Effects of alcohol on dating anxiety and on post-event processing

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Abstract

Background: Increased comorbidity between social anxiety disorder and alcohol use disorder is often explained by the self-medication hypothesis, claiming that alcohol is consumed because of its negatively reinforcing quality. However, findings looking at the anxiety reduction using alcohol in formal speech situations are inconsistent. Furthermore, effects of alcohol on post-event processing have not yet been investigated, but may also motivate alcohol use in social situations.

Objectives: Investigation of the effects of alcohol on anxiety within and after an informal social situation as well as on post-event processing.

Methods: 122 participants (61 high socially anxious) joined a blind date after either drinking cranberry juice, placebo or alcohol, followed by a standardized social feedback. Self-reported anxiety was assessed directly after and one day after the blind date. Memory for feedback was assessed five minutes after and the day after the date.

Results: Alcohol reduces anxiety within the social situation, for both high and normal socially anxious participants. There is also a trend to remember the social feedback more positively under the influence of alcohol, reflecting reduced negatively biased post-event processing.

Limitations: Participants were not suffering from an alcohol use disorder and were not diagnosed with social anxiety disorder.

Conclusions: Self-medication is assumed to work effectively within an informal social situation. Effects on post-event processing must further be assessed.

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1 Introduction

Social anxiety disorder is a highly prevalent mental disorder characterized by fear of negative evaluation within social situations (Clark & Wells, 1995). Individuals suffering from social anxiety disorder are afraid they might show embarrassing behavior or physical symptoms of anxiety. Social anxiety disorder is highly comorbid with alcohol related problems (Magee, Eaton, Wittchen, McGonagle & Kessler, 1996; Kessler, Chiu, Demler, Merikangas & Walters, 2005). A prominent hypothesis underlining the relationship between social anxiety disorder and alcohol use disorders claims that social phobics drink alcohol in order to cope with their anxiety symptoms shown in social situations (Quitkin, Rifkin, Kaplan & Klein, 1972). This so-called self-medication hypothesis has repeatedly been tested (for an overview: Stevens, Rist, & Gerlach, 2008). However, studies in which participants were asked to give a speech did not consistently reveal an anxiety-reducing effect of alcohol. It has been argued that giving a speech is an anxiety-provoking context in which the consumption of alcohol is deemed inappropriate and individuals may fear a performance deficit due to intoxication (Abrams, Kushner, Medina & Voight, 2002). Evidence for this assumption comes from a study by Abrams and colleagues (2002), who showed that socially anxious participants drink even less alcohol before giving a speech than before a neutral activity. Alcohol may also have an indirect effect on anxiety: Post-event processing is a cognitive behavior shown by socially anxious individuals after the social situation has already passed. It is characterized by reminiscing over negative aspects of the social encounter and remembering fear and a negative representation of oneself. Since alcohol has detrimental effects on memory (i. e., Birnbaum & Parker, 1977), one might argue that the

consumption of alcohol leads to less (negatively biased) post-event processing and thus to less (remembered) fear.

Against this background, this study was conducted in order to test both a direct effect of alcohol on anxiety within the social situation and an indirect effect of alcohol on post-event processing after the social situation has passed. The social situation was explicitly chosen to be an informal interactional situation (a blind date), in which the consumption of alcohol might be more appropriate than in a performance situation such as giving a speech. Another research interest concerned the social skills hypothesis claiming a deficit of social performance in individuals suffering from social anxiety disorder (i. e., Hofmann, Gerlach, Wender, & Roth, 1997; Baker & Edelmann, 2002; Beidel, 2010). In the first part of this thesis, the reader will get an overview of previous literature on social anxiety disorder, its epidemiology, comorbidity and etiology (Chapter 2). Dating anxiety is highlighted and understood as a facet of social anxiety disorder in which fear of negative evaluation by a potential partner is relevant.

After having described the theoretical background, hypotheses are formulated (Chapter 3). In a further step, a pilot study is presented (Chapter 4). The pilot study was conducted in order to develop a useful measurement assessing dating anxiety. The "Dating Anxiety Scale for Adolescents" (Glickman & La Greca, 2004) was translated into German and its psychometric properties were assessed. Chapter 5 then illustrates the main study in which the effect of alcohol on self-reported anxiety within a social situation and on post-event processing is investigated. The thesis is concluded with a discussion of the observed results (Chapter 6).

2 Theoretical background

2.1 Symptoms of social anxiety disorder

It is not unusual to experience a moderate level of stress or anxiety in social situations such as giving a speech in front of a class or interacting with authorities (Hazen & Stein, 1995). Up to 40 % of the general population describe themselves as 'shy' (Zimbardo, Pilkonis, & Norwood, 1974). For some people, however, this fear can become so excessive that diagnosis of social anxiety disorder is justified. Social anxiety disorder was first officially recognized with publication of DSM-III (American Psychiatric Association, 1980). According to the text revision of the fourth edition of the DSM (APA, 2000), social anxiety disorder is known as the persistent fear of an individual to be scrutinized by others in one or more social or performance situations *(Criterion A)*. Possible situations contain both observation by others such as eating in front of others and performing in front of others (i.e., public speaking) and interactional situations (i.e., speaking with authorities or strangers, interacting with the opposite sex). The individual fears to be negatively evaluated because he or she behaves in a way that is humiliating or embarrassing or because others might recognize bodily symptoms of anxiety such as trembling, sweating or blushing. When exposed to the social situation(s), anxiety must be almost invariably elicited, possibly taking the form of a panic attack *(Criterion B*). Barlow et al. (1985) showed that individuals suffering from social anxiety disorder often experience situationally bound or situationally predisposed panic attacks so that this criterion was included. Moreover, it is claimed that the individual recognizes that the fear is excessive or unreasonable *(Criterion C). Criterion D* specifies that the feared social or performance situations are avoided because of the intense fear, negatively

reinforcing avoidance and thus leading to a vicious circle of growing social anxiety. For example, individuals do not attend a meeting at work or a party because the fear of being scrutinized is too intense. When avoidance is impossible, social situations are endured with intense fear. Furthermore, the social anxiety leads to significant impairment in academic, occupational or social role functioning *(Criterion E)*. Thus, avoidance, anxious anticipation, or distress in the feared situation(s) interfere with the individual's normal routine, occupational functioning, or social activities or relationships. Furthermore, anxiety must persist for at least six months in individuals under age 18 *(Criterion F)*. Moreover, fear may not be due to the physiological effects of substance use or a medical disorder, and may not be better explained by symptoms of another mental disorder *(Criterion G)*. Finally, if the anxiety is related to a medical condition or other mental disorder social anxiety disorder can also not be diagnosed *(Criterion H*).

According to the DSM-IV, 'generalized' social phobia can be listed as a specifier. This results from studies showing that social anxiety disorder can be reliably divided into a generalized and a non-generalized type (Turner, Beidel & Townsley, 1992). Individuals suffering from the generalized type of social anxiety disorder fear 'most social situations', experiencing distress in a wide range of social settings. Beneath performance situations, they also fear social interactions such as informal conversations, talking to authorities or attending social gatherings. Individuals suffering from anxiety within distinct social situations belong to the non-generalized type of social anxiety disorder, which is not explicitly listed as a specifier in the DSM-IV. They typically fear performance situations such as giving a speech, public eating or writing. These two subtypes differ on many aspects of psychopathology. Patients with generalized social anxiety disorder have more severe social anxiety, general anxiety, depression, and social inhibition (Bruch, 1989; Heimberg, Hope, Dodge & Becker, 1990). Moreover, they are more likely to endorse educational and occupational impairment, suffer more often from

comorbid Axis-I and Axis-II disorders and have an earlier age of onset (Stemberger, Turner, Beidel & Calhoun, 1995; Turner, Beidel, Borden, Stanley, & Jacob, 1991). In the case of generalized social anxiety disorder, it must be considered whether criteria for the diagnosis of avoidant personality disorder are fulfilled. Social anxiety disorder and avoidant personality disorder are viewed as being quantitatively rather than qualitatively distinct. Studies investigating the relationship between these two mental disorders found overlaps ranging from 25% to 89% of generalized social anxiety disorders receiving the diagnosis of avoidant personality disorder as well (Schneier, Spitzer, Gibbon, Fyer, & Liebowitz 1991; Turner, Beidel, Townsley, 1992). Individuals suffering from both disorders report more impairment than individuals suffering from social anxiety disorder only. Avoidant personality disorder is thus regarded as a more severe variant of generalized social anxiety disorder (Holt, Heimberg, & Hope, 1992a).

Recently, the fifth edition of the DSM has been published (DSM 5, APA, 2013). Changes in criteria include deletion of the requirement that individuals over age 18 years recognize that the anxiety is excessive or unreasonable. Instead, anxiety must be out of proportion to the real threat level present in the social situation. Moreover, the 6-month duration is extended to all ages and not restricted to children and adolescents. Panic attacks can be listed as a specifier.

2.2 Epidemiology and Comorbidity

Social anxiety disorder is a common mental disorder. The Epidemiologic Catchment Area (ECA: Schneier, Johnson, Hornig & Liebowitz, 1992) study reports a lifetime prevalence rate of 2.4% for adults suffering from social anxiety disorder. According to the National Comorbidity Survey (Kessler et al., 1994), 13.3% meet diagnostic criteria for social anxiety disorder at some point in their lives. Other studies report lifetime

prevalence rates of 4.9 % for males and 9.5 % for females (Wittchen, Stein & Kessler, 1999). Social anxiety disorder is thus one of the most prevalent mental disorders followed by affective disorders and alcohol-related diagnoses (Kessler et al., 1994). Jacobi et al. (2014) recently published prevalence rates for mental disorders of the general population in Germany among 18 to 79 year olds. They report a 12-month prevalence of social anxiety disorder by 2.7%. They found women to suffer more often from social anxiety disorder than men. Moreover, prevalence rates of social anxiety disorder were especially high for the younger population (ages 18-34). Variability in reported prevalence rates is due to differences across studies, i.e. the use of different diagnostic. In the National Comorbidity Survey, women were also found to more often suffer from social anxiety disorder than men (ratio of 3:2 female-to-male). Beyond sex, further risk factors for developing social anxiety disorder are being unmarried, young age (18-29) and low socioeconomic status (Schneier et al., 1992). Age at onset is reported to be early: According to Schneier et al., 21% of social phobics report onset between ages 0 and 5, 15% between ages 6 and 10, 26% between ages 11 and 15, 18% between ages 16 and 20, 10% between ages 21 and 25 and only 10% after age 26.

Social anxiety disorder has been shown to be highly correlated with other anxiety disorders, substance abuse, and affective disorders (Schneier et al., 1992). Comorbidity rates are as high as 59% for a specific phobia, 44.9% for agoraphobia, 18.8% for alcohol abuse and 16.6% for depression. 52% of individuals with a diagnosis of lifetime social anxiety disorder are suffering from at least one further lifetime mental disorder (Chartier, Walker & Stein, 2003). Accordingly, odds ratios are as high as 7.2 for other anxiety disorders, 8.95 for affective disorders and 3.06 for substance abuse. Essau, Conradt & Petermann (1999) report similar comorbidity rates for German adolescents. The most common comorbid mental disorders were somatoform disorder, followed by major depression, agoraphobia, and alcohol abuse. Wittchen et al. (1999) further report that

social phobic adolescents are at an increased risk for academic impairment. Although comorbidity rates differ between studies, there is evidence that social anxiety disorder is often accompanied by other mental disorders, leading to severe impairment and thus has to be taken seriously.

As outlined in the Introduction, the co-existence between social anxiety disorder and alcohol related problems is an issue highlighted in this thesis. It will be described separately and in more detail in the next section.

2.3 Comorbidity of Social Anxiety Disorder and Alcohol Use Disorder

Epidemiologic studies show that socially anxious persons are at an increased risk for the abuse of alcohol or for alcohol dependence (Magee et al., 1996; Kessler et al., 2005). Magee et al. found that 24% of social phobics suffer from comorbid alcohol use disorders. In most cases, social anxiety is established before alcohol related problems begin (Zimmermann et al., 2003). When people with social anxiety disorder are asked for their reason to consume alcohol, they answer that they drink in order to cope with their symptoms of anxiety (Smail, Stockwell, Canter and Hodgson, 1984). This finding supports the so-called 'self-medication hypothesis' which has been proposed as an underlying mechanism accounting for the high comorbidity between social anxiety disorder and alcohol use disorder (i. e., Quitkin et al., 1972). The 'self-medication hypothesis' suggests a negatively reinforcing quality of alcohol and claims that people suffering from social anxiety disorder drink alcohol to reduce anxiety related symptoms. Against the background of social anxieties, alcohol is thus consumed more and more often, leading to alcohol abuse or even dependence.

However, studies using public speaking as anxiety-inducing stimulus did not consistently demonstrate anxiety-releaving effects in social anxiety disorder (compare

Stevens et al., 2008). However, Abrams, Kushner, Medina & Voight (2001) conducted a study that supported the self-medication hypothesis: They gave participants diagnosed with social anxiety disorder two speech challenges. One speech occurred before and one speech occurred after they consumed either (a) an alcoholic drink they were told contained alcohol ('alcohol group'), (b) a non-alcoholic drink they were told contained alcohol ('placebo group') or (c) a non-alcoholic drink they were told contained no alcohol ('control group'). Thereby, a blood alcohol concentration of 0.5‰ was targeted. Both a pharmacologic and an expectancy effect of alcohol were found: Participants in the alcohol group and the placebo group reduced their performance anxiety from the first to the second speech challenge. This reduction was greater than for the control group. The authors interpreted these findings as evidence for the self-medication hypothesis suggesting a negatively reinforcing quality of alcohol for social fears.

In contrast, there exists evidence that people suffering from social anxiety disorder drink even less alcohol as compared to healthy people (Allan, 1995; Holle, Heimberg, Sweet & Holt, 1995). A potential explanation might be that social phobics fear a lost of control or a performance deficit by alcohol consumption, especially when performance is demanded. This is underlined by a study in which participants with social anxiety disorder were given the opportunity to drink as much alcohol as they wanted either before or after a speech challenge or a neutral activity (Abrams et al., 2002). Results showed that socially anxious participants drank less alcohol before a speech challenge than before a neutral activity. Further, they drank more alcohol after the speech challenge than before the speech challenge. Participants justified their decision with being worried of performance deficits during the speech when drinking too much alcohol. Holle et al. (1995) found that social phobics do not drink more alcohol than healthy controls when participation is demanded. They found eating in a restaurant or attending parties to be associated with more alcohol consumption for social phobics than

for healthy controls. However, when participation was expected, such as during small talk on a work break or attending a meeting, the authors found no differences in alcohol consumption between social phobics and healthy controls.

Two further studies (Naftolowitz, Vaughn, Ranc and Tancer, 1994; Himle et al., 1999) failed to find an anxiolytic effect of alcohol in a speech situation. It must be stated, though, that the targeted blood alcohol concentration of 0.3‰ was low so that pharmacological anxiolytic effects of alcohol might not have been achieved.

Stevens, Cludius, Bantin, Hermann & Gerlach (2014) conducted a study in which high and normal socially anxious particpants were asked to give a public speech. The authors found alcohol to reduce attentional biases in social anxiety. When drinking juice, high socially anxious participants preferentially paied attention to external probes. However, under the consumption of alcohol or placebo, external attentional processing was reduced. Moreover, they found alcohol to reduce facial blushing as well as to reduce self-reported social anxiety during public speaking. They interpreted these results as alcohol being anxiety releasing and thus being a safety behavior in social anxiety disorder. Cooper, Hildebrandt and Gerlach (2013) investigated the motive to drink alcohol in order to reduce social fears in patients suffering from alcohol use disorder. They conducted a study in which primarily alcohol dependent individuals with and without comorbid social anxiety disorder were explored regarding their motive to drink due to social anxiety. The authors found that alcohol dependent patients with comorbid social anxiety disorder had an elevated motive to drink due to social anxiety as compared to alcohol dependent patients without comorbid social anxiety disorder, thus replicating previous findings of alcohol drinking motives in order to reduce social fears for a clinical sample of alcohol dependent patients. The authors conclude that individuals suffering from comorbid alcohol use and social anxiety disorder have an enhanced motive to drink alcohol in social situations because they believe in fear-relieving effects of alcohol.

Cludius, Stevens, Bantin, Gerlach & Hermann (2013) stress the importance of the motive to drink due to social anxiety. Accordingly, the authors state that social anxiety increases the motive to drink due to social anxiety. However, this motive is weakened by the individuals' expectations of cognitive performance deficits after consuming alcohol. The authors further found alcohol to be consumed more frequently in situations where the intake of alcohol is deemed socially acceptable. Accordingly, the type of the social situation plays an important role determining the motive to drink. Thus, the motive drinking due to social anxiety, and not social anxiety per se, is related to hazardous alcohol use.

Taken together, these findings suggest that the relationship between alcohol use disorder and social anxiety disorder is complex. Clearly, the self-medication hypothesis must be extended since alcohol per se does not seem to be anxiety releasing in all circumstances. Expectancy effects might also be important as well as the type of social situation. Specifically, some situations such as giving a speech are probably situations in which it is less likely, that alcohol is socially acceptable. However, parties, dates or a dinner in a restaurant represent social situations in which the use of alcohol is legitimated or even expected. A recent study highlights the importance of social phobics´ beliefs regarding the consumption of alcohol (Buckner & Matthews, 2012). According to the authors, drinking alcohol is regarded as helpful when attempting to feel sexier.

2.4 Dating Anxiety

Social anxiety disorder has been defined as the 'fear of an individual to be scrutinized by others in one or more social or performance situations' (APA, 2000). Dating is one such social situation that is often associated with profound anxiety in socially anxious individuals. Dating and generally establishing romantic relationships is a normative

developmental task for adolescents (Zimmer-Gembeck, 2002), influencing adolescents' psychosocial functioning such as a positive self-worth and self-perceived competence (Collins, 2003). For most people, being on a date is accompanied by a moderate level of anxiety or stress (Neider & Seiffge-Krenke, 2001). Indeed, 54% of males and 42% of females experience dating situations as difficult (Glass, Gottman & Shmurak, 1976). Sometimes, dating anxiety can become so excessive that it interferes with dating and the development of a romantic relationship. In turn, failure to develop romantic relationships apparently has mental health implications. For example, single individuals receive 50% more mental disorder diagnoses than married people (Jacobi et al., 2004), suggesting that being able to engage in romantic relationships is a protective factor.

Dating anxiety has been linked to social anxiety disorder. Being on a date can surely be regarded as a social interaction in which the fear of negative evaluation can emerge. Physical, cognitive and behavioral symptoms associated with dating anxiety can be found in patients with social anxiety disorder as well (Leary & Kowalsky, 1995). Not surprisingly, socially anxious adults have fewer dating partners (Bruch, Heimberg, Berger & Collins, 1989) and a lower rate of marriage (Schneier et al. 1994). However, dating anxiety is specific to romantic interactions in which people have the opportunity to get to know a potential partner, whereas social anxiety pertains to social situations in general, such as giving speeches or formal and informal conversations with authorities or strangers.

Specifically, 'dating anxiety' is characterized by intense fear in dating situations, causing distress and an impaired ability to function effectively (Glickman et al., 2004). It is regularly accompanied by physical symptoms such as blushing, trembling, sweating, palpitations or stammering. Glickman and La Greca state that dating-anxious individuals often fear being evaluated in a negative manner by prospective partners, or being embarrassed by one´s own action. A possible consequence of these fears is avoidance of

potential dating situations, which, in turn, impedes the possibility to learn that the anxiety will diminish over time and that dating worries will not materialize. As a consequence, individuals may avoid dating situations more and more often, resulting in a vicious circle. Furthermore, according to self-medication hypothesis, some dating-anxious individuals may use alcohol or other drugs to reduce their social fears (Quitkin et al., 1972).

Dating Anxiety can be assessed by two questionnaires – the Dating Anxiety Survey (Calvert, DeWayne & Jensen, 1987) and the Dating Anxiety Scale for Adolescents (Glickman et al., 2004). These questionnaires will be described in detail in Section 4.1.

2.5 Cognitive models of Social Anxiety Disorder

Several cognitive behavioral models explaining the onset and maintenance of social anxiety disorder have been proposed. Two of them are ought to be outlined here because they stress the importance of a negative perception of the self or a negative mental representation of the self in the development and maintenance of social anxiety. They assume negatively biased information processing on socially relevant information to maintain symptoms of social anxiety. Especially, Clark and Wells (1995) focus on a so-called 'post-mortem' - a negatively biased rumination on the social event after it has already passed. These models thus focus on biased processing. Biased information processing and its possible changes under the consumption of alcohol is one of the central issues investigated in this thesis (see Introduction).

2.5.1 The cognitive-behavioral model by Rapee and Heimberg

It is claimed that individuals seek to create a certain - mostly positive - impression on others. Rapee and Heimberg (1997) assume that social phobics entering a social situation (i.e. giving a speech) tend to perceive the audience as a potential threat. They fear to be evaluated negatively, assuming other people to be inherently critical. Consequently, the mental representation of themselves as seen by the audience is distorted, much more than the mental representation non-socially anxious individuals form. Specifically, they form a mental representation of their external appearance and behavior by monitoring for example their own facial expressions or internal feelings. Most importantly, the mental representation is not an objective view of oneself, but rather a distorted image, for example 'I will blush and look like a tomato'. The input for this negative representation results from prior experiences in social gatherings, internally interoceptive information and possibly feedback from others. At the same time, social phobics predict the

audience's expected standard for their social performance. The mental representation of the self as seen by the audience is compared to the appraisal of the audience's presumed situational standards, providing an estimate of the audience's perception of the individual's social performance. Social phobics might have the idea: 'People who blush are regarded as being incompetent.' Probability and consequence of the negative evaluation by the audience are then determined by the discrepancy between the person's perception of the audience's appraisal of his/her performance and the perceived audience´s norm for the social performance. For example, social phobics might think: 'The impression of incompetence can lead to the lost of my job.' Anxiety is then triggered on a physiological (e.g. blushing, trembling, sweating), cognitive and behavioral level as the audience's evaluation is predicted to be negative. The generated anxiety symptoms influence the representation of the self anew, enhancing the vicious circle. Figure 1 illustrates the model by Rapee and Heimberg.

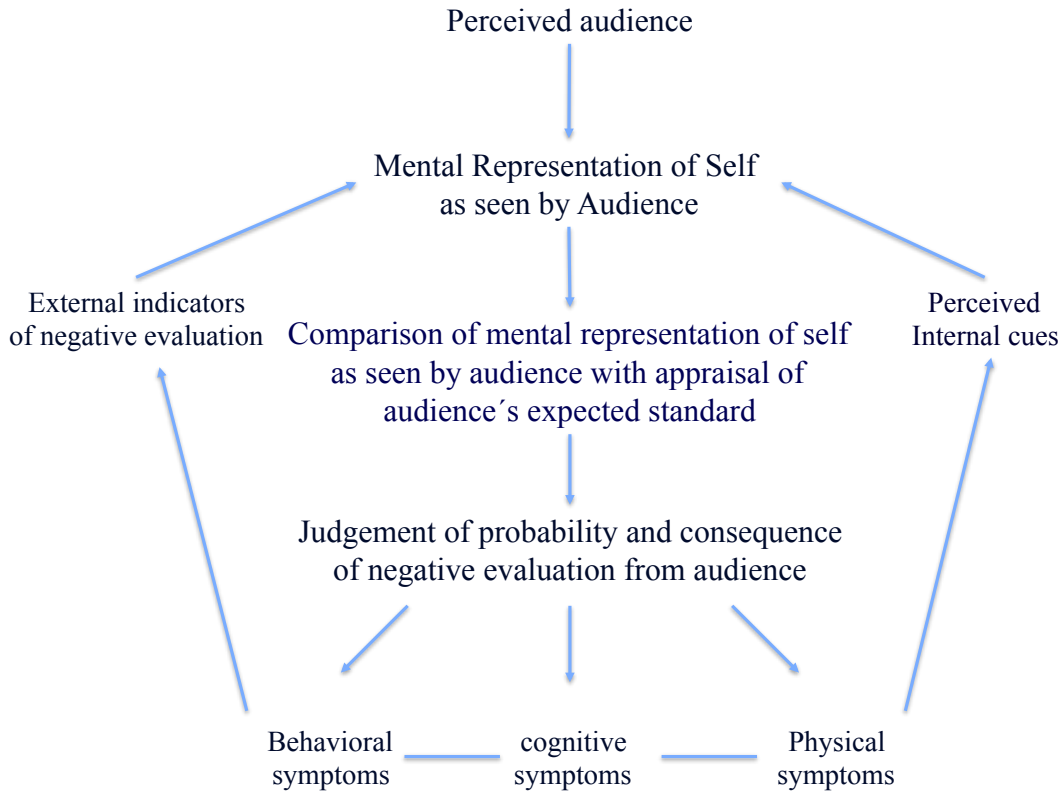

Figure 1. Schematic illustration of the cognitive model by Rapee and Heimberg (1997).

2.5.2 The cognitive model by Clark and Wells

Clark et al. (1995) present a model assuming that social phobics have developed anxiety-related assumptions on the basis of previous experiences. These assumptions are often negative beliefs about the self such as 'I am stupid' or excessively high standards for social performance such as 'I must not make any mistakes'. When entering a social situation, these assumptions are activated and the social situation is thus evaluated as being dangerous. Social phobics fear to be evaluated by others in a negative manner. Negative automatic thoughts like 'I will fail' or 'I will get a bad grade' occur. When

fearing negative evaluation, the attentional focus shifts and the self is intensively monitored using internal information. Internal information contains the individual´s belief that anxious feelings get apparent to others and thus visible. Social phobics further experience spontaneously occurring images in which they are able to see themselves as though from other people's point of view. The images are exaggerated in that shaking hands can be seen although in deed, the social phobic does not shake at all. This interoceptive information consequently leads to a negative impression of the self. To put it different, social phobics do not use external information how they appear to others by checking out what is really happening. Thus, they cannot benefit from their everyday experience with social situations.

In order to prevent the feared catastrophe, social phobics engage in various safety behaviors such as drinking cold water or opening windows when being anxious to blush. When the feared catastrophe does not occur, social phobics attribute this to their safety behavior instead of the situation´s harmlessness, reinforcing the use of further safety behavior. Besides, Clark and Wells assume that both cognitive and somatic symptoms of anxiety further contribute to the maintenance of social anxiety disorder. Somatic symptoms typically include trembling, sweating and blushing, possibly causing the feared negative evaluation by others.

After the social situation has passed, Clark and Wells assume social phobics to engage in detailed rumination over the social event, which they call post-event processing. This phenomenon is in detail described in the next section. Figure 2 schematically illustrates the cognitive model by Clark and Wells.

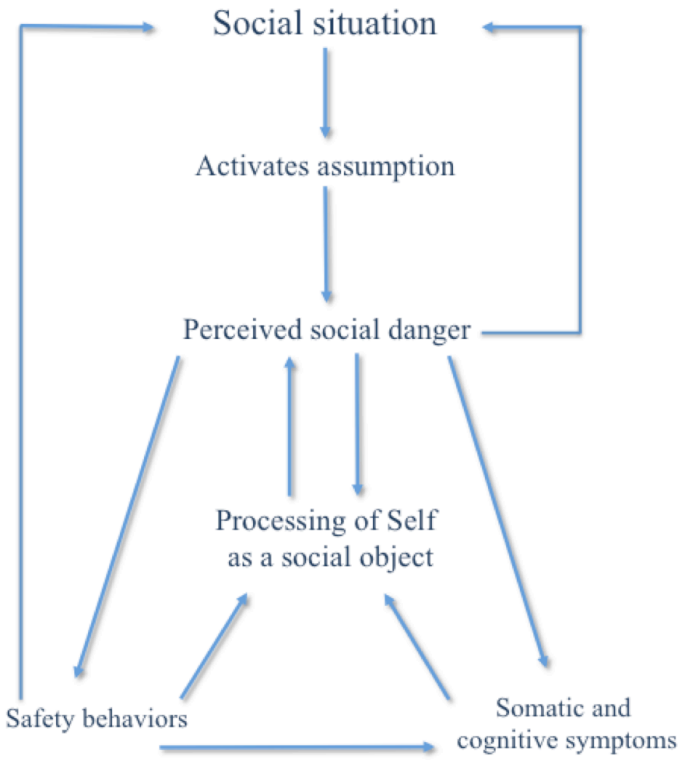

Figure 2. Schematic illustration of the cognitive model by Clark and Wells (1995).

2.5.3 Post-event processing

Cognitive models stress the importance of a negative perception of the self or a negative mental representation of the self. As mentioned above, in their cognitive model, Clark and Wells (1995) assume a so-called 'post-mortem' of previous social performances, which they call 'post-event processing'. It is the tendency of social phobics to ruminate after the social situation for hours or even days, often accompanied by a sense of shame persisting for a while even after the social situation is over and anxiety has subsided (Rachman, Grüter-Andrew & Shafran, 2000; Cody & Teachman, 2010). Socially anxious individuals are assumed to focus on monitoring themselves after the social situation. They especially monitor their anxious feelings and their negative self-perception since they were processed in detail and thus strongly encoded in memory. Thereby, the rumination appears to be negatively biased so that social phobics encode an exaggerated negative representation of themselves. Before the next social gathering occurs,

individuals engage in an anticipatory processing in which memories of the past social event get activated, possibly leading to avoidance of further social events and thus also contributing to the maintenance of social anxiety disorder (Rachman et al., 2000).

Several studies investigated in post-event processing. Rachman et al. (2000) developed the Post-Event Processing Questionnaire, which will be described in detail in Section 5. They showed that the level of social anxiety was strongly correlated with the degree of self-reported rumination about a social event. Consequently, participants high in social anxiety engaged significantly more in post-event processing than participants low in social anxiety. This result remained constant even after controlling for levels of depression – a mental disorder in which rumination frequently occurs as well. In detail, it became obvious that participants high in social anxiety did not only ruminate about past unsatisfactory social events, but that these thoughts were of intrusive quality and that they furthermore interfered with their ability to concentrate. In an experimental study, Mellings and Alden (2000) replicated the result that socially anxious participants engaged more in post-event processing than healthy controls. The extent of post-event processing predicted recall of negative self-related information. They also found that socially anxious participants had worse memory for neutral information. They concluded that rumination increased the salience of negative aspects of the event, facilitating the recall of this information.

Edwards, Rapee and Franklin (2003) asked participants high and low in social anxiety to give a three-minute speech for which they were given feedback by the experimenter. Participants were further asked to recall their feedback. The authors hypothesized that high and low socially anxious individuals differ in the degree to which they engaged in negative rumination. They further hypothesized that a bias toward negative information would become apparent one week after the social performance, proposing a memory bias. They showed that high socially anxious individuals engaged more in post-event

processing after a social event, thus replicating the studies mentioned above. Moreover, they found that high socially anxious participants recalled significantly more negative feedback than positive feedback. There was no significant difference in recall of negative and positive feedback for the low socially anxious participants. High socially anxious participants recalled significantly more negative feedback than the low socially anxious participants, whereas this difference was not evident for recall of the positive feedback. The authors interpreted these results in favor of a negatively biased post-mortem for individuals high in social anxiety.

Cody and Teachman (2010) conducted a study in which they asked participants high and low in social anxiety to give a speech followed by a standardized feedback on their performance. Feedback consisted of both positive and negative items. Memory for feedback was tested immediately after the feedback and two days after the speech. Results showed that participants high in social anxiety recognized negative feedback items as worse than the control group, suggesting a memory bias. This was predicted by the frequency and intent of post-event processing. They further found that after two days, participants high in social anxiety remembered their positive feedback as significantly worse as compared to participants low in social anxiety.

To sum up, these results suggest a negatively biased rumination of social phobics after the social situation has passed.

2.6 Effects of alcohol on memory

It has been well established that alcohol has detrimental effects on memory (i. e., Birnbaum & Parker, 1977). Regardless of whether a person is alcohol dependent, abusing or a moderate drinker, the ingestion of alcohol produces an impairment in memory (Parker, Alkana, Birnbaum, Hartley & Noble, 1974). In particular, storage of

new information is impaired by alcohol intoxication (Ryback, 1971), whereas retrieval of already learned material is not impaired: Birnbaum, Parker, Hartley and Noble (1978) conducted a study in which participants learned a free-recall list and a paired-associate lists while they were sober. They had to recall the lists one week after, either sober or intoxicated. Results showed that neither free recall nor cued recall were influenced by the alcohol intoxication at the time of testing. Similarly, Jones (1973) found that the number of words recalled from lists that were learned before ingestion was not affected by alcohol intoxication.

In contrast, storage of new information can be severely impaired when being intoxicated. Also, the effect of alcohol on memory is more pronounced as intoxication increases (Jones, 1973; Jones & Vega, 1972). For example, Jones and Jones (1977) found evidence for an impairment of storage due to alcohol. Intoxicated subjects learning word-lists were able to recall words from the end of the list, but recalled less words from the beginning of the list. Jones et al. (1977) interpreted these results as a consolidation failure since words at the beginning of the list are assumed as being consolidated and stored in long-term memory whereas words from the end of the list are assumed as being stored in short-term memory. The authors further found evidence for a normal functioning of retrieval: Words learned before alcohol consumption but tested after intoxication were recalled as often as in the placebo condition. Furthermore, Lister, Eckardt and Weingartner (1987) annote that alcohol profoundly disrupts the individual's ability to form new memories. Even low doses of alcohol can interfere with the acquisition of small items such as names. Beyond others, White, Jamieson-Drake & Swartzwelder (2002) stress the link between blackouts and alcohol consumption. They conducted an e-mail survey in which they asked college students about their blackouts. Among those who drank in the 2 weeks before the survey, 9.4% had experienced a blackout during that period. Lee, Roh and Kim (2009) state that a high blood alcohol

concentration is able to induce a blackout. They define an alcoholic blackout as a phenomenon of acute alcohol intoxication - an 'amnesia for the events of any part of a drinking episode without loss of consciousness' which is characterized by memory impairment during intoxication in the relative absence of other skills deficits. A blackout can be thus regarded as evidence for the selective impairment of memory due to alcohol consumption. In her review, Mintzer (2007) points out that the intake of alcohol impairs working memory, episodic memory and semantic memory and that memory encoding is more impaired than retrieval. Weafer, Gallo and de Wit (2014) conducted a study which further found that memory is impaired under the consumption of alcohol. The authors asked healthy social drinkers to attend a viewing session in which they consumed either alcohol or placebo before or immediately after viewing affective and alcohol-related images. Stimuli had to be recalled or recognized 48 hours later. The authors found that encoding was significantly impaired when alcohol was drunk. Taken together, alcohol seems to impair memory, especially storage of new information.

2.7 Social skills in social anxiety disorder

A large number of studies assessed the question whether individuals suffering from social anxiety disorder are less socially skilled as compared to healthy controls. Spitzberg and Cupach (1989) define social skills as the 'ability to interact with other people in a way that is both appropriate and effective'. Social skills are regarded to be essential for the processes of social adjustments and functioning of individuals (Turner, Beidel & Townsley, 1992). Thus, developing social skills is an important competence to fulfill.

According to the above described cognitive models (Clark et al., 1995; Rapee et al., 1997), individuals suffering from social anxiety disorder show socially inadequate

behavior within social situations. Social phobics´ attention to interoceptive information as well as safety behavior lead to a negative impression on others. However, social phobics can be divided into two groups:

1) Social phobics who actually possess adequate social skills, but who may not be able to apply them within the social situation because they are inhibited by their anxiety, indicating a performance deficit.
2) Social phobics who do not possess social skills and are thus conspicuous within the social situation.

However, Angélico, Crippa & Loureiro (2013) underline that inadequate performance in a social situation might be due to behavioral inhibition rather than to an actual lack of abilities.

Literature shows that social phobics' concern about their social performance might be justified: Evidence for a deficit in social skills in social anxiety disorder comes from a number of experimental studies. Beidel, Rao, Scharfstein, Wong & Alfano (2010) explored differences in social skills between social phobics of the generalized and the non-generalized subtype. They found that individuals of both the generalized and the non-generalized subtype had deficits in social skills as compared to healthy controls. Individuals of the non-generalized type were less skilled than healthy controls and individuals of the generalized subtype were even less skilled than individuals of the non-generalized subtype. Levitan et al. (2012) hypothesized that participants diagnosed with social anxiety disorder would be judged in poorer social performance than controls. Results indeed showed that observers' ratings for social phobics resulted in less socially adequate behavior than for controls, as measured by voice intonation and fluency of speech. In another study, Baker and Edelmann (2002) asked social phobics and a non-clinical comparison group to join a conversation with a confederate. They found that

social phobics showed significantly less eye contact during the conversation as compared to the control group. Social phobics were further judged as less skilled regarding gestures, speech fluency and overall performance. A recent study by Cooper, Bantin, Hermann, Gerlach & Stevens (in submission) further supports a social skills deficit in socially anxious participants. They asked 62 patients diagnosed with social anxiety disorder and 60 controls to participate in a speech task. Before the speech began, participants drank either an alcoholic drink, a placebo, or juice. Results showed that social performance for the socially anxious participants was rated worse than for the control participants. Specifically, the more anxious the patient, the poorer the performance during the speech as evaluated by the observers. Moreover, participants drinking alcohol were rated as even less socially competent as compared to participants drinking placebo or juice, respectively. Thereby, socially anxious participants were not aware of their lack in social performance.

Hofmann, Gerlach, Wender & Roth (1997) investigated 24 participants diagnosed with social anxiety disorder and 25 non-phobic controls. Participants were asked to give a videotaped 10-minute speech in front of two people. The authors found that compared to controls, social phobics made longer pauses and more frequent pauses during their speech. Moreover, social phobics were demonstrated to have a greater so-called 'ah-ratio'. That is, social phobics made more filled pauses, consisting of utterances like 'ah', 'hum', etc. However, the authors did not find any statistically significant differences in gaze behavior between social phobics and controls. Correspondingly, mean eye-contact duration, the number of eye contacts per minute and the percent of total eye-contact time relative to the total speaking time were the same for both groups. The lack of differences in eye contact might be interpreted as evidence against a social skills deficit for social phobics.

In contrast, there is also evidence that individuals suffering from social anxiety disorder do not differ from healthy controls in their social skills. For example, Rapee and Lim failed to find social skills differences in their study (1992). They asked 28 participants with social anxiety disorder and 33 nonclinical controls to give an impromptu speech to a small audience. When rated by the audience on global items such as confident appearance, there were no significant differences between social phobics and healthy controls on public speaking performance. Beidel, Turner and Dancu (1985) neither found significant differences between socially high and low anxious participants for skillfulness in same-sex interactions and in an impromptu speech. Strahan and Conger (1998) asked male participants high and low in social anxiety to participate in an opposite-sex videotaped interview. The female interviewer asked questions such as 'What are your strengths and weaknesses?' or 'Tell me about how you handle conflict on the job or with your friends.' Overall performance as rated by the observers showed no differences between groups. Hence, the socially anxious group did not show inferior performance as compared to the non-anxious group, contradicting the hypothesis of a social skills deficit in social anxiety disorder.

Voncken and Bögels (2008) investigated social skills in different types of social situations. They asked whether patients diagnosed with social anxiety disorder were characterized by biased perception of their social performance or by actual skills deficits compared to control participants. 48 participants diagnosed with social anxiety disorder and 27 control participants were asked to give both an impromptu speech and to get acquainted with two confederates. Results showed that patients with social anxiety disorder showed actual performance deficits during a conversation. However, in case of the speech, patients showed no performance deficits, but they underestimated their social performance. Differences in social skills between the speech and the conversation were explained by a different level of experienced structure: While during a speech, the

patients mainly had to act, they had to interact with a confederate during the conversation, resulting in less control over the situation. Rapee et al. (1997) underline that the structure of the task may be a determinant variable in social performance of social phobics. Social phobics are at greater risk to show competence deficits in non-structured situations than in situations involving clear social rules. This might be due to the fact that social phobics learn strategies and abilities during their lives to face predictable situations. Thompson and Rapee (2002) also claim the structure of the social situation to moderate differences between the social performance of socially anxious and non-anxious individuals.

Taken together, these results show mixed evidence for the hypothesis of a social skills deficit in individuals suffering from social anxiety disorder. There is plenty of evidence for a lack of social skills in social anxiety disorder; nevertheless the type of social situation seems to play an important role.

There exists also evidence that individuals with social anxiety disorder differ from healthy controls in their judgement of themselves. High socially anxious individuals show less favorable ratings of themselves relative to judges' ratings when asked to rate their performance. In the study by Rapee et al. (1992), when social phobics were asked to rate themselves on public speaking performance, they rated their own performance comparably worse than did nonclinical controls. Furthermore, the audience evaluated socially anxious individuals´ social performance as more positive than the socially anxious participants evaluated themselves. This result supports the prediction of the cognitive models assuming that socially anxious individuals tend to underestimate the quality of their own social behavior (Clark, 2001; Clark et al., 1995; Rapee et al., 1997). Christensen, Stein, & Means-Christensen (2003) found that high socially anxious participants judged themselves as less sociable, less likeable, more nervous, less intelligent and more distant in the interaction with other participants. Bögels, Rijsemus &

DeJong (2002) found in their study that high socially anxious participants underestimated their skills during a conversation with two confederates. It must be stated, though, that low socially anxious participants underestimated their social skills to the same extent. Alden and Mellings (2004) asked 25 patients with Generalized Social anxiety disorder and 26 non-anxious controls to participate in a conversation with a confederate. They then had to judge their own social behavior and were also judged by the confederate. It became obvious that the participants suffering from generalized social anxiety disorder were rated by themselves and by the confederates as less skillful and feeling/appearing more anxious than the control participants.

It is not only interesting whether there are biases in social phobics' perception of themselves, but also in their perception of others. Alden and Wallace (1995) asked whether social phobics are prone to perceptual biases when rating others' behavior. They asked 32 social phobics and 32 nonclinical controls to participate in an opposite-sex conversation with a confederate. After the conversation, participants had to judge themselves and their confederate in their social behavior. Besides the fact that the patients suffering from social anxiety disorder displayed a negative bias in their appraisals of their own behavior, they also showed a positive bias in their judgements of their partner's social behavior. The negative appraisal of the patients' own behavior did not extend to the appraisal of the conversational partners. Social phobics perceived the confederate more positively than did the control group. Cody et al. (2010) asked high and low socially anxious participants to give a speech and to watch a speech given by a confederate. In the following, participants were given a feedback of the own performance and a feedback on the confederate's speech. Afterwards, participants had to recognize both their own and the confederate's feedback. The authors found that high socially anxious participants remembered the confederate's feedback as being more positive than their own.

To sum up, it can be stated that research on social skills in social anxiety disorder is extensive, and that many studies favor the hypothesis of a social skills deficit in social phobics. It seems that particularly unstructured situations may be problematic for high socially anxious individuals. Moreover, socially anxious individuals seem to rate themselves as less favorable than they rate others and they tend to perceive others more positive than themselves.

3 Hypotheses

The first question addressed in this thesis concerns the anxiety releasing effects of alcohol in social situations. As several epidemiologic studies (see for example Magee et al., 1996; Kessler et al., 2005) indicated a strong association between social anxiety disorder and alcohol related problems, one might ask why social phobics are at an increased risk to consume alcohol in a problematic manner. The self-medication hypothesis proposes that people high in social anxiety drink alcohol because of its anxiety releasing effect, thus negatively reinforcing further consumption of alcohol within social situations (i. e., Quitkin et al., 1972). However, results regarding self-medication effects of alcohol are mixed: Studies using a speech as the anxiety-inducing stimulus did not consistently show an anxiety-releasing effect in social phobics (Stephens et al., 2008). In this study an informal social situation (a blind date) was used as the anxiety-provoking stimulus, assuming a blind date as being a situation in which the consumption of alcohol is more socially legitimated than during a speech and that it is a situation in which anxiety of a performance deficit does not play a major role. Indeed, socially anxious persons reported to drink alcohol to manage the impressions they wish to make on others hoping that alcohol would be helpful when attempting to feel sexier (Buckner et al., 2012).

Accordingly, alcohol is hypothesized to have an anxiety-releasing effect in the blind date situation. Hence, participants in the alcohol condition are assumed to experience less anxiety during a blind date than participants drinking juice. It is also assumed that anxiety is reduced for participants in the placebo condition as compared to the juice condition since literature has shown that the expectancy of drinking alcohol can reduce anxiety as well (e. g., de Boer, Schippers & van der Staak, 1994). Because social

phobics are at an increased risk to develop alcohol-related problems, participants high in social anxiety are assumed to especially benefit from the anxiety-releasing effect of alcohol.

The comorbidity between social anxiety disorder and alcohol use disorder might also partially be explained by the effect of alcohol on memory. As already mentioned, it has been well established that the consumption of alcohol impairs storage of new information (i.e., Ryback, 1971). As outlined above, post-event processing is the tendency of socially anxious individuals to ruminate about the experienced fear within the social situation and the acute negative representation of the self in this situation so that memory of the social situation is encoded even more negatively than it actually was (Rachman et al., 2000). So far, the influence of alcohol on post-event processing has rarely been studied. Since alcohol has detrimental effects on memory, it may affect post-event rumination and remembered fear. The negatively biased rumination and thus the remembered fear after the social event might be reduced when alcohol is consumed before the social situation. To put it differently, indiviudals inflicted with social anxiety disorder might drink alcohol before social situations in order to prevent their perceived inadequacy of social performance and their fear to be stored in memory and to ruminate less about the social situations. Consequently, we hypothesize that participants drinking alcohol would on the one hand experience less anxiety during the date, and on the other hand also remember less fear on the morning after the date as compared to participants in the juice and placebo condition. Since we expect post-event processing after the blind date to raise remembered fear, we further assumed that remembered fear on the next morning would be increased as compared to experienced fear during the date, especially for high socially anxious participants. However, this increase should be reduced after drinking alcohol as compared to after drinking juice. Thus, high socially anxious

participants should especially benefit from drinking alcohol with regard to their remembered fear on the morning after the date.

Alcohol might not only reduce memory for perceived fear, but also reduce negatively biased post-event processing and thus yield memory on a received feedback to be more positive as compared to drinking juice. Cody et al. (2010) investigated high and low socially anxious participants' memory on positive and negative feedback items on a speech. Memory was tested immediately after giving the speech and after a delay of two days. It was shown that high socially anxious participants remembered their positive feedback items as significantly more negative after the delay of two days than immediately after the speech. This was not shown for the participants low in social anxiety. This indicates that high socially anxious participants might have engaged in post-event processing, resulting in negatively biased memory for their own feedback. Alcohol might at this point function as a medication in order to prevent negatively biased post-event processing and thus to prevent negative rumination on the self, leading to a more positive memory on a received feedback. It is thus hypothesized that participants in the alcohol condition engage in less post-event processing, which is assumed to be reflected in memory of a more positive feedback as compared to participants in the placebo and juice condition. Again, this effect is hypothesized to become especially evident for high socially anxious participants who are assumed to especially benefit from the consumption of alcohol.

Further hypotheses concern participants' social skills. Social skills hypothesis has largely been discussed in literature. Voncken and Bögels (2008) emphasize that the experienced structure of the task has an influence on social skills. They found differences in social skills between a speech and a conversation to be due to a different level of perceived structure: While during a speech, the participants mainly had to act, they had to interact with a confederate during the conversation, resulting in less control over the

situation. Rapee et al. (1997) further underline that social phobics tend to show competence deficits in unstructured situations as compared to situations in which clear social rules are involved. In this thesis, participants are asked to join a blind date – an unstructured social situation. Accordingly, it is hypothesized that participants high in social anxiety are evaluated as being less socially skilled than participants low in social anxiety. As Buckner et al. (2012) point out that drinking alcohol is regarded as helpful when attempting to feel sexier, one might argue that in a date, the consumption of alcohol can help socially anxious individuals to be evaluated as more socially skilled as compared to when being sober. Alcohol might thus compensate a deficit in social skills while being on a date.

Literature indicates that socially anxious individuals tend to show a positive bias in their judgements of others' social behavior (Alden & Wallace, 1995). Cody and Teachman (2010) found high socially anxious participants to remember a confederate's feedback more positively than their own. Hence, it is further hypothesized that high socially anxious participants evaluate the confederate more positively than normal non socially anxious participants.

To sum up, it is hypothesized that

1) when being sober, high socially anxious participants report more anxiety, especially during the blind date and the morning after the date as compared to normal socially anxious participants and that

2) high socially anxious participants report less anxiety during the blind date and the morning after the date when drinking alcohol as compared to juice/placebo. It is further hypothesized that

3) when being sober, high socially anxious participants remember a worse feedback as compared to normal socially anxious participants and that

4) high socially anxious participants remember a better feedback under the consumption of alcohol as compared to juice/placebo. Moreover, it is hypothesized that

5) high socially anxious participants are evaluated as being less socially skilled as compared to normal socially anxious participants. Finally, it is hypothesized that

6) high socially anxious participants yield a more positive feedback to the confederate as compared to normal socially anxious participants.

4 Pilot study: Development and psychometric properties of the German version of the Dating Anxiety Scale for Adolescents

4.1 Introduction

As mentioned in Section 2.4, two questionnaires have been developed measuring dating anxiety. The Dating Anxiety Survey (Calvert, DeWayne & Jensen, 1987) is a self-report questionnaire assessing hetero-social dating anxiety in males and females. Its internal consistency is adequate and the questionnaire is thus a reliable measurement of dating anxiety. However, items focus on interactions in college (for example 'Calling up a guy about some classwork') and may not be adequate for dating outside of college. Thus, it is restricted to use in college populations and accordingly no adequate measure to assess dating anxiety in this study's population (see below).

The Dating Anxiety Scale for Adolescents (Glickman et al., 2004) is a self-report measure assessing distress during interactions with dating partners or members of the opposite sex. It was developed from a pool of items included on other anxiety measures, namely the Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1998), the Social Avoidance and Distress Scale (SAD: Watson & Friend, 1969), the Interaction Anxiousness Scale (Leary, 1983), the Fear of Negative Evaluation Scale (Watson & Friend, 1969), and the Shyness Scale (Cheek & Buss, 1981). From these questionnaires, items measuring fear of negative evaluation as well as social avoidance and distress were selected and adapted to hetero-social and dating situations. It consists of 26 items and measures three factors: Fear of Negative Evaluation (FNE-Dating), Social Distress on a Date (SD-Date) and Social Distress in a Group (SD-Group). Items are for example 'I am usually nervous going on a date with someone for the first time' or 'I am afraid that the

person I am dating will find fault with me'. Five filler items are included to provide a break from rating anxiety-related items. These three factors account for 60.1% of the variance and have high internal consistencies with Cronbach's α = .94 for Total DAS-A, .92 for FNE-Dating, .88 for SD-Date and .81 for SD-Group. Confirmatory factor analysis revealed a good fit for the three-factor model with a RMSEA = 0.057, a Goodness-of-Fit Index = .95 and a standardized root mean square residual = .039. The Chi^2-test resulted in Chi^2= 661.2 (*df*: 186), p<0.001. Thus, psychometric properties of this questionnaire are good.

Since the Dating Anxiety Survey (Calvert et al., 1987) is restricted to use in college populations and thus no adequate measure for elderly participants, it was decided to measure dating anxiety by the Dating Anxiety Scale for Adolescents (Glickman et al., 2004). The Dating Anxiety Scale for Adolescents was translated from English into German. Its development and the assessment of its psychometric properties are outlined in the following section.

4.2 Methods

4.2.1 Participants

Participants were 697 undergraduate students (20% male) of different faculties recruited from a random sample of students of the University of Cologne. They ranged from 18 to 25 years of age (M=20.87, SD=1.80).

The sample of 697 participants consisted of two subsamples that were recruited at two different time points. Sample 1 consisted of 330 students (21.8% male) who were recruited in 2010. Their age ranged from 18 to 25 years (M=20.84, SD=1.86). Sample 2 was recruited one year later, consisting of 367 students (19.1% male), with comparable

socio-demographic characteristics. They ranged from 18 to 25 years of age (M=20.89, SD=1.75).

4.2.2 Measures

Participants completed nine questionnaires. In addition to the German version of the Dating Anxiety Scale for Adolescents and a measure that assessed demographic variables, participants completed measures assessing social anxiety disorder and related body symptoms, drinking behavior, and worries. These latter measures were used to evaluate the concurrent validity of the German-language DAS-A. In the following, the questionnaires are described in detail.

Dating Anxiety Scale for Adolescents (DAS-A: Glickman & La Greca, 2004)

Dating anxiety was assessed with the 26 items of the German-language DAS-A. Each item was rated on a 5-point Likert-type scale ranging from 1 (*not at all characteristic of me*) to 5 (*extremely characteristic of me*). A total score was calculated by summing all items except for the five filler items. In the English-language original, three factors could be identified: The factor 'Fear of Negative Evaluation while being on a date', consisting of ten items such as: 'I am afraid that the person I am dating will find fault with me'. Furthermore, a factor called 'Social Distress while being on a date' could be identified, containing seven items such as: 'I often feel nervous when talking to an attractive member of the opposite sex' and finally, a third factor called 'Social Distress while being in a group'. This factor contains four items such as: 'Parties make me anxious and uncomfortable'. The original DAS-A was adapted and translated to the German language according to guidelines suggested for cross-cultural research (Brislin, 1970). Using two bilingual translators, one translated the DAS-A from the original language (English) to German, and another translated it from German back to English.

Differences in the original and the back-translated versions of the DAS-A were discussed and resolved by joint agreement of both translators and three additional bilingual individuals in a group discussion.

Social Phobia Scale (SPS: Mattick & Clarke, 1989; German version by Stangier, Heidenreich, Berardi, Golbs, & Hoyer, 1999)

The SPS is a common self-report measure assessing anxiety in situations in which people may be observed or scrutinized by others. It consists of 20 items (e.g. 'I become anxious if I have to write in front of other people'), which are rated on a five-point scale from 0 (*not at all*) to 4 (*very much*). A total score is calculated by summing all items. Items pertain to situations or themes that involve being observed by others (e.g. speaking in a group, writing in public). The Social Phobia Scale is a questionnaire with high test-retest reliability (r = .93 in a 12 week test-retest). It has furthermore high construct validity to measures such as the Social Interaction Anxiety Scale (r = .72) and the Fear of Negative Evaluation Scale (r = .60). We used this measure since we expected symptoms of social anxiety disorder to be highly correlated with symptoms of dating anxiety, possibly both underlying the concept of fear of negative evaluation.

BTS-Q Fear of Blushing Subscale (Bögels & Reith, 1999; German translation by Härtling, Bögels, Klotsche & Hoyer, 2012)

This subscale of the Blushing, Trembling and Sweating Questionnaire assesses fear of blushing. Fear of blushing is a central somatic symptom reported by socially anxious people (Glashouwer, de Jong, Dijk, & Buwalda, 2011). It consists of seven items (e.g. 'To what extent are you hindered in your daily functioning by blushing?'), which are rated on a scale from 0 *(not at all/never)* to 10 *(always/very much)*. A total score is calculated by summing all items. Cronbach's α for the Fear of Blushing subscale is high (r = .95). The homogeneity of the BTS-Q is satisfactory for all subscales (ranging

from .77 to .98), except for Avoidance associated with sweating. Furthermore, the BTS-Q has good discriminant validity. It is able to discriminate healthy persons from patients and persons afraid of showing bodily symptoms from those without the fear of showing somatic symptoms. We used this measure as a potential correlate for bodily symptoms, especially blushing, in dating situations.

Body Sensations Questionnaire (BSQ: Chambless, Caputo, Bright & Gallagher, 1984; German translation by Ehlers, Margraf, & Chambless, 1993)

The BSQ assesses body symptoms that are reported by individuals who are nervous or in a situation that they are afraid of. Typical symptoms include being afraid of palpitations or nausea. The BSQ consists of 17 items, each rated from 1 (*not at all*) to 5 (*extremely*). The total score is calculated by summing all items. Reliability can be regarded as satisfying (Cronbach's α ranging from .80 to .95 and test-retest reliability ranging from .63 to .66). Correlations with other instruments assessing anxiety ranges from $r = .40$ to $r = .58$. This measure was used since we expected the fear of body sensations such as palpitations to be positively correlated with anxiety while being on a date.

Alcohol Use Disorders Identification Test (AUDIT: Saunders, Aasland, Babor, de la Fuente, & Grant, 1993; German translation by Rist, Scheuren, Demmel, Hagen & Aulhorn, 2003)

The AUDIT consists of 10 questions assessing the frequency and amount of drinking, and the health and social consequences of drinking behavior. Sample items include for example: 'How often do you drink alcohol?' It identifies individuals with hazardous or harmful patterns of alcohol consumption, and provides a measure of harmful alcohol use. Responses to each question are scored from 0 to 4 and total scores

are obtained. Its reliability is adequately high, with a median reliability coefficient of .83, ranging from .75 to .97.

Penn State Worry Questionnaire (PSWQ: Meyer, Miller, Metzger & Borkovec, 1990; German translation by Stöber, 1995)

The PSWQ assesses aspects of pathological worrying: constancy, intensity, excessiveness and burden by worries. It consists of 16 items (e.g., 'My worries overwhelm me.'). Responses to each question are scored from 1 (*not at all characteristic of me*) to 5 (*extremely characteristic of me*) and summed to a total score. Test-retest reliability has been shown to be quite high (r = .92). The PSWQ correlates significantly with the Cognitive Somatic Anxiety Questionnaire (r = 0.69), its Cognitive Subscale, (r = 0.70), and to a lesser degree, its Somatic Subscale (r = 0.55) (Meyer et al., 1990). This measure was used because we expected worrying to be a potential symptom while having a date, for example worrying about the impression one wishes to make to a potential partner.

4.2.3 Procedure

Participants were contacted via email. After written informed consent was obtained, they were invited to participate in an online survey in which they filled out the questionnaires.

4.3 Statistical Analyses

For the factor analyses, the mean- and variance- adjusted method of the weighted least squares (WLSMV estimator) was used (Muthén & Muthén, 2010). This is the best estimator for ordinal data, if normal distribution cannot be assumed (Brown, 2006). Also, participants' response behavior was analyzed. When any score from 1 to 5 of any item

was responded by only 5% or less, this score was combined with the adjacent score up to at least 5% of the responses for the factor analysis.

Scores for the DAS-A were calculated computing a total score across the factors, that is the 21 items of the DAS-A were summed to a Total DAS.

4.3.1 Exploratory factor analysis

The aim of the pilot study was to replicate the three-factor solution of the original DAS-A. Initially, an exploratory factor analysis was conducted for the first subsample in the statistical program MPlus. The exploratory factor analysis was computed after removing the five filler items, as it was done in the factor analysis of the English-language version. A geomin oblique rotation was used. The oblique rotation permits factors to be correlated with one another (Fabrigar, MacCallum, Wegener & Strahen, 1999). This was expected given that the original DAS-A factors were intercorrelated (Glickman et al., 2004). The geomin rotation is recommended when factor indicators have substantial loadings on more than one factor resulting in a variable complexity greater than one (Browne, 2001). To define the models´ fit, we determined the RMSEA, the CFI and the TLI.

4.3.2 Confirmatory Factor Analysis

After conducting the exploratory factor analysis, a confirmatory factor analysis was conducted with the subsample of the second time point of measurement. This was done in order to test whether the factor structure yielded by the exploratory factor analysis could be replicated.

We further tested convergent validity with the German version of the Social Phobia Scale, the Body Sensations Questionnaire, the BTS-Q Fear of Blushing Subscale,

the Penn State Worry Questionnaire and the Alcohol Use Disorder Identification Test, using Spearman Brown Correlations. We expected positive correlations between individuals' reports of dating anxiety and their reports of social fears, bodily symptoms, worries and the consumption of alcohol.

To evaluate the psychometric properties of the German-language DAS-A, internal consistencies of the questionnaire were computed as well as intercorrelations between DAS-A factors, part-whole correlations and difficulties of all individual items.

4.4 Results

Participants' response behavior

Analysis of the participants' response behavior showed that the distribution of the responses was skewed to the left as was to be expected with an unselected sample.

4.4.1 Exploratory factor analysis

Factors with eigenvalues greater than 1.00 were retained, a scree plot suggested that a four-factor solution appeared optimal. The four-factor solution accounted for 70.9% of the variance. Factor 1 accounted for 49.5% of the variance, factor 2 for 10%, factor 3 for 6.2% and factor 4 for 5.2%. The four-factor solution yielded a good fit with a RMSEA = 0.057, a CFI = 0.984 and a TLI =0.975. The Chi^2-test resulted in Chi^2= 303.2 (*df*: 132), $p < 0.05$. An overview of factor loadings of the items can be extracted from the appendix.

Factor loadings of the items mainly reproduced the subscales of the English version of the questionnaire. However, there was one difference in the factor structure of the German DAS-A compared to the American version.

Factor 1 (9 items; 49.5% of the variance) was characterized by concern or worry of the adolescent to be judged negatively by a date or a member of the opposite sex. In

the English version, these 9 items also loaded on one factor, which was labeled 'Fear of Negative Evaluation' (Glickman et al., 2004). However, in the English version, item 2 ('I am often afraid that I may look silly or foolish while on a date') also loaded on Factor 1; in the German version, this item loaded on factor 2.

Factor 2 (4 items; 10% of the variance) was characterized by distress and fear (being nervous or tense) while having a date (translated as 'romantische Verabredung' in German) with a single member of the opposite sex. Factor 3 (4 items; 5.2% of the variance) was characterized by distress and fear while 'being with someone of the opposite sex.' Both Factors 2 and 3 pertain to interactions with a single member of the opposite sex, someone who could be perceived as a potential partner. In the English version of the DAS-A, Factors 2 and 3 comprised only one factor, called 'Social Distress While Being on a Date' (Glickman et al., 2004).

Factor 4 (4 items; 5.2% of the variance) was characterized by inhibition and distress during hetero-social group situations. This factor was also found in the English version of the DAS-A and was labeled 'Social Distress in a Group'.

4.4.2 Confirmatory factor analysis

Confirmatory factor analysis was computed with the data of the subsample recruited one year after the first assessment. It was done to confirm the four-factor solution yielded by the exploratory factor analysis and to evaluate the fit of the four-factor model. Confirmatory factor analysis yielded a fit for the four-factor model with a root mean square error of approximation = .076, Chi^2 = 570.39 (*df*: 183), $p < 0.001$. We furthermore yielded a CFI = 0.97 and a TLI = 0.966. These scores all indicate a good fit (Bollen, 1989; Browne & Cudeck, 1993).

Thus, the factor structure provided by the exploratory factor analysis could be confirmed by the confirmatory factor analysis. We additionally attempted to confirm the

three-factor model proposed by Glickman et al., (2004). This model had a slightly worse fit with a root mean square error of approximation of .088 (Chi^2 = 713.96; *df*: 186, $p < 0.001$), a CFI of .959, and a TLI of .954. We further tested whether there was a statistically significant difference between the three- and the four-factor solution. The Chi^2 test for difference testing in MPlus revealed a statistically significant difference between the two models with Chi^2 = 77.8 (*df*: 3), $p < 0.001$. It thus seems that the four-factor model represents a substantially better fit to the data than the three-factor model for the German version of the DAS-A.

Factor loadings can be extracted from Table 7 (see Appendix).

4.4.3 Convergent validity

The German version of the DAS-A (total score) yielded significant positive correlations to the German version of the Social Phobia Scale (r = 0.57, $p < .01$). We further yielded positive correlations between the DAS-A (total score) and the Body Sensations Questionnaire (r = 0.31; $p < .01$), the BTS-Q Fear of Blushing Subscale (r = 0.30; $p < .01$) and the Penn State Worry Questionnaire (r = 0.54; $p < .01$). No significant correlations between the German version of the DAS-A and the Alcohol Use Disorders Identification Test were found (r = .11).

4.4.4 Internal consistencies

The internal consistencies of the four DAS-A factors, as well as the total, were calculated using Cronbach's α. Alpha coefficients were .95 for Total DAS-A, .93 for Factor 1, .87 for Factor 2, .82 for Factor 3 and .79 for Factor 4. Thus, all scales had high internal consistency.

4.4.5 Intercorrelations between factors

The DAS-A factors were intercorrelated, with *r*s ranging from .55 to .86. This is close to the intercorrelations found in the English version of the DAS-A, where r*s* ranged from .59 to .73.

4.4.6 Item characteristics

Part-whole correlations of the items ranged between .37 and .78 (M=.66, SD=.1). Difficulties of the items ranged between .36 and .70 (M=.56, SD=.09). Table 1 contains numbers of means, standard deviations, range and Cronbach's alpha, part-whole correlations and facility index.

Table 1

Means, standard deviations, range, cronbach's alpha, part-whole correlations and facility index for the DAS-A subscales

	I	II	III	IV
M	24	12.77	10.3	8.74
SD	8.34	4.1	3.9	3.68
Range	32	16	16	14
α	.93	.87	.82	.79
r_{it}	.65-.78	.66-.72	.63-.74	.37-.56
p	.49-.70	.58-.70	.45-.56	.36-.53

Note. α = Cronbach's Alpha; r_{it} = part-whole correlations; p = facility index; Factor I = Fear of Negative Evaluation; Factor II = Nervousness while on a date; Factor III = Nervousness in opposite-sex interactions; Factor IV = Social Distress in a group

4.5 Discussion

The aim of the pilot study was to evaluate a German-translation of a questionnaire that had been developed previously for the assessment of dating anxiety and to evaluate its psychometric properties. The German version of the DAS-A appears to have good psychometric properties, and thus may be a valuable instrument for the measurement of adolescents´ fear of dating. The internal consistencies of the four DAS-A factors, as well as the total, were adequately high. Furthermore, we found both part-whole correlations and difficulties of the items to be high. The intercorrelations between factors were all greater than r = .55, indicating that the construct of dating anxiety is fairly homogenous. High convergent validity with several measures of anxiety underlines the importance of the construct 'fear of dating'.

The factor structure of the German-language version of the Dating Anxiety Scale for Adolescents was found to be very similar to the factor structure of the English-language original. However, the three-factor solution of the English version could not be replicated completely in the German version. A four-factor structure revealed a statistically significant better model fit in the German version. The same items loaded on the factor 'Fear of negative evaluation' with exception of item 2 ('I am often afraid that I may look silly or foolish while on a date'), which belonged to a new factor with the wording 'date', which is separated from the other factors. This new factor is labeled 'Nervousness while on a date'. Note that we decided to translate the term 'date' into the German term 'romantische Verabredung'. The term date has no direct equivalent in German. However, the term 'romantische Verabredung' adds a specific connotation. Specifically, it highlights that the purpose of the date is romantic in nature. Arguably, this wording is the reason why the original factor 'Social Distress while being on a date' in the English version is divided into two factors in the German version. Arguably, the reason may be related to special wording in the German translation of the questionnaire.

In the German version, there are four items with the wording ‘dating someone’, yielding one factor. The factor is labeled ‘inhibition and distress while having a date’. The other four items contain the wording ‘someone of the opposite sex’, yielding to another factor. This factor reflects inhibition and distress when being with someone who might be a potential dating partner. We label this factor ‘nervousness in opposite-sex interactions’. Note that these items capture interactions with a potential dating partner, and not necessarily an interaction while being on a date. The different wording seems to be not relevant in the English version, but only relevant in the German one. Glickman and her colleague (2004) mentioned in the English version as well that the factor ‘Social Distress while being on a date’ could be divided into distress while being on a date and distress in interactions with someone who could be perceived as a potential dating partner. It can nevertheless be stated that these two factors are very similar in content, since they are highly intercorrelated (r = .84). Finally, the factor ‘Social Distress in a Group’ could be replicated in the German version by exactly the same four items as in the English version.

Intercorrelations between factors are middle to high. It must thus be assumed that there is an overlap between factors in content. The fit-indices of the four-factor model are good (RMSEA=.076, Chi^2 = 570.39 (*df*: 183), $p < 0.001$, CFI = 0.97 and TLI = 0.966.).

Convergent validity of the questionnaire has been examined by correlations with the German version of the Social Phobia Scale (Stangier et al., 1999). A correlation of .57 can be regarded as adequately high. This underlines the fact that social anxiety disorder and dating anxiety are similar concepts and have the same underlying fear (the fear of being evaluated by others in a negative manner or being embarrassed by one´s own action).

We further found a positive correlation between the Body Sensations Questionnaire and the DAS-A (r = 0.31; $p < .01$). This makes sense since people who are

afraid of dating situations will probably experience the same body symptoms like any people who are afraid of any situation. For example, dating anxious people will experience palpitations, dizziness, sweating, and nausea.

Moreover, a positive correlation between the DAS-A and the subscale 'Fear of Blushing' from the BTS-Q ($r = 0.3$; $p < .01$) was found. It can be assumed that people who are nervous while having a date probably fear blushing as a somatic symptom.

The high correlation between the DAS-A and the PSWQ might reflect the fact that persons with dating anxiety tend to worry in a pathological way. In fact, Magee et al. (1996) found that 13.3% of persons with social anxiety disorder suffer from comorbid generalized anxiety disorder, in which pathological worries are the main symptom.

The non-significant correlation between the DAS-A and the AUDIT is not surprising, given that it is well know that social anxiety per se is not able to predict alcohol use (Cludius et al., 2013). However, it has previously been argued that anxiety in dating situations may be most likely associated with consumption of alcohol since in such situations, use of alcohol may be legitimated or even expected. For example, a recent study investigated whether socially anxious persons drink alcohol to manage the impressions they wish to make on others (Buckner et al., 2012). Whereas in speech situations, alcohol was rarely consumed, drinking alcohol was regarded as helpful when attempting to feel sexier.

There are some limitations to be stated concerning generalization of the study. First of all, only students participated. Also, it would have been useful to also measure depressive syndroms in order to examine possible correlations between dating anxiety and depression. A substantial correlation between social anxiety and depression can often be found (Magee et al., 1996, Zimmermann, Chelminski & McDermut, 2002). In general, correlations between any anxiety disorder and depression can often be found

(Jacobi et al., 2004). This underlines the impairment of anxiety disorders and therefore, probably, the suffering from dating anxiety.

In conclusion, it can be stated that there now exists a German measure for the assessment of dating anxiety which has proofed to be an economic as well as a reliable and valid instrument. Its psychometric properties must further be examined in clinical populations.

5 Main Study: Influence of alcohol on social anxiety and on post-event processing

5.1 Methods

5.1.1 Recruitment

Participants were recruited via flyers hung up in buildings of the University of Cologne or via e-mail. E-mails were sent to students of the university. Both socially anxious and non-anxious male and female participants were recruited. In detail, flyers and e-mails asked for individuals feeling either secure or insecure while being with someone of the opposite sex. People willing to participate were then screened by telephone to test for their overall suitability for the study. For example, they were screened on the Dating Anxiety Scale to test whether they were either high socially anxious or normal socially anxious. On the telephone, participants were informed of the possibility of consuming alcohol during the experiment and were therefore asked to explicitly not arrive by car. When participants agreed to join the study, they were sent a letter with further information on the study. This information sheet contained instructions to eat a light meal 4 hours before the beginning of the experiment and reminded participants to ask for a chauffeur in case they would consume alcohol. Participants received based on their own preferences either course credit points or, alternatively, 21 euros for their participation.

5.1.2 Participants

Participants were screened for social anxiety according to DSM-IV, using the German version of the Structured Clinical Interview for DSM-IV (Wittchen,

Wunderlich, Gruschwitz, & Zaudig, 1997). However, they did not necessarily have to fulfill the DSM-IV criteria for a diagnosis of social anxiety disorder. Participants suffering from current drug or alcohol abuse or dependence, current episode of depression or psychotic episodes were excluded. Also, alcohol naivety, current use of medication or a current psychotherapeutic treatment led to exclusion from the experiment. Participants were 122 undergraduate students (44% male) recruited from a random sample of students of the University of Cologne. Their age ranged from 19 to 51 years (M = 25.95, SD = 5.6).

5.1.3 Standard assessment instruments

Dating Anxiety Scale for Adolescents (DAS-A: Glickman & La Greca, 2004; German version by Gerhards & Gerlach)

Dating anxiety was assessed with the 26 items of the German-language DAS-A, e.g. 'I am afraid that the person I am dating will find fault with me'. The original DAS-A was adapted and translated to the German language according to guidelines suggested for cross-cultural research (Brislin, 1970). The questionnaire assesses fear of negative evaluation while being on a date as well as social distress while being on a date with a single person or while being in a group.

Drinking Due to Social Anxiety (DDSA: Wagner, Stangier, Heidenreich & Schneider, 2004)

This questionnaire is a self-report measure assessing the consumption of alcohol in order to reduce social fears. It consists of 28 items (e.g. 'I drank to overcome my shyness'). Items pertain to situations of evaluation or interaction, in which the person might drink alcohol to reduce social fears. It has high internal consistency of Cronbach´s

Alpha = .97. Convergent validity to questionnaires assessing social anxiety disorder is high (Social Phobia Scale r = .60 and Social Interaction Anxiety Scale r = .63).

Social Phobia Scale (SPS: Mattick & Clarke, 1989; German version by Stangier, Heidenreich, Berardi, Golbs, & Hoyer, 1999)

As described in Section 4, the SPS is a common self-report measure assessing anxiety in situations in which people may be observed or scrutinized by others. It consists of 20 items (e.g. 'I become anxious if I have to write in front of other people'). Items pertain to situations or themes that involve being observed by others (e.g. speaking in a group, writing in public). The Social Phobia Scale is a questionnaire with high test-retest reliability (r = .93 in a 12 week test-retest). It has furthermore high construct validity to measures such as the Social Interaction Anxiety Scale (r = .72) and the Fear of Negative Evaluation Scale (r = .60).

Social Interaction Anxiety Scale (SIAS: Mattick and Clarke, 1989; German version by Stangier, Heidenreich, Berardi, Golbs, & Hoyer, 1999)

The SIAS is a self-report measure assessing anxiety in a variety of situations in which social interaction is required. It consists of 20 items (e.g. 'I get nervous if I have to speak with someone in authority (teacher, boss)'). A total score is calculated by summing all items after reversing the three positively-worded items (items 5, 9 and 11). Cronbach´s alpha has been proved to be satisfactory (ranging from .88 to .93). The SIAS is highly correlated with the SPS (r= .73).

Fear of Negative Evaluation Scale (FNE: Watson & Friend, 1969; German version by Vormbrock & Neuser, 1983)

The German FNE is a self-report measure assessing anxiety of being evaluated in a negative manner by others. Its 20 items contain statements about the evaluation of

oneself (e.g. 'I am afraid that I may look ridiculous and make a fool of myself'). Fear of negative evaluation is directed to both members of a social group and to authorities. A total score is calculated by summing all items after reversing the four positively-worded items (items 4, 7, 11 and 15). The Fear of Negative Evaluation Scale is a questionnaire with high test-retest reliability of .78.

Simplified Beck Depression Inventory (BDI-V: Schmitt & Maes, 2000; German version by Hautzinger, Bailer, Worall & Keller, 1994)

The BDI-V is a simplified version of the original BDI by Beck, Ward, Mendelsohn, Mock & Erbaugh (1961). It was developed to improve the economy of the BDI. The BDI-V is a self-report questionnaire assessing characteristic attitudes and symptoms of depression during the past week. It consists of 20 items (e.g. 'I feel sad'). It has high internal consistency with Cronbach's Alpha = .9. It further possesses high reliability with r = .64. Concurrent validity with respect to other measures assessing depression is high, e.g. r = .89 between BDI and ADS.

Alcohol Use Disorders Identification Test (AUDIT: Saunders, Aasland, Babor, de la Fuente, & Grant, 1993; German translation by Rist, Scheuren, Demmel, Hagen & Aulhorn, 2003)

As described in Section 4, The AUDIT consists of 10 questions assessing the frequency and amount of drinking as well as the health and social consequences of drinking behavior. Sample items include for example: 'How often do you drink alcohol?' It identifies individuals with hazardous or harmful patterns of alcohol consumption, and provides a measure of harmful alcohol use. Its reliability is adequately high, with a median reliability coefficient of .83, ranging from .75 to .97.

Post-event Processing Questionnaire (Rachman, Grüter-Andrew & Shafran, 2000; German version by Fehm, Hoyer, Schneider, Lindemann & Klusmann, 2008)

The original version of the Post-Event Processing Questionnaire consists of 13 items assessing ruminative and negative thinking about a past social event. This questionnaire was translated and adopted into German language by Fehm et al., using a visual analogue scale ranging from 0 to 100. The German version consists of 30 items with adequate psychometric properties (Cronbach´s alpha = 0.85). Instead of the visual analogue, in the present study a five-point Likert scale ranging from 0 ('never') to 4 ('always') was used.

Rumination Questionnaire (Mellings & Alden, 2000)

The Rumination Questionnaire consists of five items assessing the extent to which persons engage in post-event processing, e.g. 'To what extent did you think about the conversation with your partner in the time since you had the conversation?' Ratings are made on 7-point Likert-type scales. The five items are summed to yield a total score. Cronbach's alpha is 0.70 for the total score (Mellings et al., 2007).

Structured Clinical Interview for DSM-IV (SCID: First, Spitzer, Gibbon, & Williams, 1996; German version by Wittchen, Wunderlich, Gruschwitz, & Zaudig, 1997)

The SCID is a semi-structured interview used to determine DSM-IV axis I and axis II disorders. In this study, we were only interested in axis 1 disorders. We used this measure to exclude participants with current drug or alcohol abuse or dependence, current episode of depression or psychotic episodes.

5.1.4 Self-report measures

Participants' self-reported anxiety was assessed on a 10-point Likert-type scale ranging from 1 ('not at all') to 10 ('extremely'). State anxiety was assessed at baseline after

conducting the SCID (‘baseline’), shortly before the blind date (‘pre’), right after the blind date (‘during’) and the next day (‘morning after’).

5.1.5 Social Performance Rating Scale

Furthermore, participants were rated on the Social Performance Rating Scale (SPRS: Fydrich & Bürgener, 1999) in order to get an observer-rated feedback on the participants’ social performances. The SPRS is a standardized rating system for social performance. It consists of five scales assessing gaze direction, voice quality, speech, discomfort (agitation and nervousness) and fluency of conversation. Items are rated on a 5-point Likert scale ranging from 1 (‘very good’) to 5 (‘very poor’). Higher scores indicate worse performance. Participants’ social performance were assessed by trained raters.

5.1.6 Feedback

After the blind date participants were given a false, standardized feedback on their behavior during the date. The feedback consisted of 20 items with 10 positive and 10 negative items, for example ‘confident’ and ‘blushing’, respectively. It was adopted from the feedback used by Cody et al. (2010). Items were rated on a 5-point Likert scale ranging from 0 (‘not at all’) to 4 (‘extremely’). Standardized feedback was given to participants pretending to reflect the confederate´s impression that they made during the date. Participants were then – five minutes after and the morning after the date – asked to remember the feedback they received. Hence, they were asked to mark the values of the items which they remembered were marked by the confederate. This was done in order to calculate the deviation between the standardized feedback participants received from

the confederate and the remembered feedback. Two statistical values – separately for 10 positive and 10 negative items - were calculated:

a) a value of a simple deviation indicating the direction of the deviation – whether it was positive or negative – in the following called ‘memory valence’

$$i=110x1-x0i10,$$

where:

$x0$: value of the standardized item

$x1$: value of the remembered item

$x1-x0i$: difference of item *i*.

This value indicates whether the feedback is remembered as more positive or as more negative than it actually was. It thus detects positive and negative memory biases, respectively.

b) a value of a squared deviation indicating the accuracy of memory – in the following called ‘memory accuracy’

$$i=110x1-x0i210,$$

where:

$x0$: value of the standardized item

$x1$: value of the remembered item

$x1-x0i2$: squared difference of item *i*.

This value indicates – independent of the direction of a memory bias – how accurate feedback is remembered. Inaccuracy thus results from absolute deviations between standardized and remembered items.

The terms ‘memory valence’ and ‘memory accuracy’ are adopted from Cody et al. (2010). They were calculated to test the hypothesis that high socially anxious

participants remember the feedback under the consumption of alcohol differently as compared to juice/placebo (Section 3). The standardized feedback can be taken from the Appendix.

Beyond receiving a standardized feedback, participants were asked to yield a feedback to the blind-date partner in order to assess participants' judgement on the confederate. The feedback items were the same on which participants were evaluated (see Appendix).

5.1.7 Procedure

As mentioned above, participants were recruited via e-mail or flyers. After sending their contact information, they were then given a telephone call to shortly inform them about the procedure of the experiment. They were told that they had to organize a driver due to the possible alcohol administration. They were further given nutrition advice for the study day. They were told to eat a light meal about 4 hours before the beginning of the experiment due to the possible consumption of alcohol. This information was also sent in a letter.

The experiment started at 4 p.m. When participants arrived on the study day, they signed the informed consent. They were then told that the study would examine the influence of alcohol on anxiety while being on a blind date. They were not told of the hypothesized influence of alcohol on their memory for feedback and on memory for their perceived fear. After the informed consent was signed, a urine sample for pregnancy testing was obtained from women in the alcohol condition. A structural clinical interview (SCID) was then conducted in order to exclude the above named psychic disorders. Subsequently, participants completed the DAS-A, DDSA, SPS, SIAS, FNE, BDI and the AUDIT and were assessed for baseline state anxiety on a scale ranging from 1 ('not at all') to 10 ('extremely') *('baseline-anxiety')*. Then, a baseline blood alcohol concentration was captured to ensure they were not intoxicated with alcohol. A standard

breath-analyzer with an accuracy of 0.03mg/L (Dräger Alcotest 7410; Dräger Safety AG & Co. KGaA, Lübeck, Germany) was used. For participants in the alcohol condition, the required amount of alcohol was calculated based on their height, weight, age and sex using a version of the Widmark formula (Widmark, 1932), modified by Kapur and colleagues (Breslin, Kapur, Sobell, & Cappell, 1997; Fisher, Simpson & Kapur, 1987). A breath alcohol concentration of 0.7 ‰ was targeted. The alcohol beverage was one part vodka and two parts cranberry juice, the non-alcohol beverage was cranberry juice only. The amount of alcohol or juice was divided into three doses, each of them to be drunk within five minutes. After another five minutes, state anxiety was assessed anew *('pre-anxiety')*. This was followed by a 3-minute blind date with a confederate in which the confederate was instructed to answer in a standardized manner with a lot of time for the participant to speak. The instruction for the two conversational partners was as follows: 'We would like you to have a 3-minute conversation. The purpose of the conversation is to get to know each other.' When the interaction was over, state anxiety was assessed again. It was asked how much anxiety the participant experienced *during* the date *('during')*. Afterwards, the participant had to give a feedback to the confederate and in turn, received a standardized feedback with 10 positive and 10 negative items from the confederate (adopted from Cody et al., 2010). Five minutes after, the participant had to remember the feedback which he/she received by the confederate for the first time. Participants were given a blank copy of the feedback without circled ratings and instructed to reproduce the item ratings as accurately as possible. Finally, participants in the alcohol group were picked up by a friend in order to ensure they would get home safe. All participants were invited for another testing on the morning after the date. Participants were asked to remember their self-reported anxiety during the blind date *('morning after')*. They were further asked to remember again the feedback given by the

confederate as well as to complete the PEP-Questionnaire (Rachman et al., 2000) and the Rumination Questionnaire (Mellings et al., 2000).

5.2 Statistical Analyses

In order to explore differences regarding scores on self-report questionnaires, multivariate analysis of variance was employed. To explore the influence of group and of drink on self-reported social anxiety and on remembered feedback, repeated measures ANOVAs were employed with GROUP (high socially anxious vs. normal socially anxious) and DRINK (alcohol vs. placebo vs. cranberry juice) as the between-subjects factor and TIME as the within-subjects factor, that is, the repeated measures factor. In order to reveal differences in memorized feedback, a repeated-measures ANOVA was conducted with TIME (five minutes after and the morning after the date) as the within-subjects factor and DRINK (alcohol vs. placebo vs. juice) and GROUP (high vs. normal socially anxious) as the between-subjects factors. An alpha level of 0.05 was used for all statistical tests.

5.3 Results

5.3.1 Sociodemographic data and psychopathology

122 individuals participated in the experiment. However, not all of these 122 participants returned on the second day. This will be reflected in the degrees of freedom (see sections below). Participants´ age ranged between 19 and 51 years, with a mean age of 25.95 and a standard deviation of 5.6. 56 % were female. 82.9 % were unmarried, 10.3 % were unmarried, but living together with their partner. 3.4 % were married and 3.4 % were divorced. 90.3% reported the German language to be their first language, the rest of the participants reported other first languages. The sample consisted exclusively of students:

67.8 % reported having a university-entrance diploma, the so-called German 'Abitur', whereas 32.2 % reported to already have a graduate degree. Chi-square tests revealed that high socially anxious participants did not differ from normal socially anxious participants with respect to educational level, marital status and first language. They did not differ either with respect to age. However, they differed significantly with respect to gender ($F_{(1,125)} = 11.19$; $p < .001$; $\hat{w}^2 = 0.09$) (see Table 2).

Table 2

Socio demographic data for high and normal socially anxious participants

	High socially anxious N=61	Normal socially anxious N=61
Age (M, SD)	26.6 (6.7)	25.3 (4.5)
% unmarried	81.0	84.7
First language (% German)	91.8	88.7
Educational level (% graduate degree)	32.2	32.2
Sex (% female)	69.4	42.9

Note. Comparisons are calculated by Chi^2-tests. Numbers are cases in % and for age means and standard deviations, respectively.

To test whether there were any differences in psychopathological measures between high and normal socially anxious particitpants at all, a multivariate analysis of variance (MANOVA) was conducted with GROUP as the fixed factor and the sum of the scores of the AUDIT, BDI, DAS-A, DDSA, FNE, SIAS, SPS, PEP-Q and RQ, respectively, as the dependent variables. Results revealed statistically significant differences between groups ($F_{(1,118)} = 36.7$; $p < .001$; $\eta_p^2 = .75$). In detail, high and normal socially anxious

participants significantly differed on the measures of the BDI, DAS-A, DDSA, FNE, SIAS, SPS, RQ and PEP-Q, respectively ($p < .001$, see Table 3). No statistically significant mean difference between high and normal socially anxious participants was found for the AUDIT ($F_{(1,118)} = 3.76$; $p = .06$). Table 3 shows differences in the psychometric measures of social anxiety disorder, dating anxiety, post-event processing, drinking behavior (due to social anxiety disorder) and depression between high and normal socially anxious participants, respectively. As can be extracted from Table 3, high socially anxious participants differed significantly on all measures of psychopathology except the AUDIT as compared to normal socially anxious participants in the expected direction. Accordingly, high socially anxious participants reported greater scores of depression, dating anxiety, social anxiety disorder, fear of negative evaluation, more post-event processing and drinking due to social anxiety. However, as mentioned above, no significant differences were revealed in the AUDIT, a measure identifying individuals with hazardous or harmful patterns of alcohol consumption.

Table 3

Psychopathological measures for high and normal socially anxious participants

	High socially anxious N=61	Normal socially anxious N=61	Effect sizes (Cohen's d)	F-values
AUDIT	5.8 (3.3)	7.2 (4.5)	.33	3.76
BDI V	29.1 (12.1)	19.3 (11.4)	.83	17.55
DAS-A	91.6 (10.6)	58.4 (10)	3.22	320.52
DDSA	55.0 (18.8)	43.2 (12.2)	.74	14.85
FNE	54.0 (8.6)	41.5 (7.7)	1.53	75.85
PEP-Q	60.6 (16.8)	37.6 (17.0)	1.36	46.24
RQ	19.0 (5.0)	14.4 (4.0)	1.02	25.36
SIAS	39.9 (12.9)	23.4 (9.5)	1.46	64.41
SPS	23.6 (13.7)	9.3 (7.8)	1.28	47.59

Note. AUDIT = Alcohol Use Disorder Identification Test; BDI V = Beck Depression Inventory V; DAS-A = Dating Anxiety Scale for Adolescents; DDSA = Drinking due to Social Anxiety; FNE = Fear of Negative Evaluation Scale; PEP-Q = Post-Event Processing Questionnaire; RQ = Rumination Questionnaire; SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale. All means significantly differ between high and normal socially anxious participants except for the means of the AUDIT ($p < .001$). Numbers are means and standard deviations in brackets.

5.3.2 Self-reported anxiety

In order to reveal differences in participants' self-reported anxiety, a repeated-measures analysis of variance was conducted. Both GROUP (high socially anxious vs. normal

socially anxious) and DRINK (alcohol vs. placebo vs. juice) served as between-subjects factors and TIME (baseline vs. pre vs. during vs. morning after the date) was the repeated-measures factor, hence the within-subjects variable.

We were first interested in differences between groups when being sober. Accordingly, analyses for the juice condition revealed a significant main effect for GROUP ($F_{(1,41)} = 11.18$; $p < .01$; $d = .85$) in the expected direction. Hence, when being sober, high socially anxious participants reported significantly more anxiety as compared to normal socially anxious participants. Means were 4.23 (SD = 1.7) for high socially anxious participants and 2.82 (SD = 1.63) for normal socially anxious participants on a scale ranging from 1 to 10. There was also a significant main effect of TIME ($F_{(3,39)} = 4.05$; $p < .05$; $\eta_p^2 = .07$). Participants remembered significantly more anxiety the morning after the date (M = 3.98; SD = 1.98) as compared to baseline (M = 3.24; SD = 1.59) and the morning after the date as compared to during the date (M = 3.48; SD = 1.99). However, there was no significant interaction effect for TIME*GROUP.

Analyses including all types of drinks revealed a significant main effect for GROUP in the expected direction ($F_{(1,116)} = 32.92$; $p < .001$; $d = .82$). High socially anxious participants reported significantly more anxiety than normal socially anxious participants (mean difference = 1.35, $p < .001$). Means of self-reported anxiety were 3.84 (SD =1.91) for the high socially anxious group and 2.49 (SD = 1.32) for the normal socially anxious group on a scale ranging from 1 to 10. Figure 3 shows means in self-reported anxiety in the juice condition and for all types of drinks for both high and normal socially anxious participants.

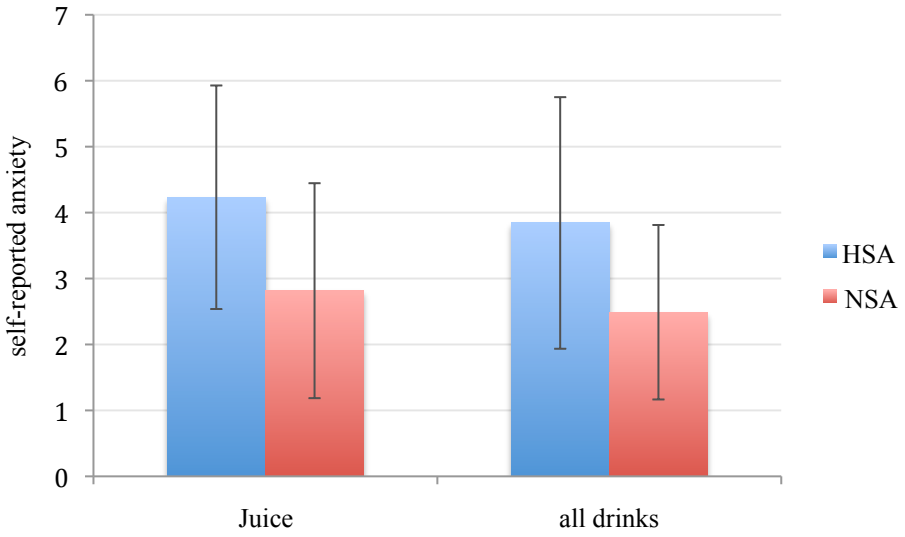

Figure 3. Means of self-reported anxiety for high socially anxious (HSA) and normal socially anxious (NSA) participants. Higher scores indicate more anxiety. Bars indicate standard deviations.

Analyses further revealed a significant main effect for DRINK ($F_{(2,116)} = 4.75$; $p < .01$, $\eta_p^2 = .08$). Post-hoc Bonferroni tests revealed a significantly lower self-reported anxiety for participants drinking alcohol as compared to cranberry juice (mean difference = .86, $p < .01$). Means of self-reported anxiety were 3.53 (SD = 1.81) for the juice condition, 3.3 (SD = 1.95) for the placebo condition and 2.67 (SD = 1.54) for the alcohol condition. There was neither a significant difference in self-reported anxiety between the alcohol and the placebo condition nor between the placebo and the juice condition. Figure 4 shows means of self-reported anxiety depending on the type of drink. Figure 5 shows means of self-reported anxiety depending both on the group and on the type of drink.

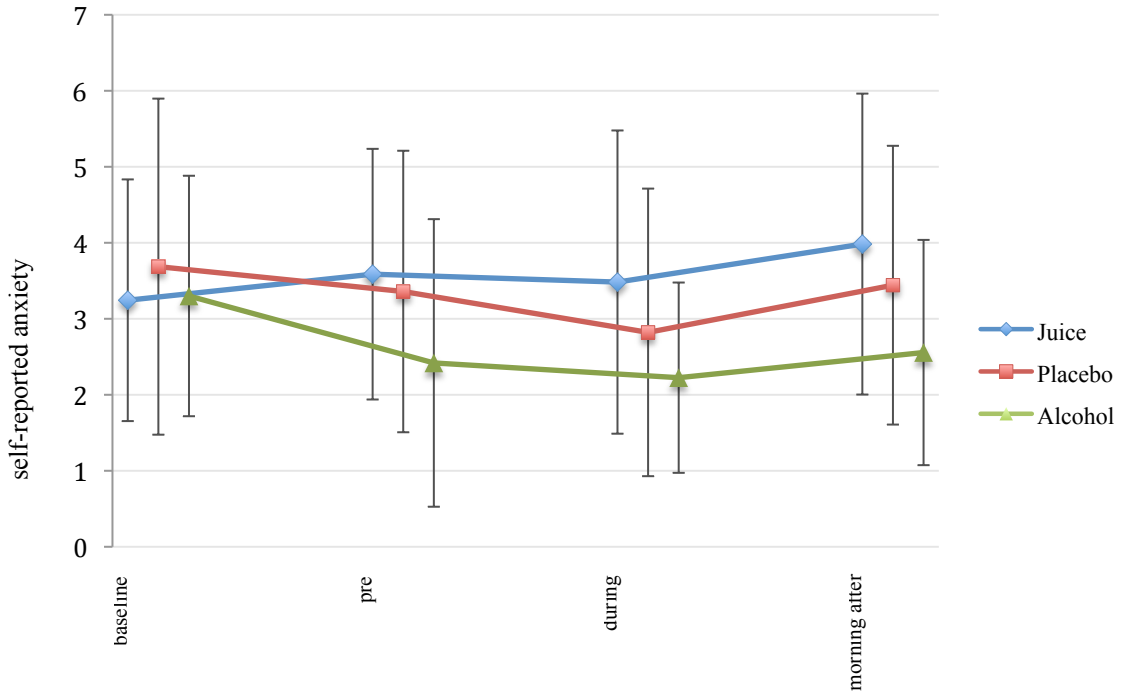

Figure 4. Self-reported anxiety depending on the type of drink (juice, placebo and alcohol) at the four time points of measurement. Bars indicate standard deviations.

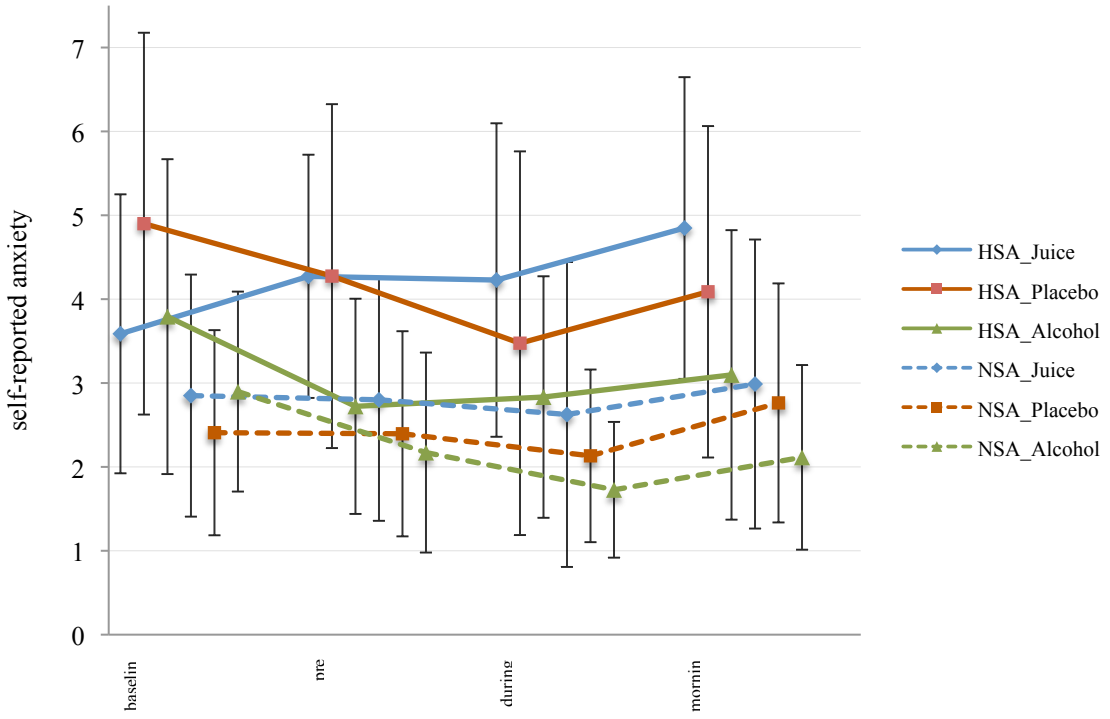

Figure 5. Self-reported anxiety depending on group and the type of drink (juice, placebo and alcohol) at the four time points of measurement. Bars indicate standard deviations.

Repeated measures ANOVA further yielded a significant main effect of TIME ($F_{(3,114)} = 7.43$; $p < .001$, $\eta_p^2 = .06$). Means in self-reported anxiety were 3.41 (SD = 1.89) for baseline, 3.11 (SD = 1.67) shortly before the date, 2.84 (SD = 1.81) during the date and 3.32 (SD = 1.87) on the morning after the date. Contrasts revealed that there were significant differences in self-reported anxiety between baseline and during the date (mean difference = .57, $p < .001$) on the one hand and during the date and the morning after (mean difference = -.48, $p < .001$) on the other hand. In more detail, participants reported significantly less anxiety during the date as compared to baseline and remembered significantly more anxiety on the morning after the date as compared to during the date. Figure 6 illustrates the main effect of TIME.

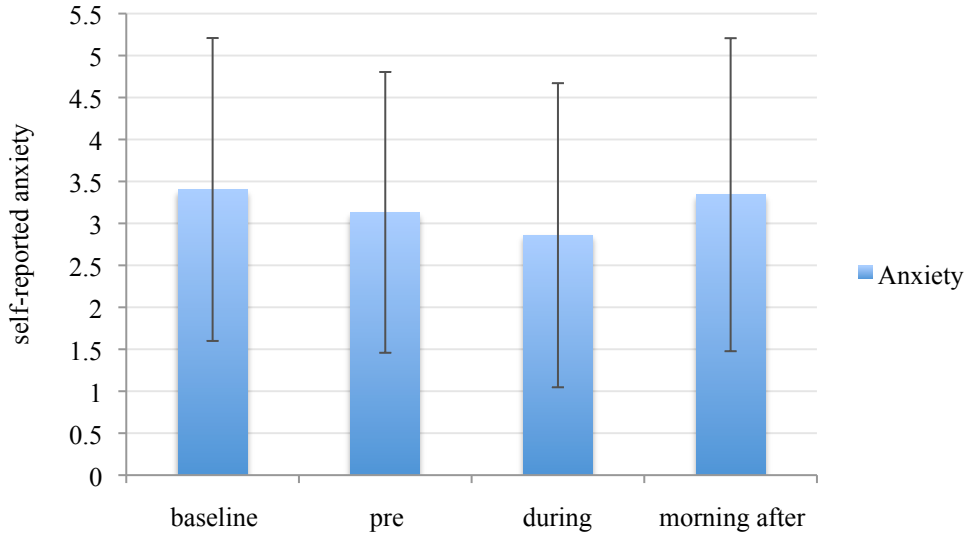

Figure 6. Self-reported anxiety for the different time points of measurement. Bars indicate standard deviations.

Moreover, repeated measures ANOVA revealed a significant interaction effect for DRINK*TIME ($F_{(6,228)} = 3.55$; $p < .01$, $\eta_p^2 = .07$). Linear contrasts revealed a

significant effect ($F_{(2,116)} = 6.12$; $p < .01$, $\eta_p^2 = .1$), indicating that the type of drink had different effects on self-reported anxiety depending on the time of the anxiety's measure. To break down this interaction, contrasts were performed revealing significant interactions when comparing alcohol to juice before the date ('pre'), $F_{(1,118)} = 26.46$; $p < .001$, during the date ('during'), $F_{(1,118)} = 22.73$; $p < .001$ and the morning after the date ('morning after'), $F_{(1,116)} = 23.43$; $p < .001$. At baseline, self-reported anxiety did not significantly differ between alcohol and juice. This can be extracted from Figure 4. Analyses did not reveal a significant interaction effect for GROUP*DRINK nor a significant threefold interaction effect for GROUP*DRINK*TIME (see Figure 5). Accordingly, the effect of alcohol was not moderated by GROUP.

In order to further understand the relationship between self-reported anxiety on the morning after the blind date and other variables assessed, a multiple regression was conducted with 'remembered anxiety on the morning after' as the outcome variable and both the Post-event Processing Questionnaire (Rachman et al., 2000) and the Rumination Questionnaire (Mellings et al., 2000) as the predictor variables. Analyses revealed that remembered anxiety on the morning after the date was positively related to the items of the Rumination Questionnaire with a Pearson correlation coefficient of $r = .51$ ($p < .001$). It was further revealed that remembered anxiety on the morning after the date was positively related to the Post-event Processing Questionnaire with a Pearson correlation coefficient of $r = .47$ ($p < .001$), indicating that both trait measures of post-event processing had a positive relationship to the anxiety reported on the morning after the date.

Regression analysis revealed a R^2 of .293, when both the Rumination Questionnaire and the Post-event Processing Questionnaire were included as predictor variables. Hence, 29.3% of the variation in self-reported anxiety on the next morning was significantly accounted for by these measures, $F_{(2,117)} = 24.23$; $p < .001$. Further

regression analysis revealed a R^2 of .016 when both the Rumination Questionnaire and the Post-event Processing Questionnaire were included as predictor variables and the difference between self-reported anxiety on the morning after the date and self-reported anxiety during the date was included as dependent variable. Accordingly, the increase in self-reported anxiety from 'during the date' to 'the morning after the date' was not significantly accounted for by post-event processing or rumination ($F_{(2,119)} = .96$; $p = .39$).

5.3.3 Standardized feedback

In order to reveal differences in memorized feedback, a repeated-measures ANOVA was conducted with TIME (five minutes after and the morning after the date) as the within-subjects factor and DRINK (alcohol vs. placebo vs. juice) and GROUP (high vs. normal socially anxious) as the between-subjects factors. Analyses were conducted separately for positive and negative items of the feedback. Two values were calculated: memory valence and memory accuracy (see Section 5.1.6).

Memory valence

We were firstly interested in differences between high and normal socially anxious participants when being sober. To put it differently, we asked whether there were any differences at all between groups regarding memory biases. For the analyses of the juice condition, results of the *positive items* revealed a significant main effect for GROUP, $F_{(1,41)} = 5.89$; $p < .05$; $d = .71$ in the expected direction. High socially anxious participants remembered a significantly worse feedback than normal socially anxious participants (Figure 7). Means in memory valence for positive items were -1.35 (SD = 2.99) for high socially anxious and .55 (SD = 2.35) for normal socially anxious participants five

minutes after the date and -1.09 (SD = 3.19) for high socially anxious and 1.05 (SD = 2.84) for normal socially anxious participants on the morning after the date, respectively.

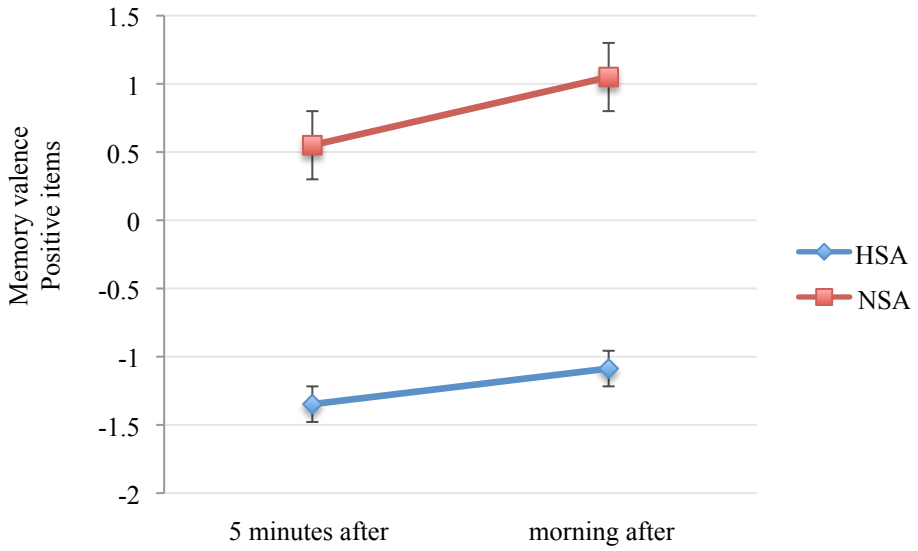

Figure 7. Differences in memory valence (juice condition) for positive items between high and normal socially anxious participants. Positive values indicate a more positively remembered feedback. Bars are standard errors.

However, the difference between groups was found for positive feedback items only. Analyses of *negative items* revealed a marginally significant main effect for TIME, $F_{(1,41)} = 3.71$; $p = .061$; $d = .21$ (Figure 8). Both high and normal socially anxious participants remembered negative feedback items less negative on the morning after the date than shortly after the date. Means were 1.35 (SD = 3.48) shortly after the date and 2.16 (SD = 4.09) on the morning after the date.

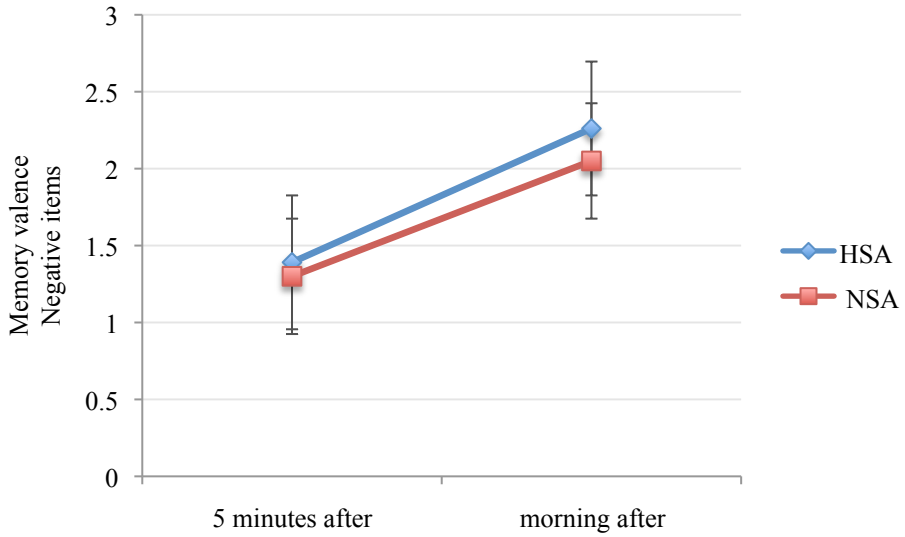

Figure 8. Differences in memory valence (juice condition) for negative items between high and normal socially anxious participants. Positive values indicate a more positively remembered feedback. Bars are standard errors.

Differences in memory valence between high and normal socially anxious participants were then analyzed for all types of drinks (alcohol vs. juice vs. placebo). This was done to test the hypothesis that high socially anxious participants remember a more positively feedback when alcohol is drunk as compared to when juice/placebo is drunk. However, a DRINK*GROUP*TIME repeated-measures analysis did not reveal any significant interactions or main effects.

Memory accuracy

Further analyses were conducted to test how accurate memory ratings were. Again, analyses for the juice condition were conducted first to reveal any differences in accuracy between high and normal socially anxious participants. A repeated measures ANOVA was conducted with TIME and VALENCE of the items (positive vs. negative) as the within-subjects factors and GROUP as the between-subjects factor. Analyses revealed a significant main effect for TIME, $F_{(1,41)} = 15.16$; $p < .001$; $d = .42$. Means

were .86 (SD = .54) for five minutes after and 1.1 (SD = .61) for the morning after the date. Accordingly, memory accuracy was worse the morning after the date as compared to five minutes after the date. Neither a significant main effect for VALENCE, nor for GROUP, nor a significant interaction effect were revealed.

Afterwards, all types of drinks were integrated into analyses. A repeated measures ANOVA was conducted with GROUP and DRINK as between-subjects factors and TIME and VALENCE as within-subject factors. Results showed significant main effects for TIME, $F_{(1,117)} = 5.83$; $p < .05$; $d = .19$, VALENCE, $F_{(1,117)} = 10.02$; $p < .01$; $d = .32$ and DRINK, $F_{(2,117)} = 4.32$; $p < .05$; $\eta_p^2 = .07$. In detail, memory was found to be less accurate on the morning after the date as compared to five minutes after the date. Means were 1.01 (SD = .86) for five minutes after the date and 1.15 (SD = .61) for the morning after the date. Moreover, negative items were found to be remembered less accurately as compared to positive items. Means were 1.2 (SD = 1.02) for negative items and .95 (SD = 0.44) for positive items. Finally, alcohol led to greater deviations as compared to placebo and juice. Means were 1.27 (SD = .87) for alcohol, .99 for placebo (SD = .65) and .97 (SD = .58) for juice, respectively. Analyses further revealed a significant three-way interaction for TIME*VALENCE*DRINK, $F_{(2,117)} = 4.45$; $p < .05$; $\eta_p^2 = .07$. As can be observed in Figure 9, negative items were remembered especially inaccurate five minutes after the date when drinking alcohol. There was no significant effect for GROUP. See Table 4 for means and standard deviations for memory accuracy depending on group, drink, valence of the items and time, respectively.

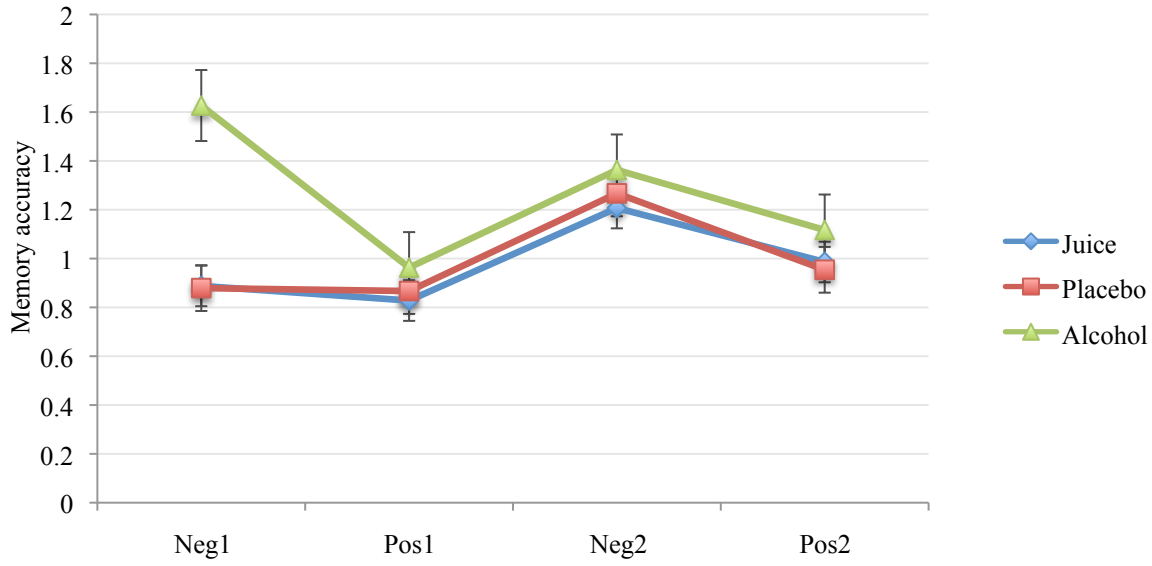

Figure 9. Memory accuracy for negative and positive items five minutes after the date and the morning after the date. Bars indicate standard errors.

Note. Neg1 = negative items five minutes after the date; Pos1 = positive items five minutes after the date; Neg2 = negative items the morning after the date; Pos2 = positive items the morning after the date.

Table 4

Deviations in feedback depending on group, drink, time and valence

		High socially anxious N=61	Normal socially anxious N=61	Effect sizes (Cohen's d)
Neg. deviation T1	Juice	.95 (.85)	.82 (.56)	.18
	Placebo	1.07 (1.11)	.68 (.52)	.45
	Alcohol	1.57 (1.18)	1.67 (2.18)	.06
Pos. deviation T1	Juice	.83 (.37)	.83 (.34)	0
	Placebo	.83 (.45)	.91 (.5)	.17
	Alcohol	.97 (.47)	.96 (.54)	.02
Neg. deviation T2	Juice	1.27 (.97)	1.14 (.59)	.16
	Placebo	1.48 (.94)	1.04 (.59)	.56
	Alcohol	1.42 (.85)	1.32 (.66)	.13
Pos. deviation T2	Juice	1.1 (.41)	.86 (.41)	.59
	Placebo	.89 (.42)	1.02 (.4)	.32
	Alcohol	1.12 (.31)	1.11 (.55)	.02

Note. Numbers are means and standard deviations in brackets, respectively.

Neg. deviation T1 = deviation of negative items five minutes after the date Pos. deviation T1 = deviation of positive items five minutes after the date; Neg. deviation T2 = deviation of negative items the morning after the date; Pos. deviation T2 = deviation of positive items the morning after the date.

5.3.4 Post-event processing

In order to test the effect of the type of drink and of group on post-event processing, a multivariate ANOVA was conducted with the total sum of the Post-event Processing Questionnaire (PEPQ; Rachman et al., 2010) as a dependent variable and the total sum of the Rumination Questionnaire (RQ; Mellings et al., 2000) as another dependent variable, whereby group and drink served as fixed factors. Analyses revealed a statistically significant main effect for GROUP in the expected direction for both questionnaires ($F_{(1,118)} = 24.97$; $p < .001$; $d = 7.06$ for the RQ and $F_{(1,118)} = 46.39$; $p < .001$; $d = 9.64$ for the PEPQ.) Means were 18.85 (SD = .6) for high socially anxious participants and 14.58 (SD = .61) for normal socially anxious participants in the RQ. In the PEPQ, means were 59.99 (SD = 2.23) for high socially anxious participants and 38.44 (SD = 2.24) for normal socially anxious participants, where higher scores indicate more post-event processing after the social interaction has passed. Analyses revealed neither a significant main effect for DRINK nor a significant interaction effect for GROUP*DRINK (see Figure 10).

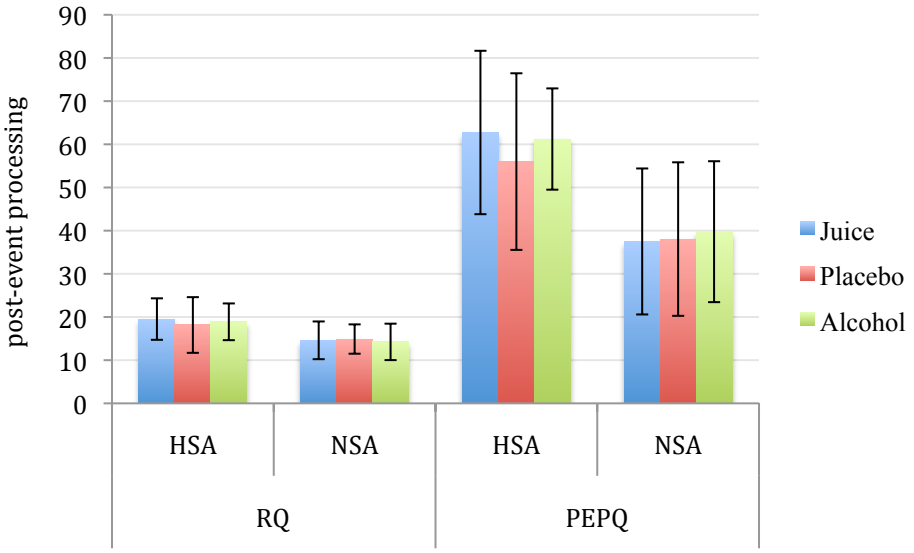

Figure 10. Self-reported post-event processing as measured by the Post-event processing questionnaire (PEPQ) and by the Rumination Questionnaire (RQ) depeding on drink and group. Bars indicate standard errors. Note that scales differ between the RQ and the PEPQ.

5.3.5 Social competence

In order to reveal differences in participants´ social competence, a univariate ANOVA was conducted with social competence as the dependent variable and GROUP and DRINK as fixed factors. Analyses revealed a statistically significant main effect for GROUP in the expected direction ($F_{(1,118)} = 4.29$; $p < .05$; $d = .38$). Accordingly, high socially anxious participants were judged as being significantly less socially competent than normal socially anxious participants (Figure 11). Means were 2.14 (SD = .67) for high socially anxious participants and 1.88 (SD = .71) for normal socially anxious participants, whereby higher scores indicate less social competence.

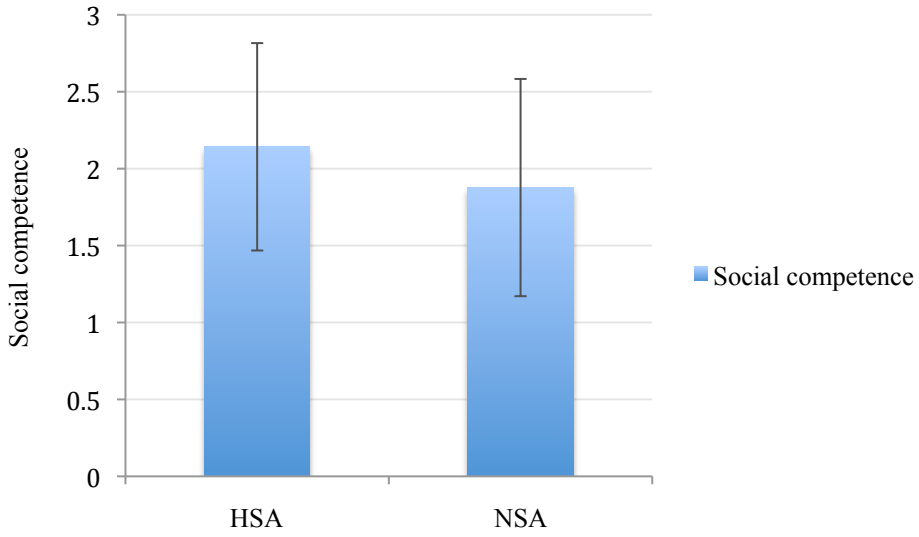

Figure 11. Ratings of social competence for high and normal socially anxious participants. Higher ratings indicate less social competence. Bars are standard deviations.

Analyses revealed no significant main effect for DRINK. Accordingly, social competence did not differ depending on whether participants drank juice, placebo or alcohol (Figure 12). There was also no significant interaction between DRINK x GROUP.

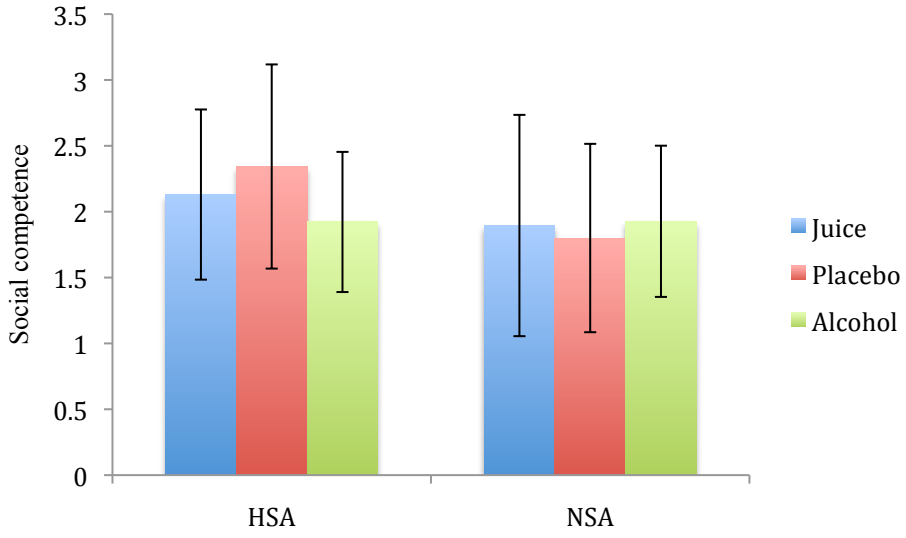

Figure 12. Ratings of social competence for high and normal socially anxious participants depending on the type of drink. Higher ratings indicate less social competence. Bars are standard deviations.

5.3.6 Feedback to the confederate

Participants judged the confederates' behaviour during the date on the same feedback scale they received as standardized feedback. The feedback the participants gave to the confederate was summed to a total score of 20 items, thereby changing prefix of the negative items.

In order to test for differences in the evaluated confederate's performance, a univariate analysis of variance was conducted with the sum of the feedback items as the dependent variable and GROUP and DRINK as between-group factors. Analysis revealed a significant main effect for GROUP ($F_{(1,117)} = 5.22$; $p < .05$; $d = 3.41$). High socially anxious participants gave a significantly worse feedback to the confederates than normal socially anxious participants. Means were 22.82 (SD = 7.96) for the high socially anxious participants and 25.63 (SD = 5.29) for the normal socially anxious participants. Figure 13 illustrates feedback ratings to the confederate.

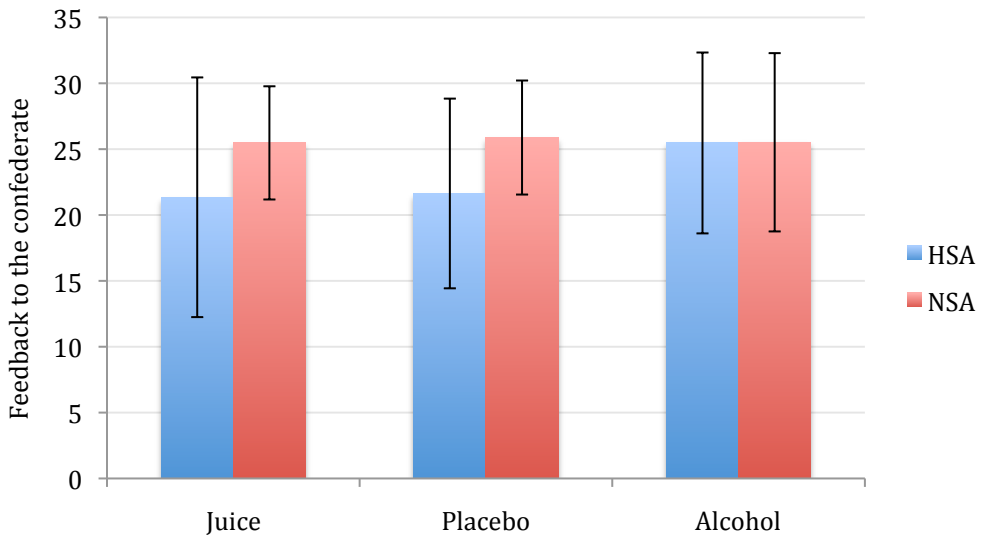

Figure 13. High and normal socially anxious participants' ratings of the confederates' behavior as measured by the feedback scale. Higher scores indicate better feedback. Bars indicate standard deviations.

Analyses did not reveal a significant main effect for DRINK, ($F_{(2,117)} = 1.1$; $p = .34$; $\eta_p^2 = .018$) neither a significant interaction effect for GROUP x DRINK ($F_{(2,117)} = 1.24$; $p = .29$; $\eta_p^2 = .021$). Means and standard deviations as well as effect sizes can be extracted from Table 5.

Table 5

Feedback to the confederate depending on group and drink

	High socially anxious N=61	Normal socially anxious N=61	Effect sizes (Cohen's d)
Juice	21.35 (9.1)	25.48 (4.3)	.58
Placebo	21.64 (7.2)	25.88 (4.33)	.71
Alcohol	25.47 (6.87)	25.52 (6.77)	.01

Note. Numbers are means and standard deviations in brackets, respectively.

To further understand if the difference between groups stem from positive or negative feedback items, the feedback given to the confederate was differentially analyzed by positive and negative items. Results showed that there was a significant main effect for GROUP for the negative items ($F_{(1,119)} = 6.81$; $p < .05$; $d = .48$), whereas there was no significant main effect for GROUP for the positive items. Thus, the significant main effect for GROUP in the total sum seems to stem from a significant difference between groups in the evaluation of negative items (see Figure 14 and Table 6, respectively).

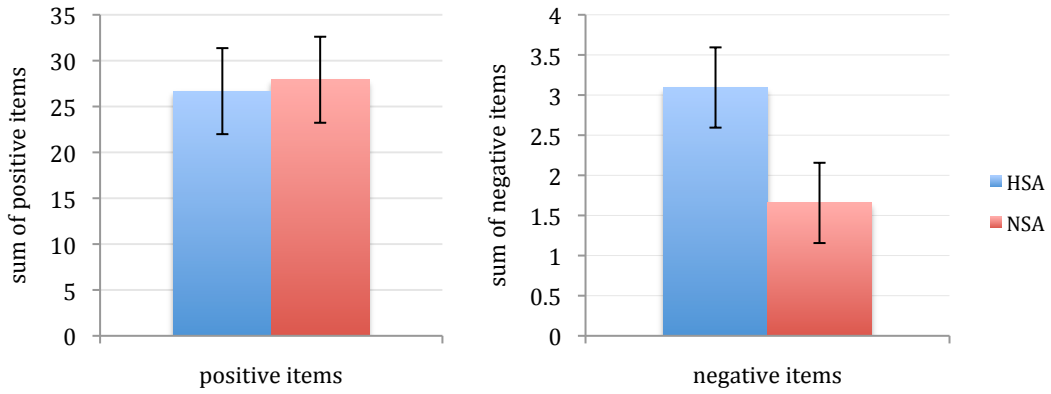

Figure 14. High and normal socially anxious participants' ratings of the confederates' behavior split by positive and negative items. Higher scores indicate better feedback. Bars indicate standard deviations.

Table 6

Feedback to the confederate split by positive and negative items

	High socially anxious N=61	Normal socially anxious N=61	Effect sizes (Cohen's d)
Positive items	26.68 (4.69)	27.92 (4.23)	.28
Negative items	3.09 (3.76)	1.66 (1.83)	.48

Note. Means significantly differ between high and normal socially anxious participants for negative items ($p < 0.05$). Numbers are means and standard deviations in brackets, respectively.

6 Discussion

This thesis was conducted in order to test for the effects of alcohol in an informal social situation on social anxiety and on post-event processing. Increased comorbidity between social anxiety disorder and alcohol use disorder is often explained by the self-medication hypothesis: alcohol is consumed in social situations because of its anxiety releasing effect (Quitkin et al., 1972). However, this proposed anxiety-releasing effect in social phobics has not consistently been found in studies using a speech as the anxiety-inducing stimulus (see for an overview Stevens et al., 2008). One might argue that a speech is a social situation in which the consumption of alcohol further leads to the anxiety of a performance deficit and is thus no appropriate situation in which drinking alcohol is regarded as a social relief. Therefore, here a situation in which the consumption of alcohol might be more legitimated than in a speech was used. Specifically, a blind date was deemed appropriate as social situation in which drinking alcohol might reduce anxiety. Dating is regarded as social interaction in which typical fears of social phobics might develop. Several authors have pointed out the link between social anxiety disorder and dating anxiety: For example, socially anxious adults have fewer dating partners (Bruch et al., 1989) and a lower rate of marriage (Schneier et al. 1994).

Increased comorbidity between social anxiety disorder and alcohol use disorder might not only be explained by a direct anxiety-releasing effect of alcohol within a social situation, but also indirectly by an effect of alcohol on so-called ‘post-event processing’. Literature assumes post-event processing to play an important role in the maintenance of social anxiety disorder (Clark et al., 1995; Rachman et al., 2000). It is described as the negative rumination after the social situation leading to a negative bias of the representation of the self and to biased remembered fear. Due to its detrimental effects

on memory, alcohol might reduce negatively biased post-event processing and thus indirectly work as anxiety-releasing (Birnbaum et al., 1977). Consequently, the purpose of this study was to test both a direct effect of alcohol *within* the social situation and an indirect effect of alcohol on post-event processing *after* the social situation. It was hypothesized that especially high socially anxious participants experienced less anxiety during a blind date and remembered less anxiety the next morning when drinking alcohol as compared to when drinking juice/placebo. It was further hypothesized that high socially anxious participants remembered a more positive feedback when drinking alcohol as compared to when drinking juice/placebo. In the following sections, results will be discussed with regard to the hypotheses outlined above.

6.1 Self-reported anxiety

As outlined above, a central issue in this study concerned the high comorbidity between social anxiety disorder and alcohol use disorder. Alcohol was assumed to be anxiety reducing within a blind dating situation, especially for high socially anxious participants. Before testing an anxiolytic effect of alcohol for high socially anxious participants, however, the first question was whether there were any differences in self-reported anxiety between high and normal socially anxious participants at all while being sober. Analyses revealed a significant difference between groups in the expected direction. When sober, high socially anxious participants reported significantly more anxiety as compared to normal socially anxious participants. Accordingly, the hypothesis that when drinking juice, high socially anxious participants were more anxious than normal socially anxious participants was confirmed. Obviously, the blind date was an appropriate situation to induce social fears. For the juice condition, there was also a significant main effect for TIME. Participants remembered significantly more anxiety on the morning

after the date as compared to baseline and to during the date. This might reflect that post-event processing indeed occurred and led to more remembered fear than there actually was within the situation. The increase in remembered anxiety when being sober was thus – besides the inserted psychometric measures such as the Post-event Processing Questionnaire and the Rumination Questionnaire – indirect evidence for the presence of negatively biased post-event processing. However, there was no significant interaction effect for TIME*GROUP. The difference between groups was thus not differentially influenced by TIME. Accordingly, it cannot be stated that the increased anxiety of high socially anxious participants was especially evident during the date and the morning after the date. The increase in remembered anxiety found on the morning after the date rather seems to hold for both high and normal socially anxious participants. An explanation might be that participating in a blind date and receiving a feedback afterwards is for both high and normal socially anxious individuals a situation in which post-event processing might be stimulated and thus may lead for both groups to more remembered anxiety. Indeed, participating in a date is for most people accompanied by a moderate level of anxiety or stress (Neider et al., 2001). One might conclude that as a consequence, most people engage in post-event processing and thus remember more anxiety as compared to the experienced anxiety within the social situation. Moreover, receiving the feedback might have created a basis to ruminate over the blind date so that normal socially anxious participants also engaged in post-event processing and consequently remembered more fear than they experienced within the situation.

After having shown differences in self-reported anxiety between high and normal socially anxious participants when drinking juice, all kinds of drinks were integrated into statistical analyses (juice, placebo and alcohol) to test for an anxiety releasing effect of alcohol. Again, we were interested in differences of self-reported anxiety between high and normal socially anxious participants. Results showed a significant main effect for

GROUP in the expected direction. Accordingly, high socially anxious participants reported more state anxiety than normal socially anxious participants.

Most importantly, the question was whether the consumption of alcohol was anxiety releasing. To put it different, we were interested in whether self-medication by alcohol worked in an informal social situation. Results revealed the hypothesized main effect of DRINK. Hence, as expected, self-reported anxiety differed significantly depending on the type of drink. Post hoc analyses revealed that participants who drank alcohol reported significantly less anxiety as compared to participants who drank juice. There was neither a significant difference between the placebo and the alcohol condition nor between the juice and the placebo condition. Thus, it can be concluded that there is a pharmacologic effect of alcohol in the blind date situation. Beyond pharmacological effects, expectancy effects of alcohol seem to reduce the experienced anxiety in the blind date situation as well. Arguably alcohol can reduce social fears (Quitkin et al., 1972; Stevens et al., 2008). Cludius et al. (2013) state that alcohol is consumed more frequently in situations where the intake of alcohol is deemed socially acceptable. Consequently, self-medication by the intake of alcohol seems to be effective while having a blind date. Self-medication hypothesis is thus strengthened by this study's results.

Beyond the effects of alcohol, it was also tested whether there were differences in participants' self-reported anxiety at different time points of measurement. Analyses revealed a significant main effect for TIME. Significant differences in self-reported anxiety were found between 'baseline' and 'during the date' and between 'during the date' and the 'morning after'. Thereby, anxiety decreased from 'baseline' to 'during the date' and increased from 'during the date' to the 'morning after'. All participants knew they would participate in a blind date when baseline anxiety was measured. Participants were already informed that they would participate in a blind date when they were screened on the telephone. Thus, at baseline, participants might have already experienced

anticipatory anxiety, which decreased over time until the date began. Hence, the reduction of anxiety from ‘baseline’ to ‘during the date’ might be due to participants’ habituation to the situation. From ‘baseline’ to ‘during the date’, approximately 30 minutes have passed – sufficient time for the participants to habituate to the study situation and to the arising anxiety. The increase in anxiety from ‘during the date’ to the ‘morning after’ might reflect that post-event processing has occurred. As discussed for the juice condition, participants received a standardized feedback after the blind date. Arguably, they were thus encouraged to ruminate over the social situation and over the feedback they received. Since post-event processing is assumed to have occurred, remembered fear might have increased as compared to the experienced fear during the date and participants remembered more fear than they actually had. Clark and Wells (1995) already emphasized that post-event processing leads to a negatively biased representation of the self and to an exaggerated memory on anxious feelings.

It was subsequently interesting to test whether the identified anxiety releasing effect of alcohol was evident at certain time points of measurement, especially during the date and the morning after the date. A significant interaction effect for TIMExDRINK was found. The above described pharmacologic effect of alcohol was found to be especially relevant for the time shortly before the date (‘pre’), during the date (‘during’) and after a delay of one day (‘morning after’) as compared to ‘baseline’. While participants drinking juice reported more anxiety for these time points of measurement as compared to baseline, participants drinking alcohol reported less anxiety. The decrease in anxiety shortly before and during the date is probably due to pharmacologic effects of alcohol and its expectancy effects. The decrease in anxiety on the morning after the date as compared to baseline can be regarded as a consequence of these pharmacologic and expectancy effects. Participants drinking alcohol remembered less fear on the next

morning as compared to participants drinking juice. However, they actually also *experienced* less anxiety within the social situation.

There was no significant interaction effect for GROUPxTIME. Accordingly, the time point of the anxiety's measurement did not differentially influence the difference in self-reported anxiety between high and normal socially anxious participants. The increase in anxiety from 'during the date' to 'morning after the date' holds for both high and normal socially anxious participants. Why did high and normal socially anxious participants not differ in this increase of anxiety? That is, why was the increase in anxiety for normal socially anxious participants as large as for high socially anxious participants? At first sight it is surprising that normal socially anxious participants also remembered more fear on the morning after the date than they actually reported during the date – as well as did high socially anxious participants. However, since both groups received the feedback after the date and therefore had the chance to ruminate, it is well imaginable that normal socially anxious participants engaged in post-event processing as well and thus remembered more fear than they had during the date. Results thus suggest that post-event processing does not only take place in participants high in social anxiety, but also in normal socially anxious participants.

We were finally interested in interaction effects of group, drink and time. That is, did high socially anxious participants especially benefit from the consumption of alcohol at a certain time – during the date and the morning after the date? Analyses neither revealed an interaction effect of GROUP and DRINK nor the hypothesized threefold interaction effect of TIME * GROUP * DRINK. Consequently, the hypothesis that high socially anxious participants especially benefit from the anxiolytic effect of alcohol during the date or the morning after the date was not confirmed. The current results suggest that participants benefit from the consumption of alcohol within the social situation. However, normal socially anxious participants benefit as well as high socially

anxious participants from the consumption of alcohol within the social situation. This might be due to the fact that – as outlined above - having a date is for 54% of males and 42% of females experienced as difficult (Glass et al., 1976) and accompanied by a certain level of stress (Neider et al., 2001). It thus seems that blind dating situations are in general social situations provoking social fears. It seems rare that individuals do not experience any fear at all while being on a blind date. Participants got to know each other in this study for the very first time. Being exposed to this situation likely evokes social fears in normal socially anxious individuals as well. This is underlined by our data showing that scores in the Dating Anxiety Scale were comparably high (see Section 5.3.1). Consequently, even normal socially anxious participants experienced a moderate level of social fears and thus experienced the anxiety releasing effect of alcohol.

It was also hypothesized that high socially anxious participants would especially benefit from drinking alcohol in terms of remembered anxiety and reported amount of post event processing the morning after the date. As compared to baseline, a decrease in anxiety on the morning after the date can be observed when alcohol is drunk. However, remembered anxiety was not decreased more in the socially anxious alcohol group. Hence, alcohol did not show an anxiety reducing effect after the date. Why did participants drinking alcohol also remember more anxiety on the morning after the date? One might argue that the targeted blood alcohol concentration of 0.7 ‰ was not sufficient to impair memory. Parker, Birnbaum & Noble (1976) found that an impairment in memory can best be observed when blood alcohol concentrations of 0.8 ‰ are being used. Jones et al. (1977) found no impairment on immediate memory for a blood alcohol concentration of 0.6 ‰ when word lists had to be remembered.

In summary, alcohol reduced self-reported anxiety within an informal social situation, thus contributing to the increased comorbidity between social anxiety disorder and alcohol use disorder in terms of self-medication. Thereby, both high and normal socially

anxious participants seem to benefit from the consumption of alcohol by reducing social fears. Another possible mechanism explaining the coexistence of social anxiety disorder and alcohol use disorder was assumed to be found in reduced negatively biased post-event processing when drinking alcohol. This will be discussed in the next section.

6.2 Standardized feedback

Memory valence

After having shown an anxiety releasing effect of alcohol within a blind dating situation, another question addressed in this study concerned a possible indirect effect of alcohol on participant's anxiety, that is, post-event processing. Post-event processing was exploited by participants' memory for standardized feedback items. To put it differently, the question was whether under the consumption of alcohol, memory for a received standardized feedback was positively biased the morning after the blind date. Again, we were first interested whether there were differences in memory between high and normal socially anxious participants at all if sober, thereby assuming high socially anxious participants to remember a negatively biased feedback as compared to normal socially anxious participants. When participants were sober, analyses of positive feedback items revealed that high socially anxious participants remembered a significantly worse feedback than normal socially anxious participants. This result underlines a negative bias in memory for high socially anxious participants when drinking juice. Negatively biased memory might be interpreted as the result of post-event processing (Rachman et al., 2000). Additionally considering the result that self-reported anxiety was significantly higher on the morning after the date as compared to during the date, we can assume that post-event processing might have occurred after the date and led to a negative representation of the self and to increased anxiety. Accordingly, the hypothesis that high socially anxious participants remember a worse feedback as compared to normal socially

anxious participants when being sober can be confirmed for positive items. However, this bias was not influenced by TIME – the difference between groups was significant both five minutes after the date and the morning after the date. To put it different, already after five minutes, participants high in social anxiety remembered a negatively biased feedback. This suggests the presence of a negative memory bias even before post-event processing has occurred. Cody et al. (2010) also investigated memory biases between high and low socially anxious participants. For positive feedback items, they also found high socially anxious participants to remember a worse feedback than low socially anxious participants. However, group differences were influenced by TIME. High socially anxious participants remembered a significantly worse feedback than low socially anxious participants on the morning after the date, but not five minutes after the date. One might question why results in this thesis differed from what Cody et al. (2010) found. Cody et al. asked students of psychology classes to give a speech. One might argue that they were used to receive a feedback after giving a short talk since this is often done in psychology classes. Therefore, the received feedback might not have immediately led to rumination. In contrast, we asked participants to roleplay a blind date. Arguably, it is not common to receive detailed feedback directly after having a date. Some participants even stated directly after receiving the feedback that it was unusual to be informed what kind of impression they made during the date. Receiving the feedback might thus for high socially anxious participants have been sufficient to directly encode an overall impression of the self. It might be imaginable that five minutes were even sufficient to induce at least some post-event processing and thus leading to negatively biased memory. Accordingly, it is possible that the type of social situation led to the different results observed.

After having shown that under the consumption of juice, high socially anxious participants show negatively biased memory for positive items, memory for negative

feedback items was analyzed as well. Again, we were first interested in memory differences between high and normal socially anxious participants when drinking juice. For negative items (while sober), both high and normal socially anxious participants remembered a positively biased feedback. Moreover, memory for the negative feedback items was even more positively biased on the morning after the date as compared to five minutes after the date. This effect of TIME was only marginally significant. However, Cody et al. (2010) found as well that negative feedback items were on average remembered more positively the morning after as compared to 5 minutes after the social situation. One might ask why memory for negative feedback was biased in the positive direction. Literature proposes a self-enhancement bias according to which individuals desire to decrease the negativity of one's self-concept (Leary, 2007). This bias has been proposed to serve for the establishment and maintenance of one's relationship with other people. Nevertheless, it remains interesting that there are differences in memory valence for positive and negative items. Whereas participants normal in social anxiety show a positive memory bias for both positive and negative items, high socially anxious participants show a positive memory bias for negative items only. For positive items, they show a negative memory bias. Thus, normal socially anxious participants seem to be positively biased in a quite stable manner, while high socially anxious participants remember a positive feedback worse and a negative feedback better than it actually was. Arguably, since positive feedback items were inconsistent with high socially anxious participants' negative self-schemas, they might have been encoded and remembered in a way that they fit the negative self-schemas as acting in an embarrassing or humiliating way. Consequently, positive information might have been encoded more negatively than it actually was. On the other hand, negative items might have been too threatening for participants' self-esteem so that the above described self-enhancement bias was inserted. It must be admitted at this place that negative feedback items of the standardized

feedback were indeed drastic. For example, participants received the feedback that they had extremely long pauses, that they spoke much too quickly, that they moved around excessively and that they stammered over words very much. It is possible that this negative feedback was in a way exaggerated and was not like what participants perceived themselves. After receiving the feedback, some participants even stated that part of the negative feedback items was quite intense and hard. Subsequently, self-enhancement bias might have been established.

So far, analyses for the juice condition have shown high socially anxious participants to remember positive feedback items more negatively than normal socially anxious participants. However, memory for negative feedback items was positively biased in both high and normal socially anxious participants. In a further step, the question was whether the consumption of alcohol might lead to (even more) positively biased memory as compared to the consumption of juice. When implying all types of drinks into analyses, results revealed no significant main effects or interaction effects – neither for positive nor for negative items. It was hypothesized that high socially anxious participants would remember a better feedback when drinking alcohol as compared to when drinking juice/placebo. Such an interaction effect was not found. However, for positive items, beyond the fact that there was a trend for high socially anxious participants to remember a worse feedback as compared to normal socially anxious participants ($F_{(1,117)} = 2.74$; $p = .1$), means in memory valence indicated a more positively remembered feedback for participants drinking alcohol as compared to participants drinking juice. Means were .89 for the alcohol condition and -.21 for the juice condition ($F_{(2,117)} = 2.42$; $p = .09$). However, it must be stated that neither the difference between groups nor between drinks was statistically significant. Nevertheless, one might argue that there is a trend when drinking alcohol to a positively biased

memory on feedback, especially since the mean (.89) clearly leans towards the positive direction.

Memory accuracy

Memory accuracy was analyzed beyond memory valence to test whether high and normal socially anxious participants differed in how well they remembered feedback items. When being sober, results showed a significant main effect for TIME. Accordingly, memory on the morning after the date was less accurate as compared to shortly after the date. Participants seem to simply have forgotten to a certain degree in what way they were evaluated. Furthermore, both high and normal socially anxious participants were equally accurate in their memory of the feedback received. This replicates results by Cody et al. (2010) who found that neither group had more accurate memory. In accordance with Cody et al. (2010), one might assume both groups to be equally accurate because socially phobics' negative self-schemas are only relevant to memory valence, but not to memory accuracy. Consequently, when they were sober, high socially anxious individuals were obviously less positively biased, but not less accurate than healthy controls. We found no main effect for VALENCE. However, Cody et al. (2010) found the items' valence to differentially influence memory accuracy. They found positive items to be remembered more accurately than negative items.

Nevertheless, when including all types of drinks into analyses, we also found a significant main effect for VALENCE in the same direction: Positive items were remembered more accurately than negative items. Moreover, we found a significant main effect for TIME and DRINK and a significant interaction effect for TIME*VALENCE*DRINK. Items were remembered more accurately shortly after the date as compared to the next morning. Furthermore, items were remembered more accurately when drinking juice or placebo as compared to alcohol – this can be well

explained by detrimental effects of alcohol on memory (Birnbaum et al., 1977). The significant threefold interaction suggests accuracy to be significantly worse for negative items shortly after the date only when drinking alcohol. A less accurate memory for negative social information when drinking alcohol might thus negatively reinforce the consumption of alcohol. However, this effect did not differentiate between groups. Both high and normal socially anxious participants remembered positive items more accurately and negative items less accurately when they drank alcohol.

6.3 Post-event processing

In both the Rumination Questionnaire and the Post-event Processing Questionnaire, a statistically significant main effect for GROUP was found in the expected direction. High socially anxious participants reported more post-event processing – as measured by the PEP-Q - as compared to normal socially anxious participants. This finding is in line with the results from Cody and Teachman (2010). They also found high socially anxious participants to engage in more post-event processing after a speech task as compared to low socially anxious participants. Beyond the Post-event Processing Questionnaire, they measured general rumination by the Ruminative Response Scale of the Response Styles Questionnaire. They found high socially anxious participants to engage in more rumination as compared to low socially anxious participants. The same pattern was found in this study: high socially anxious participants reported more rumination as compared to normal socially anxious participants. Post-event processing is thus once more highlighted as an important component in social anxiety disorder, which Rachman and colleagues already pointed out in 2000. Did participants benefit from the consumption of alcohol in terms of reduced post-event processing? Results revealed no main effect for drink on PEP or rumination. Type of drink had no differential effect on

the extent to which participants engaged in post-event processing or rumination. Drinking alcohol did not reduce post-event processing as compared to drinking juice or placebo. As described above, self-reported anxiety was found to be differentially influenced by TIME. Participants remembered more anxiety the morning after the date as compared to self-reported anxiety during the date. The lack of a pharmacologic and/or expectancy effect of alcohol on post-event processing might explain the increase in anxiety from 'during the date' to 'the morning after the date'. Post-event processing is thus assumed to increase remembered anxiety.

6.4 Social competence

We assumed that high socially anxious participants were less socially skilled than normal socially anxious participants. Although literature concerning social skills deficitis is mixed, there is a preponderance of evidence claiming that individuals suffering from social anxiety disorder are less socially competent as compared to healthy controls (Beidel et al., 2010) – especially when evaluated in unstructured social situations (Rapee et al., 1997; Thompson et al., 2002). Socially anxious participants have been judged to be less attractive and friendly (Jones & Russell, 1982) as well as less likeable and comfortable to be around (Meleshko & Alden, 1993). In the present study, high socially anxious participants were evaluated as being less socially competent as compared to normal socially anxious participants. This finding strengthens the hypothesis of a social skills deficit in social phobics. Thereby, socially anxious participants may either not possess adequate social skills or they may be inhibited to apply them due to their experienced fear within the situation. Analyses revealed no significant main effect for DRINK. Consequently, the type of drink had no effect on the confederate-rated social competence. Since there was no interaction effect for GROUP*DRINK, high socially

anxious participants' deficits in social skills were not differentially influenced by the effect of alcohol. Figure 15 even might lead to the conclusion that high and normal socially anxious participants were equally socially competent when drinking alcohol. This might indicate that high socially anxious participants did indeed possess adequate social skills which were applied as recently as they consumed alcohol. As Buckner (2012) pointed out, alcohol can help to feel sexier. Consequently, during a date, social phobics might drink alcohol to compensate not only to better their inhibited social abilities but also to improve aspects of themselves.

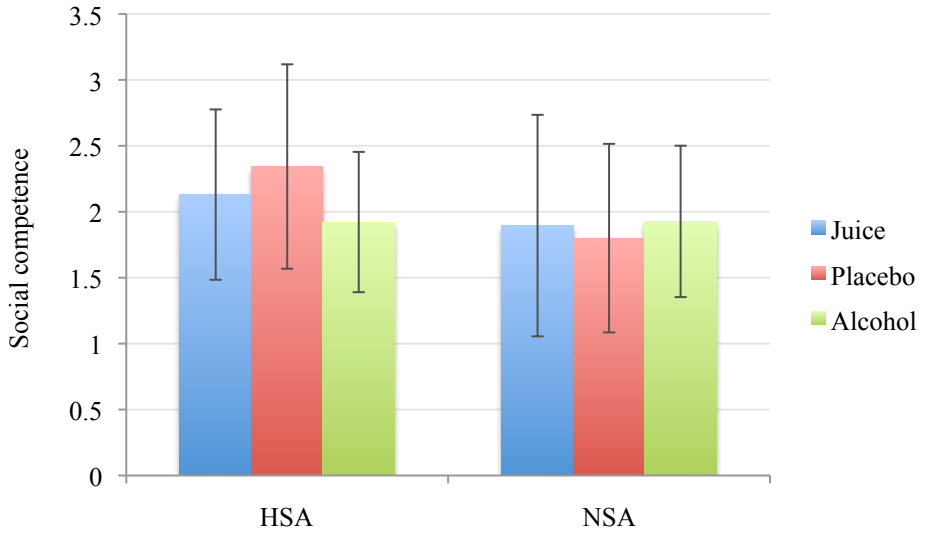

Figure 15. Social competence ratings for both high and normal socially anxious participants in the juice, placebo and alcohol condition. Higher values indicate less social competence. Bars indicate standard deviations.

A recent study (Cooper, Bantin, Hermann, Gerlach & Stevens, in submission) found slightly different results for a speech situation. According to our results, social phobics were less socially skilled as compared to healthy controls. However, the authors found that alcohol had a negative effect on social competence. In detail, participants who drank

alcohol were evaluated as less socially competent than participants who drank juice. However, whereas Cooper and colleagues used a speech situation, we used a blind date. As already pointed out, speech situations might be situations in which the consumption of alcohol is inappropriate and intoxicated persons are evaluated as socially incompetent. In a blind date, alcohol is more legitimated and might help individuals to behave more confident and thus to appear more socially competent.

Thus, as high socially anxious individuals are in a blind date situation assumed to compensate a deficit in social skills by drinking alcohol, this suggests a further negatively reinforcing effect of alcohol.

6.5 Feedback to the confederate

It was further hypothesized that high and normal socially anxious participants would differ in their judgement of the confederate's behavior within the social situation. Antony, Rowa, Liss, Swallow and Swinson (2005) showed socially phobic individuals to make more upward social comparisons and thus judge themselves inferior to others. Alden et al. (1994) found that in a conversation task, social phobics perceived the confederate more positively than did the control group. These results suggest a positive bias for socially anxious participants in the perception of others. In contrast, we found a negatively biased perception of the confederate's behavior for high socially anxious participants as compared to normal socially anxious participants. Specifically, high socially anxious participants evaluated the confederates' behavior more negatively than did the control group, independent of drink. Note, however, that evaluations of high socially anxious participants were clearly positive and far from zero (M=22.58). Arguably, normal socially anxious participants' evaluations were more positively biased as compared to the high socially anxious participants' evaluation. Why did high socially

anxious participants evaluate the confederates' behavior more negatively than did normal socially anxious participants? A possible explanation might be that high socially anxious participants encoded the blind date in general as more negatively than normal socially anxious participants did. Accordingly, the situation might have been so unpleasant and awkward for high socially anxious participants that they encoded the situation and thus the confederate's social competence in an overall negative manner. Besides, the confederate was instructed to answer in a standardized manner as much as possible with a lot of time for the participant to speak. Accordingly, confederates might have appeared as being reserved, boring, nervous, or shy. Normal socially anxious participants might have thought that the confederate was a participant high in social anxiety so that they were thus more gentle in their evaluation of the confederate. On the other hand, participants high in social anxiety might have perceived the confederate as another high socially anxious participant and might have transferred their anxious feelings and negatively biased self-perception to the confederate. Consequently, high socially anxious participants might have been stricter in their evaluation of an interactional partner as compared to normal socially anxious participants.

6.6 Limitations

There are several limitations of this study which will be delineated in the following.

First of all, no participants with alcohol use disorders were included. Unfortunately, administering alcohol to a participant of whom it is known that he or she has alcohol related problems cannot be implemented for ethical reasons.

Moreover, high socially anxious participants were not necessarily suffering from diagnosed social anxiety disorder according to DSM-IV. As can be extracted from Section 5.1.7, a structured clinical interview for DSM-IV was conducted, but only to

exclude participants suffering from current drug or alcohol abuse or dependence, current episode of depression or psychotic episodes. Of course, some of the high socially anxious participants (14.8%) were simultaneously suffering from social anxiety disorder, but this was not requested. This might cause results to be less generalized to overall social anxiety disorder, but to exclusively hold for the specific situation of a blind date. However, as a lot of studies investigated speech situations (Stevens et al., 2008) as typical situations in which social fears occur, we attached importance to the informal situation of a blind date.

Generalization might further be limited since exclusively students participated in the study.

Accordingly, in future studies, it might be advisable to require a diagnosis of social anxiety disorder for inclusion. Results showed that both high and normal socially anxious participants benefitted from the anxiety-releasing effect of alcohol within the social situation. It might be interesting whether a significant interaction for GROUP and DRINK would emerge if participants diagnosed with social anxiety disorder, thus more severely disordered, joined a blind date. Arguably, more severely disordered participants might benefit even more from the anxiety-relieving effect of alcohol and hence differ significantly from healthy controls. Moreover, it might be interesting in future studies to increase targeted blood alcohol concentration. If blood alcohol concentration was higher, effects on memory might be larger and remembered anxiety on the morning after the date might have significantly decreased as compared to self-reported anxiety during the date.

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Table 7

Matrix of the factor loadings of the four-factor solution

	F1	F2	F3	F4
Factor 1: Fear of Negative Evaluation (r)	-	0.84	0.86	0.57
03. Worrying about not being attractive	**0.73**	0.52	0.47	0.29
06. Worrying about the impression one makes during a date	**0.72**	0.55	0.43	0.18
08. Concerning of what people of the opposite sex think of oneself	**0.74**	0.48	0.76	0.29
14. Worrying about not being accepted by a potential partner	**0.80**	0.56	0.45	0.30
17. Concerning about giving a negative impression	**0.81**	0.56	0.49	0.29
20. Being afraid of showing flaws	**0.75**	0.39	0.41	0.41
22. Worried about the impression on members of the opposite sex	**0.81**	0.48	0.74	0.36
23. Being afraid of showing faults to a potential partner	**0.88**	0.49	0.42	0.39
26. Worrying about the evaluation of a potential partner	**0.74**	0.45	0.43	0.27
Factor 2: Nervousness while on a date (r)	0.84	-	0.84	0.55
01.Being nervous on a first date	0.43	**0.89**	0.37	0.35
02. Being afraid of looking silly or foolish	0.65	**0.69**	0.37	0.34
09. Feeling nervous during a date	0.58	**0.89**	0.49	0.35
13. Feeling tense during a date	0.50	**0.76**	0.53	0.37
Factor 3: Nervousness in opposite-sex interactions (r)	0.86	0.84	-	0.79
07. Difficulties to relax while being with a member of the opposite sex	0.42	0.40	**0.81**	0.48
10. Nervous while talking to an attractive member of the opposite sex	0.54	0.56	**0.62**	0.49
19. Being tense and jittery when feeling observed	0.47	0.40	**0.64**	0.44

24. Being shy with someone of the opposite sex	0.43	0.49	**0.79**	0.56
Factor 4: Social Distress in a group (r)	0.57	0.55	0.79	**-**
04. Feeling uncomfortable in a group with both males and females	0.34	0.48	0.41	**0.82**
12. Being quiet when in a group of both males and females	0.25	0.39	0.44	**0.84**
16. Feeling nervous or tense in casual get-togethers	0.41	0.35	0.59	**0.73**
21. Being anxious on parties	0.36	0.30	0.31	**0.59**

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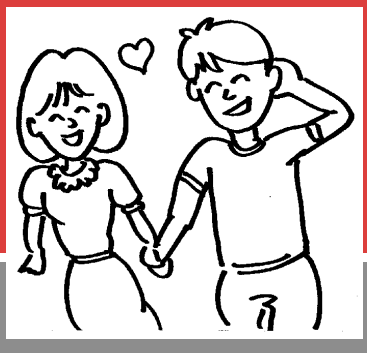

Sehr geehrte(r) Frau/ Herr XXX,
wie bereits telefonisch besprochen sende ich Ihnen hiermit eine Terminbestätigung für die Studie „Der Einfluss von Alkohol auf die Ängstlichkeit während einer simulierten romantischen Verabredung und auf deren kognitive Verarbeitung ‘ und eine Anfahrtsbeschreibung des Lehrstuhls für Klinische Psychologie zu.

Der Termin für das erste Treffen findet am Dienstag, dem 26.02.2013 um 15 Uhr statt. Sie finden mich in der zweiten Etage auf der rechten Seite im Raum 2.16.
Das zweite Treffen findet einen Tag später, am Mittwoch, dem 27.02.2013 um 10 Uhr am gleichen Ort statt.
Wie bereits besprochen, sollten Sie bereit sein, Alkohol zu trinken und deshalb nicht mit dem Auto anreisen. Außerdem sollten Sie am Tag der Untersuchung ab 12.30 Uhr nichts mehr essen sowie ab 14.00 Uhr nichts mehr trinken.

Falls Sie den Termin nicht wahrnehmen können, würde ich Sie bitten mir dies rechtzeitig mitzuteilen, damit wir einen neuen Termin vereinbaren können. Sie können mich hierfür telefonisch unter 0221-4706980 oder per E-Mail unter ricarda.gerhards@uni-koeln.de kontaktieren.

Bei Fragen vorab können Sie mich gerne anrufen. Ich bedanke mich und freue mich auf unser Treffen.

Mit freundlichen Grüßen
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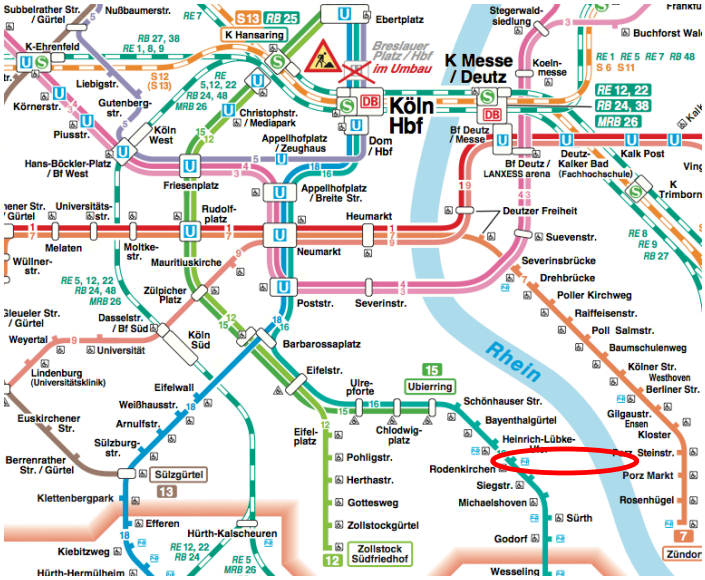
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Der Einfluss von Alkohol auf die Ängstlichkeit während einer simulierten romantischen Verabredung und auf deren kognitive Verarbeitung

Alkoholgruppe- nur zur Information der Ehtikkommission

Sie sind eingeladen, an einer Studie zur Wirkung von Alkohol auf die Ängstlichkeit während einer simulierten romantischen Verabredung teilzunehmen. Wir hoffen durch unsere Studie ein besseres Verständnis der Alkoholwirkung auf Körpersymptome sowie auf Gefühle und Gedanken in Verbindung mit Körpersymptomen zu erlangen. Wir sind daran interessiert, ob der Genuss von Alkohol Auswirkungen auf die subjektiv empfundene Angst hat und inwiefern er das Nachdenken über soziale Ereignisse beeinflusst. Die folgende Information soll den Ablauf der Studie erläutern.

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Laborsitzung: Die Untersuchung wird etwa 1,5 Stunden dauern. Hier haben Sie genug Zeit, sich mit der Umgebung und der Untersuchungssituation vertraut zu machen. Zu Beginn bitten wir Sie, einige Fragebögen auszufüllen. Anschließend wird ein physiologisches Messgerät angelegt und Sie werden gebeten, die alkoholischen Getränke zu sich zu nehmen. Eine genaue Beschreibung dieser Messung findet sich im nächsten Abschnitt. Nach dem Konsum der Getränke werden Sie dann gebeten, die andere Person, die ebenfalls an dieser Studie teilnimmt, so gut wie möglich kennenzulernen.
Wir möchten Sie bitten, am nächsten Tag wieder ins Labor zu kommen, um Ihren Kortisolspiegel zu messen und 2 letzte Fragebögen auszufüllen. Dies wird ungefähr eine halbe Stunde in Anspruch nehmen.

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Befragung: Sie werden während der Untersuchung regelmäßig gebeten, die Frage bezüglich Ihrer momentan wahrgenommenen Angst zu beantworten.

Alkoholgabe: Nachdem Sie den Handschuh angelegt haben, werden Sie in einem Zeitraum von 15 Minuten eine bestimmte Menge Alkohol (Wodka-Cranberry) trinken, so dass ein Blutalkoholgehalt von 0.6 Promille erreicht wird. Im Anschluss daran werden Sie gebeten, eine weitere an dieser Studie teilnehmende Person kennenzulernen. Nach Ende des Experiments bitten wir Sie, so lange in den Räumen der Universität zu bleiben, bis Ihr Blutalkoholgehalt einen Wert von 0.3 Promille erreicht hat oder sich abholen zu lassen. Die Messungen der Alkoholkonzentration erfolgen über ein Atemalkoholmessgerät der Firma Draeger.

Schwangerschaftstest: Es ist im Sinne unserer Sorgfaltspflicht notwendig einen Schwangerschaftstest vor der Alkoholverabreichung durchzuführen, um einen schädlichen Einfluss von Alkohol auf eine mögliche Schwangerschaft mit Sicherheit auszuschließen.

Was sind mögliche Vorteile?
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Weiterhin können Sie auf Wunsch als Entgelt für Ihre Teilnahme an einem Seminar zur Bekämpfung Ihrer Dating-Angst teilnehmen. Sollten Sie dies nicht wünschen, erhalten Sie für Ihre Teilnahme eine Entschädigung in Höhe von 7€ pro Stunde.

Wir machen Sie darauf aufmerksam, dass in einigen Fällen Zufallsbefunde entdeckt werden können, die eine Indikation für eine Behandlung ergeben. Falls sich bei Ihnen Anhaltspunkte für eine behandlungsbedürftige Erkrankung ergeben, würden wir Ihnen eine weitere diagnostische Abklärung empfehlen und Ihnen gegebenenfalls Adressen für eine psychotherapeutische Behandlung anbieten.

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Der Einfluss von Alkohol auf die Ängstlichkeit während einer simulierten romantischen Verabredung und auf deren kognitive Verarbeitung

Placebogruppe- nur zur Information der Ethikkommission

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Befragung: Sie werden während der Untersuchung regelmäßig gebeten, die Frage bezüglich Ihrer momentan wahrgenommenen Angst zu beantworten.

Alkoholgabe: Nachdem Sie den Handschuh angelegt haben, werden Sie in einem Zeitraum von 15 Minuten eine bestimmte Menge Alkohol gemischt mit Cranberry-Saft trinken, so dass ein Blutalkoholgehalt von 0.5 Promille erreicht wird. Im Anschluss daran werden Sie gebeten, eine weitere an dieser Studie teilnehmende Person kennenzulernen. Nach Ende des Experiments bitten wir Sie, so lange in den Räumen der Universität zu bleiben, bis Ihr Blutalkoholgehalt einen Wert von 0.3 Promille erreicht hat oder sich abholen zu lassen. Die Messungen der Alkoholkonzentration erfolgen über ein Atemalkoholmessgerät der Firma Draeger.

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(Saftgruppe – Nur zur Information der Ethikkommission**)**

Sie sind eingeladen, an einer Studie zur Wirkung von Alkohol auf die Ängstlichkeit während einer simulierten romantischen Verabredung teilzunehmen. Um den Einfluss von Alkohol auf Körpersymptome zu prüfen, benötigen wir einige Teilnehmer, die vor unserer Untersuchung Alkohol konsumieren, sowie eine Vergleichsgruppe, die dies nicht tut. Sie wurden der Gruppe zugelost, die keinen Alkohol konsumieren wird. Wir hoffen durch unsere Studie ein besseres Verständnis der Alkoholwirkung auf Körpersymptome sowie auf Gefühle und Gedanken in Verbindung mit Körpersymptomen zu erlangen. Wir sind daran interessiert, ob der Genuss von Alkohol Auswirkungen auf die subjektiv empfundene Angst hat und inwiefern er das Nachdenken über soziale Ereignisse beeinflusst. Die folgende Information soll den Ablauf der Studie erläutern.

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Getränkegabe: Nachdem Sie den Handschuh angelegt haben, werden Sie in einem Zeitraum von 15 Minuten eine bestimmte Menge Cranberrysaft trinken. Im Anschluss daran werden Sie gebeten, eine weitere an dieser Studie teilnehmende Person kennenzulernen.

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Einverständniserklärung

1.
Ich bin durch
Herrn/Frau_____am_____ schriftlich über Zweck und Ablauf der Studie „Der Einfluss von Alkohol auf die Ängstlichkeit während einer simulierten romantischen Verabredung und auf deren kognitive Verarbeitung' unterrichtet worden.

2.
Ich wurde darüber informiert, dass die erhobenen Daten unter Einhaltung der Vorschriften des Datenschutzes nach Entfernung von Namen, Geburtsdatum und Anschrift ausschließlich zu wissenschaftlichen Zwecken auf elektronischen Datenträgern gespeichert und mittels statistischer Verfahren zusammengefasst und ausgewertet werden. Bei einer Veröffentlichung der Studienergebnisse in einer psychologischen Fachzeitschrift werden nur Sammelstatistiken veröffentlicht, d. h. persönliche Daten jedweder Art bleiben anonym.

3.
Die vorliegende Einverständniserklärung bezieht sich auf alle Daten, die während der Untersuchung an der Universität zu Köln erhoben werden und kann jederzeit widerrufen werden, so dass meine Daten auch nach Abschluss der Untersuchung zu jedem Zeitpunkt gelöscht werden können.

4.
Ich gebe diese Einverständniserklärung unter der Bedingung ab, dass alle Personen der Schweigepflicht unterliegen, die im Verlauf der Untersuchung Befunde, die meine Person betreffen, zur Kenntnis nehmen.

5.
Ich bin darauf aufmerksam gemacht worden, dass die Teilnahme jederzeit ohne Angabe von Gründen widerrufen werden kann, ohne dass mir daraus Nachteile entstehen. Die laufende Untersuchung kann jederzeit unterbrochen werden. Bei Abbruch steht mir dennoch ein reduzierter Geldbetrag bzw. das Seminar zur Bewältigung der Angst zu.

6.
Die Aufzeichnung und Auswertung der Daten erfolgt pseudonymisiert. Die Codierliste ist nur dem Versuchsleiter zugänglich und wird nach Abschluss der Studie gelöscht. Ich bin darüber informiert worden, dass ich jederzeit eine Löschung all meiner Daten verlangen kann, solange die Codierliste existiert.
Mir ist bekannt, dass bei anonymisierten Daten (nach Löschung der Codierliste) keine selektive Löschung meiner Daten, aber auch keine Rückschlüsse auf meine Person möglich sind. Ich bin einverstanden, dass anonymisierte Daten zu

Forschungszwecken weiter verwendet werden und mindestens 10 Jahre gespeichert bleiben.

7.
Ich habe die Informationen zur Studie inhaltlich verstanden und mir wurde genügend Zeit für Rückfragen eingeräumt.

Name: _____

_____
Köln, den

_____
_____
Unterschrift des Probanden Unterschrift des Versuchsleiters

Lieber Versuchsteilnehmer!

Dies ist die Rückmeldung Ihrer Gesprächspartnerin über Ihr Verhalten in der Interaktionssituation.

Universität zu Köln

Der Gesprächspartner…

	Gar nicht	**etwas**	**mäßig**	**sehr**	**extrem**
wirkte selbstsicher	0	1	**2**	3	4
war kurzatmig	**0**	1	2	3	4
war interessant	0	1	2	**3**	4
sagte häufig ‘ähm’	0	**1**	2	3	4
sprach flüssig	0	1	**2**	3	4
machte einen guten Eindruck	0	1	**2**	3	4
hat zu schnell gesprochen	0	1	2	3	**4**
ist sichtbar errötet	**0**	1	2	3	4
hielt Augenkontakt	0	**1**	2	3	4
schien zu schwitzen	0	**1**	2	3	4
schien gut vorbereitet	0	**1**	2	3	4
sprach verständlich	0	1	2	3	**4**
verhaspelte sich	0	1	2	**3**	4
wirkte souverän	0	1	2	**3**	4
hatte eine zitternde Stimme	**0**	1	2	3	4
hatte eine gut hörbare Stimme	0	**1**	2	3	4
machte lange Pausen	0	1	2	3	**4**
zitterte sichtbar	0	**1**	2	3	4
hat sich übermäßig bewegt	0	1	2	**3**	4
wirkte intelligent	0	1	2	3	**4**

Lieber Versuchsteilnehmer!

Wir möchten Sie nun bitten, Ihre Gesprächspartnerin zu beurteilen. Kreuzen Sie dazu bitte jeweils eine Zahl zwischen 0 (‘gar nicht’) und 4 (‘extrem’) an.

Die Gesprächspartnerin…

	Gar nicht	**etwas**	**mäßig**	**sehr**	**extrem**
wirkte selbstsicher	0	1	2	3	4
war kurzatmig	0	1	2	3	4
war interessant	0	1	2	3	4
sagte häufig ‘ähm’	0	1	2	3	4
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hielt Augenkontakt	0	1	2	3	4
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zitterte sichtbar	0	1	2	3	4
hat sich übermäßig bewegt	0	1	2	3	4
wirkte intelligent	0	1	2	3	4

Lieber Versuchsteilnehmer!

Wir möchten Sie bitten, sich an die Rückmeldung Ihrer Gesprächspartnerin über Ihr Verhalten während der Interaktion zu erinnern. Kreuzen Sie bitte die Zahl an, die Ihre Gesprächspartnerin ankreuzte, um Sie zu beurteilen.

Der Gesprächspartner…

	Gar nicht	**etwas**	**mäßig**	**sehr**	**extrem**
wirkte selbstsicher	0	1	2	3	4
war kurzatmig	0	1	2	3	4
war interessant	0	1	2	3	4
sagte häufig ‘ähm’	0	1	2	3	4
sprach flüssig	0	1	2	3	4
machte einen guten Eindruck	0	1	2	3	4
hat zu schnell gesprochen	0	1	2	3	4
ist sichtbar errötet	0	1	2	3	4
hielt Augenkontakt	0	1	2	3	4
schien zu schwitzen	0	1	2	3	4
schien gut vorbereitet	0	1	2	3	4
sprach verständlich	0	1	2	3	4
verhaspelte sich	0	1	2	3	4
wirkte souverän	0	1	2	3	4
hatte eine zitternde Stimme	0	1	2	3	4
hatte eine gut hörbare Stimme	0	1	2	3	4
machte lange Pausen	0	1	2	3	4
zitterte sichtbar	0	1	2	3	4
hat sich übermäßig bewegt	0	1	2	3	4

wirkte intelligent	0	1	2	3	4

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