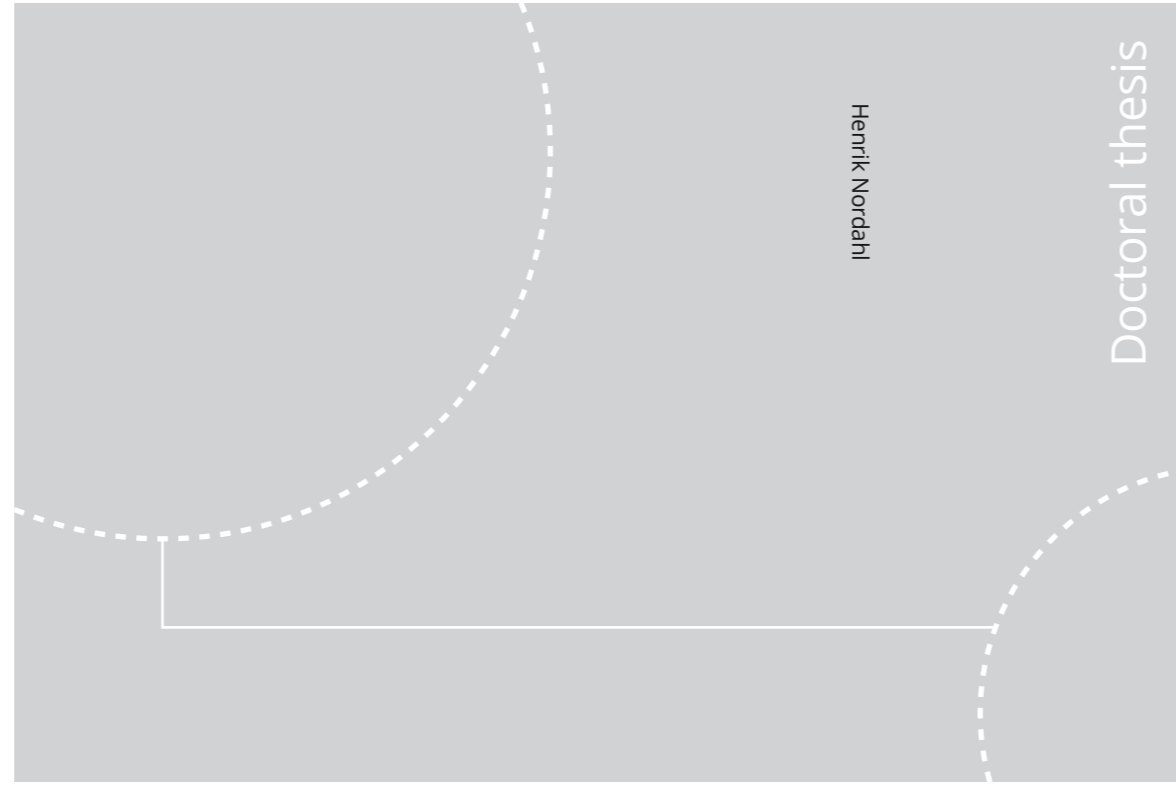


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Summary

Social anxiety disorder (SAD) is characterized by a marked or intense fear/anxiety of social situations in which the individual may be scrutinized by others. It is one of the most common mental health disorders with a life-time prevalence of 12 %. SAD often has an early onset and is considered a relatively chronic disorder if left untreated. Furthermore, SAD is also associated with the development of depressive symptoms and work-related problems.

Currently, the treatment of choice for SAD is individual Cognitive-behavioural Therapy based on the Clark and Wells model (1995) which builds on Beck's schema theory (Beck, 1976) and the Self-Regulatory Executive Function (S-REF) model of psychological disorder (Wells & Matthews, 1994). Central to the model is the view that individuals with SAD hold negative beliefs about the social self which cause them to engage in an information processing style characterized by self-attention and safety behaviors. This style is not capable of providing unambiguous disconfirmation of social fears and concerns during feared social situations. Hence, the Clark and Wells model accounts for the persistence of SAD with reference to a number of specific cognitive-behavioural mechanisms involving vicious circles that are responsible for maintaining the problem.

A conceptual feature of the Clark and Wells model (1995) is that it draws on different theoretical frameworks in an integrative way that may create upper limits to what can be achieved in conceptualization and treatment of the disorder. For example, it places the content of cognition in center stage and argues that schemas or negative beliefs give rise to self-processing and social anxiety. However, the S-REF model (Wells & Matthews, 1994) that partially informed its development emphasizes failures to adaptively regulate processing such as worry and attention as the main features of psychological disorder. This effect is thought to emerge from metacognitive beliefs (i.e. beliefs about cognition) rather than from the content of negative self-beliefs.

The aim of the current PhD project was therefore to explore the relative importance of metacognitive beliefs versus social phobic cognitive beliefs to social anxiety and to related problems such as depression symptoms and work status in socially anxious individuals. Furthermore, the thesis also includes a preliminary investigation of Metacognitive therapy (MCT; Wells, 2009) for SAD using single case methodology with the aim to investigate the feasibility of this treatment.

Study 1 examined change in negative cognitive and metacognitive beliefs as independent correlates of symptom improvement in 46 SAD patients undergoing evidence-based treatments. Both types of beliefs decreased during treatment. However, change in negative metacognitive beliefs was the only consistent independent predictor across all outcomes and change in cognitive beliefs did not significantly predict outcomes when change in self-consciousness was controlled.

Study 2 aimed to test the relative contribution of metacognitive beliefs to depression symptoms in 102 SAD patients when also controlling social anxiety severity and factors postulated in cognitive models. In this study we found that negative metacognitive beliefs and low confidence in memory were the only factors explaining individual variance in depression symptoms when the overlap between the predictors were controlled.

Study 3 aimed to test the relative contribution of metacognitive beliefs to work status (in- or out-of-work) in a sample of 204 high socially anxious individuals when also controlling social anxiety severity and factors postulated in cognitive models of SAD. Being out-of-work was associated with greater symptom severity and greater endorsement of maladaptive coping strategies and beliefs. However, only negative metacognitive beliefs significantly predicted work status when the overlap between predictors were controlled, suggesting that greater endorsements of negative metacognitive beliefs were associated with being out-of-work.

Study 4 aimed to explore the effects of MCT for SAD using single case methodology across three patients with different presentations of SAD; performance type, generalized, and generalized with comorbid avoidant personality disorder, representing increasing SAD severity/complexity. All patients responded during treatment and achieved substantial symptom reductions which were largely maintained at 6 months' follow-up, suggesting that MCT was a feasible treatment for these patients.

In summary, the current thesis indicates that change in metacognitive- rather than cognitive beliefs is associated with symptom improvement in individuals undergoing treatment for SAD. Metacognitive- but not cognitive beliefs are statistical predictors of depression symptoms in patients with SAD, and of work status amongst high socially anxious individuals. These emerging data support the idea that moving beyond the content of cognition and towards a greater metacognitive-focused conceptualization and treatment of SAD may contribute positively to further developments. In line with this notion, MCT which aims to target metacognitive beliefs and strategies directly rather than the content of cognition appears to be a suitable treatment and was associated with positive outcomes for patients with different presentations of SAD. Hence, the metacognitive approach has the potential to advance our understanding and treatment of SAD, and the current thesis supports further research in this direction.

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Acronyms and Abbreviations

ADIS-IV	The Anxiety Disorders Interview Schedule
APA	American Psychological Association
ATT	Attention Training Technique
AvPD	Avoidant Personality Disorder
BAI	Beck Anxiety Inventory
BDI	Beck Depression Inventory
CAS	Cognitive Attentional Syndrome
CBT	Cognitive-Behavioural Therapy
DSM-III	Diagnostic and Statistical Manual of Mental Disorders (3 th ed.)
DSM-III-R	Diagnostic and Statistical Manual of Mental Disorders (3 th ed., revised)
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders (4 th ed.)
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders (4 th ed., text revision)
DSM-5	Diagnostic and Statistical Manual of Mental Disorders (5 th ed.)
ES	Effect size
FNE	Fear of Negative Evaluation
IPT	Interpersonal Therapy
LSAS	Liebowitz Social Anxiety Scale
MCQ-30	Metacognitions Questionnaire-30
MCT	Metacognitive therapy
MDD	Major depressive disorder
NICE	National Institute for Health and Care Excellence

RCT	Randomized controlled trial
REC	Regional Committee for Medical and Health Research Ethics
SAD	Social Anxiety Disorder
SAD	Social Avoidance and Distress Scale
SAR	Situational Attentional Refocusing
SCID-I	Structured Clinical Interview for DSM-IV Axis I Disorders
SCID-II	Structured Clinical Interview for DSM-IV Axis II Disorders
SIAS	Social Interaction Anxiety Scale
SPRS	Social Phobia Rating Scale
S-REF	Self-Regulatory Executive Function
SSRI	Selective serotonin reuptake inhibitors

List of papers

- I. Nordahl, H., Nordahl, H. M., Hjemdal, O., & Wells, A. (2017). Cognitive and metacognitive predictors of symptom improvement following treatment of social anxiety disorder: A secondary analysis from a randomized controlled trial. *Clinical Psychology & Psychotherapy*, *24*, 1221-1227. doi: 10.1002/cpp.2083

- II. Nordahl, H., Nordahl, H. M., Vogel, P. A., & Wells, A. (2018). Explaining depression symptoms in patients with social anxiety disorder: Do maladaptive metacognitive beliefs play a role?. *Clinical Psychology & Psychotherapy*, *25*, 457-464. doi: 10.1002/cpp.2181

- III. Nordahl, H., & Wells, A. (2017). Social anxiety and work status: the role of negative metacognitive beliefs, symptom severity and cognitive-behavioural factors. *Journal of Mental Health*, *24*, 1-5. doi: 10.1080/09638237.2017.1340622

- IV. Nordahl, H., & Wells, A. (2018). Metacognitive Therapy for Social Anxiety Disorder: An A–B Replication Series Across Social Anxiety Subtypes. *Frontiers in Psychology*, *9*:540. doi: 10.3389/fpsyg.2018.00540

1. Introduction

1.1. Social Anxiety Disorder

According to the Diagnostic and Statistical Manual of Mental Disorders' 5th edition (DSM-5; American Psychological Association [APA], 2013), Social anxiety disorder (SAD) is characterized by a marked and persistent fear of one or more social- or performance situations in which the person is exposed to possible scrutiny by others. The individual fears that he or she will act in a way or show anxiety symptoms that will be negatively evaluated and thus lead to loss of self-worth. Social situations are avoided or endured with intense fear or anxiety. The fear or anxiety is out of proportion to the actual threat posed by the social situation and the context. Furthermore, the anxiety, fear or avoidance is persistent, causes clinically significant distress and/or functional impairment. In addition, the fear and avoidance must not be better explained by other issues such as another mental disorder, effects of a substances, or medical conditions. If the fear/avoidance is restricted to speaking or performing in public, one should use the specifier SAD "performance only". The diagnostic criteria for SAD are presented in table 1.

Table 1: DSM-5 Diagnostic Criteria for SAD (APA, 2013).

300.23 (F40.10)

-
- A. Marked fear or anxiety about one or more social situations in which the individual is exposed to possible scrutiny by others. Examples include social interactions (e.g., having a conversation, meeting unfamiliar people), being observed (e.g. eating or drinking), and performing in front of others (e.g. giving a speech).
Note: In children, the anxiety must occur in peer settings and not just during interactions with adults.
 - B. The individual fears that he or she will act in a way or show anxiety symptoms that will be negatively evaluated (i.e. will be humiliating or embarrassing; will lead to rejection or offend others).
 - C. The social situation almost always provoke fear or anxiety.
Note: In children, the fear or anxiety may be expressed by crying, tantrums, freezing, clinging, shrinking, or failing to speak in social situations.
 - D. The social situations are avoided or endured with intense fear or anxiety.
 - E. The fear or anxiety is out of proportion to the actual threat posed by the social situation and to the sociocultural context.
 - F. The fear, anxiety, or avoidance is persistent, typically lasting for 6 months or more.
 - G. The fear, anxiety, or avoidance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
 - H. The fear, anxiety, or avoidance is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication) or another medical condition.
 - I. The fear, anxiety, or avoidance is not better explained by the symptoms of another mental disorder, such as panic disorder, body dysmorphic disorder, or autism spectrum disorder.
 - J. If another medical condition (e.g., Parkinson’s disease, obesity, disfigurement from burns or injury) is present, the fear, anxiety, or avoidance is clearly unrelated or is excessive.
- Specify if:*
-
- Performance only:** If the fear is restricted to speaking or performing in public.
-

1.1.1. The History of Social Anxiety Disorder or “Social Phobia”

The diagnosis of social phobia has seen substantial changes since it was first introduced in the DSM classification system forty years ago with the publication of the DSM-III (APA, 1980). Here, social phobia was considered a phobic disorder characterized by a central fear of being scrutinized or embarrassed in social situations. Moreover, it was expected to be debilitating solely when the individuals were confronted with the object of their fear. The idea that social anxiety generalizes to many different social situations did not exist at the time, and the DSM-III examples concerned social phobias that later were considered specific social phobias, such as using public lavatories or speaking in public. The DSM-III-R (APA, 1982) expanded the examples of social fears and included reasons why individuals fear rejection, for example “Being unable to continue talking while speaking in public”. Furthermore, a specifier indicating the presence or absence of a “generalized subtype” was defined.

The DSM-IV (APA, 1994) and the later DSM-IV-TR (text revision) (APA, 2000) added the term *Social Anxiety Disorder* in parentheses after Social Phobia. This reflected the growing recognition that various forms of specific phobias could be differentiated from social phobia based on several important clinical and pathophysiological factors. Reasons for fearing rejection in SAD were further elaborated. Furthermore, fear of showing anxiety symptoms was addressed specifically, by its inclusion in criterion A as a primary source of fear: “The individual fears that he or she will act in a way (or show anxiety symptoms) that will be humiliating or embarrassing” (p. 456). Under diagnostic features in the text, the anxiety symptoms were described more clearly and the criteria incorporated the potential for panic attacks in social situations.

The significant change from DSM-IV (APA, 1994) to DSM-5 (APA, 2013) is that the latter no longer includes the criterion that the individual recognizes that their fears are excessive.

1.1.2. Recognition and Assessment

SAD was once regarded as the “neglected anxiety disorder” (Liebowitz, Gorman, Fyer, & Klein, 1985), but has received a substantial amount of attention from researchers and clinicians since it was first introduced in the DSM system (Bögels et al., 2010). Social anxiety can be conceptualized as presenting on a continuum in terms of severity (Bögels et al., 2010), and even subclinical levels of social anxiety are associated with negative outcomes such as disrupted learning (Russell & Topham, 2012), poorer occupational functioning (Acarturk, de Graaf, Van Straten, Ten Have, & Cuijpers, 2008), and elevated risk for comorbid disorders (Fehm, Beesdo, Jacobi, & Fiedler, 2008).

The NICE (2013) guidelines for SAD highlight that it is under-diagnosed, which could be related to poor recognition among practitioners or a general lack of understanding about its severity and complexity (Pilling, Mayo-Wilson, Mavranouzouli, Kew, Taylor, &

Clark, 2013). It may also be linked to the public's lack of knowledge of its existence i.e. an appreciation of social anxiety as a mental health problem and not as a personality characteristic such as shyness (APA, 2013). In addition, most individuals with SAD do not seek treatment unless they develop an additional mental health problem, typically another anxiety disorder, depression or a substance-use disorder (Wittchen & Fehm, 2003).

1.2. Prevalence

SAD is the third most common psychiatric disorder following depression and substance dependence (Kessler et al., 1994). Lifetime prevalence ranges from 2.4 % to 13 % (Kessler et al., 1994; Magee, Eaton, Wittchen, McGonagle, & Kessler, 1996; Kessler, Chiu, Demler, & Walters, 2005; Kessler, Berglund, Demler, Jin, Merikangas, & Walters, 2005; MacKenzie & Fowler, 2013; Kessler, Petukhova, Sampson, Zaslavsky & Wittchen, 2012; Ruscio, Brown, Chiu, Sareen, Stein, & Kessler, 2008). SAD is found in countries around the world but seem to be more common in western high-income countries compared to African and Eastern Mediterranean regions (Stein et al., 2017). In America, the 12-months prevalence rates are estimated to be around 7 % in adults and in children and adolescents (APA, 2013).

In general populations, higher rates of SAD are found in females with approximately 2 females per male with SAD (Stein et al., 2017), and they report greater clinical severity compared to men (Asher, Asnaani, & Aderka, 2017). However, in clinical samples, gender rates are equivalent or slightly higher for males, which might be explained by gender roles and social expectations playing a significant role in explaining the heightened help-seeking behavior in male patients (APA, 2013).

1.3. Onset and Course

The median age of onset of the disorder is found to be in mid-adolescence, as studies indicate onset between age 13 (Kessler et al., 2005) and 15-17 (Kessler et al., 2012). DSM-5 states that the median age of SAD in the US is 13 years with 75 % of those affected having an age of onset between 8 and 15 years (APA, 2013). Due to the early onset of SAD, it often precedes the development of other disorders (Magee et al., 1996; Fehm et al., 2008). Furthermore, SAD is associated with a chronic course if left untreated (Bruce et al., 2005), and the course of SAD seem to be similar for men and women (Asher et al., 2017). Moreover, childhood onset is associated with greater severity (Rosellini, Rutter, Bourgeois, Emmert-Aronson, & Brown, 2013).

1.4. Aetiology

The aetiology underlying SAD is complex, and probably best understood within a biopsychosocial model as multiple pathways might be implicated in the development of the disorder. It is likely that those who are genetically predisposed might be more susceptible to specific environmental factors, and the disorder is likely to be a result of an interaction between individual vulnerability and environmental factors (Merikangas, Lieb, Wittchen, & Avenevoli, 2003).

Gene studies have established a genetic basis for social anxiety but are inconclusive when it comes to identifying a reliable “genetic profile” (Stein & Gelernter, 2014), but the genetic basis for social anxiety seems to be more shared with extraversion than with neuroticism (Stein et al., 2017). In twin studies, both genetic and non-shared environmental factors are associated with social anxiety, and shared environmental factors to a lesser extent (Scaini, Belotti, & Ogliari, 2014). Several psychological factors seem to be implicated in the development of SAD, for example parental personality and style (Beidel & Turner, 2007; Bar-Haim, Dan, Eshel, & Sagi-Schwartz, 2007; Brumariu & Kerns, 2008; de Rosnay,

Cooper, Tsigaras, & Murray, 2006; Lewis-Morrarty et al., 2012) and traumatic experiences such as bullying (McCabe, Antony, Summerfeldt, Liss, & Swinson, 2003; Loukas & Pasch, 2013).

While many factors are likely to contribute to the development of SAD, the primary focus of the present thesis is on two psychological models which cover intrapsychic maintenance factors amenable to change through treatment. The central factors emphasised in these models will be described in the following sections.

1.5. Comorbidity and Related Problems

SAD is associated with high levels of comorbidity. Ruscio et al. (2008) reported that 63 % of participants with lifetime SAD met criteria for at least one other lifetime DSM-IV disorder, and Fehm, et al. (2008) reported that 88 % of individuals with SAD had at least one other DSM-IV disorder during the past 12 months. In addition to other anxiety disorders and problems with alcohol abuse (Schneier, Foose, Hasin, Heimberg, & Liu, 2010), two of the most common comorbid problems with SAD are depression and work-related problems, which will be a focus in the present thesis. Compared to comorbid anxiety, comorbid depression has been found to be associated with greater functional impairment such as lower work ability among SAD-patients (Aderka, Hofmann, Nickerson, Hermesh, Gilboa-Schechtman, & Marom, 2012).

1.5.1. Depression

Specifically, several studies indicate that SAD is a powerful risk factor for the development of depression (Beesdo et al., 2007; Belzer & Schneier, 2004; Dalrymple & Zimmerman, 2007). Ohayon and Schatzberg (2010) reported that SAD-patients were 5 times more likely to develop major depressive disorder (MDD) compared to controls, and Dalrymple and Zimmerman (2007) found that 42 % of individuals with SAD had comorbid

MDD. Comorbid SAD and MDD is particularly problematic compared to pure MDD, as it is associated with a more severe course of depression with more suicidal ideation and suicide attempts (Stein, Fuetsch, Müller, Höfler, Lieb, & Wittchen, 2001; Dalrymple & Zimmerman, 2007), higher persistence of SAD (Blanco et al., 2011), greater impairment in work, studies and social life (Aderka et al., 2012; Dalrymple & Zimmerman, 2007), worse quality of life (Barrera & Norton, 2009) and higher probability of comorbid alcohol use disorders (Dalrymple & Zimmerman, 2007).

1.5.2. Work-related Impairment

SAD seems to have an especially negative impact on occupational functioning compared to other common mental disorders (Moitra, Beard, Weisberg, & Keller, 2011). Within the school environment, SAD is associated with drop-out (Stein & Kean, 2000) and with lower educational attainment (Katzelnick & Greist, 2001; Wittchen, Stein, & Kessler, 1999). Social anxiety in adolescence is associated with unemployment and sickness absence in young adulthood (Narusyte, Amin & Svedberg, 2017). When employed, individuals with SAD tend to miss 8 times more work days (Wittchen, Fuetsch, Sonntag, Müller, & Liebowitz, 2000), and have substantial more disability days compared to non-SAD individuals (Fehm et al., 2008). Furthermore, the economic costs associated with SAD and occupational functioning have been reported as substantial for individuals and for society, and even subthreshold SAD is associated with substantial costs due to impaired work ability (Acarturk et al., 2008).

1.6. Treatment of Social Anxiety Disorder in Adults

The most recent clinical guidelines for recognition, assessment and treatment of SAD by the National Institute for Health and Care Excellence (NICE) was published in 2013. These recommendations are based on careful consideration of the evidence available and

practitioners are expected to take these fully into account, along the individual needs, in the treatment of SAD (p 2; NICE, 2013). According to NICE (2013), there are several interventions that have proven efficacious for SAD. However, psychological treatment, and more specifically individual Cognitive-behavioural therapy (CBT) based on the Clark and Wells model (1995) or the Rapee and Heimberg model (1997) is recommended as the treatment of choice (NICE, 2013).

Mayo-Wilson and colleagues (2014) conducted a systematic review and network meta-analysis that aimed to compare interventions for SAD and identify which were the most effective in adults. They included 101 trials which explored 41 interventions or control conditions. Compared with waitlist control, several classes of medications (monoamine oxidase inhibitors, benzodiazepines, selective serotonin-reuptake inhibitors and serotonin-norepinephrine reuptake inhibitors, and anticonvulsants), individual CBT, group CBT, exposure and social skills training, self-help with support, self-help without support, and psychodynamic psychotherapy were efficacious. However, in line with the NICE (2013) guidelines, individual CBT was found to be most effective, and the authors concluded that in particular individual CBT that was based on the Clark and Wells (1995) model provided large effects (standardized mean difference compared to waitlist reported to be -1.56, with 95% confidence interval for recovery from -1.85 to -1.27 based on three included studies).

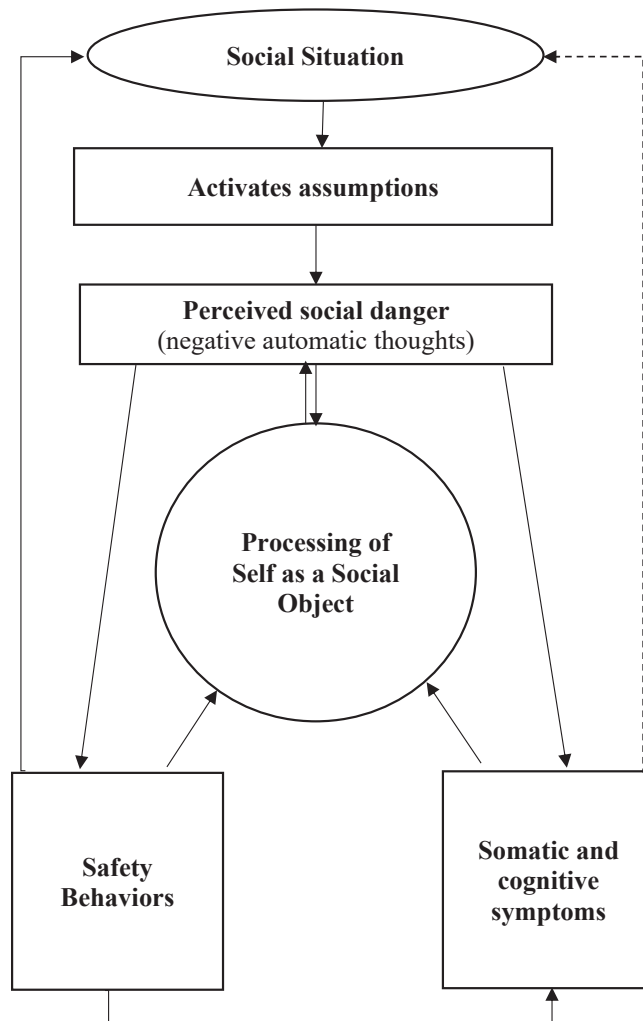
The Clark and Wells (1995) model is considered the benchmark model of SAD. For example, the treatment developed from it (e.g., Wells, 1997) is considered the most effective intervention (Mayo-Wilson et al., 2014) and is recommended as the treatment of choice for SAD (NICE, 2013). Furthermore, the Clark and Wells (1995) model preceded the Rapee and Heimberg (1997) model and heavily influenced it. While the treatment protocols developed based on these models differ, for example the Rapee and Heimberg protocol focus on graded exposure to feared situations while the Clark and Wells protocol targets attentional- and

interpretive bias through attention manipulation and video feedback, the overlap between the two cognitive models are substantial. They differ on the importance given to vigilance to external threat. The Clark and Wells (1995) model proposes that attention is diverted away from the external environment and towards the internal physiological response and internal self-image during social situations, while the Rapee and Heimberg (1997) model suggest that attention is divided between the reaction of the audience and self-focused attention. However, both models emphasize cognitive beliefs and schemas as the underlying factors of self-processing and social anxiety. In other words, they do not differ in terms of the knowledge structures that are thought to underlie social anxiety.

1.7. The Clark and Wells (1995) model of Social Phobia

Building on Beck's schema theory (Beck, 1976) and the Self-Regulatory Executive Function (S-REF) model of psychological disorder (Wells & Matthews, 1994; 1996), Clark and Wells (1995) advanced a cognitive model of SAD that has been very influential. Central to the model is the view that individuals with SAD engage in an information processing style characterized by self-focused attention and unhelpful coping behaviors. Self-attention is not capable of providing unambiguous disconfirmation of social fears and concerns in feared social situations as the primary source of information comes from feelings and sensations rather than external information which has the potential to correct distorted beliefs. Hence, the Clark and Wells model accounts for the persistence of SAD with reference to a number of specific cognitive-behavioural mechanisms involving vicious circles that are responsible for maintaining the problem. This model is depicted in figure 1.

Figure 1. A cognitive model of social phobia. From Wells (1997, p. 169). Copyright 1997 by John Wiley & Sons Limited. Reprinted with permission.



1.7.1.1. Assumptions and beliefs. According to the model as a result of past experience, individuals with SAD hold negative assumptions and beliefs about social situations and the social self that are activated when entering or anticipating a social situation.

These beliefs contribute to negative appraisals of social situations and the vicious cycles that maintain SAD. Three types of assumptions and beliefs are identified in the model:

- 1) Conditional assumptions (e.g., “If I show signs of anxiety, people will think I am weak”; “If people like me they will begin the conversation first”)
- 2) Unconditional beliefs about the social self (e.g., “I am boring”; “I am unlikeable”)
- 3) High standards and rules for social performance (e.g., “I must always get everyone’s approval”; “I have to appear intelligent and relaxed”)

Activation of such assumptions and beliefs leads to a perception of potential social danger, which is evident as anticipatory worry or negative automatic thoughts; for example, “what if I shake”; “they will notice I’m anxious”; and “I’ll babble and talk funny”, which increases the sense of threat and anxiety. Furthermore, the somatic and cognitive symptoms that accompany anxiety are themselves subject to negative appraisal and may be interpreted as evidence of failure and impending social humiliation.

1.7.1.2. Processing of the Self as a social object. Negative automatic thoughts about the social self are not only associated with an increase in anxiety symptoms, but are also accompanied by a shift in attention in which the individual becomes self-conscious and engages in self-processing with a specific focus towards how they think they appear to others. The socially anxious individual uses internal information in the form of feelings or an image of the self in their mind's eye to infer how they must appear. The image of the self typically consists of an “observer perspective”, meaning that it entails seeing oneself as if from someone else’s vantage point. In images of this type, anxiety symptoms and personal inadequacies are seen as highly conspicuous, and the socially anxious person assumes that the negative observer image accurately reflects what other people can see in them. This process

in turn reinforces negative self-appraisals of performance and negative thoughts about evaluation by others.

1.7.1.3. Safety behaviors. In order to prevent feared social outcomes, such as showing anxiety or failed performance, safety behaviors are used. For example, individuals fearful of saying something that others will judge as stupid will often say little or mentally rehearse sentences before talking. Contrary to their intended effect, safety behaviors are problematic and maintain social anxiety in several ways. They contribute to heightened self-focused attention, prevent disconfirmation of negative beliefs and assumptions, increase feared symptoms, can draw attention towards the individual, and have the potential to contaminate the social situation by, for example, making the person with SAD appear withdrawn or unfriendly.

In addition to the safety behaviors that are used during a social encounter, avoidance of social situations is a problem because it prohibits experiences that could disconfirm assumptions and beliefs.

Furthermore, before exposure to situations anticipatory worry and planning is used to try and deal with and avoid social threat, for example mentally rehearsing conversations. This is a negative process that heightens the sense of danger and anxiety. On leaving the social situation the individual may also engage in a 'post-mortem' that consist of rumination; analyzing their performance and recalling what might have gone wrong. This process can transform a relatively positive experience into a sense of failure to perform well. Each of these processes contributes to emotional distress and negative self-processing even in the absence of direct social threat.

1.7.2. Cognitive Behavioural Therapy for SAD (based on Clark and Wells, 1995)

A course of CBT treatment for SAD (Wells, 1997) is typically implemented over a 12-14 session time-frame in which sessions are held weekly and each session is normally 60-

90 minutes in duration. Moreover, the treatment follows a particular sequence in maximizing the efficiency of cognitive-behavioral change. It is a logical derivation from the model to use strategies early in treatment that reconfigure the patient's behaviors and focus of attention in a way that maximizes subsequent change in negative thoughts and beliefs.

Session 1-3 of treatment usually consists of case formulation, socialization, and cognitive preparation for restructuring, involving manipulations of safety behaviors and of attention. Treatment sessions 4-6 typically focus on a continuation of behavioral experiments, often involving exposure to test negative appraisals and predictions, and also video feedback methods to correct the distorted self-image. Sessions 7-9 continue with cognitive and behavioral reattribution methods, and introduce bandwidth maneuvers aimed at further interrogating the environment and discovering that social catastrophes (e.g. everyone staring at you) are unlikely, even in the event of failed performance. Finally, sessions 10-14, involves consolidation of material learned, relapse prevention, and a continuation of work on the remaining issues (i.e. residual negative beliefs and avoidance).

1.7.3. Empirical support for CBT based on the Clark and Wells model in adults

The efficacy of CBT based specifically on the Clark and Wells (1995) model and treatment manuals (e.g. Wells, 1997) has been evaluated in several randomized controlled trials. Clark et al. (2003) reported that CBT was superior to fluoxetine combined with self-exposure, and superior to placebo combined with self-exposure. The effect size for CBT pre to post treatment on social anxiety symptoms was large (Cohen's $d = 1.31$). In a different study, Clark and colleagues (2006) demonstrated that CBT was superior to exposure plus applied relaxation. The effect size for CBT was reported to be large from pre to post treatment (Cohen's $d = 2.63$) and 86 % of patients were classified as recovered at post treatment. Both these studies reported that treatment effects were maintained at follow up one

year after treatment. Moreover, CBT was also associated with large effect sizes on secondary outcome measures such as depression.

Stangier, Heidenreich, Peitz, Lauterbach, and Clark (2003) compared individual with group CBT, and found that the treatment was most efficacious in the individual format with a large mean effect size for social anxiety measures at post treatment (Cohen's $d = 1.17$) and at six months follow up (Cohen's $d = 1.57$). In a similar study, Mörtberg, Clark, Sundin, and Åberg Wistedt (2007) reported individual CBT to be more efficacious than group- and intensive group CBT. The individual CBT was associated with a large mean effect size for social anxiety measures post treatment (Cohen's $d = 1.62$) and at 1-year follow up (Cohen's $d = 1.89$).

CBT has been compared to Interpersonal therapy (IPT) in two studies. Stangier, Schramm, Heidenreich, Berger, and Clark (2011) reported that CBT was superior to IPT and that the response rate for CBT was 65.8 % and largely maintained at 1-year follow up. CBT was associated with large controlled effect sizes on measures of social anxiety and medium controlled effect sizes for depression symptoms. In another study, CBT was evaluated against IPT in a residential setting: Borge, Hoffart, Sexton, Clark, Markowitz and McManus (2008) reported a medium effect size for CBT from pre to post (Cohen's $d = .76$) and that 31 % of patients were classified as recovered post treatment. However, the effects of CBT were not statistically different from those of residential Interpersonal therapy.

Leichsenring et al. (2013) conducted a large RCT where they compared CBT to psychodynamic therapy. They found CBT to be the superior intervention, and reported a remission rate for CBT of 36 %. The effect size for CBT from pre to post treatment was large (Cohen's $d = 1.32$). However, it is important to note that Leichsenring and colleagues delivered CBT over a mean of 25.7 sessions, suggesting that the treatment manual was not adhered to.

To summarize, CBT based on the Clark and Wells model is associated with moderate to large effects on primary and secondary outcome measures which is largely maintained at follow up.

1.8. A Return to Theoretical Influences

A conceptual feature of the Clark and Wells model (1995) is that it draws on different theoretical frameworks in an integrative way that may create upper limits to what can be achieved (Wells, 2007). For example, it places the content of cognition in center stage and argues that schemas or negative beliefs give rise to self-processing and social anxiety. However, the S-REF model (Wells & Matthews, 1994) that partially informed its development emphasizes the failure to adaptively regulate processing such as worry and attention as the main features of disorder. This effect is thought to emerge from a different set of knowledge structures, and Wells (2000) has argued that it might not be necessary to deal with negative beliefs and schemas as they are not the cause of psychological disorders such as SAD. Therefore, identifying which knowledge structures underlie social anxiety and related problems is important as it would influence the target of treatment and perhaps enhance outcomes.

1.9. The Self-Regulatory Executive Function model of Psychological Disorder

In the Self-Regulatory Executive Function (S-REF) model (Wells & Matthews, 1994), also called the metacognitive model of psychological disorders, psychological disorder results from a perseverative and negative thinking style called the *Cognitive Attentional Syndrome* (CAS). The CAS is considered a transdiagnostic mechanism in psychological disorders, and consist of over-thinking in the form of worry/rumination, threat monitoring, and maladaptive coping strategies (Wells, 2009). In SAD, self-processing in the form of self-

consciousness and the use of safety behaviors (including avoidance, anticipatory processing, and the post-mortem) are considered parts of the CAS. In the metacognitive model, biased top-down control of attention and regulation of excessive thinking such as worry are the most important factors underlying pathology. These processes are not regulated or directed by cognitive beliefs or schemas as emphasised in cognitive models (Wells & Matthews, 1994). More specifically, Wells and Matthews (1994) specified that a different set of beliefs is important and have been overlooked in CBT. The beliefs concerned are metacognitive in nature, representing beliefs about thinking: e.g. “Worrying is uncontrollable” and “I cannot trust my memory”. Wells and Matthews (1994) proposed that metacognitions are transdiagnostic factors involved in most disorders including SAD. For example, the belief that worrying is uncontrollable leads to a persistence of worrying about the social self (e.g. “I’m inadequate”) because the person does not use their mind to interrupt the process.

1.9.1. Evidence for Metacognitive Beliefs in Emotional Disorders

Over the last 20-30 years, it has been reliably established that maladaptive metacognitive beliefs are elevated across psychological disorders. In a meta-analysis including more than 3000 patients and 3000 healthy individuals, Sun and colleagues (2017) showed elevated maladaptive metacognitive beliefs in patients with major depressive disorder, psychosis, eating disorders, obsessive-compulsive disorder, and generalized anxiety disorder. Other studies have demonstrated a role for maladaptive metacognitive beliefs in for example health anxiety (Bailey & Wells, 2015), post-traumatic stress (Fergus & Bardeen, 2017), addiction (Hamonniere & Varescon, 2018), test-anxiety (O’Carroll & Fisher, 2013), and trait-anxiety (Nordahl, Hjemdal, Hagen, Nordahl, & Wells, 2019). Moreover, some studies suggest that metacognitive beliefs are stronger and more reliable predictors of psychological vulnerability and symptoms of disorder than the content of cognition (Gwilliam, Wells, & Cartwright-Hatton, 2004; Myers & Wells, 2005; Spada, Moneta, &

Wells, 2007; Myers, Fisher, & Wells, 2009; Solem, Håland, Vogel, Hansen, & Wells, 2009; Bennett & Wells, 2010; Bailey & Wells, 2016; Nordahl & Wells, 2017a). Hence, while metacognitive beliefs have been overlooked in CBT, their association with emotional distress and disorders have now been established across a range of disorders.

1.10. Cognitive- and Metacognitive Beliefs in Social Anxiety

In summary, the Clark and Wells (1995) model and the S-REF model (Wells & Matthews, 1994) emphasize different knowledge structures underlying self-processing and social anxiety. Gkika, Wittkowski and Wells (2018) recently conducted a systematic review on cognitive beliefs and metacognitive beliefs and social anxiety, as defined by Clark and Wells (1995) and Wells and Matthews (1994), respectively. A total of 23 papers were included, and the authors report a robust positive relationship between cognitive beliefs and social anxiety, and between metacognitive beliefs and social anxiety. Moreover, through their narrative synthesis, the authors report that the relationship between cognitive beliefs and social anxiety appeared to be mediated by cognitive processes, but metacognitive beliefs appeared to have both direct and indirect (mediated by cognitive processes) effects on social anxiety. This notion is consistent with the metacognitive model (Wells & Matthews, 1994) where cognitive beliefs act as the trigger or the output of the CAS rather than as the cause of disorder. Nonetheless, Gkika et al. (2018) identified that there was a need to evaluate the relative contribution of cognitive- and metacognitive beliefs in social anxiety more directly.

More recently, three more studies that report on the associations between metacognitive beliefs and social anxiety have been published. Nordahl, Ødegaard, Hjemdal and Wells (2019) reported significant positive correlations of moderate strength between all MCQ-30 (Wells & Cartwright-Hatton, 2004) domains of metacognitive beliefs and social anxiety. Nordahl and Wells (2019a) demonstrated that metacognitive strategies and beliefs

(positive and negative) as assessed with the CAS-1 (Wells, 2009) were correlated with social anxiety whilst controlling for social phobic beliefs. Nordahl and Wells (2017a) aimed to test the goodness of fit of a hypothesized model based on the Clark and Wells (1995) model and a hypothesized model based on the metacognitive model (Wells & Matthews, 1994), and found that the metacognitive model provided a significantly better fit to the data. More specifically, negative metacognitive beliefs and cognitive confidence had the closest association with social anxiety among the metacognitive belief domains (Nordahl & Wells, 2017a). However, neither of these studies reported on the relative contribution of cognitive- versus metacognitive beliefs to social anxiety.

1.10.1. Treatment Studies on SAD Informed by the Metacognitive Approach

Informed by the metacognitive perspective (Wells & Matthews, 1994), three studies have shown that briefer and more metacognitive-focused intervention might be effective and time efficient in the treatment of SAD. In a case-series, Wells and Papageorgiou (2001) reported that SAD could effectively be treated with an average of 5.5 treatment sessions with positive results that were maintained at 6-months follow up. In this study, regulating attention in social situations was the main emphasis. In a different study, Nordahl, Vogel, Morken, Stiles, Sandvik, and Wells (2016) modified the CBT manual (Wells, 2007) and included specific enhancements based on the metacognitive approach such as greater systematic work on changing attention in social situations and more work on worry and rumination. Sixty-eight percent of patients treated with this intervention were classified as recovered, and an additional 18 % as improved following this treatment. The effect sizes were large and maintained at 12 months' follow-up. However, these studies left out several important components which are emphasized in the metacognitive model such as directly targeting metacognitive beliefs (Wells & Matthews, 1994) and retained some of the cognitive components of the Clark and Wells (1995) treatment, for example the case-formulations were

based on the Clark and Wells (1995) model, and there was some work on testing negative thoughts. However, Vogel and colleagues (2016) treated SAD-patients with the combination of Situational Attentional Refocusing (SAR; Wells, 2000) and the Attention Training Technique (ATT; Wells, 1990), two metacognitive therapy applications that specifically target metacognitive strategies and beliefs rather than the content of cognition. In this study, SAR and ATT led to large pre to post effects in social anxiety, and 46 % of the patients were recovered following treatment. These studies support Wells' (2000; 2007; 2009) notion that taking a more metacognitive approach may be beneficial in the treatment of SAD and that it might not be necessary to deal with negative beliefs and assumptions or the content of negative thoughts.

1.11. Aims and Research Questions

As reviewed in the introduction, SAD is one of the most common mental disorders, has an early onset, is relatively chronic if left untreated, and is also considered a vulnerability factor for developing comorbid mental health problems such as depression and also work-related problems. While CBT which aims to target negative social phobic beliefs currently is considered the treatment of choice, the metacognitive model suggests that metacognitive beliefs (i.e. beliefs about cognition) rather than cognitive beliefs (i.e. the content of cognition) give rise to psychological disorder. Identifying factors that contribute to social anxiety and related problems has the potential to enhance conceptualization and treatment of SAD. Thus, the main aim of the current thesis is to explore the relative importance of metacognitive beliefs versus social phobic cognitive beliefs to social anxiety and to related problems such as depressive symptoms and work status in socially anxious individuals. Furthermore, the thesis also includes a preliminary investigation of Metacognitive therapy (MCT; Wells, 2009) for

SAD using single case methodology as a means to investigate the feasibility of the treatment.

The main research questions addressed in the present thesis are:

I. Does change in metacognitive beliefs correlate with symptom improvement following treatment in patients with SAD when controlling change in self-consciousness and change in social phobic beliefs (Paper I)?

II. Do maladaptive metacognitive beliefs correlate with depression symptoms in patients with SAD when controlling social anxiety severity and factors postulated in cognitive models such as social phobic beliefs (Paper II)?

III. Do maladaptive metacognitive beliefs correlate with work status in high socially anxious individuals when controlling social anxiety severity and factors postulated in cognitive models such as social phobic beliefs (Paper III)?

IV. Is Metacognitive therapy associated with positive effects for patients with different presentations of SAD (Paper IV)?

1.11.1. Does change in metacognitive beliefs correlate with symptom improvement following treatment in patients with SAD when controlling change in self-consciousness and change in social phobic beliefs (Paper I)?

Identifying which knowledge structures underlie social anxiety and its maintenance is important as it would suggest what belief domains (cognitive and/or metacognitive) should be targeted in treatment and hence has the potential to inform better understanding and further development of effective interventions. Thus, Paper I explored the relative importance of

change in negative metacognitive beliefs and change in negative cognitive beliefs for symptom improvement. It involved treatment of 46 patients with SAD and examined effects after controlling for change in self-consciousness (which is emphasized in both models and a marker for self-processing). We hypothesized that change in negative metacognitive beliefs will account for a significant amount of the variance in symptom outcome, after controlling for symptom severity at pretreatment, gender, change in self-consciousness, and change in cognitive beliefs.

1.11.2. Do maladaptive metacognitive beliefs correlate with depression symptoms in patients with SAD when controlling social anxiety severity and factors postulated in cognitive models (Paper II)?

SAD is a major risk factor for developing depression and the co-existence of these disorders is associated with greater suffering, lower quality of life and lower functioning overall (Belzer & Schneier, 2004; Dalrymple & Zimmerman, 2007; Ohayon & Schatzberg, 2010). The identification of mechanisms underlying depressive symptoms and vulnerability for developing depression in patients with SAD is therefore of significant conceptual and therapeutic importance. Paper II explored if maladaptive metacognitive beliefs account for variance in depression symptoms among patients diagnosed with primary SAD after controlling for factors that previously have been identified as risk factors; symptom severity and gender, and for factors postulated in cognitive models such as social phobic beliefs. We hypothesized that metacognitive beliefs, and more specifically negative metacognitive beliefs, are positively associated with depression symptoms even after controlling for social phobic beliefs and other relevant factors.

1.11.3. Do maladaptive metacognitive beliefs correlate with work status in high socially anxious individuals when controlling social anxiety severity and factors postulated in cognitive models (Paper III)?

Several studies have shown that social anxiety has a negative impact on occupational functioning and that it is associated with more absence from work. Thus, the identification of factors contributing to work ability may inform interventions that enhance return to work which would benefit both individuals and society. Paper III explore if metacognitive beliefs are associated with work status (in- or out-of- work) among high socially anxious individuals when controlling for social anxiety severity and factors postulated in cognitive models such as social phobic beliefs. We hypothesized that metacognitive beliefs would be associated with work status (i.e. higher dysfunctional metacognitions associated with being out of work) among high socially anxious individuals over and above the controlled factors.

1.11.4. Is Metacognitive therapy associated with positive effects for patients with different presentations of SAD (Paper IV)?

According to the metacognitive model, all psychological disorders are intensified and maintained by a negative thinking style called the *Cognitive Attentional Syndrome (CAS)* which consists of worry/rumination, threat monitoring, and maladaptive coping behaviors. Metacognitive- rather than cognitive beliefs underlie and direct the CAS. Hence, MCT therefore aims to target the CAS and its underlying metacognitive beliefs rather than aiming to modify the content of cognition. Paper IV reports on the first evaluation of full MCT for SAD and examines the feasibility of this treatment using single-case replication methodology that span cases of increasing complexity.

2. Method

2.1. Participants and Procedure

The four papers included in this thesis vary in their design and in the samples that have been used. Consequently, the samples, design and procedure will be described in more detail separately for each paper below. Further details regarding each sample's demographic and diagnostic characteristics can be found in papers I-IV attached at the end of this thesis. Additional details about the samples can also be found in the published papers from the trials of which paper I and II in this thesis are based (Nordahl et al., 2016; Vogel et al., 2016).

Paper I: The participants in this study were forty-six patients diagnosed with primary SAD (DSM-IV-TR; APA, 2000) that had participated in a larger randomized controlled trial (RCT) study comparing the effect of paroxetine, pill-placebo, cognitive therapy, or the combination of paroxetine and cognitive therapy (Nordahl et al., 2016). In the RCT, the inclusion criteria were; age of 18-65 years, fulfilment of DSM-IV criteria for SAD, and symptoms present for at least 6 months. The exclusion criteria were; any form of physical disease, psychotic illness, acute suicidality, a primary diagnosis of major depressive disorder, diagnosis of body dysmorphic disorder, drug or alcohol dependence, cluster A or B personality disorder, not willing to accept random allocation, those with prior exposure to SSRIs or cognitive therapy, pregnancy and those with plans to become pregnant during the next 6 months (Nordahl et al., 2016).

In the original RCT study, 102 patients with SAD were randomized, and 86 completed the treatment they were randomized to; paroxetine ($n = 21$), cognitive therapy ($n = 22$), paroxetine and cognitive therapy ($n = 20$), and pill-placebo ($n = 23$). For the current study, we were interested in predictors of change over the course of treatment in effective evidence-based treatments. Thus, all participants in the pill-placebo condition ($n = 23$) were excluded as they had not received an effective and recommended treatment. Moreover, 17 out

of the remaining participants were excluded due to missing data at pre- or at post treatment on the MCQ-30 (Wells & Cartwright-Hatton, 2004) or on the SPRS (Wells, 1997).

Paper II: This study looked at data from patients that had been diagnosed with generalized SAD at the university outpatient clinic at the Department of psychology, Norwegian University of Science and Technology, prior to inclusion in controlled trials (Nordahl et al., 2016; Vogel et al., 2016). For the current study, we included patients with SAD as their principal disorder that also were diagnosed with or without avoidant personality disorder. Patients that had other comorbid disorders than avoidant personality disorder were excluded because we did not know if these disorders preceded social anxiety or shared separate links with metacognitive beliefs. Specifically, patients with a diagnosis of major depressive disorder had to be excluded as a means to explore the hypothesized relationships and not just an association between metacognitions and current or previous major depressive disorder. Thus, this study included 102 participants with a principal diagnosis of SAD with or without avoidant personality disorder and without any other comorbid mental disorder.

Paper III: The participants included in this study were derived from a sample of individuals signing up to participate in an online survey of social anxiety through advertisement on social media. We used the Fear of Negative Evaluation (FNE; Watson & Friend, 1969) as a screening tool to identify high socially anxious individuals. Those that could not be classified as high socially anxious, who were below 18 years of age, and those reporting to be students or retired were excluded from the current study. Out of a total of 712 that took part in the survey, we identified 204 participants that were classified as high socially anxious, were 18 years old or above, and who reported to be working ($n = 102$) or on long-term sick leave ($n = 102$).

Paper IV: This study included the first three participants with different presentations of SAD that were consecutively referred to the university outpatient clinic at the Department

of psychology, Norwegian University of Science and Technology. All patients referred for treatment of SAD were assessed with the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I; First et al., 1997b) and Axis II personality disorders (SCID-II; First et al., 1997a) by an independent assessor. The inclusion criteria were; a primary diagnosis of SAD, 18 years old or above, and signed written informed consent in accordance with the Declaration of Helsinki. The exclusion criteria were; concurrent treatment for a mental disorder, evidence of psychotic or organic illness, cluster A and B personality disorders, active suicidality, and substance/alcohol dependence. Patient 1 was a 24-year old female who presented with SAD performance subtype, patient 2 was a 70-year old male who presented with generalised SAD, and patient 3 was a 27-year old female who presented with generalised SAD, avoidant personality disorder, and recurrent depressive disorder, currently moderately depressed.

2.2. Ethics

The data used in this thesis has been derived from different studies. All these studies have been approved by the Regional Committee for Medical and Health Research Ethics (REC) which is appointed by the Ministry of Education and Research in Norway to foresee that research is undertaken in an acceptable manner and in line with the Norwegian law. All subjects included in the studies have given informed consent in accordance with the Declaration of Helsinki.

Paper I was a secondary analysis from a randomized controlled trial (Nordahl et al., 2016) which was approved by REC in 2003 (reference number: REK-018-03). Paper III was based on an internet survey which was approved by REC in 2016 (reference number: 2016/705). Paper IV which aimed to examine the effects associated with MCT for three patients with different presentations of SAD was approved in 2015 (reference number:

2015:1794). Paper II included participants from three studies; the study by Nordahl and colleagues (2016) which also paper I was based on, the study by Nordahl & Wells (2018) that also paper IV was based on, and in addition a study conducted by Vogel and colleagues (2016) which was approved by REC in 2014 (reference number: 2014/965/REK midt).

2.3. Instruments and Measures

2.2.1. Diagnostic interviews

2.2.1.1. The Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I)

The SCID-I (First et al., 1997b) is a semi-structured diagnostic interview based on the DSM-IV (APA, 1994) criteria for symptom disorders. It was used to assess whether participants included in this thesis fulfilled the criteria for an axis I disorder according to the DSM-IV. It has been reported that the SCID-I has good inter-rater reliability for symptom disorders such as Social phobia ($\kappa = 0.83$) (Lobbestael, Leurgans, & Arntz, 2011).

2.2.1.2. The Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II)

The SCID-II (First et al., 1997a) is a semi-structured diagnostic interview based on the DSM-IV (APA, 1994) criteria for personality disorders. It was used to assess whether participants included in this thesis fulfilled the criteria for a personality disorder. It has been reported that the SCID-II has good inter-rater reliability for personality disorders such as Avoidant personality disorder ($\kappa = 0.83$) (Lobbestael et al., 2011).

2.2.1.3. The Anxiety Disorders Interview Schedule (ADIS-IV)

The ADIS-IV (DiNardo, Brown, & Barlow, 1994) is a semi-structured diagnostic interview based on DSM-IV (APA, 1994) criteria. It was used in the treatment studies that the data from paper I and II is derived from in addition to SCID-I and II with a particular view on SAD as the ADIS-IV also includes clinical severity ratings of different disorders.

Brown, Di Nardo, Lehman, and Campbell (2001) reported good to excellent inter-rater reliability for the majority of DSM-IV categories, including Social phobia ($\kappa = 0.80$).

2.2.2. Social anxiety symptoms

2.2.2.1. Fear of Negative Evaluation (FNE)

The FNE (Watson & Friend, 1969) is a 30-item measure of apprehension and anxiety over anticipated social evaluations. This measure uses a true-false scale and has shown good internal consistency ($\alpha = .94$) and test-retest reliability ($r = .78$) (Watson & Friend, 1969). FNE has a range from 0 to 30, high scores indicating higher levels of social anxiety. Furthermore, cut-off scores have been established which identifies those who are low socially anxious (7 points or below) and high socially anxious (22 points or above) (Stopa & Clark, 2001). The FNE was used as an outcome measure in paper I and IV, and as an independent variable in paper II and III. Moreover, the FNE was also used to screen for eligible participants (high socially anxious individuals) in paper III.

2.2.2.2. Social Avoidance and Distress scale (SAD)

The SAD (Watson & Friend, 1969) is a 28-item measure of distress in social situations and avoidance, using a true-false scale. Its internal consistency has been found excellent ($\alpha = .94$) and its test-retest reliability ranged from .68 to .79 (Watson & Friend, 1969). SAD has a range from 0 to 28, high scores indicating higher levels of social anxiety. The SAD was used as one out of four outcome measures in paper I.

2.2.2.3. Liebowitz Social Anxiety Scale (LSAS)

The LSAS (Liebowitz, 1987) is a 24-item measure of fear and avoidance related to social interaction and performance which originally was developed as a clinician-administered measure and later transformed to a self-report measure. For each item, participants have to rate both fear and avoidance on a four-point scale ranging from 0

(“none”/“never”) to 3 (“severe”/“usually”). LSAS-SR has a range from 0 to 144, higher scores indicating higher levels of social anxiety. Its internal consistency has been found to be excellent ($\alpha = .94$) (Fresco et al., 2001) and the scale has good test-retest reliability ($r = .83$) (Baker, Heinrichs, Kim, & Hofmann, 2002). The LSAS-SR was used as an outcome measure in paper I.

2.2.2.4. Social Interaction Anxiety Scale (SIAS)

The SIAS (Mattick & Clarke, 1998) is a 20-item scale that measures fear of and responses to social interactions. Each item is scored on a scale from 0 (“not at all characteristic or true of me”) to 4 (“extremely characteristic or true of me”). SIAS has a range of 0 to 80, and higher scores indicating higher levels of social interaction anxiety. It has shown high internal consistency ($\alpha = .93$) and test-retest reliability (.92) (Mattick & Clark, 1998). The SIAS was used as an outcome measure in paper I and IV.

2.2.3. Other symptom measures

2.2.3.1. Beck Anxiety Inventory (BAI)

The BAI (Beck, Epstein, Brown, & Steer, 1988) is a 21-item self-report scale designed to assess the severity of somatic and cognitive anxiety symptoms over the previous week. Each item is reported on a 4-point scale ranging from 0 (“not at all”) to 3 (“severely – it bothered me a lot”), and the BAI has a range from 0 to 63, higher scores indicating higher levels of anxiety. BAI has high internal consistency ($\alpha = .92$) and good test-retest reliability (.75) (Beck et al., 1988). The BAI was used as an independent variable in paper II as a means to control for non-specific anxiety levels when exploring metacognitive beliefs as statistical predictors of depression symptoms in patients with SAD, and was also reported as a secondary outcome measure in paper IV.

2.2.3.2. Beck Depression Inventory (BDI)

The BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a 21-item self-report scale assessing current level of depression symptoms. Each item is reported on a 4-point scale from 0 to 3, and the BDI has a range from 0 to 63, higher scores indicating higher levels of depression. The BDI has high internal consistency ($\alpha = .86$) and the test-retest reliability has been reported as more than .60 (Beck, Steer & Carbin, 1988). The BDI was used in paper II to assess severity of depression symptoms among SAD-patients, and was also reported as a secondary outcome measure in paper IV.

2.2.4. Measures of maintenance factors

2.2.4.1. Social Phobia Rating Scale (SPRS)

The SPRS (Wells, 1997) has five rating-scales assessing key components of the Clark and Wells (1995) model of social anxiety; distress, avoidance, self-consciousness, use of safety behaviors, and negative cognitive beliefs: 1. *Distress*; participants are asked to rate how distressed they have been by their social anxiety in the last week on a scale ranging from 0 (“not at all”) to 8 (“extremely, never been worse”). 2. *Avoidance*; participants are asked to rate to what extent they have avoided social situations the previous week on a scale ranging from 0 (“not at all”) to 8 (“all the time”). 3. *Self-consciousness*; participants are asked to rate how self-conscious they have felt in social situations the last week on a scale ranging from 0 (“not at all”) to 8 (“extremely”). 4. *Use of safety behaviors*; participants are asked how often they use different examples of safety behaviors when they are socially anxious. Participants give a rating for 15 different examples of safety behaviors, e.g. “try to relax” and “avoid eye contact”, on a scale from 0 (“not at all”) to 8 (“all the time”). A total score can be derived by summing the ratings for each item. 5. *Negative cognitive beliefs*; participants are asked to rate how much they believe 14 different negative beliefs characterizing social phobia on a scale from 0 (“not at all”) to 100 (“totally convinced that the belief is true”) when they are

socially anxious, e.g. “I look bad” and “They will notice I’m anxious”. A total score can be derived by summing the belief ratings for each item, so the total scale ranges from 0 to 1400. We are currently working on a manuscript reporting the psychometric properties of the SPRS. The safety behaviors subscale and the negative cognitive beliefs subscale both have excellent internal consistency ($\alpha = .88$, and $\alpha = .96$, respectively), high test-retest reliability over 8 weeks ($r = .79$, and $r = .89$, respectively) and is also sensitive to treatment effects (Nordahl, Nordahl, & Wells, in prep). The SPRS has been used in all of the papers in this thesis and its subscales have represented central elements in the Clark and Wells (1995) model of social phobia.

2.2.4.2. Metacognitions questionnaire 30 (MCQ-30)

The MCQ-30 (MCQ-30: Wells & Cartwright-Hatton, 2004) is a 30-item self-report scale measuring beliefs about thinking. Responses are required on a four-point scale ranging from 1 (“do not agree”) to 4 (“agree very much”). A five-factor structure exists: 1) positive beliefs about worry (“Worrying helps me to avoid problems in the future”); 2) negative beliefs about the uncontrollability and danger of worry (“My worrying is dangerous to me”); 3) cognitive confidence (“I have a poor memory”); 4) need to control thoughts (“I should be in control of my thoughts all the time”); and 5) cognitive self-consciousness (“I monitor my thoughts”). High scores reflect more reported problems with the item in question. The MCQ-30 has demonstrated good psychometric properties in several studies (e.g., Wells & Cartwright-Hatton, 2004; Spada, Mohiyeddini, & Wells, 2008; Nordahl et al., 2019). The MCQ-30 or its subscales has been used as the main measure of metacognitive beliefs in paper I to IV.

2.2.4.3. CAS-1

The CAS-1 (Wells, 2009) is a 16-item self-report measure that assesses four dimensions; worry/rumination, threat monitoring, coping behaviors, and metacognitive

beliefs. The first two items reflect the amount of time spent worrying or 'dwelling' on problems and focusing attention on threat. The next six items capture the frequency of unhelpful strategies used to cope with negative thoughts or feelings (e.g., "Tried not to think about things"), and the final eight items assess positive and negative metacognitive beliefs about the CAS (e.g., "Worrying helps me cope"; "I cannot control my thoughts"). In line with its intended use, several clinical studies have used the CAS-1 to assess and monitor metacognitive strategies and beliefs during treatment and demonstrated that it is sensitive to treatment effects (see Nordahl and Wells (2019a) for psychometric properties and an overview of treatment studies that have used the CAS-1). The CAS-1 was used in paper IV to monitor components of the CAS over the course of treatment.

2.4. Statistical Analyses

2.4.1. Research question I - *Does change in metacognitive beliefs correlate with symptom improvement following treatment in patients with SAD when controlling change in self-consciousness and change in social phobic beliefs (Paper I)?*

Change scores for cognitive beliefs, negative metacognitive beliefs, and self-consciousness were calculated by subtracting the post-score from pre-score for each variable. We used several independent samples t-tests and Cohen's *d* (Cohen, 1988) to evaluate the magnitude of change in social anxiety levels following treatment (FNE, LSAS, SAD, SIAS) and the change in the independents (cognitive beliefs, negative metacognitive beliefs, and self-consciousness).

Pearson bivariate correlations were computed between change in cognitive beliefs, change in negative metacognitive beliefs, change in self-consciousness and gender to investigate the relationships between the predictors.

Four linear hierarchical linear regression analysis were conducted, one for each symptom measure (FNE, LSAS, SAD, SIAS), using post-treatment scores as the dependent whilst controlling for each of these respective variables at pre- treatment before adding the predictors to the model (gender, change in cognitive beliefs, change in self-consciousness, and change in metacognitive beliefs).

2.4.2. Research question II - *Do maladaptive metacognitive beliefs correlate with depression symptoms in patients with SAD when controlling social anxiety severity and factors postulated in cognitive models (Paper II)?*

Pearson bivariate correlations were used to explore the correlational relationship between all the variables used in this study. Moreover, a hierarchical linear regression analysis was conducted to explore if metacognitive belief domains explained additional and independent variance in depression symptoms among SAD-patients when controlling for gender, AvPD, social fears, anxiety severity, social phobic cognitive beliefs, and self-consciousness and avoidance.

2.4.3. Research question III - *Do maladaptive metacognitive beliefs correlate with work status in high socially anxious individuals when controlling social anxiety severity and factors postulated in cognitive models (Paper III)?*

Independent samples t-tests were used to compare the two groups (working or out-of-work) in terms of the predictors used in the study. As we ran a total of 11 independent t-tests, Bonferroni's correction was applied (α -level .0045). Binary logistic regression was run to test the unique contribution of the predictors to work status. Before adding metacognitive beliefs to the model, we controlled for social anxiety severity (FNE, social anxiety distress), avoidance, self-consciousness, safety behaviors, and cognitive beliefs.

2.4.4. Research question IV - *Is Metacognitive therapy associated with positive effects for patients with different presentations of SAD (Paper IV)?*

In order to assess the effects associated with MCT for SAD, a single case series using A-B methodology with follow-up was implemented. Due to the design of this study, no statistical analysis was conducted. However, single-case designs are adaptations of interrupted time-series designs and can provide a rigorous experimental evaluation of intervention effects and hence provide a basis for establishing causal interference.

3. Results

3.1. Does change in metacognitive beliefs correlate with symptom improvement following treatment in patients with SAD when controlling change in self-consciousness and change in social phobic beliefs?

This study examined change in negative cognitive and negative metacognitive beliefs as independent correlates of symptom improvement in 46 patients undergoing evidence-based treatments.

Social anxiety symptoms pre- and post- treatment were assessed across four different outcome measures (FNE, SAD, SIAS, and LSAS), and the change in symptoms following treatment indicated a large effect size as assessed by Cohen's *d* for all measures (*ES* ranging from .97 to 1.80). The change in self-consciousness and negative cognitive beliefs also indicated a large effect size, with an *ES* of 1.76 and 1.72, respectively, whilst the change in negative metacognitive beliefs indicated a medium effect size (*ES* = .62).

The relationship between the predictor variables was explored using bivariate correlations. Gender was not significantly correlated with any of the other predictors. Change in self-consciousness was positively and significantly correlated with change in cognitive beliefs ($r = .33, p = .027$), but was not correlated with change in negative metacognitive beliefs ($r = -.01, p = .926$). Change in cognitive beliefs and change in negative metacognitive beliefs was not significantly inter-correlated ($r = .04, p = .794$).

Four regression analyses were conducted, one for each outcome measure (FNE, LSAS, SAD and SIAS). The results indicated that symptom score at time 1 was a strong and significant predictor of symptom score at time 2 for all measures, also in the final step of the regression models. Gender was not related to outcome in any of the symptom measures. In step 3, change in cognitive beliefs was related to change in three out of four symptom measures, and explained 8.7 % of the variance in FNE, 8.3 % of the variance in LSAS, and

9.6 % of the variance in SIAS at post treatment. Change in cognitive beliefs was not a significant predictor of SAD score at post treatment when pre treatment score and gender were controlled. In step 4, when controlling for gender and change in cognitive beliefs, change in self-consciousness was a significant incremental predictor of symptom change in three measures, and explained 9.7 % additional variance in FNE, 10.2 % in LSAS and 9.4 % in SIAS. Change in self-consciousness was not a significant predictor of post treatment SAD in this model. Moreover, adding change in self-consciousness to the model led cognitive beliefs to become non-significant as a predictor in the case of all outcome measures. In the final step, change in negative metacognitive beliefs explained a significant additional 15.9 % of the variance in FNE, 5.9 % of the variance in LSAS, 12.9 % of variance in SAD, and 10.3 % of the variance in SIAS. Further, when negative metacognitive beliefs were added to the model in the final step, change in self-consciousness became a significant predictor of SAD score post treatment. In the final equation, only change in self-consciousness and change in negative metacognitive beliefs explained variance in symptom measures at post treatment, while change in cognitive beliefs was not a significant predictor in any of the models.

Main finding: Change (i.e. reduction) in negative metacognitive beliefs, but not change in negative cognitive beliefs were significant correlates of symptom improvement following treatment.

3.2. Do maladaptive metacognitive beliefs correlate with depression symptoms in patients with SAD when controlling social anxiety severity and factors postulated in cognitive models such as social phobic beliefs?

This study examined if metacognitive beliefs could account for independent variance in depression symptoms among 102 patients diagnosed with primary SAD when the contribution from social anxiety severity and factors postulated in cognitive models were accounted for.

Correlational analyses indicated that symptoms of depression were not significantly associated with avoidance, but were positively and significantly associated with symptoms of anxiety, fear of negative evaluation, social phobic beliefs, self-consciousness, and metacognitive beliefs (all of the MCQ-30 subscales).

Using hierarchical linear regression analysis, we found that negative metacognitive beliefs and cognitive confidence were significant predictors of depressive symptoms, while gender, avoidant personality disorder, social fears (FNE), anxiety symptoms (BAI), social phobic beliefs, self-consciousness and avoidance were non-significant. Negative metacognitive beliefs were the strongest predictor of depressive symptoms, and in sum, metacognitive beliefs explained 20.8 % of the variance in depressive symptoms in SAD patients over and above the other predictors.

Main finding: Metacognitive beliefs (negative metacognitive beliefs and judgements of confidence in memory), but not cognitive beliefs, were significant positive statistical predictors of depression symptoms in patients with primary SAD.

3.3. Do maladaptive metacognitive beliefs correlate with work status in high socially anxious individuals when controlling social anxiety severity and factors postulated in cognitive models such as social phobic beliefs?

This study examined correlates of work status (being in- or out-of-work) in 204 high socially anxious individuals.

The out-of-work group showed significantly greater symptoms and significantly greater severity of avoidance, self-consciousness, use of safety behaviors, negative beliefs about the uncontrollability and danger of thoughts, and greater beliefs about the need to control thoughts compared to the working group. However, the groups did not differ in terms of negative cognitive beliefs, positive metacognitive beliefs, cognitive confidence, or cognitive self-consciousness.

Binary logistic regression was used to determine if metacognitive beliefs were independent predictors of group membership after controlling for FNE score, distress, and factors central in the cognitive model. We found that negative metacognitive beliefs were a significant predictor of group membership, with an odds ratio above 1 indicating that a higher score on negative metacognitive beliefs was associated with belonging to the disability group. Neither severity (FNE-score, level of social anxiety distress in the last week), nor factors emphasized in CBT (avoidance, self-consciousness, use of safety behaviors, negative cognitive beliefs) were significant predictors. Apart from negative metacognitive beliefs, none of the other metacognitive belief domains were significant as predictors in this analysis.

Main finding: Higher negative metacognitive beliefs, but not cognitive beliefs, were significant correlates of work status (i.e. being out of work) in high socially anxious individuals.

3.4. Is Metacognitive therapy associated with positive effects for patients with different presentations of SAD?

In order to evaluate the effects associated with MCT for SAD, a single case replication series (across SAD subtypes) using an A-B design with follow up was implemented. The first three patients with different presentations of SAD consecutively referred to the university outpatient clinic at the Department of Psychology, Norwegian University of Science and Technology, were included.

Eight sessions of MCT were associated with substantial reductions in social anxiety, depression, metacognitive beliefs and strategies, and social phobic cognitive beliefs, and at post treatment none of the patients met the diagnostic criteria for SAD. Moreover, each patient was assessed every session with the FNE (the primary outcome measure) and time spent worrying/rumination and threat monitoring (i.e. the CAS). The FNE scores changed less rapidly than the CAS, but they seemed to follow the same trajectory, an observation that is consistent with the hypothesized effect of MCT on underlying process-related variables that are purported to subsequently impact on symptoms. Furthermore, gains made in treatment were largely maintained at 6 months follow up.

Main finding: Metacognitive therapy appears to be a suitable treatment and was associated with positive outcomes for patients with different presentations of SAD.

4. Discussion

4.1. Summary

The recommended treatment for SAD is individual Cognitive-behavioural Therapy based on the Clark and Wells model (1995). A conceptual feature of the Clark and Wells model (1995) is that it draws on different theoretical frameworks in an integrative way that may create upper limits to what can be achieved in conceptualization and treatment of the disorder. Influenced by Beck's schema theory (Beck, 1976), it places the content of cognition in centre stage and argues that schemas or negative beliefs give rise to self-processing and social anxiety. This perspective is incompatible with the Self-Regulatory Executive Function (S-REF) model of psychological disorder (Wells & Matthews, 1994), which also influenced the Clark and Wells (1995) model, but places regulation of cognitive style in centre stage and argues that metacognitive beliefs give raise to self-processing and social anxiety. Identifying which knowledge structures underlie social anxiety and related problems is important as it would influence which belief domains (cognitive and/or metacognitive) should be targeted in treatment and hence it has the potential to inform better understanding and further development of effective interventions.

The primary aim of the present thesis was therefore to explore the relative importance of social phobic cognitive beliefs versus metacognitive beliefs to social anxiety and to related problems such as depression symptoms and work status in socially anxious individuals. In addition, this thesis includes a preliminary investigation of Metacognitive therapy (Wells, 2009) for SAD using single case methodology as a means to investigate the feasibility of this treatment approach.

4.1.1. Cognitive- and Metacognitive Beliefs as Predictors of Symptom

Improvement Following Treatment

In paper I we explored change in negative cognitive versus negative metacognitive beliefs as statistical predictors of symptom improvement in patients undergoing evidence-based treatments while also controlling for change in self-consciousness. Across four different outcome measures, change in self-consciousness and in negative metacognitive beliefs, but not change in negative cognitive beliefs, accounted for independent variance in symptom improvement when the overlap between the predictors was accounted for. These findings suggest that metacognitive belief change was a stronger predictor of symptom improvement than change in cognitive beliefs. This finding is in line with similar studies that have demonstrated that change in metacognitive beliefs correlate with symptom improvement, for example in patients with OCD (Solem et al., 2009) and Chronic Fatigue Syndrome (Fernie, Murphy, Wells, Nikcevic, & Spada, 2016). Rather than aiming to modify cognitive beliefs in the psychological treatment of SAD, treatment may be better placed if it deals with the specific attentional processes (self-consciousness) and negative beliefs about the uncontrollability and danger of thoughts, as predicted by the metacognitive model (Wells & Matthews, 1994).

4.1.2. Cognitive- and Metacognitive Beliefs as Predictors of Depression

Symptoms in SAD

In paper II we examined the relative importance of cognitive versus metacognitive beliefs as statistical predictors of depression symptoms in patients with primary SAD, and found that metacognitive beliefs in the form of negative beliefs about the uncontrollability and danger of worry and judgements of confidence in memory, but not cognitive beliefs, accounted for individual variance. This finding is in line with the metacognitive model (Wells & Matthews, 1994) and suggests that metacognitive beliefs contribute to depression symptoms in SAD patients, indicating that metacognitions are generic risk factors for co-morbidity and may account for some of the correlation between depressive symptoms and

SAD. In line with our findings, two previous studies have reported a positive association between change in metacognitive beliefs (negative metacognitive beliefs, cognitive confidence, beliefs about the need for control of thoughts) and change in depressive symptoms following CBT for SAD (McEvoy, Mahoney, Perini, & Kingsep, 2009; McEvoy & Perini, 2009). Others have reported that social phobic cognitive beliefs explain unique variance in depression symptoms while controlling for social anxiety (Wong, Moulds, & Rapee, 2014; Gregory & Peters, 2017), but these studies did not control for metacognitive beliefs so that the shared variance between symptoms and cognitions might be explained by a third factor, such as their association with the CAS. Therefore, targeting metacognitive beliefs directly in the treatment of SAD may have the benefit of addressing comorbid depression symptoms and/or vulnerability in parallel.

4.1.3. Cognitive- and Metacognitive Beliefs as Predictors of Work Status in Socially Anxious Individuals

In paper III we examined the relative importance of cognitive versus metacognitive beliefs as statistical correlates of work status among high socially anxious individuals, and found that negative metacognitive beliefs, but not cognitive beliefs, were statistical predictors of work status. This finding suggest that negative metacognitive beliefs might be important for work status, and that examining these beliefs in treatment might facilitate return-to-work among the high socially anxious. This finding is in line with other studies that have shown metacognitive beliefs to be correlated with work status in a community sample when controlling for a diagnosis of mental disorder and trait-anxiety (Nordahl & Wells, 2017b). They are also consistent with data that metacognitive beliefs predict work ability among those with a common mental disorder when controlling for mental and physical health symptoms (Nordahl & Wells, 2019b), and with a recent study showing that metacognitive beliefs prospectively predict return to work in patients with chronic pain, chronic fatigue and

common mental disorders (Jacobsen, Glette, Hara, & Stiles, 2020). Moreover, the measured cognitive beliefs were not a significant predictor of work status, indicating that targeting these beliefs in treatment may not lead to enhanced return-to-work.

4.1.4. Metacognitive therapy for Social Anxiety Disorder

Papers I – III suggested that metacognitive beliefs rather than cognitive beliefs seem to be important correlates of social anxiety and related problems such as depression symptoms and work status. These findings are in line with the S-REF model (Wells & Matthews, 1994) and set the stage for targeting metacognitive beliefs and the regulation of thinking more directly rather than the content of cognition, when treating patients with SAD. Metacognitive change may be important for both symptom improvement and wider improved outcomes in functioning. Paper IV set out to examine the feasibility and effects that might be associated with Metacognitive therapy (Wells, 2009) that directly deals with metacognitions. To do this a design involving systematic replication across different types of SAD was chosen. MCT was associated in each case with a decrease in social anxiety and in depression symptoms, in metacognitive beliefs and strategies, but also in social phobic beliefs even though these were not directly targeted. This observation suggests that cognitive beliefs may be sensitive to manipulations of metacognition and may be a secondary effect of metacognitive factors that are the more central mechanism of disorder (Wells, 2019). A similar finding was reported by Vogel and colleagues (2016) who treated SAD-patients with the combination of Situational Attentional Refocusing (SAR; Wells, 2000) and the Attention Training Technique (ATT; Wells, 1990), two metacognitive therapy applications that specifically target metacognitive strategies and beliefs. In this study, SAR and ATT led to large pre- to post- effects in social anxiety and metacognitive beliefs, and in a composite SPRS score which includes factors emphasized in the Clark and Wells (1995) model such as social phobic beliefs.

4.2. Meaning and Clinical Importance of the Findings

Papers I – III in this thesis report that metacognitive- rather than cognitive beliefs are significant correlates of social anxiety, depression symptoms and work status in socially anxious individuals. These findings are in line with the metacognitive model of psychological disorder (Wells & Matthews, 1994) where emotional distress is thought to be maintained by the *Cognitive Attentional Syndrome* (i.e. the CAS) and the metacognitive factors (for example metacognitive beliefs) that underlie it. In this approach, cognitive beliefs (such as the negative self-beliefs emphasised in the Clark and Wells (1995) model are considered either input or output of the CAS, and not in themselves a cause of emotional disorder. Wells and Matthews (1994) argued that it is necessary to modify the metacognitive control factors that can help bring universal maladaptive thinking patterns under control, rather than changing the content of cognition. MCT was specifically design to address the regulation of thinking, and can, as shown in paper IV, be applied in patients with different presentations of SAD.

While several studies have implicated social phobic beliefs in social anxiety (Gregory, Wong, Marker, & Peters, 2018) and depression whilst controlling for social anxiety (Wong, Gregory, Gaston, Rapee, Wilson, & Abbott, 2017), previous studies that have explored the role of cognition in social anxiety and related problems have not controlled for the potential contribution of metacognitive beliefs (Gkika et al., 2018). Although we have previously tested the goodness of fit of a cognitive- versus a metacognitive model of social anxiety (Nordahl & Wells, 2017a), we did not examine the relative contribution of belief domains. Hence, the present thesis builds on previous research that has reported an association between social phobic-, and metacognitive beliefs, and social anxiety (Gkika et al., 2018) by testing their importance whilst controlling for the overlap between them. The results suggest that

metacognitive beliefs are more reliable predictors compared to cognitive beliefs in this context.

The clinical implication of the present thesis is that we should consider moving beyond the content of cognition in conceptualizing and treating SAD, and that targeting metacognitive beliefs, in particular beliefs about the uncontrollability and danger of thoughts, may produce more effective and/or faster, as well as broader outcomes than targeting cognitive beliefs. It may be the case that changes in negative automatic thoughts or underlying schemas are not necessary to promote recovery. This implies that current models of SAD should be modified to include relevant metacognitive beliefs and to down-play the importance of negative cognitive beliefs. The metacognitive model (Wells & Matthews, 1994; Wells, 2019) may serve as a basis to develop a disorder-specific model and treatment manual with the potential to enhance clinical relevance and outcomes for patients with SAD.

An important observation emerging from papers I – III is that particular negative metacognitive beliefs, that is beliefs about the uncontrollability and danger of thoughts, are related to social anxiety, depression symptoms and work status in socially anxious individuals. These findings confirm a central prediction from the metacognitive model (Wells & Matthews, 1994) which states that negative metacognitive beliefs are likely to predict mental ill-health in general as they contribute to reduced investment in controlling thinking and also to negative interpretations of internal experience, compromising choice of effective coping strategies when exposed to stress (i.e. the CAS). Previous studies have demonstrated that negative metacognitive beliefs are more strongly correlated with symptoms than other domains of metacognitions in a range of mental disorders (Sun et al., 2017) including social anxiety (Gkika et al., 2018). The present thesis shows more specifically that these beliefs also are implicated in the overlap between problems associated with SAD, and that they may

account for comorbidity within SAD even when the effects of cognitive beliefs are accounted for.

Rather than formulating social anxiety, depression symptoms, and poor work ability as separate but related problems, we may speculate that dealing with metacognitive beliefs may have a broader impact on symptoms and functioning as they are transdiagnostic factors (Wells & Matthews, 1994). For example, if metacognitive beliefs are risk factors for social anxiety, depression symptoms, and work ability, treating SAD without properly modifying them may not remove the more generic risk for developing pathology associated with maladaptive metacognitions. Metacognitive therapy (Wells, 2009) that directly aims to modify metacognitive beliefs has proven to be an effective treatment for depression and anxiety and is also associated with high effect sizes on secondary outcomes such as depression symptoms in patients undergoing treatment for anxiety disorders (Normann & Morina, 2019). Furthermore, MCT for major depressive disorder appears effective for depression symptoms (Callesen, Reeves, Heal, & Wells, 2020), but also has an impact on anxiety and work ability (Hagen et al., 2017), comorbid diagnosis (Hjemdal et al., 2017), neuropsychological functioning (Groves et al., 2015), and interpersonal problems (Strand et al., 2018). Based on the findings in the present thesis, MCT might have similar effects on SAD and related problems which might offer a time- and cost-efficient treatment alternative.

4.3. Strengths and Limitations

A major strength of the present thesis is that it set out to explore an area of research, namely the relative contribution of cognitive- versus metacognitive beliefs to social anxiety, that others have called upon following a systematic review of the literature on cognition and metacognition in social anxiety (Gkika et al., 2018). While the present thesis indicate that metacognitive beliefs may be more reliable correlates of social anxiety and related problems

than social phobic cognitive beliefs, causal inferences from these studies cannot be made due to their cross-sectional nature.

A strength of the present thesis is in the samples of studies in paper I, II and IV which include participants that have been thoroughly assessed and diagnosed with SAD. However, a limitation in particular with study III is that a self-report measure was used to find eligible participants which might compromise the validity and generalizability of the findings. However, it has been argued that using analogue SAD-samples can facilitate progress in the field (Stopa & Clark, 2001; Hirsch & Clark, 2004). Moreover, sample size in all papers is limited, and in particular the participant to predictor ratio in paper I might have affected the results.

The MCQ-30 (Wells & Cartwright-Hatton, 2004) was used to assess metacognitive beliefs in this thesis, and has been shown to have good psychometric properties across samples and many countries including Norway (Nordahl et al., 2019; Grøtte et al., 2016). However, to assess social phobic cognitive beliefs, the SPRS (Wells, 1997) was used across studies, and its psychometric properties have not been previously reported. However, the SPRS was developed to assess beliefs emphasised in the Clark and Wells (1995) model by one of the originators (Wells, 1997). Furthermore, we are currently in the process of publishing a study on the psychometric properties of the SPRS where we found that cognitive beliefs can best be accounted for by a one-factor solution, and that this scale had excellent internal consistency, incremental validity, stability over 8 weeks and was sensitive to treatment effects (Nordahl, Nordahl, & Wells, in prep.). While caution must be taken in interpreting our findings, the aforementioned study reported that cognitive beliefs as assessed in the SPRS is a reliable and valid scale.

Never the less, the Clark and Wells (1995) model specifies that there are three types of social phobic cognitive beliefs; high standards, conditional-, and unconditional beliefs. In

the present thesis, cognitive beliefs were investigated as one factor which potentially could suppress any specific contribution from subcategories of beliefs. For example, high standards and conditional beliefs, but not unconditional beliefs have been reported to correlate with social anxiety when the overlap between these belief domains are controlled (Gkika et al., 2018). Moreover, the current thesis focused on beliefs closely related to only two models (Clark & Wells, 1995; Wells & Matthews, 1994) at the exclusion of other cognitive models of SAD (e.g., Hofmann, 2007) and broader areas of cognition, such as interpretations, perceptions, and judgements, and also more specific types of metacognitive beliefs.

In paper I to III, we accounted for the potential contribution of factors emphasised in the Clark and Wells (1995) model of SAD and the Wells and Matthews (1994) model (e.g., self-consciousness, avoidance) using scales from the SPRS that only use 1 item for each domain to assess these constructs which may compromise sensitivity. However, these factors are included in both models and the primary aim of the present thesis was to explore the relative contribution of cognitive- versus metacognitive beliefs.

Paper IV is the first study to assess full MCT for SAD, but is only based on three cases with different presentations of SAD, the assessors were not blind to treatment condition, only one therapist conducted the treatment, and we were unable to partial-out the effects specifically due to treatment techniques as opposed to non-specific factors. The findings must therefore be considered only indicative of the potential usefulness of MCT for SAD.

4.4. Implications for Further Research

Clinical implications of the findings presented in this thesis have been discussed in section 4.2., and can be summarized as supporting the proposal that moving beyond the content of cognition and towards the regulation of cognitive style by addressing

metacognitive beliefs, may enhance the conceptualization and treatment of SAD. In the following section, I will present some implications for further research based on the findings in the present thesis and on the metacognitive approach in relation to social anxiety.

To the authors' knowledge, all studies looking at metacognitive beliefs as formulated by Wells and colleagues and social anxiety are of cross-sectional design, meaning that causal inferences concerning relationships between metacognitive beliefs and social anxiety cannot be made. The temporal precedence between metacognitive beliefs and social anxiety and related problems should be established, and according to the metacognitive model (Wells & Matthews, 1994; Wells, 2019), changes in metacognitive beliefs should precede changes in symptoms and impairments (see e.g. Nordahl et al., 2019).

The present thesis has shown that metacognitive beliefs are associated with social anxiety, but also related problems such as depression symptoms and work status. Further studies should look into a potential role for metacognitive beliefs in other areas related to social anxiety, such as substance abuse and dependence (Buckner, Schmidt, Lang, Small, Schlauch, & Lewinsohn, 2008) and avoidant personality disorder (Friborg, Martinussen, Kaiser, Øvergård, & Rosenvinge, 2013). Because of the transdiagnostic nature of metacognitive beliefs, they might explain comorbidity and overlap in social anxiety beyond depression symptoms and work status, and the effect of targeting these beliefs domains directly should be evaluated in terms of primary and secondary outcomes.

According to the metacognitive model (Wells & Matthews, 1994), both common (i.e., negative metacognitive beliefs) and more specific domains of metacognitive beliefs (e.g., confidence in memory) can underlie different presentation of distress and/or problems. The present thesis focused primarily on negative metacognitive beliefs as these are the most important beliefs domain across pathologies according to the metacognitive approach. However, both paper II in this thesis and another paper we published (Nordahl & Wells,

2017a) indicate a role for cognitive confidence in social anxiety. Further research should look more into specific domains of metacognitive beliefs that may contribute to social anxiety and related problems, which might warrant the development of new measures.

In the present thesis, cognitive beliefs do not account for variance in social anxiety and related problems when we control for attentional processes and metacognitive beliefs. If social anxiety is directly linked to underlying metacognitive beliefs rather than cognitive beliefs and schemas, this raises the question about how cognitive beliefs should be conceptualized. Social phobic cognitive beliefs may be the situational output of running a particular plan that is metacognitive in nature. Hence, the metacognitive beliefs directing this plan presents the stable entity, followed by the activation of its corresponding CAS strategies producing negative self-beliefs. Thus, one prediction raising from the metacognitive model that should be examined is that negative cognitive beliefs can result from the processing directed by underlying metacognitive beliefs. Further clarification of the relationship between metacognitive- and cognitive social phobic beliefs should therefore be pursued empirically.

To date, only the case-series in the present thesis has explored the effects of full MCT for SAD. Thus, there is a need to conduct open and controlled studies to explore the efficacy of MCT for SAD and to compare MCT with other treatments such as CBT. Moreover, it might be that MCT could be delivered differently for patients with different presentations of SAD. For example, for those with milder presentations of the disorder, brief and cost effect procedures such as SAR and ATT targeting attentional styles might be sufficient (see Wells & Papageorgiou, 2001; Vogel et al., 2016; Nordahl & Wells, 2018). For those with more severe presentations, such as SAD in combination with personality problems, a more comprehensive metacognitive treatment package may be beneficial as for example more specific types of metacognitive knowledge contribute to resistance to change (Wells, 2019).

Another option is to investigate the effects of MCT for SAD delivered in group formats. Group MCT has been associated with very positive outcomes in patients with major depressive disorder (Dammen, Papageorgiou, & Wells, 2015), generalized anxiety disorder (Haseth, Solem, Sørø, Bjørnstad, Grøtte, & Fisher, 2019), obsessive-compulsive disorder (Papageorgiou et al., 2018), and in a transdiagnostic setting (Callesen, Capobianco, Heal, Juul, Nielsen, & Wells, 2019), but has not been explored in SAD. While CBT delivered in group format is found to be less effective than individual CBT for SAD (Mayo-Wilson et al., 2014), this is still an open question for MCT. It might be that targeting “the how” of thinking rather than “the what people think” is easier and more effective in group settings.

Finally, the relevance of metacognitive theory and MCT for SAD should be explored in different contexts. For example, there is some preliminary evidence suggesting that MCT is a feasible and effective treatment for children and adolescents with anxiety and depression (Esbjørn, Normann, Christiansen, & Reinholdt-Dunne, 2018; Simons & Kursawe, 2019; Simons, Schneider, & Herpertz-Dahlmann, 2006), but this has not specifically been tested for SAD. Furthermore, there is a need to explore the role of metacognitive beliefs in social anxiety and the effects of MCT for SAD in different cultures. For example, social anxiety is thought to be associated with different types of cognitive beliefs in East Asian cultures. Self-beliefs related to the “interdependent self” are seen as important in the etiology of social anxiety in Japan (Norasakkunkit, Kitayama, & Uchida, 2012). One interesting line of research would therefore be to explore the relative importance of cognitive- versus metacognitive beliefs in a different cultural context.

5. Conclusions

In summary, the current thesis suggests that change in metacognitive- rather than social phobic cognitive beliefs is associated with symptom improvement in individuals undergoing treatment for SAD. Metacognitive- but not cognitive beliefs are statistical predictors of depression symptoms in patients with SAD, and of work status amongst high socially anxious individuals. These emerging data support the idea that moving beyond the content of cognition and towards a greater metacognitive-focused conceptualization and treatment of SAD may contribute positively to further developments. In line with this notion, MCT which aims to target metacognitive beliefs directly rather than the content of cognition appears to be a suitable treatment and was associated with positive outcomes for patients with different presentations of SAD. Hence, the metacognitive approach has the potential to advance our understanding and treatment of SAD, and the current thesis supports further research in this direction.

6. References

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Paper I

RESEARCH ARTICLE

Cognitive and metacognitive predictors of symptom improvement following treatment for social anxiety disorder: A secondary analysis from a randomized controlled trial

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Cognitive therapy for social anxiety disorder (SAD) based on the Clark and Wells model emphasizes negative beliefs about the social self and self-consciousness as central causal factors. However, Wells' metacognitive model proposes that metacognitive beliefs are central to pathology universally. The relative importance of cognitive and metacognitive beliefs in the treatment of SAD is therefore an important research question. This study examined change in negative cognitive and negative metacognitive beliefs as independent correlates of symptom improvement in 46 SAD patients undergoing evidence-based treatments. Both types of beliefs decreased during treatment. However, change in metacognitive belief was the only consistent independent predictor across all outcomes and change in cognitive beliefs did not significantly predict outcomes when change in self-consciousness was controlled. The implication of this finding is that metacognitive change might be more important than cognitive belief change in symptom outcome and recovery in SAD.

Key Practitioner Message

- Cognitive and metacognitive beliefs decreased during treatment of SAD.
- Change in self-consciousness predicted symptom improvement.
- Change in metacognition predicted symptom improvement over change in cognition.
- Change in metacognition was a more reliable predictor than change in cognition.

KEYWORDS

beliefs, metacognition, metacognitive beliefs, social anxiety disorder, social phobia

1 | INTRODUCTION

According to the NICE guidelines (NICE, 2013), the treatment of choice for social anxiety disorder (SAD) or social phobia is cognitive therapy (CT) based on the model by Clark and Wells (Clark & Wells, 1995). In support of the guidelines, a recent meta-analysis concluded that the treatment based on the Clark and Wells model is highly effective and superior to other psychological treatments and drugs (Mayo-Wilson et al., 2014).

Clark and Wells' (1995) cognitive model of SAD draws on concepts from cognitive (Beck, 1976) and metacognitive (Wells & Matthews, 1994) theory and proposes that on entering social situations, people with social anxiety experience negative automatic

thoughts and a shift in attention to self-focus on a biased and distorted inner image of the self. Safety behaviours are used to deal with negative beliefs about how one appears to others but impair performance and increase self-focused attention. In addition to these factors, anticipatory worry and post-event rumination-based thinking before and after social encounters contribute to problem maintenance. This pattern of processing can be traced back to underlying negative beliefs and assumptions about the social self (e.g., "I'm boring").

The metacognitive model of psychological disorder proposed by Wells and Matthews (1994, 1996) places the emphasis on different knowledge structures to those posited in cognitive theories such as Clark and Wells. Specifically, the metacognitive approach specifies that beliefs about thinking (i.e., metacognitive beliefs) are universally

involved in psychological disorders, including social anxiety. In particular, beliefs concerning the uncontrollability and danger of thoughts are considered a transdiagnostic factor that contribute to distress by compromising mental self-regulation because they facilitate a particular pattern of responding to inner experiences called the cognitive attentional syndrome (CAS; Wells, 2009). The CAS consists of worry/rumination, threat monitoring and maladaptive coping strategies that initiate, intensify, and maintain emotional distress (Wells & Matthews, 1994). Negative metacognitive beliefs (beliefs about the uncontrollability and corresponding danger of thoughts) lead to persistence of the CAS due to a failure to attempt control and because they lead to negative and threatening interpretations of mental events. The metacognitive model therefore predicts that negative metacognitive beliefs play an important role in the maintenance of self-processing strategies (e.g., anticipatory and post-event processing, self-focused attention) in patients with SAD and suggests that these beliefs are a more important underlying factor than cognitive beliefs (schemas) in psychological disorders, including SAD (Wells, 2000).

There is a limited work on the effects of psychological treatments on cognitive and metacognitive beliefs domains and the relative importance of each domain in symptom outcome. However, in one study on obsessive-compulsive disorder, metacognitive beliefs were a better predictor for outcome than responsibility and perfectionism, and only metacognition was significant when the overlap between the predictors was controlled (Solem, Håland, Vogel, Hansen, & Wells, 2009). Metacognitive beliefs were also a better predictor of obsessive-compulsive symptoms than cognitive belief domains in a community sample (Solem, Myers, Fisher, Vogel, & Wells, 2010). In patients with chronic fatigue syndrome treated with cognitive behavioural therapy or graded exercise therapy, change in metacognitive beliefs accounted for a significant proportion of symptom improvement in both treatment conditions (Fernie, Murphy, Wells, Nikčević, & Spada, 2016). Furthermore, one study found that metacognitive beliefs about alcohol use accounted for individual differences in drinking behaviour over and above the construct of alcohol expectancies (cognitive belief domain), with only social performance alcohol expectancies explaining variance when metacognitions were added to the model (Spada, Moneta, & Wells, 2007). These data support the importance of metacognitive belief domains and suggest that metacognitions may be more robust predictors of symptoms than cognitive beliefs.

The current study aimed to explore the relative importance of cognitive beliefs and negative metacognitive beliefs for outcome in a clinical sample that underwent treatment for SAD. Identifying which knowledge structures underlie social anxiety and its maintenance is important as it would suggest what belief domains (cognitive and/or metacognitive) should be targeted in treatment and hence it has the potential to inform better understanding and further development of effective interventions. Our hypotheses were as follows: (a) Both cognitive belief and metacognitive belief domains will decrease during treatment; (b) self-consciousness will decrease during treatment; and (c) negative metacognitive beliefs will account for a significant amount of the variance in symptom outcome, after controlling for symptom severity at pretreatment, gender, change in cognitive beliefs, and self-consciousness.

2 | METHOD

2.1 | Participants

Forty-six patients diagnosed with SAD (DSM-IV-TR; American Psychiatric Association, 2000) were included in the analyses. These patients were participants in a larger randomized controlled trial (RCT) study (Nordahl et al., 2016). We excluded all participants in the placebo pill condition as they had not received an effective treatment, and we were interested in the changes that underlie improvement in effective evidence-based treatments. Thirty participants from the active treatment conditions in the original RCT could not be included in this study because they did not complete the metacognitions questionnaire. A detailed description of the final sample's demographic and diagnostic information is provided in Table 1.

2.2 | Measures

The following self-report questionnaires were administered at pretreatment and post-treatment:

The Fear of Negative Evaluation scale (FNE; Watson & Friend, 1969) is a 30-item measure of apprehension and anxiety over anticipated social evaluations. This measure uses a true-false scale and has shown good internal consistency ($\alpha = .94$) and test-retest reliability ($r = .78$; Watson & Friend, 1969). FNE has a range from 0 to 30, high scores indicating higher levels of social anxiety. In this study, the Cronbach's alpha was .87.

The Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987) is a 24-item measure of fear and avoidance related to social interaction and performance. A higher score indicates higher levels of social anxiety. Its internal consistency has been found to be excellent ($\alpha = .96$; Heimberg et al., 1999) and the scale has good test-retest reliability ($r = .83$) (Baker, Heinrichs, Kim, & Hofmann, 2002). In this study, the Cronbach's alpha was .90.

The Social Avoidance and Distress scale (SAD; Watson & Friend, 1969) is a 28-item measure of distress in social situations and avoidance, using a true-false scale. Its internal consistency has been found excellent ($\alpha = .94$), and its test-retest reliability ranged from .68 to .79. SAD has a range from 0 to 28, high scores indicating higher levels of social anxiety. In this study, the Cronbach's alpha was .92.

The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) is a 20-item scale that measure fear of and responses to social interactions. It has shown high internal consistency ($\alpha = .93$) and test-

TABLE 1 Demographics and clinical characteristics (N = 46)

Demographics	M (SD)	N	%
Age	30.02 (9.23)		
Female gender		22	47.8
Married/cohabitant		19	41.3
Currently employed		26	56.5
Comorbid AvPD		22	47.8
Treated with CT		17	37.0
Treated with SSRI (paroxetine)		13	28.3
Treated with a combination of CT and SSRI		16	34.8

Note. AvPD = avoidant personality disorder; CT = cognitive therapy.

retest reliability (.92), and high correlation with the FNE (.66, $p < .001$). SIAS has a range from 0 to 80, high scores indicating higher levels of social anxiety. In this study, the Cronbach's alpha was .93.

The Social Phobia Rating Scale (SPRS; Wells, 1997) has five rating scales assessing key components of one of the most commonly employed CT treatments for social phobia (Clark & Wells, 1995); distress, avoidance, self-consciousness, use of safety behaviors, and negative beliefs. In our analyses, we used two of the subscales from the SPRS: (a) Self-consciousness; patients are asked to rate how self-conscious they have felt in difficult situations the last week on a scale ranging from 0 (*not at all*) to 8 (*extremely self-conscious*). (b) Cognitive beliefs; we computed a variable we called cognitive beliefs out of the negative beliefs rating scale. The scale consists of 14 items, for example, "I look bad" and "They will notice I'm anxious", each item ranging from 0–100. This scale was used as measure of cognitive beliefs typical for social phobic patients, ranging from 0 to 1,400. The scale had high internal consistency at pretreatment ($\alpha = .90$) and at post-treatment ($\alpha = .97$).

The Metacognition Questionnaire-30 (MCQ-30; Wells & Cartwright-Hatton, 2004) is a 30-item self-report scale measuring beliefs about thinking. Responses are required on a 4-point scale ranging from 1 (*do not agree*) to 4 (*agree very much*). A 5-factor structure exists: (a) positive beliefs about worry, (b) negative beliefs about the uncontrollability of thoughts and corresponding danger, (c) cognitive confidence, (d) need to control thoughts, and (e) cognitive self-consciousness. High scores reflect more reported problems with the item in question. In our analyses, we focused on the fourth factor measuring negative metacognitive beliefs about the controllability and danger of thoughts, for example, "My worrying is dangerous for me," as these beliefs are important for maintaining distress according to the S-REF model. The Metacognition Questionnaire-30 has demonstrated good psychometric properties (Cronbach's alpha ranging from .72 to .93) and the internal consistency of the uncontrollability and danger subscale has been shown to be excellent ($\alpha = .93$; Wells & Cartwright-Hatton, 2004). In this study, the Cronbach's alpha for the subscale was .71.

2.3 | Treatment

This sample was drawn from a larger RCT study (Nordahl et al., 2016) and comprised participants who had been included in one of the

following treatment conditions: treated with SSRI (paroxetine hydrochloride) administered over 26 weeks, treated with cognitive therapy based on the Clark and Wells model (Clark & Wells, 1995), or the combination of these two treatments (we excluded the untreated control group). The psychological treatment also included elements from metacognitive therapy (Wells, 2009). Thus, there was greater systematic work on changing attention in social situations, more work on eliminating worry and rumination, and experiments were used in each session, that is, testing social performance while changing attention. However, there was no direct work on metacognitive beliefs.

2.4 | Overview of data analyses

For our first analysis, we calculated change scores and within-group effect sizes for all the measures using paired samples *t* tests and Cohen's *d* (Cohen, 1988). Then, we ran correlational analyses to investigate the relationship between the predictors, gender, change in self-consciousness, change in cognitive beliefs, and change in negative metacognitive beliefs.

A hierarchical multiple linear regression analysis was conducted to predict post-treatment scores in each of the social anxiety measures (FNE, LSAS, SAD, and SIAS) whilst controlling for each of these respective variables at pretreatment. In general, higher rates of SAD are found in females than in males in the general population (with odds ratios ranging from 1.5 to 2.2; DSM-V; APA, 2013). Therefore, we controlled for gender in the regression analysis. Change in self-consciousness was included and controlled in the model as this process is a factor in both cognitive and metacognitive theory. On the final step of the equation we entered change in negative metacognitive beliefs (beliefs about the uncontrollability and danger of thoughts) to test any unique contribution of this variable.

3 | RESULTS

3.1 | Treatment effects

All three treatment conditions were effective in the original study, but the group treated with CT alone showed a significantly greater improvement than SSRI, with the combination of treatments showing an intermediate effect (Nordahl et al., 2016). For this study, we calculated changes and effect sizes for the overall treated sample, presented

TABLE 2 Paired samples *t* tests for pre-treatment and post-treatment symptom measures, cognitive beliefs, self-consciousness, and negative metacognitive beliefs with Cohen's *d* effect sizes and change scores for the predictors ($N = 46$)

Measure	Range	Pre-treatment	Post-treatment	Δ	<i>t</i>	<i>d</i>
FNE	0–30	24.61 (4.40)	13.57 (7.48)		9.88*	1.80
LSAS	0–144	62.64 (23.64)	38.13 (26.76)		6.58*	0.97
SAD	0–28	20.13 (5.90)	11.57 (7.40)		7.98*	1.28
SIAS	0–80	40.48 (12.92)	24.41 (14.46)		7.44*	1.17
Cognitive beliefs	0–1,400	746.56 (287.23)	240.78 (300.14)	–505.78 (330.41)	10.27*	1.72
Self-conscious.	0–8	4.33 (1.41)	1.69 (1.59)	–2.64 (1.85)	9.60*	1.76
MCQ-30: neg.	6–24	13.57 (3.90)	11.26 (3.57)	–2.31 (3.98)	3.92*	0.62

Note. FNE = Fear of Negative Evaluation, LSAS = Liebowitz Social Anxiety Scale; SAD = Social Avoidance and Distress scale; SIAS = Social Interaction Anxiety Scale; MCQ-30 = Metacognition Questionnaire-30; MCQ-30: neg. = negative metacognitive beliefs about uncontrollability and danger of thoughts.

* $p < .01$.

in Table 2. In this sample, the change in social anxiety symptoms indicated a large effect size for all four symptom measures as assessed by Cohen's *d*. The change in self-consciousness and cognitive beliefs also indicated a large effect size, whilst the change in negative metacognitive beliefs indicated a medium effect size.

3.2 | Correlational analyses

We investigated the relationship between the predictor variables using bivariate correlations. Gender was not significantly correlated with any of the other predictors. Change in self-consciousness was positively and significantly correlated with change in cognitive beliefs ($r = .33$, $p = .027$) but was not correlated with change in negative metacognitive beliefs ($r = -.01$, $p = .926$). Change in cognitive beliefs and change in negative metacognitive beliefs was not significantly intercorrelated ($r = .04$, $p = .794$).

3.3 | Regression analyses

Four regression analyses were conducted, one for each outcome measure (FNE, LSAS, SAD, and SIAS). The results indicated that symptom score at time 1 was a strong and significant predictor of symptom score at time 2 for all measures, also in the final step of the regression models. Gender was not related to outcome in any of the symptom measures. In step 3, change in cognitive beliefs was related to change in three out of four symptom measures and explained 8.7% of the variance in FNE, 8.3% of the variance in LSAS, and 9.6% of the variance in SIAS at post-treatment. Change in cognitive beliefs was not a significant predictor of SAD score at post-treatment when pre-treatment score and gender were controlled. In step 4, when controlling for gender and change in cognitive beliefs, change in self-consciousness was a significant incremental predictor of symptom change in three measures and explained 9.7% additional variance in FNE, 10.2% in LSAS, and 9.4% in SIAS. Change in self-consciousness was not a significant predictor of post-treatment SAD in this model. Moreover, adding change in self-consciousness to the model led cognitive beliefs to become non-significant as a predictor in the case of all outcome measures. In the final step, change in negative metacognitive beliefs explained a significant additional 15.9% of the variance in FNE, 5.9% of the variance in LSAS, 12.9% of variance in SAD, and 10.3% of the variance in SIAS. Further, when negative metacognitive beliefs were added to the model in the final step, change in self-consciousness became a significant predictor of SAD score post-treatment. In the final equation, only change in self-consciousness and change in negative metacognitive beliefs explained variance in symptom measures at post-treatment, while change in cognitive beliefs was not significant a predictor in any of the models. The regression analyses are presented in Table 3.

4 | DISCUSSION

This study set out to evaluate changes in cognitive and negative metacognitive beliefs in patients undergoing treatment for SAD and to evaluate specific changes as predictors of symptom improvement. We found that both cognitive beliefs and negative metacognitive

beliefs changed during treatment but that these changes were not correlated with each other. Self-consciousness also significantly decreased during treatment and this change was positively associated with change in cognitive but not metacognitive beliefs.

The main finding of our study was that change in negative metacognitive beliefs explained a large proportion of the variance in SAD symptoms at post-treatment when symptoms at time 1, gender, change in cognitive beliefs, and change in self-consciousness were controlled, and this finding was consistent across all four symptom measures. Together with change in negative metacognitive beliefs, change in self-consciousness was also a significant predictor in the final equation in all measures, but for one of the models (SAD), change in self-consciousness was only a significant predictor when entered together with change in negative metacognitive beliefs. An unexpected finding was that change in cognitive beliefs had no predictive value in any of the models when controlling for change in self-consciousness and change in negative metacognitive beliefs. These results suggest that the relationship between change in cognitive beliefs and SAD symptoms in patients undergoing the treatment conditions here is dependent on change in attention-based processes. Furthermore, change in negative metacognitive beliefs added predictively over and above change in cognitive beliefs and change in self-consciousness, and therefore seemed to be a more important underlying correlate of symptom improvement than change in cognitive beliefs.

These results demonstrate that hypothesized cognitive and metacognitive factors change during effective CT and drug treatments for SAD and that these changes are related to symptom improvement. However, the data shows that metacognitive belief change was a stronger predictor of symptom improvement than cognitive belief change in this trial. These results suggest that rather than aiming to modify cognitive beliefs in the psychological treatment of SAD, treatment may be better placed if it deals with the specific attentional processes (self-consciousness) and negative metacognitive beliefs about the uncontrollability and danger of thoughts, as would be predicted by the metacognitive model. It has been suggested that cognitive beliefs might simply act as the trigger for or output of repetitive negative thinking in psychopathologies, and it is necessary to modify the metacognitive control factors that can help bring such universal maladaptive thinking patterns under control (Wells & Matthews, 1994, 1996). Whilst cognitive therapy and medications (SSRI) do not directly target metacognitive beliefs, we would expect any effective treatment to impact on underlying maintenance mechanisms, and metacognitive beliefs may be one such mechanism for which there are multiple pathways (involving different treatments) to change. For example, Solem et al. (2009) showed that change in metacognition predicted symptom improvement in patients undergoing exposure and response prevention for obsessive-compulsive disorder despite the fact that metacognitive beliefs are not directly targeted in exposure and response prevention.

There are several implications of these results; negative metacognitive beliefs seem to be an important factor for symptom improvement in SAD, and changing these beliefs could possibly produce more effective and faster outcomes than targeting cognitive beliefs. It may be the case that change in negative automatic thoughts

TABLE 3 Statistics for each step of the regressions and betas on the final step with score on FNE, LSAS, SAD, and SIAS post-treatment as dependent variables and symptom severity pretreatment, gender, change in cognitive beliefs, change in self-consciousness, and change in negative metacognitive beliefs as predictors (N = 46)

Step		F cha	R ² cha	β	t
FNE					
1		3.684	.079		
	FNE pretreatment			.28	1.919
2		.033	.001		
	FNE pretreatment			.28	1.906
	Gender			.03	.182
3		4.282	.087*		
	FNE pretreatment			.37	2.470*
	Gender			.04	.280
	Cognitive beliefs			.31	2.069*
4		5.288	.097*		
	FNE pretreatment			.33	2.327*
	Gender			.07	.481
	Cognitive beliefs			.19	1.245
	Self-consciousness			.33	2.300*
5		10.777	.159**		
	FNE pretreatment			.42	3.242**
	Gender			.11	.921
	Cognitive beliefs			.20	1.444
	Self-consciousness			.34	2.613*
	MCQ-30: negative			.41	3.283**
LSAS					
1		13.433	.242**		
	LSAS pretreatment			.49	3.665**
2		.253	.005		
	LSAS pretreatment			.48	3.474**
	Gender			-.07	-.503
3		4.995	.083*		
	LSAS pretreatment			.54	4.002**
	Gender			-.07	-.530
	Cognitive beliefs			.29	2.226*
4		7.027	.102*		
	LSAS pretreatment			.58	4.578**
	Gender			-.03	-.261
	Cognitive beliefs			.19	1.504
	Self-consciousness			.34	2.651*
5		4.413	.059*		
	LSAS pretreatment			.54	4.463**
	Gender			-.01	-.104
	Cognitive beliefs			.17	1.393
	Self-consciousness			.35	2.814**
	MCQ-30: negative			.25	2.101*
SAD					
1		10.000	.189**		
	SAD pretreatment			.43	3.162**
2		.071	.001		
	SAD pretreatment			.42	2.863**
	Gender			-.04	-.266

(Continues)

TABLE 3 (Continued)

Step		F cha	R ² cha	β	t
3		2.049	.039		
	SAD pretreatment			.48	3.185**
	Gender			-.01	-.099
	Cognitive beliefs			.21	1.431
4		3.794	.067		
	SAD pretreatment			.53	3.541**
	Gender			.02	.166
	Cognitive beliefs			.13	.863
	Self-consciousness			.28	1.948
5		8.750	.129**		
	SAD pretreatment			.50	3.678**
	Gender			.05	.389
	Cognitive beliefs			.10	.759
	Self-consciousness			.29	2.213*
	MCQ-30: negative			.36	2.958**
SIAS					
1		10.646	.198**		
	SIAS pretreatment			.45	3.263**
2		.168	.003		
	SIAS pretreatment			.43	3.040**
	Gender			-.06	-.410
3		5.635	.096*		
	SIAS pretreatment			.54	3.803**
	Gender			-.03	-.185
	Cognitive beliefs			.33	2.374*
4		6.218	.094*		
	SIAS pretreatment			.54	4.048**
	Gender			.00	.027
	Cognitive beliefs			.22	1.614
	Self-consciousness			.33	2.493*
5		7.938	.103**		
	SIAS pretreatment			.52	4.182**
	Gender			.03	.251
	Cognitive beliefs			.20	1.554
	Self-consciousness			.34	2.806**
	MCQ-30: negative			.32	2.817**

Note. FNE = Fear of Negative Evaluation; LSAS = Liebowitz Social Anxiety Scale; MCQ-30 = Metacognition Questionnaire-30; SAD = Social Avoidance and Distress scale; SIAS = Social Interaction Anxiety Scale.

* $p < .05$.

** $p < .01$.

or underlying schemas are not necessary to promote recovery. This implies that current models of SAD might be modified to include relevant metacognitive beliefs. Moreover, new measures of metacognitive beliefs could be developed to assess metacognitive knowledge in social anxiety that may determine the efficacy of treatment and could be used to predict improvement rate and to monitor underlying maintenance factors.

A major limitation of this study is that a substantial number of the participants from the RCT study (Nordahl et al., 2016) could not be included in this secondary analysis due to missing data on

the MCQ-30. However, our findings were consistent across all four outcome measures even though the predictor to participant ratio was not exemplary. Further, we used a pooled group of treated individuals where the treatments were different, and we cannot infer what predicts outcome in the different forms of treatment. Since this is the first test of metacognitive and cognitive change as predictors of outcome in SAD, our research question was much more general; what changes and correlates independently with outcome when individuals undergo effective treatment? The fact that the group is heterogeneous in treatment modality could be viewed as a potential

strength in that only the most robust and universal correlates are likely to emerge from the dataset.

In conclusion, this study is the first to show that improvement in SAD symptoms is associated with change in negative metacognitive beliefs over and above change in cognitive beliefs and somewhat surprisingly that cognitive beliefs made no statistical contribution to improvement when metacognitive beliefs and self-attention were simultaneous predictors. These data bring further support to the metacognitive model of psychological disorder and appear to modify a core assumption of cognitive models and treatments for SAD that give emphasis to changing cognitive schemas.

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Paper II

Explaining depression symptoms in patients with social anxiety disorder: Do maladaptive metacognitive beliefs play a role?

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Social anxiety disorder (SAD) is a major risk factor for developing symptoms of depression. Severity of social anxiety has previously been identified as a risk factor, and cognitive models emphasize dysfunctional schemas and self-processing as the key vulnerability factors underlying general distress in SAD. However, in the metacognitive model, depressive and other symptoms are related to metacognitive beliefs. The aim of this study was therefore to test the relative contribution of metacognitions when controlling for SAD severity and factors postulated in cognitive models. In a cross-sectional design, 102 patients diagnosed with primary SAD were included. We found that negative metacognitive beliefs concerning uncontrollability and danger and low confidence in memory emerged as the only factors explaining depressive symptoms in the regression model, suggesting that metacognitive beliefs are associated with increased depressive symptoms in SAD patients.

KEYWORDS

co-morbidity, depression, metacognition, metacognitive beliefs, social anxiety disorder, vulnerability

1 | INTRODUCTION

Social anxiety disorder (SAD) is one of the most common mental disorders with a lifetime prevalence of 13% (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012) and is associated with substantial functional disability, less life satisfaction, and lower quality of life (Stein & Kean, 2000). If left untreated, SAD has a chronic course and low rates of recovery (Bruce et al., 2005). In addition, about two thirds of individuals with lifetime SAD meet the criteria for at least one other lifetime mental disorder (Ruscio et al., 2008), and due to its early onset, SAD usually precedes the development of other disorders (Fehm, Beesdo, Jacobi, & Fiedler, 2008).

In particular, SAD is a major risk factor for depression (Belzer & Schneier, 2004; Dalrymple & Zimmerman, 2007). Ohayon and Schatzberg (2010) showed that the odds of developing major depressive disorder (MDD) was more than 5 times higher in SAD patients than in controls. Compared with patients with MDD only, patients with SAD and MDD are more likely to have lower functioning overall and lower social functioning, worse quality of life, earlier age of MDD onset, greater depressive symptom severity, longer duration of depressive episodes, greater suicidal ideation, greater likelihood of

co-morbid alcohol use disorders, and worse treatment outcomes (Aderka et al., 2012; Barrera & Norton, 2009; Blanco et al., 2011; Dalrymple & Zimmerman, 2007; Ohayon & Schatzberg, 2010; Stein et al., 2001). In children, social anxiety predicts depressive symptoms 1 year later even when initial levels of depression are controlled, whereas depressive symptoms do not predict social anxiety 1 year later (Aune & Stiles, 2009). The identification of mechanisms underlying depressive symptoms and vulnerability for developing MDD in patients with SAD is therefore of significant conceptual and therapeutic importance.

Previous research has indicated that vulnerability for developing depression in patients with SAD might be explained by greater severity of social fears (Stein & Kean, 2000). As the number of social fears increases, the quality of life decreases and the chance of depressive symptoms increases (Acarturk, de Graaf, van Straten, ten Have, & Cuijpers, 2008; Ruscio et al., 2008). Moreover, about half of SAD patients also have a co-morbid diagnosis of avoidant personality disorder (AvPD; Friberg, Martinussen, Kaiser, Øvergård, & Rosenvinge, 2013), which has been viewed as a more severe form of SAD (Bögels et al., 2010), and patients with SAD and co-morbid AvPD report more depressive symptoms compared with

patients with SAD alone (van Velzen, Emmelkamp, & Scholing, 2000). Thus, depressive symptoms might result from severity of social anxiety as indicated by the presence of co-morbid AvPD, greater severity of social fears, or higher anxiety levels (e.g., Beesdo et al., 2007).

It has been argued that common (transdiagnostic) underlying predictors of distress in disorders rather than topographical differences (e.g., symptom severity) should become a greater focus in psychopathology research (e.g., Wells & Matthews, 1994). Furthermore, different models offer disparate views of which underlying factors are central to distress. In cognitive approaches (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997), distress in SAD results from the effect of social phobic beliefs (schemas) on processing. These beliefs, such as "I'm a failure," give rise to biased processing of the self and maladaptive coping strategies. It has been documented that individuals with social anxiety and depression share similar negative self-schematic structures (Dozois & Frewen, 2006) and cognitive biases such as self-focused attention (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Moreover, schemas and processing of the self could reinforce social fears and predispose socially anxious individuals to avoidant coping. Avoidance has been shown to mediate the relationship between anxiety and later depression (Jacobson & Newman, 2014), and behavioural avoidance has been shown to mediate the relationship between anxiety and depressive symptoms in patients with SAD (Moitra, Herbert, & Forman, 2008) and is also a key characteristic of AvPD (American Psychiatric Association [APA], 2013). Thus, from a cognitive approach, self-beliefs and the strategies and symptoms that lead from them could account for the vulnerability to depressive symptomatology in patients with SAD.

In contrast to the cognitive approach, metacognitive theory (Wells & Matthews, 1994, 1996) proposes that a particular pattern of responding to inner experiences called the *cognitive attentional syndrome* (CAS; Wells, 2009) is universally involved in psychological disorders. The CAS consists of worry or rumination and threat monitoring and maladaptive coping strategies and is directly linked to underlying metacognitive beliefs (i.e., beliefs about thinking). Maladaptive metacognitive beliefs are thought to compromise mental self-regulation because they facilitate the activation of the CAS in response to cognitive appraisals. For example, the belief that thinking is uncontrollable predisposes an individual to perseverate and brood over negative self-beliefs (e.g., "I'm inadequate") when they occur. Thus, in the metacognitive approach, patients with SAD are vulnerable to depressive symptomatology due to their thinking style, which is guided by their underlying metacognitive beliefs, rather than due to social fears and self-beliefs (schemas).

In line with the metacognitive model (Wells & Matthews, 1994), maladaptive metacognitive beliefs have been associated with social anxiety (see Gkika, Wittkowski, & Wells, 2017 for a review) and with depression (see Sun, Zhu, & So, 2017 for a review). Moreover, two studies have investigated the association between change in metacognitive beliefs and depressive symptoms in SAD patients undergoing cognitive-behavioural therapy. McEvoy, Mahoney, Perini, and Kingsep (2009) reported positive bivariate correlations between

Key Practitioner Message

- The present study provides an empirical support for an association between metacognitive beliefs and depressive symptoms in patients with social anxiety disorder, even when controlling for other relevant factors such as social anxiety severity and severity of social phobic cognitions and behaviours.
- This finding indicates that a treatment approach which aims to directly modify maladaptive metacognitive beliefs could be potentially beneficial as metacognitions are associated with multiple types of distress.

reductions in depressive symptoms and reductions in negative metacognitive beliefs, cognitive confidence, and beliefs about the need to control thoughts. McEvoy and Perini (2009) found a positive correlation between reductions in depressive symptoms and reductions in cognitive confidence and beliefs about the need to control thoughts. Although these studies indicate that metacognitive beliefs are associated with depressive symptoms in SAD patients, they did not test the relative predictive value of metacognitive beliefs while controlling for the other indicated risk factors in this context. The primary aim of the present study was therefore to explore predictors of depressive symptoms in patients with primary SAD by testing the capacity of metacognitive beliefs to explain additional and unique variance in them. In order to test the utility of the metacognitive model, we selected patients with a principal diagnosis of SAD with or without AvPD. To provide a stringent test of the contribution of metacognitions, several variables were controlled before exploring the relative contribution of metacognitive beliefs. Gender was controlled as the risk of developing depression is considerably higher among women than men (Kuehner, 2003), and female gender has been reported as a significant predictor of the progression from SAD to subsequent depression (Beesdo et al., 2007). Moreover, as social fear or disorder severity may explain the vulnerability for depression in patients with SAD, we controlled for the presence of AvPD, fear of negative evaluation, and general anxiety severity. Furthermore, components that are given prominence in cognitive models (social phobic beliefs, self-consciousness, and avoidance) were controlled before adding metacognitive beliefs to the model. Our hypotheses were as follows: (a) depressive symptoms will be positively correlated with social fears, anxiety levels, social phobic beliefs, self-consciousness, avoidance, and metacognitive beliefs; (b) disorder severity indicated by the presence of AvPD, social fears, and anxiety levels will predict depressive symptoms; and (c) metacognitive beliefs will positively predict depressive symptoms even when SAD severity (AvPD, social fears, and anxiety levels) and factors central in cognitive models are controlled. Among the metacognitive belief domains, we expected negative metacognitive beliefs (beliefs about the uncontrollability and corresponding danger of thoughts) to be the strongest predictor of depressive symptoms

as these beliefs are the strongest metacognitive associates of the CAS across psychological disorders (Sun et al., 2017; Wells, 2009). However, we were also interested to explore if other domains of metacognitive beliefs could make an additional contribution when negative metacognitive beliefs and the other predictors were accounted for, and so we explored any additional contributions on subsequent steps.

2 | METHODS

2.1 | Participants and procedure

One hundred and two patients ($n = 102$) diagnosed with generalized SAD (DSM-IV-TR; APA, 2000) with or without AvPD were included in this study. The patients screened were from assessments prior to inclusion in controlled trials (H. M. Nordahl et al., 2016; Vogel et al., 2016) and had been assessed at the University Outpatient Clinic at the Department of Psychology, Norwegian University of Science and Technology. None of the included patients in this study were taking anxiolytic and antidepressant medications. All of the patients were assessed on the *Anxiety Disorders Interview Schedule for DSM-IV* (DiNardo, Brown, & Barlow, 1994) and on the Structured Clinical Interview for DSM-IV Axis II Disorders (First, Gibbon, Spitzer, & Benjamin, 1997) by trained assessors and met the criteria for SAD as their principal diagnosis, meaning that social anxiety was the most debilitating problem for these patients at the time of assessment. Among the available patients, we excluded 35 patients who had other co-morbid disorders than AVPD because we did not know if these disorders preceded social anxiety or shared separate links with metacognitions. Metacognitions have been linked to depressive disorder in other research (e.g., Halvorsen et al., 2015; Papageorgiou & Wells, 2003), and as our research question was about the severity of depressive symptoms in those with principal SAD, patients with a co-morbid diagnosis of MDD had to be excluded as a means to explore the hypothesized relationships and not just an association between metacognitions and current or previous MDD. Moreover, metacognitive beliefs (e.g., beliefs about the uncontrollability of worry) could pick up symptoms of generalized anxiety disorder (GAD), so all individuals with co-morbid GAD had to be excluded from this study to make sure that our exploration of the association between these metacognitions and depressive symptoms were not contaminated by GAD symptoms. The interrater reliability of independent raters was determined on the basis of 20 randomly selected videotaped assessments out of the first 80 included participants. For the diagnosis of SAD, the kappa was $\kappa = 0.84$, and for AvPD, it was $\kappa = 0.80$. All participants were Caucasian and had Norwegian as their native language. Of the included participants, 59 (58%) were diagnosed with co-morbid AvPD. Forty-seven (46%) of the participants were female, and the mean age was 29.8 years ($SD = 10.6$). As their marital status, 61 (60%) reported that they were single, 35 (34%) were married or cohabitant, 2 (2%) were divorced, and 4 (4%) were in a relationship. Of the total sample, 40 (39%) reported that they had received higher education, and 27 (27%) were still students.

2.2 | Measures

The Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a 21-item self-report scale assessing current level of depression symptoms. BDI has a range from 0 to 63, with high scores indicating higher levels of depression. The BDI has high internal consistency ($\alpha = .86$), and the test-retest reliability has been reported as more than .60 (Beck, Steer, & Garbin, 1988). In this study, the scale had good internal consistency ($\alpha = .80$).

The Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988) is a 21-item self-report scale designed to assess the severity of somatic and cognitive anxiety symptoms over the previous week. Scores range from 0 to 63, with high scores indicating higher levels of anxiety. BAI has high internal consistency ($\alpha = .92$) and good test-retest reliability (.75; Beck, Epstein, et al., 1988). In this study, the scale had excellent internal consistency ($\alpha = .90$).

The Fear of Negative Evaluation (FNE) Scale (Watson & Friend, 1969) is a 30-item measure of apprehension and anxiety over anticipated social evaluations. The measure uses a true-false scale with good internal consistency ($\alpha = .94$) and test-retest reliability ($r = .78$; Watson & Friend, 1969). FNE has a range from 0 to 30, with high scores indicating higher levels of social fears and anxiety. In this study sample, the scale had good internal consistency ($\alpha = .88$).

The Social Phobia Rating Scale (Wells, 1997) has five rating scales assessing key components of the cognitive model and therapy of social anxiety (Clark & Wells, 1995): distress, avoidance, self-consciousness, use of safety behaviours, and social phobic beliefs. In this study, we used the following subscales: Avoidance: Participants are asked to rate the extent they have avoided social situations the previous week on a scale ranging from 0 (*not at all*) to 8 (*all the time*). Self-consciousness: Participants are asked to rate how self-conscious they have felt in social situations the last week on a scale ranging from 0 (*not at all*) to 8 (*extremely*). Social phobic beliefs: Participants are asked to rate how much they believe 14 different negative beliefs characterizing social phobia on a scale from 0 (*not at all*) to 100 (*totally convinced that the belief is true*) when they are socially anxious, for example, "I look bad" and "They will notice I'm anxious." A total score can be derived by summing the belief ratings for each item, so the total scale ranges from 0 to 1,400. In this study, the scale had excellent internal consistency ($\alpha = .90$). The psychometric properties of the Social Phobia Rating Scale have been reported as good as indicated by excellent internal consistency ($\alpha = .96$) and test-retest reliability over 8 weeks ($r = .89$) for the total score (H. Nordahl, Nordahl, & Wells, n.d.).

The Metacognitions Questionnaire 30 (MCQ-30; Wells & Cartwright-Hatton, 2004) is a widely used 30-item self-report scale measuring beliefs about thinking. Responses are required on a 4-point scale ranging from 1 (*do not agree*) to 4 (*agree very much*). MCQ-30 has a replicable five-factor structure concerning (a) positive beliefs about worry, (b) negative beliefs about the uncontrollability and danger of worry, (c) cognitive confidence, (d) need to control thoughts, and (e) cognitive self-consciousness. Higher scores reflect stronger endorsements of the beliefs in question. The measure has shown good internal consistency with a ranging from .72 to .93

and a retest correlation for the total scale was .75 (Wells & Cartwright-Hatton, 2004). In this study, the internal consistency ranged from .77 to .91.

2.3 | Overview of statistical analyses

Pearson bivariate correlations were used to explore the correlational relationship between the variables. A hierarchical multiple regression analysis was run to test the additional contribution of metacognitive factors in explaining variance in symptoms of depression. BDI was treated as the dependent variable. Gender was controlled in the first step; the presence of AvPD, social fears (FNE), and anxiety severity (BAI) in the second step; social phobic beliefs in the third step; and self-consciousness and avoidance in the fourth step. In the fifth step, negative metacognitive beliefs were entered as we predicted they would be the strongest metacognitive correlate of depressive symptoms. In the final step, we included all the remaining subscales of the MCQ-30 using stepwise entry to explore if any of the remaining metacognitive belief domains could explain additional variance over and above the prespecified predictors.

an additional 14.6% of the variance. On the third step, social phobic beliefs were not a significant predictor of depressive symptoms, but entering social phobic beliefs led all other predictors to be nonsignificant. On the fourth step, neither self-consciousness nor avoidance were significant predictors of depressive symptoms, and none of the control variables from the previous steps were significant. On the fifth step, negative metacognitive beliefs were entered and were significant predictors of depressive symptoms, explaining an additional 17.3% of the variance. In the sixth step, when stepwise entry was used to explore any potential contribution from the remaining MCQ-30 subscales, cognitive confidence entered the model and explained an additional of 3.5% of the variance. In this final step, negative metacognitive beliefs and cognitive confidence were significant predictors of depressive symptoms, whereas gender, AvPD, social fears (FNE), anxiety symptoms (BAI), social phobic beliefs, self-consciousness, and avoidance were nonsignificant. Negative metacognitive belief was the strongest predictor of depressive symptoms, and in sum, metacognitive beliefs explained 20.8% of the variance in depressive symptoms in SAD patients over and above the other predictors. The regression summary statistics are presented in Table 2.

3 | RESULTS

3.1 | Correlational analyses

Symptoms of depression were positively and significantly associated with symptoms of anxiety, fear of negative evaluation, social phobic beliefs, self-consciousness, and all of the MCQ-30 subscales. However, depressive symptoms were not significantly associated with avoidance. The bivariate correlations between all variables are presented in Table 1.

3.2 | Linear regression analyses

On the first step of the regression, gender was not a significant predictor of depressive symptoms. On the second step, anxiety (BAI) was significant and, when entered together with AvPD and FNE, explained

4 | DISCUSSION

To the authors' knowledge, this is the first study to investigate metacognitive beliefs as predictors of depressive symptoms in patients diagnosed with principal SAD. Our findings suggest that metacognitive beliefs, in particular higher beliefs about the uncontrollability and danger of worry and judgements of lower confidence in memory, are associated with increased depressive symptoms in these patients. SAD severity as indicated by social fears, AvPD, BAI, and endorsement of cognitive-behavioural factors (severity of social phobic beliefs, self-consciousness, and avoidance) did not contribute to depressive symptoms when metacognitive beliefs were entered.

This is an interesting finding because it suggests that metacognitive beliefs contribute to depressive symptoms in SAD patients (at least cross-sectional, i.e., at a maintenance level) even

TABLE 1 Mean value and standard deviations for all variables and the bivariate correlations between them ($N = 102$)

	2	3	4	5	6	7	8	9	10	11	Mean (SD)
1. BDI	.291**	.281**	.309**	.209*	.194	.210*	.506**	.345**	.395**	.409**	12.31 (6.43)
2. BAI		.312**	.254*	.382**	.293**	.242*	.366**	.003	.216*	.173	18.62 (8.94)
3. FNE			.436**	.326**	.254*	.253*	.247*	.168	.218*	.231*	24.42 (4.82)
4. SP-beliefs				.304**	.206*	.019	.157	.174	.150	.109	719.43 (286.40)
5. Self-consc.					.461**	.144	.345**	.038	.234*	.210*	4.50 (1.66)
6. Avoidance						.278**	-.010	.034	.046	.016	3.32 (2.05)
7. MCQpos							.373**	.140	.386**	.445**	8.70 (3.19)
8. MCQneg								.288**	.656**	.543**	14.08 (4.11)
9. MCQcc									.392**	.441**	11.43 (5.05)
10. MCQnc										.683**	10.37 (3.51)
11. MCQcsc											12.76 (3.74)

Note. SD = standard deviation; BDI = Beck Depression Inventory; BAI = Beck Anxiety Inventory; FNE = Fear of Negative Evaluation; SP-beliefs = social phobic beliefs; self-consc. = self-consciousness; MCQ = Metacognitions Questionnaire; MCQpos = positive metacognitive beliefs; MCQneg = negative metacognitive beliefs; MCQcc = cognitive confidence; MCQnc = need for control; MCQcsc = cognitive self-consciousness.

* $p < .05$. ** $p < .01$.

TABLE 2 Statistics for each step of the regressions and betas on the final step with BDI as the dependent variable and gender, avoidant personality disorder, social fears, anxiety, social phobic beliefs, self-consciousness, avoidance, and the MCQ-30 subscales (stepwise entry) as predictors ($N = 102$)

Step	F change	R ² change	β	t
1	0.041	.000		
Gender			.02	0.202
2	4.666	.146**		
Gender			-.04	-0.366
Avoidant personality disorder			.16	1.475
FNE			.15	1.322
BAI			.22	2.059*
3	1.859	.019		
Gender			-.05	-0.505
Avoidant personality disorder			.13	1.124
FNE			.11	0.928
BAI			.20	1.814
Social phobic beliefs			.16	1.363
4	0.180	.004		
Gender			-.06	-0.547
Avoidant personality disorder			.14	1.214
FNE			.11	0.879
BAI			.20	1.701
Social phobic beliefs			.16	1.332
Self-consciousness			.05	0.393
Avoidance			-.07	-0.561
5	20.577	.173**		
Gender			.01	0.096
Avoidant personality disorder			.10	0.968
FNE			.07	0.623
BAI			.06	0.517
Social phobic beliefs			.16	1.498
Self-consciousness			-.11	-0.918
Avoidance			.07	0.573
MCQ-30: Negative beliefs			.48	4.536**
6	4.269	.035*		
Gender			.01	0.057
Avoidant personality disorder			.09	0.889
FNE			.06	0.512
BAI			.09	0.827
Social phobic beliefs			.14	1.291
Self-consciousness			-.08	-0.720
Avoidance			.05	0.436
MCQ-30: Negative beliefs			.42	3.800**
MCQ-30: Cognitive confidence			.20	2.066*

Note. FNE = Fear of Negative Evaluation; BAI = Beck Anxiety Inventory; MCQ-30 = Metacognitions Questionnaire 30.

* $p < .05$. ** $p < .01$.

when several other relevant factors such as social fears and factors emphasized in psychological treatment of SAD (Clark & Wells, 1995; Wells, 1997) that contribute to social anxiety severity are controlled. This finding is consistent with the metacognitive model that states that metacognitions are generic risk factors for co-morbidity. Metacognitive beliefs correlate with both social anxiety and depressive symptoms suggesting that these are more likely to be associated with depression symptom reports in patients with SAD and might explain aspects of co-morbidity. Furthermore, the metacognitive model predicts that metacognitive beliefs are not limited to depression co-morbidity in social anxiety but increase the risk of a range of pathologies. Their correlation with depression in SAD can be seen as one expression of this transdiagnostic effect.

Recent studies have shown that metacognitive beliefs rather than social phobic beliefs are the more reliable predictors of social anxiety and that beliefs about the uncontrollability and danger of thinking and low confidence in memory are particularly relevant (H. Nordahl, Nordahl, Hjemdal, & Wells, 2017; H. Nordahl & Wells, 2017a). Negative metacognitive beliefs have also been associated with lack of work status in high socially anxious individuals when symptom severity and factors emphasized in CBT are controlled (H. Nordahl & Wells, 2017b). These are the same metacognitive belief domains we found to be associated with depressive symptoms in SAD, suggesting that the same metacognitive beliefs might underlie different types of distress and impairments in SAD patients. The existence of a common set of metacognitions in social anxiety and mood symptoms is consistent with the idea that metacognitive beliefs are common factors across types of psychological distress. In line with our findings, two previous studies have reported a positive association between change in metacognitive beliefs (negative metacognitive beliefs, cognitive confidence, and beliefs about the need for control) and change in depressive symptoms following cognitive-behavioural therapy for SAD (McEvoy et al., 2009; McEvoy & Perini, 2009). As these studies also report correlational data, metacognitive beliefs could be seen as a symptom of anxiety and depression, which might account for the relationship observed. However, this is not consistent with the results of longitudinal studies that have shown that metacognitive beliefs are prospective predictors of depressive symptoms, consistent with their causal role (Cook et al., 2015; Hjemdal, Stiles, & Wells, 2013; Papageorgiou & Wells, 2009; Yilmaz, Gençöz, & Wells, 2011).

We may speculate that dealing with metacognitive beliefs may have a broader impact on symptoms as they are transdiagnostic factors. For example, if metacognitions are a risk factor for social anxiety and depression, treating social anxiety without properly modifying them may not remove the more generic risk for developing pathology associated with maladaptive metacognitions. Moreover, our results indicate that reducing social anxiety severity may not be sufficient to reduce vulnerability to depression if metacognitive beliefs are left unmodified. Metacognitive therapy (MCT; Wells, 2009) that directly aims to modify metacognitive beliefs has proven to be an effective treatment for depression and anxiety and is also associated with high effect sizes on secondary symptom measures of, for example, depression in patients undergoing treatment for anxiety disorders (Normann, Emmerik, & Morina, 2014). Moreover, MCT has previously been

shown to be associated with positive outcomes in complex cases. For example, Hjemdal et al. (2016) showed that MCT was associated with substantial improvements in co-morbid disorders in patients undergoing MCT for MDD, even though the primary focus in this treatment was depression. In a randomized controlled trial, Johnson, Hoffart, Nordahl, and Wampold (2017) treated individuals with complex anxiety disorders with either generic MCT or disorder-specific CBT and found that MCT was superior to CBT pretreatment to posttreatment in reducing anxiety (primary outcome) and depressive symptoms (secondary outcome), which might be explained by MCT being more effective in modifying common underlying determinants of distress (e.g., metacognition) in these patients.

This study has several important limitations that should be acknowledged. First, due to the study's cross-sectional design, causal inferences cannot be tested. Moreover, degree of self-consciousness and avoidance were measured using only one item for each variable, which may compromise sensitivity. Our inability to replicate findings from other studies, for example, the importance of avoidance for developing co-morbid depressive symptoms (Jacobson & Newman, 2014; Moitra et al., 2008), may be due to measurement factors as using single items to assess avoidance and self-consciousness may have limited our ability to detect effects linked to these variables. We suggest further research to address these measurement issues and to explore causal predictors of change in depressive symptoms in SAD patients. Subsequent research might further investigate whether modifying maladaptive metacognitive beliefs is associated with improvements across diagnostic categories and reductions in the risk of patients going on to develop future mental health difficulties. The metacognitive model predicts that metacognitive beliefs are not limited to depression co-morbidity in social anxiety but increase the risk of a range of pathologies, and the transdiagnostic effect of metacognitions is therefore an important area for further research.

In conclusion, this study provides empirical support for an association between metacognitive beliefs and depressive symptoms in patients with SAD, even when controlling for other relevant factors such as social anxiety severity and severity of social phobic cognitions and behaviours. This finding indicates that a treatment approach that aims to directly modify maladaptive metacognitive beliefs could be potentially beneficial as metacognitions are associated with multiple types of distress.

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CONFLICT OF INTEREST

All authors declare no conflict of interest.

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Paper III

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Paper IV



Metacognitive Therapy for Social Anxiety Disorder: An A–B Replication Series Across Social Anxiety Subtypes

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Cognitive behavioural therapy (CBT) is the treatment of choice for Social anxiety disorder (SAD). However, factors additional to those emphasised in CBT are the primary cause of psychological disorder according to the metacognitive model. Metacognitive Therapy (MCT) aims to target a perseverative thinking style named the cognitive attentional syndrome and its underlying metacognitive beliefs (beliefs about cognition). The present study aimed to explore the effects of generic MCT for SAD. Treatment related effects were evaluated using direct replication single case (A–B) methodology across three patients with different subtypes of SAD; performance type, generalised and generalised plus avoidant personality disorder, representing increasing SAD severity/complexity. All patients responded during treatment and achieved substantial symptom reductions which were largely maintained at 6 months' follow-up. Metacognitive therapy appears to be a suitable treatment and was associated with positive outcomes for patients with different presentations of SAD.

Keywords: metacognitive therapy, social anxiety disorder, social phobia, case-series, metacognition

INTRODUCTION

Social anxiety disorder (SAD) or Social phobia is characterised by a marked or intense fear of social situations in which the individual may be scrutinised by others (American Psychiatric Association, 2013). SAD can be viewed on a severity continuum ranging from the performance type characterised by fear of negative evaluation in specific performance situations, to the generalised type characterised by fear of negative evaluation in most social situations, to the generalised type with comorbid Avoidant personality disorder (AvPD) (Bögels et al., 2010; American Psychiatric Association, 2013; Heimberg et al., 2014).

The treatment of choice for SAD is Cognitive therapy (CBT) based on the model by Clark and Wells (1995; National Institute for Health and Care Excellence, 2013) and it has been found to be superior to other psychological treatments and drugs (Mayo-Wilson et al., 2014). The model Clark and Wells (1995) draws on concepts from cognitive (e.g., Beck, 1976) and metacognitive (Wells and Matthews, 1994) theory. It proposes that on entering social situations people with social anxiety experience negative automatic thoughts and shift attention to self-focus on a biased and

distorted inner image of the self. Safety behaviours are used to deal with negative beliefs about how one appears to others but impair performance and increase self-focused attention. In addition, anticipatory worry and post-event rumination before and after social encounters contributes to problem maintenance. This pattern of processing can be traced back to underlying negative beliefs and assumptions about the social self (e.g., “I’m boring”).

A conceptual feature with the model Clark and Wells (1995) is that whilst it draws on different theoretical frameworks, it places cognition rather than metacognition in centre stage. For example, it argues that schemas or negative beliefs (e.g., “I’m a failure”) give rise to self-processing and social anxiety. However, the metacognitive model argues that metacognitive beliefs, beliefs about cognition (e.g., “I cannot control my thinking”), contribute most to disorders including social anxiety (Wells and Matthews, 1994). Furthermore, in the cognitive model the emphasis is on challenging the validity of negative social cognitions whilst in MCT the focus is on controlling cognition and modifying metacognitive beliefs.

In accordance with Wells’ (2000) metacognitive therapy approach, two studies (Wells and Papageorgiou, 2001; Nordahl et al., 2016b) have shown that a briefer and more metacognitive focused intervention can be highly effective and time efficient. However, these studies left out several important components which are emphasised in the metacognitive model (Wells and Matthews, 1994, 1996) and retained some of the cognitive components of the Clark and Wells (1995) treatment. For example, case-formulations were based on the CBT model, there was some work on testing negative thoughts (even though social beliefs were not challenged). However, more recent research on the relative contribution of social phobic beliefs (cognitive beliefs) and metacognitive beliefs in a social anxiety context has shown that metacognitive beliefs but not social phobic beliefs predict symptom improvement following treatment of social anxiety disorder (Nordahl et al., 2017), work status in high socially anxious individuals (Nordahl and Wells, 2017a), and depression symptoms in patients with social anxiety disorder (Nordahl et al., 2018). Therefore, testing of whether a purer metacognitive treatment can be applied and whether positive effects are associated with it is a greater priority.

According to the metacognitive model (Wells and Matthews, 1994), all psychological disorders are intensified and maintained by a thinking style called the *cognitive attentional syndrome* (CAS; Wells, 2009) consisting of worry/rumination, threat monitoring and maladaptive coping behaviours. Maladaptive metacognitive beliefs, i.e., beliefs about cognition, give rise to the CAS which in social anxiety take the form of negative metacognitive beliefs (“Worry is uncontrollable”), positive metacognitive beliefs (“focusing on an inner image of myself helps me avoid making a bad impression”) and judgements of cognitive confidence (“When I am under pressure, I lose my grip on thinking”) (e.g., Nordahl et al., 2016a, 2017; Gkika et al., 2017; Nordahl and Wells, 2017b). Metacognitive therapy (MCT; Wells, 2009) was developed to reduce the CAS and to modify underlying maladaptive

metacognitive beliefs. MCT has been found to be an effective treatment for depression and several anxiety disorders (Normann et al., 2014), but has yet to be evaluated in its purer form in SAD.

We therefore aimed to conduct a preliminary investigation of the efficacy of MCT for SAD using single case methodology. Following the generic MCT conceptualization and treatment structure (Wells, 2009), we aimed to test if MCT could be applied using a single-case replication methodology that spanned cases of increasing complexity. Such an approach constitutes a systematic replication (Barlow and Hersen, 1984) and the search for cases in which the treatment may not work.

MATERIALS AND METHODS

Design

In order to examine the effects associated with MCT for SAD, a single case series using an A–B design with follow up was implemented. This study was carried out in accordance with the recommendations of the Regional committees for medical and health research ethics in Norway with written informed consent from all subjects. All subjects gave written informed consent in accordance with the Declaration of Helsinki. The protocol was approved by the Regional committees for medical and health research ethics (reference number: 2015;1794). Replication across three patients with different SAD presentations begins to establish the generalizability of treatment effects across the disorder. This is particularly important in SAD as the disorder is found on a severity continuum. All patients were assigned to no-treatment baselines of a minimum of 3 weeks (with the option of extension if required) to establish stability in the primary outcome measure; the fear of negative evaluation (FNE; Watson and Friend, 1969). No therapeutic input occurred during the baseline period, but there was contact over telephone to ensure that the patients completed the self-report measures. Following the baseline period, eight sessions of MCT were delivered weekly with each treatment session lasting between 45 min and 1 h. Patients were followed up 6 months after treatment, and no additional treatment was delivered during the follow-up period.

Participants

The first three patients with different presentations of social anxiety consecutively referred to the university outpatient clinical, Department of psychology, Norwegian University of Science and Technology, were included in the case series. Patients were assessed using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I/P; First et al., 1997b) and Axis II personality disorders (First et al., 1997a). The inclusion criteria were; (1) a primary diagnosis of SAD, (2) 18 years old or above, and (3) signed written informed consent in accordance with the Declaration of Helsinki. The exclusion criteria were; (1) concurrent psychological or drug treatment, (2) evidence of psychotic or organic illness, (3) the presence of cluster A or B personality disorder, (4) actively suicidal, or (5) substance or alcohol dependence.

Patient 1

Patient 1 was a 24-year old single woman struggling with the performance type of SAD for the past 4 years. In particular, making presentations as part of her studies was the major problem. She believed that she looked like “a patient with an epileptic seizure” while holding presentations because of conspicuous shaking. Furthermore, the patient described that she was anxious and worried a couple of weeks before, and for days after, presentations, leading to poor quality of life. Patient 1 had no comorbid diagnosis, and had never before had psychological treatment.

Patient 2

Patient 2 was a 70-year old retired man who presented with generalised SAD. He had been struggling with social anxiety since adolescence, and described conspicuous “shaking” as his primary symptom in social situations. He had psychological treatment for social anxiety 25 years before referral to the clinic, and experienced a brief non-lasting symptom improvement from that. The patient had for many years endured most social situations with support from his wife. However, some months ago he started to have panic attacks before social situations and therefore started to avoid most of them. The patient felt that his social anxiety now stopped him from having a normal life together with his wife, and that he wasn't able to break out of this vicious cycle.

Patient 3

Patient 3 was a 27-year old single woman who presented with generalised SAD, Avoidant personality disorder, and a recurrent depressive disorder, currently moderately depressed. She had been suffering with social anxiety since she started primary school, and had dropped out from her studies several times because of social anxiety. In addition to being afraid of social embarrassment, the patient presented with low self-esteem and a profound tendency to avoid. The patient reported several depressive episodes, the current lasting for 6 months. She had previously had unspecific psychological treatment which had ended 2 years before referral to the clinic. She reported that she had not found her previous treatment helpful.

Measures

The Fear of Negative Evaluation scale (FNE; Watson and Friend, 1969) is a 30-item measure of apprehension and anxiety over anticipated social evaluations. This measure uses a true-false scale and has shown good internal consistency ($\alpha = 0.94$) and test-retest reliability ($r = 0.78$) (Watson and Friend, 1969). FNE has a range from 0 to 30, high scores indicating higher levels of social anxiety.

The Social Avoidance and Distress scale (SAD; Watson and Friend, 1969) is a 28-item measure of distress in social situations and avoidance, using a true-false scale. Its internal consistency has been found excellent ($\alpha = 0.94$) and its test-retest reliability ranged from 0.68 to 0.79 (Watson and Friend, 1969). SAD has a range from 0 to 28, high scores indicating higher levels of social anxiety.

The Social Interaction Anxiety Scale (SIAS; Mattick and Clarke, 1998) is a 20-item scale that measure fear of and responses to social interactions. It has shown high internal consistency ($\alpha = 0.93$) and test-retest reliability (0.92). SIAS has a range from 0 to 80, high scores indicating higher levels of social anxiety.

Beck Anxiety Inventory (BAI; Beck et al., 1988a) is a 21-item self-report scale designed to assess the severity of somatic and cognitive anxiety symptoms over the previous week. Scores range from 0 to 63, high scores indicating higher levels of social anxiety. BAI has high internal consistency ($\alpha = 0.92$) and good test-retest reliability (0.75) (Beck et al., 1988a).

Beck Depression Inventory (BDI; Beck et al., 1961) is a 21-item self-report scale assessing current level of depression. BDI has a range from 0 to 63, high scores indicating higher levels of depression. The BDI has high internal consistency ($\alpha = 0.86$) and the test-retest reliability has been reported as more than 0.60 (Beck et al., 1988b).

The MCQ-30 (Wells and Cartwright-Hatton, 2004) is a 30-item self-report scale measuring beliefs about thinking. Responses are required on a four-point scale, and the scales total score range from 30 to 120. The measures consist of five subscales measuring positive beliefs about worry; negative beliefs about the uncontrollability of thoughts and corresponding danger; cognitive confidence; need to control thoughts; and cognitive self-consciousness. High scores reflect more reported problems with the item in question. Previous studies have found the psychometric properties to be good (Wells and Cartwright-Hatton, 2004).

CAS-1 (Wells, 2009) has four rating scales assessing general components of the cognitive attentional syndrome (CAS) and general positive and negative metacognitive beliefs. The instrument is typically used as a session to session instrument in MCT when no disorder-specific measure is appropriate. The first scale assesses time spent worrying and ruminating during the last week on a scale from 0 (no time) to 8 (all the time). The second scale measures threat monitoring in the same fashion. The third scale measures six examples of unhelpful coping behaviours, such as “avoid situations,” while the fourth scale assesses four examples of negative metacognitive beliefs (“I cannot control my thinking”) and four examples of positive metacognitive beliefs (“Worrying helps me cope”).

The Social Phobia Rating Scale (SPRS; Wells, 1997) has five rating scales assessing key components of one of the most commonly employed CT treatments for social phobia (Clark and Wells, 1995); distress, avoidance, self-consciousness, use of safety behaviours, and negative beliefs. In the present study, we used two of the subscales from the SPRS: (1) Use of safety behaviours; patients are asked to rate how often they use different types of safety behaviours (e.g., “try to relax”) when they have social anxiety on a scale ranging from 0 (not at all) to 8 (all the time). The subscale includes 15 items and therefore the total score range between 0 and 120. (2) Negative beliefs; the scale consists of 14 items (e.g., “I look bad”; “They will notice I'm anxious”), each item ranging from 0 to 100. This scale was used as measure of social phobic beliefs typical for social

phobic patients, ranging from 0 to 1400. The psychometric properties of the SPRS have been reported as good (Nordahl et al., unpublished).

Procedure

Assessment

Patients referred to the outpatient university clinic for treatment of social anxiety by their GP and other psychiatry services (e.g., the student's mental health service) were invited to attend an assessment interview for possible participation in the current study. All patients were assessed by assessors who were trained in administering the Structured Clinical Interview for DSM-IV (SCID I and II). Patients completed the first battery of self-report measures before attending the assessment interview. The baseline period for included patients was a minimum of 3 weeks showing stable FNE-score (the primary outcome measure). Therefore, after the assessment interview the included patients rated themselves on the FNE and CAS-1 over the succeeding weeks. All patients had a stable FNE score over the three first consecutive weeks, and were therefore scheduled for treatment within a week after the third baseline measuring point. During treatment, the FNE and CAS-1 were completed before each session. A complete set of questionnaires was administered post-treatment and at 6 months' follow-up. At post-treatment the SCID I and II was administered again by the same assessor who met the patient at pre-treatment.

Treatment

The treatment consisted of eight weekly sessions of 45–60 min duration and followed the generic MCT structure outlined by Wells (2009) and consisted of the following elements:

- (1) A case formulation based on the generic metacognitive model was developed. This conceptualization emphasised the CAS as the primary maintenance factor of social anxiety, and showed how different metacognitive belief domains give rise to the CAS and how they block adaptive coping with social anxiety. Following the development of the case formulation, patients were socialised to the formulation in order to get a better understanding of how their social anxiety persists, and hence what should be the goals for treatment (abandon CAS strategies, explore and challenge metacognitive beliefs).
- (2) The attention training technique (ATT) was introduced to facilitate a metacognitive mode of processing and to allow the patient to make discoveries about flexible executive control. The patients were asked to implement ATT twice a day for at least 4 weeks for homework, and in-session practise of the ATT was given in the first two sessions. The patients' experiences with the technique were discussed, aiming to facilitate reduction of self-processing strategies and challenging metacognitive beliefs about the uncontrollability and danger of thoughts.
- (3) Verbal reattribution strategies were used to modify negative beliefs concerning the uncontrollability of worry and rumination, and worry/rumination postponement was introduced to reduce the CAS and as an experiment to test false metacognitive beliefs about these processes being uncontrollable. Detached mindfulness was introduced with a link to ATT and presented as an alternative way to react to negative thoughts such as "What If I sound foolish" in preference to activation of the CAS.
- (4) Threat monitoring was addressed, e.g., by an advantages-disadvantages analysis to address the process of constructing the observer perspective in social situations. The consequences of this strategy were highlighted, and positive metacognitive beliefs about constructing an inner image (e.g., "constructing an inner image of how I look helps me avoid making a bad impression on others") were challenged.
- (5) Two behavioural experiments in combination with Situational Attentional Refocusing (SAR) were conducted intended to counteract threat monitoring in social situations, and to facilitate adaptive information processing in a social setting. For example, the patient and therapist went for a 10-min walk. In the first half, the patients were told to be as self-conscious as possible, in the second half they were asked to switch their attention flexibly around and notice the surroundings. This experiment was used to enhance awareness over flexible attentional control, to highlight the consequences of self-consciousness and to challenge the patient's positive beliefs about self-focused processing. Patients were asked to try and remember what they had noticed when self-conscious and when externally focused, the contrast in performance was used to challenge the patient's belief that they had poor cognition. By attributing this to the attentional strategy they were choosing to engage in beliefs underlying low cognitive confidence could be challenged.
- (6) Each patient was encouraged to apply their new awareness over flexible attentional control when facing challenging situations, and maladaptive coping strategies such as avoidance were briefly addressed with reference to its ability to prohibit the execution and discovery of adaptive metacognitive control. Worry and rumination were banned.
- (7) Relapse prevention was implemented by making a therapy blueprint in the form of an "old plan –new plan." Patients were encouraged to implement the new plan in future social situations to maintain and strengthen the gains made over the course of treatment.

Training

All patients were treated by the first author who is a clinical psychologist who has completed the MCT- Institute 2-year diploma and treatment was directed and supervised by Adrian Wells, the originator of MCT. Treatment used the techniques and structure as set out in a treatment manual (Wells, 2009).

Data Analysis

The aim of single case research is to determine if there is a clear treatment effect following the introduction of the intervention,

and hence if MCT could be a suitable treatment for SAD. Accordingly, visual examination of graphed data provides a stringent test of the treatment effects as only unambiguous effects will be apparent (Parsonson and Baer, 1992). Therefore, session by session scores across baseline, treatment and follow-up on the FNE and CAS (worry/rumination and threat monitoring) are illustrated. Descriptive statistics are presented for individual patients at pre-treatment, post-treatment and follow-up on the following measures: FNE, SAD, SIAS, BAI, BDI, MCQ-30, SPRS; social phobic beliefs, and SPRS; use of safety behaviours.

RESULTS

Pre-treatment, post-treatment and follow-up scores for each patient on standardised measures of social anxiety (FNE, SAD, SIAS) non-specific anxiety symptoms (BAI), depressive symptoms (BDI), metacognitive beliefs, use of safety behaviours and rating of social phobic beliefs are presented in **Table 1**. Eight sessions of MCT were associated with substantial reductions on all measures of social anxiety. At post-treatment, all patients were asymptomatic on BAI and BDI. Metacognitive beliefs were addressed in most treatment sessions, and decreased substantially from pre to post intervention. Finally, cognitive self-beliefs and use of safety behaviours showed a substantial decrease from pre to post-treatment, even though these components were not addressed in treatment. At 6 months' follow up, treatment gains were largely maintained.

Each patient's score on the Fear of Negative Evaluation (the primary outcome measure) and time spent worrying/ruminating and threat monitoring during the last week during the baseline, treatment and follow-up phase are illustrated in **Figure 1**. As can be seen, all patients showed a stable FNE score across the baseline period. Patient 1 presented with the performance subtype of SAD, which most likely is the reason why her FNE pre-treatment score was only six points. With the introduction of treatment, rapid and substantial reductions in CAS-activity

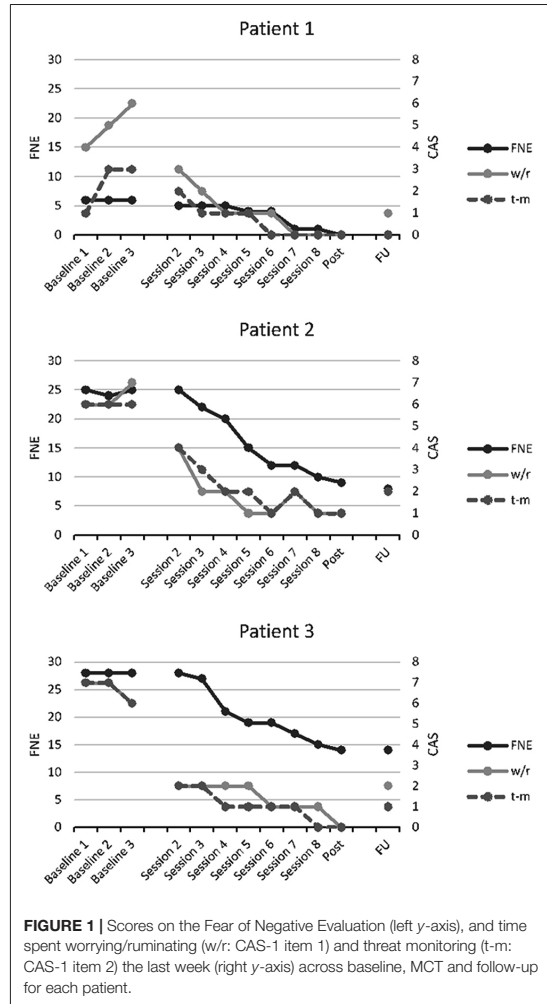


FIGURE 1 | Scores on the Fear of Negative Evaluation (left y-axis), and time spent worrying/ruminating (w/r: CAS-1 item 1) and threat monitoring (t-m: CAS-1 item 2) the last week (right y-axis) across baseline, MCT and follow-up for each patient.

TABLE 1 | Descriptive statistics for all the three cases at pre-treatment, post-treatment, and 6 months' follow-up.

Measure	Patient 1			Patient 2			Patient 3		
	Pre	Post	FU	Pre	Post	FU	Pre	Post	FU
FNE	6	0	0	25	9	8	28	14	14
SAD	2	0	0	19	8	9	21	3	8
SIAS	15	3	6	49	21	17	61	23	28
BAI	8	0	3	16	2	3	11	0	9
BDI	6	0	2	24	2	4	28	4	10
MCQ-30	52	34	34	74	37	39	64	35	40
Social phobic beliefs	290	0	0	680	230	160	960	110	90
Use of safety behaviours	48	0	3	50	30	21	47	3	18

FNE, Fear of Negative Evaluation; SAD, Social Anxiety and Distress scale; SIAS, Social Interaction and Anxiety Scale; BAI, Beck Anxiety Inventory; BDI, Beck Depression Inventory; MCQ-30, Metacognitions questionnaire 30.

can be observed in all three cases. The largest decrease in CAS activity was observed following the first two treatment sessions for all patients. The graphs also show that the FNE scores changed less rapidly than the CAS, but that they seem to follow the same trajectory. This result is consistent with the hypothesised effect of MCT on underlying process-related variables that are purported to subsequently impact on symptoms. Gains made during treatment were maintained through to the 6 months follow up point, with all patients having substantially lower FNE score at 6 months compared to baseline.

Post-treatment Diagnostic Assessment

In addition to self-report measures, all patients were re-assessed with the SCID post-treatment by the same assessor they met

before inclusion in the study. None of the patients met the diagnostic criteria for SAD following treatment. Patient 3, who prior to treatment also was diagnosed with comorbid major depressive disorder and AvPD, did not meet criteria for any diagnosis post-treatment.

DISCUSSION

The primary aim of the current study was to show any effects associated with generic MCT across the social anxiety continuum. Substantial reductions were obtained on all measures of social anxiety symptoms at post-treatment and at 6 months' follow-up. Moreover, MCT seemed to be associated with change in underlying cognitive style (e.g., worry and self-focus attention) and metacognitive beliefs that according to the metacognitive model are implicated in the cause and maintenance of SAD (Wells and Matthews, 1994; Nordahl and Wells, 2017b).

Overall the treatment was well tolerated and none of the patients reported a worsening of symptoms or distress during the course of treatment. After eight treatment sessions, none of the patients fulfilled the criteria for a mental disorder, and treatment was associated with reductions in social anxiety, general anxiety symptoms, depressive symptoms, and metacognitive beliefs. Patient 1 who presented with the performance type of SAD, was asymptomatic after session 5, and could have terminated treatment at that point. Even though patient 1 presented with low scores on self-report symptom measures, she scored relatively high on self-report measures of maladaptive metacognitive beliefs. Low symptom scores can present a challenge to treat as they can be difficult to formulate outside of specific exposure to feared situations. However, the elevated metacognition scores may well be a marker for an underlying problem which remains latent until activated. Patient 3 showed a remarkable change during the treatment period, and no longer met the diagnostic criteria for major depressive disorder or AvPD post-treatment. While recovery from a personality disorder in only eight sessions is striking, similar tendencies have been reported by Hjemdal et al. (2017) in patients with major depressive disorder and comorbid disorders undergoing MCT for depression.

Interestingly, the present study showed that MCT was associated with substantial improvements for three patients with different presentations of SAD without addressing elements such as schemas, negative automatic thoughts or safety behaviours which are important factors in CBT. According to CBT models (Clark and Wells, 1995; Rapee and Heimberg, 1997), schemas and safety behaviours are central maintenance factors of self-focused attention and social anxiety symptoms. In the present study we found that cognitive belief ratings and use of safety behaviours decreased substantially, even though these factors were not addressed in treatment. This finding is interesting in light of the metacognitive model of psychological disorders (Wells and Matthews, 1994; Wells, 2009) which suggest that cognitive beliefs/schemas could be input and/or output of the cognitive attentional syndrome, but not a cause of psychological disorder. In a recent study by Nordahl et al. (2017), change in

social phobic beliefs was not a significant predictor of symptom improvement following treatment for SAD, while change in self-consciousness and change in negative metacognitive beliefs were. Likewise, safety behaviours may be a consequence of the CAS (e.g., worrying), and not the direct cause of social anxiety.

The results from this study are encouraging; however, this study is only based on three cases with different presentations of SAD which limits inferences about the generalizability of treatment effects. Whilst the multiple baseline design controls for effects such as time, we are unable to partial-out the effects specifically due to metacognitive treatment techniques as opposed to non-specific factors. Moreover, although outcome was measured each week, more frequent measurements and the use of experience sampling methods could reveal greater dynamics in the data. The use of only one therapist means that it is not possible to determine the influence of factors such as skill level. Another limitation is that the assessors were not blind to the presence/absence of treatment which may have influenced the assessor ratings. Moreover, the treatment delivered in the current study was based on generic MCT-principles informed by recent research within the field of MCT and SAD, rather than a disorder specific MCT-manual which potentially could make treatment more efficacious.

CONCLUSION

Metacognitive Therapy was associated with substantial improvement in social anxiety and seemed to be associated with changes in underlying cognitive style (the CAS) and metacognitive beliefs. The results are preliminary and based on a case series with no control over non-specific factors or spontaneous recovery, but the results are indicative of the potential usefulness of MCT for SAD and support further evaluation in this context.

AUTHOR CONTRIBUTIONS

HN treated all the patients and wrote the first draft of the manuscript. AW provided supervision throughout the treatment and the research process, and contributed substantially to the final version of the manuscript.

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Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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