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Using advances from cognitive behavioral models of anxiety to guide treatment for social anxiety disorder

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Abstract

This case features an adult male with moderate social anxiety disorder and mild depressive symptoms who showed an initial positive response to an earlier experience of cognitive behavior therapy, but then relapsed when he started avoiding social situations again due to continuing beliefs that experiencing anxiety was unacceptable. His treatment at our clinic focused on shifting unhelpful thinking about the likelihood and consequences of becoming anxious and reengaging in avoided social situations so he could learn to tolerate negative affect and uncertainty. The treatment approach draws from cognitive behavioral models of social anxiety and highlights advances in clinical science, especially recent work on the causal role of interpretation biases (the tendency to assign negative or threatening meaning to ambiguous situations) in the maintenance and reduction of anxiety.

Keywords

social anxiety; interpretation bias; avoidance; cognitive bias modification

Social anxiety disorder is a highly prevalent problem, affecting approximately 13% of persons during their lifetime (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012). It can be seriously impairing, contributing to difficulties in relationships, work, social, and academic functioning, and even to higher risk for suicide. The current gold standard therapy to treat social anxiety is Cognitive Behavior Therapy (CBT), which focuses on shifting self-critical, unhealthy thinking patterns that fuel fears of negative evaluation and on reducing social avoidance behaviors so that clients learn they can tolerate negative affect. In this article, we describe the course of CBT provided to a socially anxious adult male who had struggled on and off with fears of negative evaluation since childhood and who sought treatment at our clinic after a return of symptoms that made it difficult for him to perform effectively in his job, hurt his career advancement opportunities, limited his use of social supports from his friends, and impaired his ability to form a healthy, lasting romantic relationship. He was treated by first author, R.K.N., and supervised by second author, B.A.T.

Cognitive Behavior Models and Therapy

CBT for social anxiety is derived from models that outline the interplay of maladaptive cognitive and behavioral styles that fuel evaluation fears. While there are a number of different cognitive-behavioral models of social anxiety (see Clark & Wells, 1995, and Heimberg, Brozovich, & Rapee, 2010, among many others), they share a number of features, so we focus here on the mechanisms that multiple researchers identify as core to maintaining the disorder. Individuals vulnerable to social anxiety preferentially allocate attentional resources to signs that they are performing poorly and being evaluated negatively. This can lead to excessive self-focused attention as anxious individuals get caught up in concerns about their social inadequacies, such as concerns about blushing or sweaty hands, or repeated intrusive thoughts and images tied to perceived evaluations from others (“she thinks I’m boring”). Interestingly, socially anxious individuals often come to fear any kind of evaluation, even positive ones. Anxious individuals create a mental representation, which is often distorted, of how they appear to their audience, and compare that representation to their rigid standard of how they *should* perform and appear. The combination of unrealistic performance standards (e.g., that there should never be a pause in a conversation) and harshly critical self-judgments lead vulnerable individuals to conclude that they are failing to meet the standard and are thus being evaluated negatively by the audience. As a result, this exacerbates symptoms of anxiety, including physiological symptoms like racing heart and sweating, cognitive symptoms like overestimating the probability that others notice even minor or imagined social *faux pas*, and behavioral symptoms, including escape, avoidance and unhealthy “safety behaviors” (e.g., only going to a party after you’ve had four drinks). These anxiety symptoms in turn further exacerbate the selective attention and vigilance for threat cues and perceived negative evaluations from others. Moreover, anxious individuals typically believe that being evaluated negatively has catastrophic consequences and ruminate on their supposed failures even after the social interaction is over, further compounding the anxious reactions. This vicious cycle maintains the avoidance behaviors and prevents individuals from learning that they are unlikely to be judged negatively, and that it is not usually ‘the end of the world’ to make a social error or even have someone think badly of one’s social performance.

There is extensive research support for CBT models and the treatment approaches that follow (see <http://www.div12.org/psychological-treatments/>). CBT typically starts with psychoeducation about the nature of anxiety and its components, and the relationships among thoughts, feelings, and behaviors. The heart of the therapy emphasizes: a) the use of cognitive restructuring (e.g., identifying self-critical or catastrophic thoughts and images, and evaluating the evidence for and against these thoughts to collaboratively explore whether there are other ways to think about the situation); b) testing unhelpful beliefs through behavioral experiments (e.g., asking a question at a lecture to test the belief that others will laugh if you speak without extensively preparing your remarks in advance); and c) exposure-based methods to reduce maladaptive avoidance, escape, and safety behaviors (e.g., saying hello to 3 strangers, practicing a conversation with new people, delivering a speech in front of an audience, or attending a social function without ‘self-medicating’ with alcohol). The therapy ends with relapse prevention to empower clients to recognize and maintain their

gains after treatment has ended by planning ahead for high-risk situations and encouraging continued practice and work on remaining goals.

A typical course of treatment runs from 12–16 sessions of 60–90 minutes each, and can be delivered effectively in either individual or group format, though there is some evidence for superior outcomes with individual treatment. There are helpful manuals that can guide treatment delivery, with especially strong research support for CBT based on Clark and Wells' (1995) and Heimberg's (Hope, Heimberg, & Turk, 2006) manuals. There is also some support for certain medications to help manage social anxiety, especially selective serotonin reuptake inhibitors (SSRIs), though the National Institute for Health and Care Excellence (NICE) guidelines recommend these as a second-line treatment (CBT is the recommended first-line approach; NICE: National Clinical Guideline Number 159). In the case described below, the client received 19 60-minute sessions over the course of 4 months, followed by 2 follow-up “booster” sessions that were provided one month and then two months after the end of therapy to aid in relapse prevention.

Advances in Clinical Science Help Refine Treatment Targets: Interpretation Bias

The emphasis on changing thinking patterns and encouraging approach behavior in therapy derives from extensive evidence in the lab that social anxiety is associated with many forms of cognitive biases and avoidance behaviors (see Steinman, Teachman, & Gorlin, in press). By cognitive biases, we refer to selective processing of disorder-relevant cues (social evaluation cues in this case) by those high vs. low in symptoms (see Mathews & MacLeod, 2005). There is evidence for a very broad range of these biases in social anxiety, including (but not limited to): selectively attending to social threat cues, especially negative, self-relevant social information (e.g., more rapidly noticing angry, compared to happy faces; see review in Teachman, Joormann, Steinman, & Gotlib, 2012); judgment and interpretation biases that favor threatening meanings (e.g., higher estimations of the likelihood that a social performance will turn out badly, and a tendency for ambiguous cues, like a neutral facial expression, to be interpreted in a negative way; see review in Steinman et al., in press); a propensity to replay perceived social failures in one's mind, known as post-event processing (e.g., repeatedly reviewing the supposedly “stupid” remarks made during a conversation; see Cody & Teachman, 2010); and a tendency to automatically associate the self with negative attributes (e.g., rapidly and relatively uncontrollably associating the self with being rejected; see review in Teachman, Cody, & Clerkin, 2010).

We focus here on recent research on interpretation bias both because this work highlights key targets for treatment, as evident in the case study below, and because we believe that a greater understanding of this bias can make seemingly illogical reactions by persons with social anxiety more comprehensible.

Imagine ‘assuming the worst’ whenever you are uncertain about a social situation... Is a dinner guest leaving early because he's busy or because he doesn't enjoy your company? Does a friend's yawn when you're talking mean she is tired or mean she thinks you're boring? Does an employer's neutral facial expression during your presentation mean she's

concentrating on what you're saying or mean she thinks you're not making sense? For socially anxious individuals, the answer they select all-too-often is the second option in each of these examples. The tendency for socially anxious individuals to assign threatening, rather than benign, meanings when there is some ambiguity in a situation is well documented and has wide-spread insidious consequences, in part because some uncertainty is endemic to all interactions because we do not know what another person is thinking. For instance, when participants are presented with brief scenarios that are ambiguous in some way – e.g., your conversation partner laughs at something you said, and it is unclear whether he is laughing at a joke you've made or laughing at you – we and many other labs have shown that socially anxious individuals rate the likelihood of the negative explanation for the laughter more highly than do non-anxious individuals. Moreover, this negative bias tends to be more pronounced for social, rather than other types of potentially threatening situations, and is particular to socially anxious participants, rather than being characteristic of individuals with other anxiety problems (e.g., obsessive compulsive disorder; Amir, Foa, & Coles, 1998). The interpretation bias is also evident when interpreting actual behaviors, such as assigning negative meanings to ambiguous social behaviors during a speech (e.g., clearing one's throat; Kanai, Sasagawa, Chen, Shimada, & Sakano, 2010), indicating the bias is not constrained to hypothetical situations (though it is most commonly assessed using hypothetical vignettes).

Understanding this bias is important for improving clinical practice. It is essential to inquire how clients are making sense of social information and not assume that they are assigning benign meanings (in line with what might be assumed for a non-anxious person). This includes social interactions that occur outside and inside of therapy. In therapy, it is important to check that clients aren't assigning negative meaning to the therapist's ambiguous behavior (e.g., thinking the therapist is judging the client negatively because she has a neutral facial expression) or thinking an exposure exercise went badly (e.g., assigning a self-blaming, catastrophic meaning to a brief pause in a conversation). Biased interpretations can also interfere with clients' willingness to try exposures if they interpret signs of anxiety, like a racing heart, as being dangerous and intolerable. Analogously, explicitly checking how clients have made sense of their social interactions and performances that occurred outside of sessions is critical. One of the seeming mysteries of social anxiety is why a client can repeatedly perform well in social situations (based on objective raters) and yet continue to believe she is failing miserably. Recognizing the many opportunities for biased interpretations can help make sense of this conundrum. Note, our goal in recognizing these biased interpretations and using cognitive restructuring techniques and behavioral experiments to shift the interpretations is not to make all interpretations positive – that would be neither credible nor useful. Rather, the goal is to encourage clients to think more flexibly, expanding their repertoire of responses to situations as they recognize that they have a choice in how they make sense of their interpersonal world and can respond to their anxiety in new, healthier ways (e.g., learning that anxiety is uncomfortable but not dangerous).

Importantly, there is also evidence that negative interpretation biases can change. For instance, we have shown in our lab that CBT (targeting panic disorder in this case) not only reduces negative interpretation bias, but also that the degree of reduction in bias predicts

how much a person subsequently decreases anxiety symptoms in therapy (Teachman, Marker, & Clerkin, 2010). This points to an important temporal connection, consistent with the idea that changing interpretation bias will improve treatment outcomes. We turn now to a case study that highlights how understanding the cognitive biases and behavioral avoidance that fuel social anxiety can be applied to formulate a treatment plan.

Case Illustration

Presenting Problem & Client Description

Anthony (a pseudonym¹) was a single, heterosexual, Italian-American male (both the client and his parents were born and raised in the United States) in his late twenties with a Bachelor's degree in Technical Writing from a large university, and a Master's degree in English from an online program. He was given referrals to several therapists in the area by his previous college therapist, and had spent some time trying to find one where he felt sufficiently comfortable to be willing to attend more than one session (our clinic was the third one he had tried). Anthony struggled with moderately severe social anxiety and mild depressive symptoms and had briefly sought treatment in college (for 9 sessions). He reported that he had found a number of strategies suggested by his previous therapist to be useful, felt comfortable in her presence, and during his last year at his university had made substantial gains in reducing his avoidance behaviors. However, he ended therapy after graduating and had found it hard to maintain gains after college. Although he had wanted to seek help again, it had taken him six years to reach out and attempt to contact local therapists, in part because he believed that he "had failed" by needing to seek therapy again (a cognitive distortion that was critical to address in therapy to increase his commitment to seeking help).

Anthony's social anxiety had plagued him since early childhood, but become particularly distressing once he graduated high school and had less of a clear "path" laid out for him. Despite being accepted to multiple universities, Anthony deferred his acceptance for a year due to his anxiety about beginning college. The ambiguous nature of what lay ahead felt very overwhelming to him and he envisioned many catastrophes – failing classes, not making friends – leading to many classic negative expectancy biases. His parents, while initially sympathetic, eventually took the stance that if he didn't "get over it" and "make something of himself," they would cut off financial support. With this threat, Anthony elected to begin college the following year at a large school where he could "disappear" into the student body. His primary social supports consisted of friends that he had known in high school; however, Anthony's embarrassment at beginning college a year later than most of his peers and frequent desire to cancel plans at the last minute for fear that he would humiliate himself made it difficult for him to successfully maintain these friendships. He did not date throughout college, and spent most of his time in his apartment. He would map out routes to his classes that allowed him to avoid as many people as possible, even if this meant taking a route that added 20 minutes to his walk.

¹Features of this case have been modified to protect the client's identity.

In his last semester of college, Anthony did seek treatment for his social anxiety. He responded quickly and well to exposure therapy, and was even able to take a part time job as a nighttime DJ for the college radio station. After 9 weeks of therapy, Anthony discontinued therapy because he was graduating and would be moving away. He had made a number of gains in reducing avoidance behavior but still appeared to retain maladaptive beliefs about the unacceptability of experiencing anxiety, judging it as weak, and assumed that his social anxiety was “cured.”

Anthony’s goal was to pursue a career in journalism; however, after spending six months unable to find a job, he moved back in with his parents and began an online Master’s program in English to strengthen his resume. The online program allowed him to avoid interacting with others outside his home and his old pattern of avoidance began to once again increase. The program did, however, culminate in successfully obtaining a job as an editor for an online magazine. Despite feeling very committed to his job, Anthony received several reprimands in his first year after not pointing out editorial or factual errors to the writers due to beliefs that they would resent his feedback. This reinforced his feelings of inadequacy, and his job became a great source of stress. A further recent stressor for Anthony was a “failed” romantic relationship, which ended approximately six months prior to his reentry into therapy. After moving back home, he had rekindled a relationship with a woman he had dated briefly in high school. The relationship became serious very quickly and Anthony had hoped to soon propose marriage, but the woman had recently ended it, in part due to frustration about Anthony’s increasing unwillingness to go out or socialize with her friends. This plunged Anthony into a depressive episode and spurred his decision to begin therapy again.

Case Formulation

A critical part of conceptualizing Anthony’s case and setting treatment goals centered on his previous successful, albeit temporary, response to exposure-based interventions and his ongoing difficulty accepting that anxiety was an expected part of life that would never fully “go away,” and not a sign of failure. Helping Anthony to alter rigid, unrealistic beliefs about the meaning and likelihood of experiencing anxiety was considered critical because this was viewed as a key vulnerability marker that had led to his return of symptoms and increasing avoidance behaviors. Thus, we sought to encourage the belief that anxiety is normal, can be tolerated, and does not need to lead to escape and avoidance. Based on these goals of altering cognitions *and* behaviors, as well as Anthony’s prior success with a behavioral intervention and the strong research support for CBT for social anxiety, CBT was selected as the treatment of choice in this case. In particular, given Anthony’s biased beliefs, which we felt made him vulnerable to further anxiety difficulties, we took a predominantly cognitive approach enhanced by behavioral exposures. Although exposure therapy alone shows strong efficacy when compared to no treatment for social anxiety, CBT that includes cognitive restructuring demonstrates equivalent or better client gains, further supporting its use for this case (Ponniah & Hollon, 2008). Interpersonal therapy was also considered, but the slightly higher efficacy shown by CBT for social anxiety, as well as Anthony’s clear dysfunctional beliefs, made CBT our first choice (Stangier, Schramm, Heidenreich, Berger, & Clark, 2011).

Notably, it was essential to discuss the treatment model and goals in a very collaborative way and invite a lot of questioning, especially because Anthony did not initially share the therapist's view about the tolerability of anxiety (not surprisingly!). In line with his rigid pre-treatment thinking, Anthony's stated treatment goals were to dispel all social anxiety in his life (to "cure it," as he explained), so that he could feel free to "be himself" and "do what he wanted in the moment." (His secondary goals were to feel less depressed about his relationship ending and to increase his assertiveness, though we elected to address these goals in a subsequent phase of treatment should that still be necessary then, given both Anthony and the therapist felt the social anxiety was the primary presenting problem causing the most significant impairment.) Although Anthony's initial goal of eliminating anxiety was not realistic, with an open discussion and review of the cognitive behavioral treatment model, we were able to work together to come up with the following shared goals:

Treatment Aims	
1.	Reinterpret ambiguous social situations in less catastrophic ways to decrease fears of negative evaluation
2.	Reduce self-critical, perfectionistic thinking when anxious or when situations do not go "just right"
3.	Increase frequency of engagement with others, and decrease avoidance behaviors resulting from social anxiety, especially with unfamiliar conversation partners

We attempted to address these goals with the following strategies:

Strategies	
1.	Provide psycho-education about how and why anxiety occurs
2.	Use cognitive restructuring (e.g., thought records) to re-evaluate unrealistic, unhelpful beliefs about the likelihood and costs of social interactions going badly and about social anxiety treatment
3.	Create and work through exposure hierarchies in work and interpersonal social domains

To assess baseline symptoms and be able to more objectively measure progress, Anthony completed two questionnaires at the outset of therapy (and approximately every 2 months thereafter). On the Brief Fear of Negative Evaluation questionnaire, a widely used measure in social anxiety research and practice, his score was at ceiling (60); on the Outcome Questionnaire, a scale commonly used in our clinic to track progress in several general domains, Anthony scored in the clinical range for overall distress (84) as well as distress regarding interpersonal relations. These results were consistent with Anthony's description of his social anxiety and relationship difficulties.

Course of Treatment

Initial foci in treatment included developing rapport and providing education on bio-psycho-social experiences of and responses to anxiety and the related treatment model. We then shifted to a focus on cognitive restructuring of unhelpful cognitions regarding social situations, as well as exposures to different feared situations. Finally, as Anthony's feelings of competence in social interactions increased and his ability to come up with alternative ways of responding to anxiety-inducing situations improved, we further adjusted our focus

to target his (biased) expectations around the experience of anxiety. We highlight some examples from each of these components of the treatment.

For approximately our first month of weekly sessions, R.K.N. focused on developing rapport and slowly introducing psycho-education about anxiety. A focus on building and not rupturing her alliance with Anthony was key, given his recent experiences of firing therapists after his first meeting with them if he felt uncomfortable in their presence, and his rigid views about the catastrophic meaning of anxiety. Given his deep desire to ‘fully rid himself of anxiety once and for all,’ too enthusiastically pushing psycho-education about anxiety or its tolerability had the potential to disrupt the therapeutic relationship, and was handled delicately. Early discussions between R.K.N. and Anthony often focused on both his goals and normalization of the experience of anxiety. As this prototypical exchange illustrates, R.K.N. worked to encourage more flexible thinking in small ways without directly challenging Anthony’s more intractable beliefs.

A: At the end of college, I was totally confident. I had total control of every situation. It was the first time in my life that I felt like that, and that’s what I want again.

R.K.N.: You decided to do things, even knowing they were things that made you anxious.

A: No, I just *always* felt good. My therapist there was so wonderful. She made it all go away. That’s what I want – complete control over how I feel.

R.K.N.: You felt incredible. It sounds like you were able to make some of the changes you wanted to, which helped you feel more confident. You forgot about the anxiety for a while and nothing went wrong.

A: Well, it’s not that nothing ever went wrong, I just could handle it. But I also think I was causing fewer problems and was coming across to others better because I was confident. I never realized how many problems I had until they went away for a bit. Like, my brother has never understood my problems, because he never experiences any of that stuff. Most people don’t. They can just start a conversation with someone or talk in class or whatever. I got to have a taste of that.

R.K.N.: So, doing more with other people, like starting conversations and talking in class, had a very positive impact. I wonder if there are some situations where you could try doing things with other people even before you *feel* confident. You know, a lot of, if not most, people get at least a little bit nervous in those kind of situations. It’s actually more unusual not to.

This highlights a number of themes that often predominated, especially in the earlier part of therapy: Anthony’s feeling of strong therapeutic alliance with his previous therapist and desire for R.K.N. to help him “fix things” in the same way; his lack of recognition that he could decide to make changes (e.g., reduce avoidance behaviors) regardless of how he felt; and his difficulty perspective-taking and recognizing that others might have similar feelings.

While he had successfully done a number of exposures to great success in his first, brief foray into therapy, he had either made or retained few of the cognitive changes that we chose to primarily focus on, given this was conceptualized as central to his return of symptoms. This was getting in the way of him recognizing that he could make choices about his actions even when he was feeling nervous in a situation, as well as recognizing that his anxiety was likely not as transparent to those around him as he worried it might be. He had very strong beliefs that only if he was not anxious would other people find him likeable. However, when he did decide to do exposures, he was frequently successful in getting through them, and regularly felt less anxious afterward. It was his negative expectations that tended to get in the way and prevent him from approaching a situation, and his interpretive biases and harsh post-event processing that led him to “rewrite history,” assigning negative meanings to what his social partner might have thought or noticed after the fact, regardless of how the situation had unfolded.

We began to work in session on helping Anthony consider new ways of thinking about social situations and his anxiety reactions. R.K.N. introduced the idea of having a choice in how one responded to an anxious thought using cognitive restructuring strategies and tools, such as thought records (worksheets on which clients identify unhelpful, distressing thoughts and evaluate the evidence for and against the thoughts, then derive new, “balanced” thoughts which take into account evidence from both sides). Anthony initially struggled with this because he wanted to simply *remove* all anxious thoughts. This, again, at times threatened to disrupt the therapeutic relationship, so restructuring was combined with a great deal of empathizing and reassurance.

A: Work was terrible yesterday. I saw my co-worker at the copy machine and just wasn’t feeling like I could talk to anyone, so I went back to my desk and just made copies later. At the end of the day I saw him again, and it was so awkward because it was so obvious that I was uncomfortable and avoided him.

R.K.N.: What were you worried he might be thinking?

A: He probably thinks I’m an unfriendly weirdo. And like, we’ve worked together for months, so I shouldn’t even be nervous around him. He probably thinks I’m a freak.

R.K.N.: How did he react when you saw him later?

A: He waved. But I bet he was still thinking it and just did that to be nice.

R.K.N.: We’ve talked before about considering different *possible* explanations to understand a situation, and I’m wondering if that would help here.

A: Telling myself something else doesn’t change anything, though. It had already happened. And what if he was thinking that stuff? I mean, yeah, maybe he didn’t notice me or didn’t care, but he might have.

R.K.N.: It sounds like after the initial run-in happened, you were feeling pretty badly the rest of the day.

A: Yeah, I just sat in my office and didn't work, which made me feel more pathetic.

R.K.N.: So *that* is the part we're working to change right now. We're sort of going at it in reverse. Sure. The situation had already occurred. But how you reacted to it, and what you thought about it, made the rest of your day worse, and you were less productive. Maybe considering different perspectives wouldn't change the original situation, but it could have an effect on everything after that. I'm betting it would feel a lot better to not feel like you failed for the rest of the day. And as you practice it, you'll be able to do that sooner and sooner after the incident so that, even if it doesn't go perfectly, it doesn't have to affect everything else. I believe you're able to do that: you are great at coming up with alternatives.

Anthony even avoided using the words "social anxiety," because they invoked his feelings of shame about being anxious. Shame was a major part of what made his social anxiety so debilitating: he often described how it made him "less of a man," and how much better he felt in the presence of others if they understood his anxiety and he could talk about it. Interestingly, it was when he felt he could *not* acknowledge it that he found it most difficult to engage with people (for many anxious individuals, admitting to anxiety is more difficult, but Anthony was very concerned about being 'found out' so wanted to forewarn people in the hopes he would be judged less harshly). He routinely punished himself for feeling anxious because he interpreted it as a personal failing. When Anthony felt even a hint of anxiety, he would begin what he often referred to as a "downward spiral", thinking: "I'm getting anxious. I'm going to say something stupid. Everyone is going to know. I'm pathetic and weak for feeling this way. I shouldn't worry about it, but now it's too late. Now, because I've been worrying about my anxiety, everyone probably knows. I should say something so they know why I'm being weird, but they'll just judge me more. Now it's too late to fix it." and so forth.

In addition to using thought records and Socratic questioning to reevaluate his negative beliefs about the significance of anxiety, Anthony also did behavioral experiments, directly testing his belief that R.K.N. would judge him for still becoming anxious by telling the therapist about his state anxiety during session. Initially, Anthony found this very challenging but became increasingly comfortable as the experiments demonstrated she did not react negatively. He was able to build on this evidence from therapy sessions and then apply it to his experiences with others outside of therapy.

As Anthony became more adept at re-evaluating his catastrophic thinking, R.K.N. also reintroduced exposure exercises, both in session (e.g., conversations with other therapists in our clinic who acted as audiences, supposed authority figures, strangers, or other social interaction partners) and outside of session (e.g., he made a point to let colleagues know when they had made errors in their work). The goal in these exposures was to enter and remain in the challenging situation even though it generated anxiety; critically, the goal was not to directly reduce anxiety but to learn to tolerate anxiety and for Anthony to realize he could still engage and make choices even when anxious.

Once Anthony had learned the core set of skills to manage his social anxiety, while continuing to do exposures, the therapy also focused on his residual cognitive biases surrounding the end of his relationship. It quickly became evident that his romantic relationship was not the only relationship in his life that had been challenged by his relatively rigid expectations. In both his professional and personal relationships, he had a great desire to feel 'in control,' which for him meant that others' behaviors and reactions should be very consistent and predictable. In an attempt to manage his anxiety, he frequently expressed unrealistic expectations about the behavior of those close to him, and this style had contributed to the deterioration of his relationship. Describing a fight that had occurred near the end of his relationship with his ex-girlfriend (which had been one of the key triggers for him to seek therapy), he noted:

A: She told me she wanted to hang out that night, but didn't give a time. So I texted her at 6:00 to ask if she wanted to come over. She didn't text back for 15 minutes! I always reply to people right away. But it took so long that I didn't even want to see her after that. So then she said she was getting dinner with a friend, but we could get together after that. And I was just really upset because I'd been waiting all day. And so I felt like it wasn't worth it, but I actually did want to see her.

R.K.N.: So what did you decide to do?

A: I waited. I got more and more upset and when she picked me up I couldn't even talk to her. Then she started crying, and I felt like she was making it all about her. I just wanted her to tell me things ahead of time and then stick to them, but she's so flaky, and then she gets upset and says that's just how she does stuff.

R.K.N. That was a hard night. You really didn't get what you wanted from her.

A: She leaves me hanging all the time.

R.K.N.: You've mentioned this before. It seems like it hurts you a lot, every time.

A: I mean, she knows this makes me anxious.

R.K.N.: So, it felt like she was being inconsiderate and doing something on purpose that she knew would hurt you.

A: I don't know. Looking back, I realize that she always said she hated feeling tied down, so maybe that was just her baggage, and not really about trying to hurt me.

As with other aspects of his anxiety, we conceptualized his relationship difficulties as stemming from a tendency to have rigid, sometimes unrealistic expectations for himself and others. He was able to use the same cognitive restructuring approaches he had learned to address his social anxiety to reconsider his interpretations in relationships.

As Anthony's symptoms decreased in severity, we began to discuss ending therapy together. This was a final challenge for Anthony, who worried that, without therapy, he would return to being anxious and avoidant. This was a particular challenge because he had experienced a return of symptoms previously following the therapy he had completed in college. To address this concern, we spent more time than usual on relapse prevention and also spaced out his final sessions; for approximately two months, we met every other week, and then spaced it out to once a month. As we decreased our session frequency, Anthony found that he was able to maintain many of his gains on his own, with continued practice.

Outcome and Prognosis

Anthony terminated therapy approximately 8 months after beginning, although his final session was a "booster" that occurred two months after his last regular session. He significantly decreased his social anxiety and fears of evaluation, as measured by the Brief Fear of Negative Evaluation, and overall distress, as measured by the Outcome Questionnaire. In terms of his own reported changes, Anthony reportedly felt not only less anxious, but also much better prepared to take on future episodes of anxiety. His self-concept shifted from, "I am a socially anxious person" to, "I have some social anxiety, but can manage it."

Measure	Baseline	Six Months (Final Regular Session)	Eight Months (Follow-up)
Brief Fear of Negative Evaluation	60	40	44
Outcome Questionnaire	84	60	36

By the end of therapy, Anthony had taken steps to find his own apartment in the area, and had also gone on a few successful, casual dates, on which he maintained reasonable boundaries and expectations for the other person. Moreover, at work, he had begun to initiate conversations with his co-workers as well as point out areas in their articles in need of correction, and as a result, had received a far more positive performance review a month prior to the last time we met. Challenges throughout therapy included maintaining positive rapport while also helping Anthony to recognize and accept that experiences of anxiety were unlikely to be fully eradicated. These challenges were addressed by initially working on ideas that Anthony found less threatening, and as he began to see positive changes occur *despite* still feeling some anxiety, we slowly introduced the idea that anxiety is a normal, expected part of life.

Clinical Practices and Summary

In this case, our goal was not to prescribe a single, specific way of approaching the treatment of social anxiety. Instead, we highlighted the ways in which research can identify the mechanisms that contribute to and maintain anxiety, and that interventions can alter these mechanisms in multiple ways. This case mainly used traditional, in-person cognitive restructuring to reduce interpretation biases, but there are also technology-based approaches that can help anxious clients shift their unhealthy thinking patterns, which clinicians may

find valuable complements to their in-person care. We introduce this technology-delivered approach here because of the value of expanding the tools we can offer clients to relieve their suffering. All too often, clients are not willing or able to seek treatment as Anthony did, whether due to financial or scheduling constraints, stigma, or inability to access efficacious treatments (e.g., Lewis, Pearce, & Bisson, 2012). In addition, some clients simply need additional help or reminders between sessions.

Cognitive Bias Modification studies to directly change interpretation bias (CBM-I) offer an additional avenue to shift thinking styles. These studies typically use computer programs to give people repeated practice assigning less negative meanings to ambiguous situations, essentially changing the contingency so that ambiguity no longer signals threat. The most common form of interpretation bias training involves presenting anxious individuals with brief scenarios that are ambiguous in some meaningful way so that they activate disorder-relevant concerns (e.g., elicit fear of possible negative evaluation in the case of social anxiety). A typical scenario would read, “Your boss asks you a question, and you realize you respond incorrectly. Your boss corrects you. You think the experience of being corrected by your boss is n_rmal.” The participant needs to complete the final word fragment (with the letter “o” to form the word “normal” in this case) to assign a benign meaning to the situation. (A negative training version of this same scenario would present exactly the same information except the final word fragment would be aw_ul, instead of n_ormal. Completion of the word to spell “awful” assigns a far more negative, anxiety-congruent meaning.) Notice that it is not ambiguous whether or not an error was made; the ambiguity lies in what emotional meaning is assigned to this situation.

CBM-I has the advantage of being brief (sessions are usually ~15–20 minutes), technology-based (delivered via computer or, more recently, phone), and it does not require a trained therapist so it can be completed in the comfort of a person’s home. Thus, it can be a cost-effective, non-stigmatizing way to deliver an intervention that directly targets a key mechanism known to maintain anxiety, and which can be widely disseminated (see Reuland, Steinman, & Teachman, in press). We, along with other labs, have conducted numerous CBM-I studies with a wide variety of anxious populations, including youth and adults with social anxiety (e.g., Reuland & Teachman, 2014; Steinman & Teachman, 2015). Typical findings from our lab and others suggest that CBM-I often leads to shifts in interpretation biases with large effect sizes, and we usually see some corresponding changes in anxiety symptoms, but these latter effects are smaller and more variable (see meta-analysis by Hallion & Ruscio, 2011; though see Cristea, Kok, & Cuijpers, 2015, for more negative results when findings for attention and interpretation training are combined).

We describe CBM-I here as a relatively novel intervention for which there are still many open questions about how to maximize its effects. It is not intended to replace CBT or other forms of in-person therapy, but may one day prove to be a useful stand-alone intervention for some individuals (although evidence for this is still in its infancy) or helpful adjunct to psychosocial or medication treatments for other individuals. Anxious individuals can try CBM-I for free by participating in a web-based research study at <https://mindtrails.virginia.edu/> to determine if it can be helpful for them. It is one way to provide

individuals who have interpretation biases with repeated practice in assigning new meanings to potentially anxiety-provoking situations.

In Anthony's case, we utilized many of the principles that underlie CBM-I; however, these principles were presented within a standard, in-person therapy context. While the specific steps taken to alter interpretation biases vary between computer-based CBM-I and in-person cognitive restructuring as occurs in CBT, they derive from common principles about the value of changing thinking styles and promoting new learning to relieve anxiety and reduce avoidance, so overlap in posited mechanisms of change. By focusing treatment on the key mechanisms that maintain anxiety – biased thinking styles such as interpretation biases, difficulties tolerating negative emotions, and associated avoidance behaviors – we are well positioned to not only reduce current symptoms, but also reduce risk for future problems and help address co-occurring disorders (like depression in Anthony's case).

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