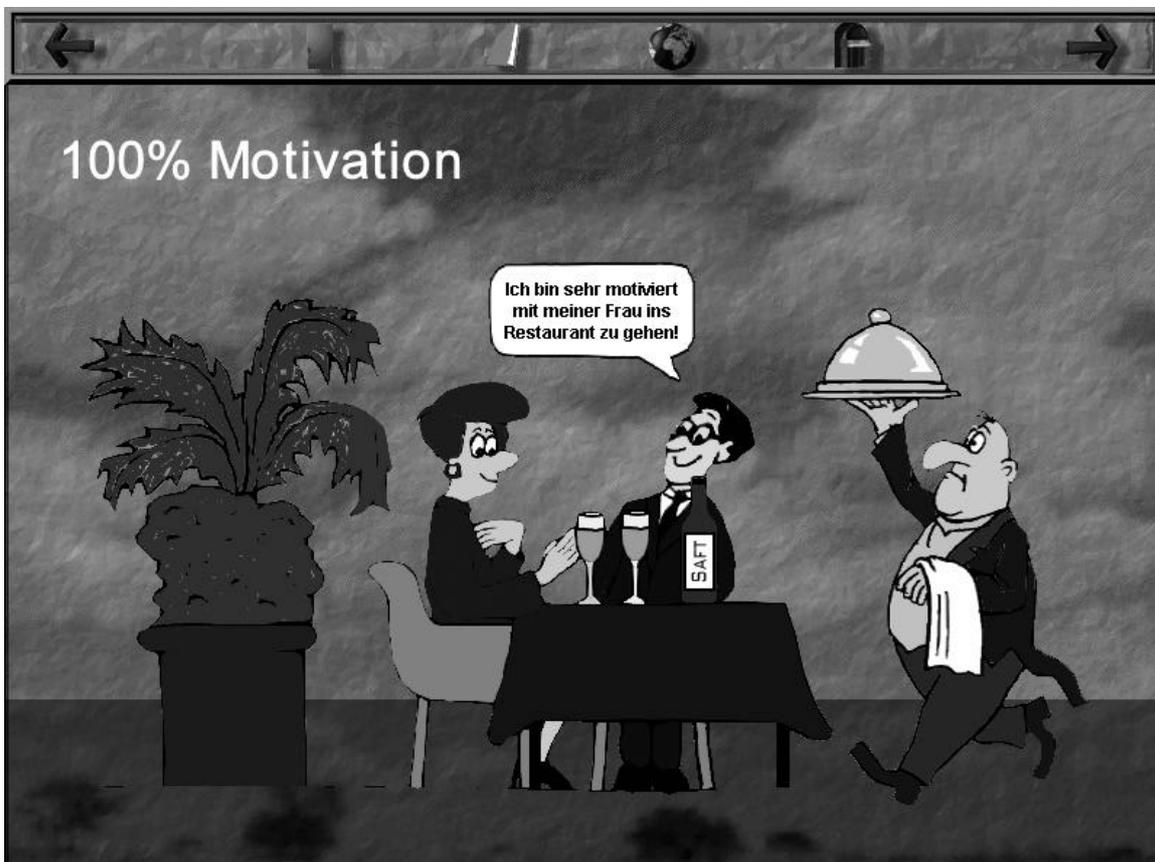
Figure 94. Treatment step 4, frame 35.

Figure 109. Treatment step 6, frame 15.

Figure 110. Treatment step 6, frame 19.

Figure 121. Treatment step 6, frame 89.

Figure 122. Treatment step 6, frame 95.

Figure 119. Treatment step 6, frame 75.

Figure 120. Treatment step 6, frame 85.

Figure 131. Treatment step 6, frame 133.

Figure 132. Treatment step 6, frame 135.
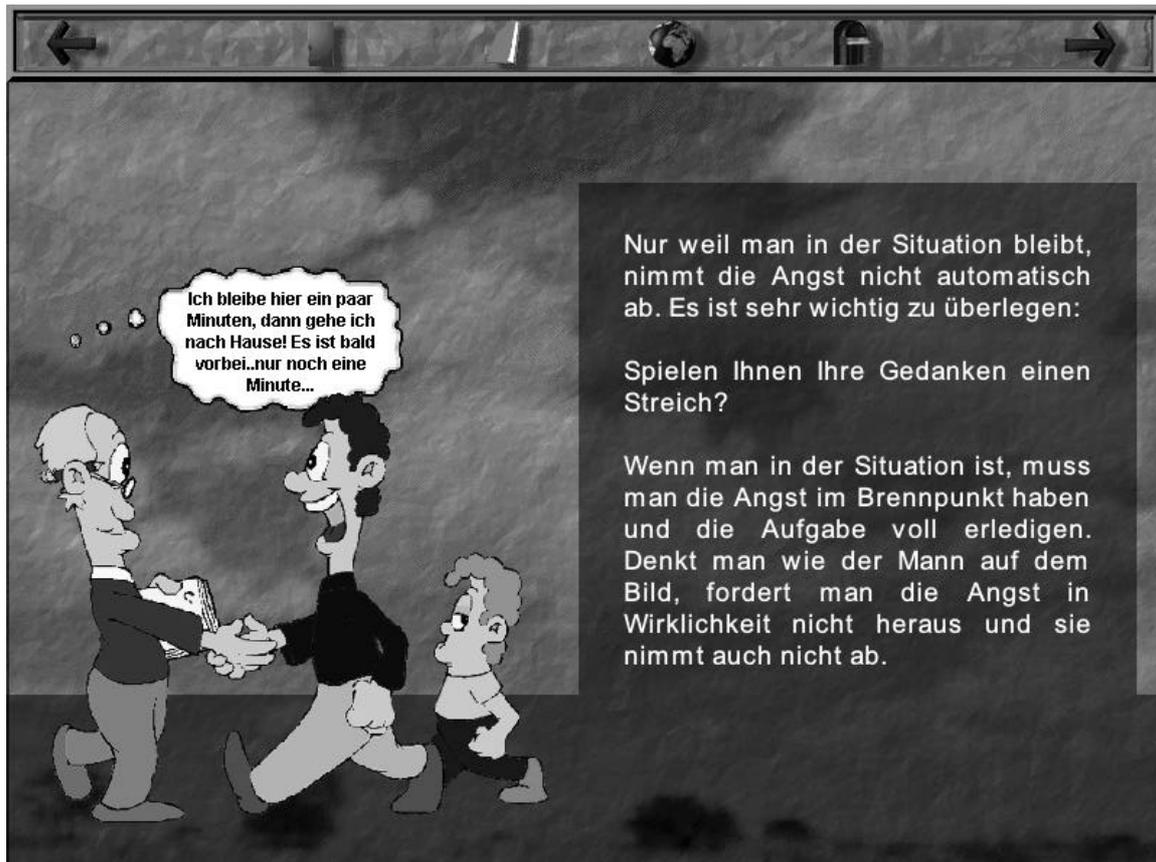
**Figure 137.** Treatment step 8, frame 11.
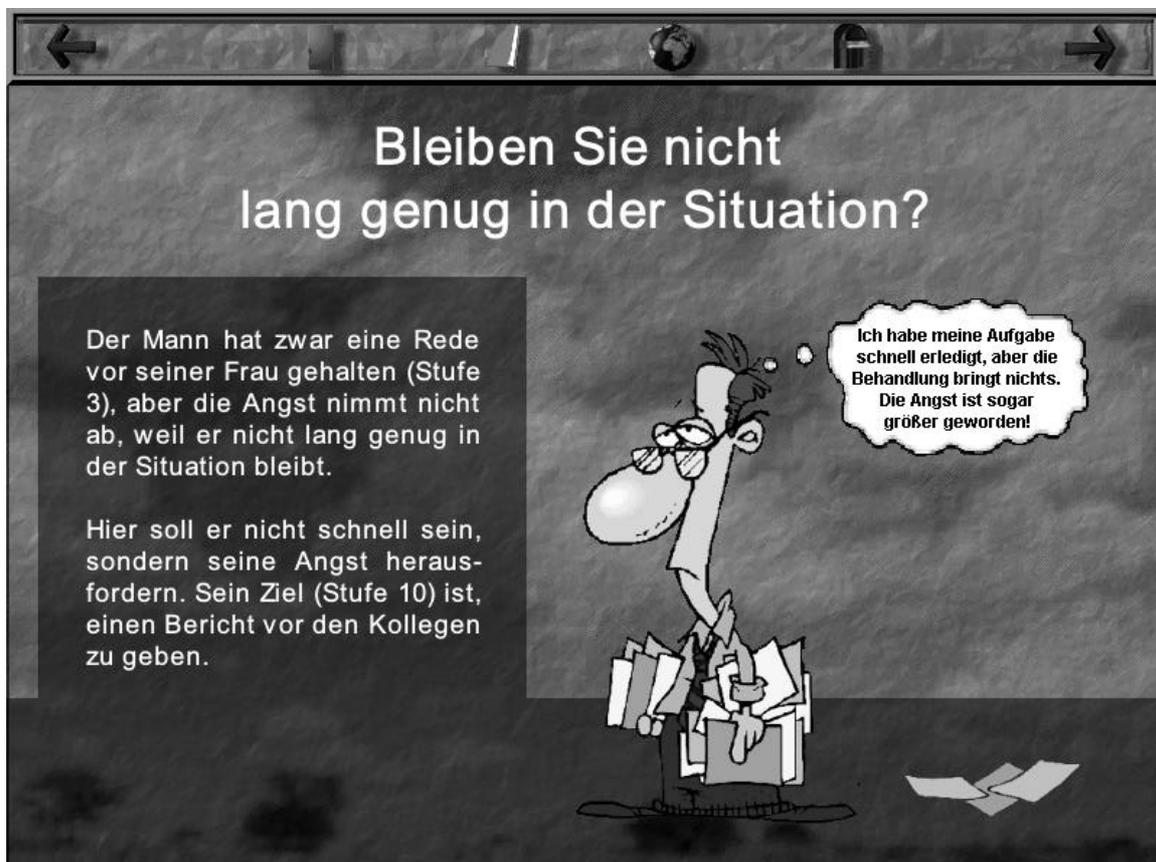
Figure 138. Treatment step 8, frame 19.

Figure 141. Conclusion and maintenance, frame 1.
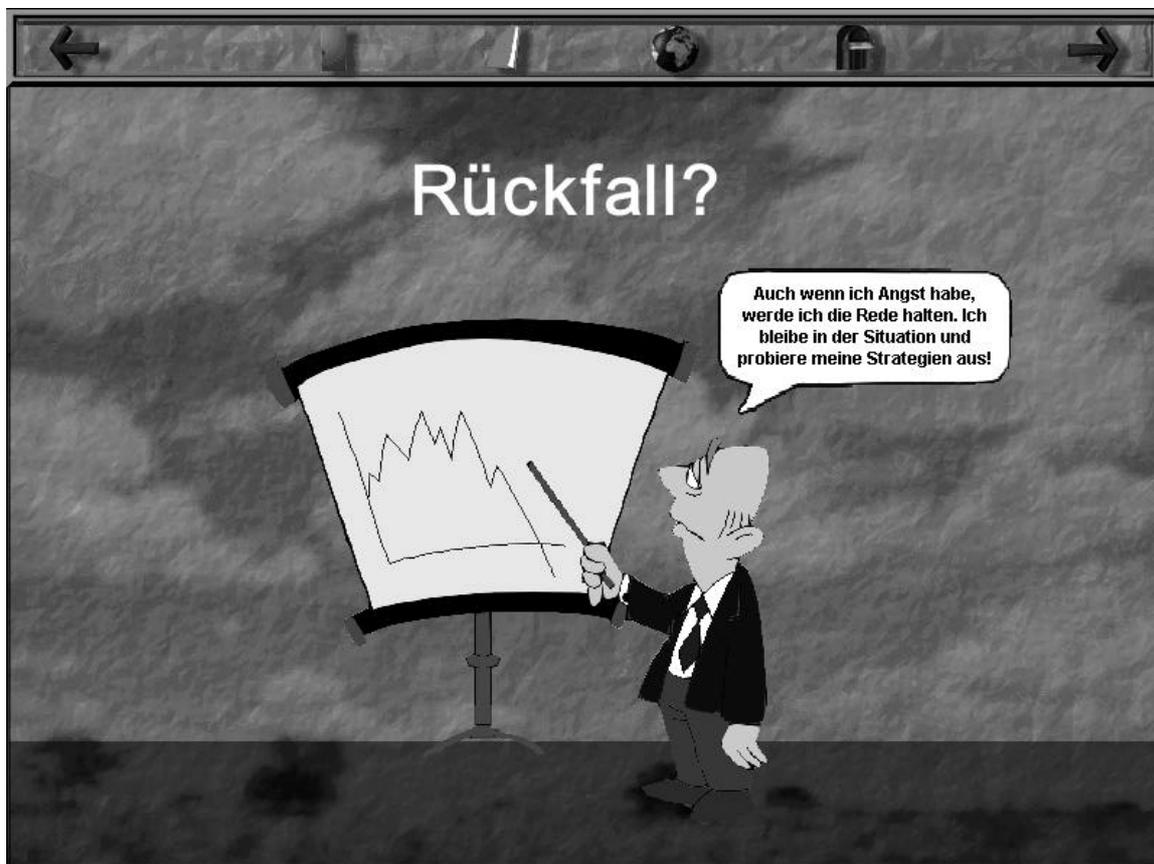
Figure 142. Conclusion and maintenance, frame 5.