Published in final edited form as:

Cogn Behav Ther. 2013 December ; 42(4): . doi:10.1080/16506073.2013.777106.

A Contemporary View of Applied Relaxation for Generalized Anxiety Disorder

Sarah A. Hayes-Skelton and Lizabeth Roemer

University of Massachusetts Boston, Susan M. Orsillo, Suffolk University, Thomas D. Borkovec, Pennsylvania State University

Abstract

Applied Relaxation (AR), originally developed by Lars-Göran Öst, is a long standing, efficacious treatment for generalized anxiety disorder (GAD). While newer treatments are continuing to be developed, AR remains one of the most efficacious treatments for GAD. However, AR has received less in-depth attention more recently, particularly in terms of potential mechanisms of action. This paper is written to honor the development and history of AR and to highlight the ways that it has continued to be adapted. In this paper, the AR treatment strategies are presented, which include: noticing early signs of anxiety, learning relaxation skills, and applying relaxation at the first sign of anxiety. Then, additional adaptations to AR are presented along with recommendations of how AR may be enhanced by understanding potential mechanisms of change. Finally, recommendations are made for the continued evolution of AR as a powerful and efficacious treatment for GAD.

Keywords

applied relaxation; progressive muscle relaxation; generalized anxiety disorder; behavior therapy

Applied Relaxation (AR) is a long standing, efficacious treatment developed by Lars-Göran Öst in the 1970's as a treatment for phobias and panic, and later for Generalized Anxiety Disorder (GAD). Over the past four decades, a large body of empirical support for this treatment has accumulated. While newer treatments for GAD are continuing to be developed, AR remains a gold standard against which these treatments are compared. Although many newer treatments have been shown to produce outcomes that are roughly equivalent to AR, little attention has been paid to the ways in which AR in and of itself could be enhanced and improved (see Norton & Price, 2007 for a meta-analysis of treatments for anxiety disorders). We write this paper both to acknowledge the considerable contribution of AR to the treatment of the chronic anxiety disorder of GAD as well as to highlight the potential for its continued evolution and impact in the future.

Currently, the majority of studies examining the efficacy of AR use it as a comparison condition for newer treatments (e.g., Dugas, et al., 2010; Hayes-Skelton, Roemer, & Orsillo, 2013; Hoyer et al., 2009; Wells et al., 2010). While this reflects AR's central role as a well-established evidence-based treatment, it also draws attention away from AR as a treatment to be explored in and of itself. This consequence is exacerbated by the fact that many studies do not fully utilize AR as it was originally intended, often only focusing on the relaxation components, omitting the application practice (see Beck, Stanley, Baldwin, Deagle, &

Disclosure Statements:

This work was supported by National Institute of Mental Health Grant No. MH085060 awarded to the first author and MH074589 awarded to the second and third authors.

Averill, 1994; Twohig et al., 2010) or describing the treatment in a way that makes it difficult to ascertain the amount of focus on the application training (e.g., Butler, Fennell, Robson, & Gelder, 1991). The omission or decreased focus on the application portion may interfere with effective dissemination of the full potency of this treatment. We appreciate what AR can offer beyond being an easy-to-learn comparison treatment. The fourth author has been using (and expanding on) AR in treating GAD for over 30 years, while the other three of us came to a new level of appreciation for this familiar treatment when we used it as a comparison condition in a recently completed RCT for GAD (Hayes-Skelton et al., 2013). Through this experience, we were continually struck by the depth and breadth of change that we witnessed in our clients receiving AR. Therefore, we write this paper to honor the work of Lars-Göran Öst by reviewing both the rich history of AR for GAD and the relevance of this deceptively simple, yet powerful, treatment in the 21st century.

Development of Applied Relaxation

Building on the successes of progressive muscle relaxation (Jacobson, 1938) and systematic desensitization (Wolpe, 1958), numerous coping techniques were developed in the 1970s that expanded on basic relaxation principles. For a few examples, Bernstein and Borkovec (1973) published a guidebook for helping professionals to apply progressive relaxation training; Russel and Sipich (1973) developed cue-controlled relaxation; and Chiang-Liang and Denney (1976) included an anxiety hierarchy as part of their applied relaxation (see Barrios & Shigetomi, 1979, for a review of these coping techniques up to 1978). It was in this climate that Öst began working on Applied Relaxation (AR) as a treatment strategy for phobias and panic. While progressive muscle relaxation (PMR) and its use in systematic desensitization provided methods for teaching individuals to reliably reduce muscle tension and achieve a more relaxed state, at least temporarily, AR emphasized the importance of making relaxation a portable skill to be used when anxiety is encountered in natural settings. The addition of explicit attention to application of these skills in daily life has shown incremental benefits over PMR in the treatment of panic disorder (Öst, 1988). As stated by Öst (1987), “the purpose of this treatment method is to teach the patient a coping skill which will enable him/her to relax rapidly, in order to counteract, and eventually abort the anxiety reactions altogether.” (p. 397). This is accomplished by: 1) recognizing early anxiety signals and 2) learning to cope with the situation through relaxation.

As described in Borkovec and Costello (1993), AR is based on the premise that anxiety involves interacting systems of cognitive, physiological, affective, and behavioral responses. These responses develop over time, with each one amplifying the others, increasing the intensity of the anxious response. Because each channel of responding influences the others, changes in one channel should affect the other responses as well. In other words, if psychological distress stems from a generalized stress activation response that is comprised of multiple central and peripheral physiological systems (e.g., Öst, 1987), then learning to reduce activation of one system (in this case, the muscular system) should also reduce activation in other systems (e.g., Gellhorn & Kiely, 1972). Therefore, AR is aimed at teaching clients to respond to anxiety with a different response, by decreasing muscle tension through relaxation before the cycle of anxiety has a chance to strengthen and increase. It is proposed that this will cause the response to spiral downward toward relaxation, rather than intensify further.

Brief Overview of Applied Relaxation Strategies

Öst (1987, 1988) provides a comprehensive review of the procedures that make up AR. As Öst highlights in these papers, similar to any good behavioral therapy, AR depends on developing a good case conceptualization/behavioral analysis (integrating knowledge of the

general theory of anxiety and relaxation reviewed above with a specific understanding of the client's presenting concerns) and a strong therapeutic relationship. Drawing from this conceptualization, the therapist begins by presenting the client with a rationale for how AR will be used and why it should work in his or her case with an emphasis on how changing the physiological responses can change the cycle of anxiety. The treatment model is then presented with a focus on the role of AR. AR is introduced as a coping skill that can be applied rapidly in any situation to weaken the anxiety response and develop new, non-anxious habits of responding. The goal of AR is to be able to relax in a short time (20–30 seconds) and to use this skill in the moment to reduce the physiological reactions and therefore the cycle of anxiety.

During early sessions, therapists help clients to recognize their early signs of anxiety. In Öst's AR, this is primarily accomplished through self-monitoring activities. Clients are asked to pay attention to and record situations in which they experience anxiety as well as their reactions to these situations throughout the week. They learn to distinguish between cognitive, affective, physiological, and behavioral cues during this process of monitoring.

At the same time that clients are engaging in self-monitoring and reviewing this monitoring in each session with the therapist, relaxation-skill building starts by teaching progressive muscle relaxation so clients can achieve a state of relaxation. Progressive muscle relaxation techniques are based on the work of Jacobson (1938) and Wolpe and Lazarus (1966). PMR is based on the theory that, because anxiety and relaxation are associated with opposing systems (sympathetic versus parasympathetic autonomic nervous systems), relaxation is incompatible with tension and anxiety. Therefore applying relaxation should decrease anxiety and tension, specifically. In general, relaxation training progresses from longer methods practiced in a setting with minimal distractions to shorter exercises that can more easily be practiced in public settings under myriad conditions. The relaxation exercises first involve tensing and releasing various muscle groups sequentially in order to relax the entire body. The tension cycle provides an opportunity to observe the sensations of tension in each muscle group and also creates a kind of "pendulum" effect so that the release of tension produces a more pronounced state of muscular relaxation than would relaxing on its own. These relaxation methods are both led by therapists in session and practiced regularly at home between sessions (ideally twice a day). For many clients with GAD, this in-depth practice is the first time they experience a state of relaxation, providing strong motivation to continue with the lengthy practice. Some clients report more anxiety when they first begin a relaxation practice; however, this increased anxiety is typically short lived. To help mitigate this anxiety, we have found it helpful to explain to clients that an increase in anxiety in the beginning is common and that continued practice will lead to more relaxation in time. As individuals are able to reliably produce relaxation with longer practices, the length is reduced by combining muscle groups. As the habit of relaxation is learned, the relaxation techniques are shortened again by having the clients do release-only relaxation in which clients relax the muscles without first producing tension. This moves closer to a coping method that can more readily be applied in response to anxiety cues as part of daily life.

Next, therapists teach cue-controlled relaxation to create a conditioned association between the word "relaxing" and the state of being relaxed. Here, the client uses the release-only relaxation to fully relax, and then the client is asked to stay in this relaxed state as she or he repeats the word "relaxing" each time she or he exhales. In this way, the word "relaxing" becomes paired with the feeling of relaxation so that eventually the word alone will induce a relaxed state.

To further promote the adaptation of relaxation practice to real life situations, therapists teach differential relaxation to promote relaxation in situations that involve movement and

other activities. Here, clients learn to relax unnecessary tension in muscles needed for a given activity and to relax completely the parts of the body that are not needed for that activity (e.g., relaxing shoulder muscles while walking). Clients first relax using the release-only or cue-controlled relaxation procedures and then therapists ask clients to start moving various parts of the body (e.g., lifting the arm) while remaining in the relaxed state. Next, therapists ask clients to relax when engaging in activities such as writing at a desk, standing, or walking. As with all the other strategies, clients practice these skills between sessions.

The final relaxation strategy taught is rapid relaxation, a practice that combines previously learned relaxation skills. The goal of rapid relaxation is to have a short (20–30 second), portable skill that can be used in a variety of situations. Here therapists ask clients to take a deep breath, think the word “relaxing” while exhaling (cue-controlled relaxation), while also scanning the body for spots of tension and releasing that tension (differential relaxation) as they engage in daily life activities. In the beginning, clients are asked to practice this skill several (15–20) times a day in non-stressful situations, often linked to a specific cue such as noticing one’s phone. Once the client has practiced the skill of rapid relaxation, she or he is then asked to apply this skill in response to early anxiety cues. This allows the client to learn to reduce anxiety in anxiety-provoking situations, keeping the anxiety from interfering with the activity. For a more detailed description of any of these relaxation practices, please see Bernstein and colleagues (2000) or Öst (1987, 1988).

Efficacy of AR for GAD

Although initial research on AR focused on panic disorder (Öst, 1987), social phobia (Öst, Jerremalm & Johansson, 1981), and specific phobia (Öst, Johansson, & Jerremalm, 1982), a large body of research now shows that AR is an efficacious treatment of GAD. Because GAD is characterized by anxiety, tension, and chronic and persistent worry (American Psychiatric Association, 2000), AR’s focus on the physiological response of reducing tension through relaxation is a natural fit. Early on, Öst (1985) published a case study showing improvement in GAD following AR. Soon after, Tarrier and Main (1986) showed that components of AR were more efficacious in treating general anxious arousal and panic attacks than a wait-list condition when administered in a single session. Since that time, several methodologically rigorous studies have examined the efficacy of AR. For example, randomized controlled trials demonstrated that AR was more efficacious than a nondirective, reflective listening therapy (Borkovec & Costello, 1993) and roughly as efficacious as cognitive therapy (Arntz, 2003; Öst & Breitholtz, 2000), cognitive behavioral therapy (Borkovec & Costello, 1993; Dugas et al., 2010), acceptance-based behavioral therapy (Hayes-Skelton et al., 2012), and worry exposure (Hoyer et al., 2009) in treating GAD. However, in both the Borkovec and Costello and the Dugas and colleagues studies, CBT led to more clinically significant change by one year follow-up or to significant change in more outcomes, respectively, compared to AR. In a follow up to the Dugas et al study, Donegan and Dugas (2012) compared changes in worry and somatic symptoms across CBT and AR since CBT is hypothesized to more directly target worry and AR is hypothesized to more directly target somatic symptoms. Overall, they found that, as expected, change in worry mediated changes in somatic symptoms to a greater degree in CBT than in AR. However change in somatic symptoms mediated changes in worry to an equivalent degree in both treatments. Further supporting the efficacy of AR, a meta-analysis by Siev and Chambless (2007) found that cognitive therapy and relaxation therapy were equivalent treatments for GAD. Because of the strength of AR in these empirical studies, it has been recognized as an empirically-supported treatment for GAD (Chambless & Ollendick, 2001).

Further Developments of Applied Relaxation

Building on the work by Öst, Borkovec and Costello (1993), Bernstein and colleagues (2000) further adapted the AR model for GAD in several ways: increasing the focus on identifying the chains of worrisome thoughts with a focus on the importance of detecting the early cues of anxiety; systematically applying relaxation in session in response to early cues; and using imaginal rehearsal of applied relaxation through self-control desensitization.

It is theorized that because of the cyclical nature of anxiety, the chain of worrisome thoughts, physical sensations, urges, and behaviors builds over time (although the timeframe can be quite short), typically becoming stronger as the cycle continues. Because of this, there is a point in the cycle where the thoughts, sensations, urges, and behaviors are not as strong. Applying relaxation at these early points should enhance its efficacy since it is easier for the relaxation to have its effect when anxiety is lower. However, it is typically much more difficult to recognize anxiety until it has reached a high level. Therefore, Bernstein, Borkovec and colleagues added specific techniques to AR to explicitly help individuals increase their awareness of earlier signs of anxiety. These techniques have clients repeatedly replay anxiety provoking situations in their imagination while continually prompting the client to pay attention to what anxiety cues occurred earlier and earlier. In this way, the client is asked to recreate the cycle of anxiety moving backward in time. As these imaginal presentations are conducted in session, clients are then asked to apply relaxation as they notice the early signs of anxiety. In addition to applying relaxation in response to early cues during the imaginal presentations, relaxation can (and should) be applied any time that the client notices an early cue of anxiety during session. Ideally, clients should be applying relaxation at least 3–5 times in each session. Clients can be prompted to let the therapist know as soon as they are aware of any early signs of anxiety. Because this is very difficult for clients to do, especially earlier in therapy, the therapist can also check in periodically to ask whether any anxiety has arisen. In this way, clients are able to frequently practice applied relaxation, often at earlier points than they would in day-to-day life because of the increased focus on the early signs during sessions. This practice likely allows the client to improve their self-efficacy with the applied relaxation practices.

Building on Goldfried's (1971) self-control desensitization procedures, clients can be asked to repeatedly imagine a stressful or anxiety provoking situation once in a relaxed state. Here, clients imagine a stressful situation until they feel anxious, then they imagine staying in the situation and applying relaxation. They continue to imagine staying in the situation until they feel relaxed. These imaginal situations can be introduced in a graduated fashion so that, over the course of therapy, clients are gaining practice applying relaxation to more and more challenging situations. These self-control desensitization procedures are combined with *in vivo* practice situations outside of session. After the client has gone through the procedures imaginally, they can be asked to engage in the actual situation while applying relaxation. Together, the addition of self-control desensitization and vigilant attention to the earliest cues of anxiety in session provides the client with a more intensive practice of applied relaxation, likely resulting in an enhanced ability to effectively use relaxation as a coping response in daily life.

Enhancing Applied Relaxation through a Focus on Mechanisms of Action

While the theory presented earlier focuses on reduced muscle activation as the primary mechanism through which AR reduces anxiety, the research on the role of reduced muscle activation has provided mixed results (see Conrad & Roth, 2007 for a review). Therefore, while the reduction in tension likely plays a role in the efficacy of AR, there are probably other mechanisms of action that are also involved. Looking to theories of GAD may

highlight specific maintaining factors of GAD that may elucidate potential mechanisms of action in AR.

Theories of GAD

The fourth author has proposed an avoidance theory of GAD (Borkovec, Alcaine, & Behar, 2004), noting that worry in GAD serves an avoidant function in numerous ways (e.g., the need to find solutions to an unsolved problem, restrictions in somatic activation, and distraction from more distressing topics). Experimental studies (for a review see Borkovec et al., 2004) indicate that worry does indeed reduce autonomic arousal and yet also maintains anxious responding and interferes with new, non-anxious learning. We have integrated the avoidance theory of worry with acceptance-based behavioral models of psychopathology (Roemer & Orsillo, 2002), leading to the suggestion that GAD is partially maintained by a reactive, fused, judgmental relationship with internal experiences, rigid avoidance and suppression of painful experiences (experiential avoidance), and reduced involvement in meaningful activities (behavioral constriction). For example, individuals with symptoms of GAD report greater negative reactivity toward their emotions (Lee, Orsillo, Roemer, & Allen, 2010; Mennin, Heimberg, Turk, & Fresco, 2005), view their worrisome thoughts as more dangerous and uncontrollable (Wells & Carter, 1999), and report more intolerance of thoughts and feelings related to uncertainty (Dugas, Gagnon, Ladouceur, & Freeston, 1998) compared to nonanxious individuals. These critical, judgmental reactions are proposed to amplify and prolong distress. Viewing internal experiences such as anxious thoughts and feelings as potentially dangerous, all-consuming, and permanent can motivate individuals to distract themselves, try to change the content of what they are feeling or thinking, and, if that fails, elicit a strong urge to escape or avoid one's internal experiences. Although attempting to avoid anxiety-provoking stimuli is a natural response to uncomfortable experiences, this response is often ineffective and may actually paradoxically increase distress (Salters-Pedneault, Tull, & Roemer, 2004). This experiential avoidance, or the internal strategies aimed at suppressing anxious thoughts, feelings, or sensations, decreasing their frequency, or changing their form (e.g., Hayes et al., 1996) differentiates those with and without a diagnosis of GAD (Lee et al., 2010). Thus, a self-perpetuating cycle of anxiety develops in which critical, avoidant reactions to internal experiences (or "reactions to reactions", Borkovec & Sharpless, 2004) trigger attempts to suppress and avoid, which compound distress, cuing more negative reactions and stronger avoidance efforts. Likewise, this unwillingness to experience what is perceived as dangerous and constant anxiety can lead to avoidance of situations that elicit anticipatory anxiety. Because this behavioral avoidance is immediately reinforced by a reduction in anxiety, it then becomes easier to avoid in the future, resulting in a pattern where avoidance becomes a habitual response to anxiety-provoking situations.

From this perspective, worry and anxiety are maintained by a problematic, fused relationship with internal experiences, experiential avoidance, and behavioral constriction, and they are reinforced through worry's function as a distraction from more distressing topics. Therefore, effective treatments should modify these maintaining factors. Strategies that cultivate *mindfulness* (a curious, non-judgmental awareness of the present moment, Kabat-Zinn, 2005); promote *decentering* (the process of seeing thoughts and feelings as objective events in the mind rather than personally identifying with them, Safran & Segal, 1990); increase *acceptance* (the recognition that experiences will come and go and that judging or resisting them is not useful, which is in opposition to experiential avoidance, Hayes, Luoma, Bond, Masuda, & Lillis, 2006); and increase *behavioral engagement* should lead to changes in the symptoms of GAD.

Mindfulness, present moment awareness, and decentering

Many of the strategies used in AR likely cultivate mindfulness and decentering as relaxation is functionally similar to mindfulness (Borkovec & Sharpless, 2004). As described in Bernstein et al. (2000), relaxation techniques may also promote present moment awareness as clients who may typically seek to avoid or ignore anxiety-related symptoms are encouraged to draw attention toward the sensations of tension and relaxation in the body (a present moment experience) and away from the content of worry (which is future focused). Thus, through relaxation clients might learn to allow worried thoughts to pass through their minds. This may weaken the habit of worry while strengthening the habit of attending to the present moment, promoting new, nonthreatening learning, and reducing the interference of worry in this process.

In addition to present-moment awareness, mindfulness also involves a compassionate, less judgmental type of awareness (Kabat-Zinn, 2005). This part of mindfulness is not explicit in PMR, and not all clients receiving PMR seem to experience this self-compassionate, mindful awareness. However, some clients do appear to use PMR and early cue detection to change their relationships with their internal experiences in a mindful, decentered, and self-compassionate way (for instance, noting that their thoughts are just thoughts and that they occur naturally and are habits, rather than signs of weakness; Hayes-Skelton, Usmani, Lee, Roemer, & Orsillo, 2012).

Additionally, the self-monitoring involved in noticing when to apply relaxation likely changes an individual's relationship with anxiety. Self-monitoring requires an individual to develop a more objective and curious type of awareness toward their experience. Typically, because anxiety is uncomfortable and prompts avoidance, individuals' efforts are aimed towards pushing away and/or ignoring their internal anxious responses, resulting in reduced awareness of their anxiety spirals. Therefore, simply paying attention to anxiety cues and writing them down and/or reporting on them naturally shifts this pattern of experiential avoidance toward one of curiosity and approach, rather than avoidance. Additionally, these self-monitoring activities naturally create an opportunity for a more objective experience toward thoughts. For example, simply saying thoughts out loud or writing them down often reduces the reactivity associated with thoughts.

Acceptance

Applied Relaxation may influence acceptance in a number of ways. For example, PMR may also promote acceptance as clients are instructed to continue with the practice while not responding with avoidance, regardless of what comes up during the exercise. Many clients report that they worry during PMR, and so the repeated experience of practicing may be teaching clients that they can have worries without needing to respond to them, demonstrating that if they just let the worries be and focus their attention elsewhere (on relaxation), then the worries or their response to the worries eventually do change on their own.

Most notably, the self-control desensitization or other imaginal recall techniques require the client to vividly recall anxiety-provoking situations. As described in more detail in the next section, similar to techniques used in other forms of behavior therapy, this re-experiencing method may serve the function of having clients notice their anxious responses while the therapist helps them to stay with the experience, encouraging clients to approach rather than avoid. Rather than automatically responding to signs of anxiety, self-monitoring of cues also requires clients to approach the cues. All of these aspects of AR likely increase the clients' acceptance of the anxiety experience.

Engagement in previously avoided situations

Of note, the applied portion of AR has an explicit focus on engaging in situations that were previously avoided. The focus on the applied practice means that clients in AR are continually and intentionally approaching and staying in situations that they have previously avoided. Consistent with inhibitory learning (Craske, Kircanski, Zelikowsky, Mystkowski, Chowdhury, & Baker, 2008), emotional processing (Foa, Huppert & Cahill, 2006), and self-efficacy (Bandura, 1977) theories underlying exposure therapy for anxiety disorders, this intentionally approaching and staying in previously avoided situations likely leads to an increased likelihood that the individual will engage in similar situations in the future, thus reducing anxiety over time. For example, using relaxation as a learned coping response to approach situations likely increases self-efficacy and a sense of performance accomplishment, which likely decreases the negative, fused reactions related to anxiety in these situations, thus increasing the likelihood of engaging in similar situations in the future. Additionally, engaging in previously avoided, potentially anxiety provoking situations likely serves as an exposure, allowing for emotional processing or new learning to occur. Exposure-based treatments, which are effective in reducing fear and anxiety in a variety of anxiety disorders (e.g., Norton & Price, 2007), promote new learning when the individual approaches the feared stimulus, yet the feared outcome does not occur (see Craske et al, 2008; Foa, et al., 2006). Similarly, Arch and Craske (2008) write about how exposure likely enhances acceptance by demonstrating that it is possible to engage in situations while experiencing anxiety. Taken together, using applied relaxation strategies to stay in previously avoided situations likely creates the context in which this new learning can occur.

Preliminary evidence

Initial evidence for the role of some of these potential mechanisms of action comes from a case series paper that presented three cases of AR for GAD (Hayes-Skelton et al., 2012). Overall, these three cases evidenced changes in mindfulness, decentering, and acceptance over the course of AR. Other research with larger samples has also shown that individuals receiving AR report significant increases in these three potential mediators of change (Hayes-Skelton, Roemer, & Orsillo, November, 2012), as well as a reduction in negative metacognitive appraisal (Hoyer et al., 2009) over the course of therapy. However, more systematic research is needed in order to examine these potential mechanisms in AR and to determine the directionality of the influences. Here, we have focused on the ways that AR may lead to change in symptoms through these mechanisms; however, the temporal order of the relationships between these variables has yet to be determined.

Suggestions for addressing mechanisms in AR

These mechanisms have likely been operating implicitly in AR as it has traditionally been practiced, and the evolution of AR (e.g., Bernstein et al., 2000) likely targets them even more effectively. However, drawing attention to and explicitly focusing on these mechanisms within AR may have the benefit of increasing its efficacy while also maintaining its simplicity. For example, providing clients with an exposure-based rationale of the benefits of approaching and staying in anxiety-provoking situations could enhance motivation and improve compliance with between-session practices. Such a rationale could also help clients stay in the situations longer, even when their anxiety is not fully reduced by AR. Similarly, explicit acceptance and decentering language may be incorporated in PMR (for additional suggestions see Bernstein et al., 2000). For example, using language that promotes the process of relaxation rather than forcing a particular state (“moving toward relaxation” vs. “completely relax your muscles now”) can promote acceptance by highlighting that some tension may remain and so any movement towards relaxation is progress rather than implying that any sign of tension indicates that the client is not doing the practice correctly. Language that encourages curiosity, such as “noticing the sensations

in your arms” encourages the client to stay engaged with the sensations rather than experientially avoiding them. As Bernstein et al. (2000) note, clients can be encouraged to “let go” of distressing thoughts or emotions as they “let go” of the muscle tension. Cultivating curiosity instead of judgment can also be helpful in learning to detect early cues. Another way to promote acceptance is to use the gerund form of verbs (i.e. “moving toward relaxation” instead of “relax”). In reviewing early cues, language that promotes decentering may involve identifying sensations as sensations or thoughts as thoughts: for example using “you have the sensation of your heart racing” rather than “your heart is racing” or “you have the thought that you are going to fail your class” instead of “knowing you’re going to fail your class”.

Future Directions for Applied Relaxation as a Treatment of GAD

To further improve upon the benefits of AR as a treatment for GAD, research is needed to identify specific mechanisms of action. Several hypothesized mechanisms could be contributing to change; however, systematic research is needed in order to elucidate the primary mechanisms of action that should be further promoted in AR practice. This research should include the potential mechanisms mentioned here, but also consider other potentially important processes such as the role of implementation intention (Gollwitzer, 1999). Similarly, research is needed to determine the directionality of these relationships between these mechanisms and the techniques in AR. Further, dismantling studies (experimental studies on the components of AR) are needed to improve our understanding of which components of AR in which combinations and which order are most effective. For example, there is evidence that the applied portion of AR is essential (Öst, 1988), but what about the other relaxation components? How much practice is needed before moving on to the shorter relaxation exercises? Many of our clients come to treatment with busy lives that make it difficult to regularly practice the longer relaxation methods; however, they seem to benefit from the treatment. Can the treatment be adapted to be more flexible?

Additionally, one of the fourth author’s emphases has been on fully attending to the early cues and frequently practicing relaxation applications within sessions. This really cements for our clients how to notice and respond to cues through this repeated practice. For example, going through situations repeatedly and in-depth to continue to notice earlier and earlier cues of anxiety likely helps clients to change their relationship with their internal experiences. In our experience, this deep practice of early cue detection promotes powerful change in AR. However, this level of analysis would also likely be beneficial in other forms of therapy, although it is rarely practiced with this intensity and focus.

A final future direction of AR is to see whether these treatment strategies can be combined with other treatment approaches for GAD to improve outcomes. For example, the simple and concise focus of AR may provide an easier introduction to therapy, while quickly providing some relaxation and awareness skills. Introducing these skills early in therapy could give the client some immediate self-efficacy and trust in the therapist, while also decreasing anxiety and worry, making it easier for the client to concentrate in session. If clients experience a slight decrease in their general arousal, it may be easier to absorb some of the more complicated theories and methods involved in other treatments for GAD.

As we said from the outset, we have a deep appreciation for AR as treatment for GAD. It has a long history of being the treatment of choice for many, although it has received less in-depth attention more recently. We wrote this paper both to honor the development and history of AR and to inspire the next generation of clinicians and researchers to continue the long tradition of treating individuals with GAD with this powerful and efficacious treatment.

References

- American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4. Washington, DC: American Psychiatric Association; 2000. text rev
- Arch JJ, Craske MG. Acceptance and commitment therapy and cognitive behavioral therapy for anxiety disorders: Different treatments, similar mechanisms? *Clinical Psychology: Science and Practice*. 2008; 15:263–279.10.1111/j.1468-2850.2008.00137.x
- Arntz A. Cognitive therapy versus applied relaxation as treatment of generalized anxiety disorder. *Behaviour Research and Therapy*. 2003; 41:633–646.10.1016/S0005-7967(02)00045-1 [PubMed: 12732372]
- Bandura A. Self efficacy: Toward a unifying theory of behavioural change. *Psychological Review*. 1977; 84:191–215. [PubMed: 847061]
- Barrios BA, Shigetomi CC. Coping-skills training for the management of anxiety: A critical review. *Behavior Therapy*. 1979; 10:491–522.
- Beck JG, Stanley MA, Baldwin LE, Deagle EA, Averill PM. Comparison of cognitive therapy and relaxation training for panic disorder. *Journal of Consulting and Clinical Psychology*. 1994; 62:818–826.10.1037/0022-006X.62.4.818 [PubMed: 7962886]
- Bernstein, DA.; Borkovec, TD. *Progressive relaxation training: A manual for the helping professions*. Research Press; Champaign, IL: 1973.
- Bernstein, DA.; Borkovec, TD.; Hazlett-Stevens, H. *New directions in progressive relaxation training: A guidebook for helping professionals*. Westport, CT: Praeger Publishers; 2000.
- Borkovec, TD.; Alcaine, OM.; Behar, E. Avoidance theory of worry and generalized anxiety disorder. In: Mennin, DS.; Heimberg, RG.; Turk, CL., editors. *Generalized anxiety disorder: Advances in research and practice*. New York, NY: Guilford Press; 2004. p. 77-108.
- Borkovec TD, Costello E. Efficacy of applied relaxation and cognitive-behavioral therapy in the treatment of generalized anxiety disorder. *Journal of Consulting and Clinical Psychology*. 1993; 61:611–619.10.1037/0022-006X.61.4.611 [PubMed: 8370856]
- Borkovec, TD.; Sharpless, B. Generalized anxiety disorder: Bringing cognitive-behavioral therapy into the valued present. In: Hayes, SC.; Follette, VM.; Linehan, MM., editors. *Mindfulness and acceptance: Expanding the cognitive-behavioral tradition*. New York: Guilford; 2004. p. 209-242.
- Butler G, Fennell M, Robson P, Gelder M. Comparison of behavior therapy and cognitive behavior therapy in the treatment of generalized anxiety disorder. *Journal of Consulting and Clinical Psychology*. 1991; 59(1):167–175.10.1037/0022-006X.59.1.167 [PubMed: 2002134]
- Chambless DL, Ollendick TH. Empirically supported psychological interventions: Controversies and evidence. *Annual Review of Psychology*. 2001; 52:685–716.10.1146/annurev.psych.52.1.685
- Chang-Liang R, Denney DR. Applied Relaxation as training in self-control. *Journal of Counseling Psychology*. 1976; 23:183–189.
- Conrad A, Roth WT. Muscle relaxation therapy for anxiety disorders: It works but how? *Journal of Anxiety Disorders*. 2007; 21:243–264.10.1016/j.janxdis.2006.08.001 [PubMed: 16949248]
- Craske MG, Kircanski K, Zelikowsky M, Mystkowski J, Chowdhury N, Baker A. Optimizing inhibitory learning during exposure therapy. *Behaviour Research and Therapy*. 2008; 46:5–27.10.1016/j.brat.2007.10.003 [PubMed: 18005936]
- Donegan E, Dugas MJ. Generalized anxiety disorder: A comparison of symptom change in adults receiving cognitive-behavioral therapy or applied relaxation. *Journal of Consulting and Clinical Psychology*. 2012; 80:490–496.10.1037/a0028132 [PubMed: 22506794]
- Dugas MJ, Brillon P, Savard P, Turcotte J, Gaudet A, Ladouceur R, Gervais NJ. A randomized clinical trial of cognitive-behavioral therapy and applied relaxation for adults with generalized anxiety disorder. *Behavior Therapy*. 2010; 41:46–58.10.1016/j.beth.2008.12.004 [PubMed: 20171327]
- Dugas MJ, Gagnon F, Ladouceur R, Freeston MH. Generalized anxiety disorder: A preliminary test of a conceptual model. *Behaviour Research and Therapy*. 1998; 36:215–226.10.1016/S0005-7967(97)00070-3 [PubMed: 9613027]
- Foa, EB.; Huppert, JD.; Cahill, SP. Emotional processing theory: An update. In: Rothbaum, BO., editor. *Pathological anxiety: Emotional processing in etiology and treatment*. New York, NY: Guilford Press; 2006.

- Foa, EB.; Rothbaum, BO.; Kozak, MJ. Behavioral treatments for anxiety and depression. In: Kendall, PC.; Watson, D., editors. *Anxiety and depression: Distinctive and overlapping features*. San Diego, CA: Academic Press; 1989.
- Gellhorn E, Kiely WF. Mystical states of consciousness: Neurophysiological and clinical aspects. *Journal of Nervous and Mental Disease*. 1972; 154:399–405. [PubMed: 5030966]
- Goldfried MR. Systematic desensitization as training in self-control. *Journal of Consulting and Clinical Psychology*. 1971; 37:228–234.10.1037/h0031974 [PubMed: 5116681]
- Gollwitzer PM. Implementation intentions: Strong effects of simple plans. *American Psychologist*. 1999; 54:493–503.
- Hayes SC, Wilson KG, Gifford EV, Follette VM, Strosahl K. Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*. 1996; 64:1152–1168.10.1037/0022-006X.64.6.1152 [PubMed: 8991302]
- Hayes SC, Luoma JB, Bond FW, Masuda A, Lillis J. Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy*. 2006; 44(1):1–25.10.1016/j.brat.2005.06.006 [PubMed: 16300724]
- Hayes-Skelton, SA.; Roemer, L.; Orsillo, SM. A randomized clinical trial comparing an acceptance based behavior therapy to applied relaxation for generalized anxiety disorder. 2012. Manuscript under review
- Hayes-Skelton, SA.; Roemer, L.; Orsillo, SM. Mechanisms of Change in an Acceptance-Based Behavioral Therapy and Applied Relaxation for Generalized Anxiety Disorder. Paper presented at the annual meeting of the Association for Behavioral and Cognitive Therapies; National Harbor, MD. 2012 Nov.
- Hayes-Skelton SA, Usmani A, Lee J, Roemer L, Orsillo SM. A fresh look at potential mechanisms of change in Applied Relaxation: A case series. *Cognitive and Behavioral Practice*. 2012; 19:451–462.10.1016/j.cbpra.2011.12.005 [PubMed: 23888107]
- Hoyer J, Beesdo K, Gloster AT, Runge J, Höfler M, Becker ES. Worry exposure versus applied relaxation in the treatment of generalized anxiety disorder. *Psychotherapy and Psychosomatics*. 2009; 78:106–115. [PubMed: 19218829]
- Jacobson, E. *Progressive relaxation*. Oxford, England: University of Chicago Press; 1938.
- Kabat-Zinn, J. *Coming to our senses: Healing ourselves and the world through mindfulness*. New York: Hyperion; 2005.
- Lee J, Orsillo SM, Roemer L, Allen L. Distress and avoidance in generalized anxiety disorder: Exploring the relationships with intolerance of uncertainty and worry. *Cognitive Behaviour Therapy*. 2010; 39:126–136.10.1080/16506070902966918 [PubMed: 19714542]
- Mennin DS. Emotion regulation therapy for generalized anxiety disorder. *Clinical Psychology and Psychotherapy*. 2004; 11:17–29.10.1002/cpp.389
- Norton PJ, Price EP. A meta-analytic review of cognitive-behavioral treatment outcome across the anxiety disorders. *Journal of Nervous and Mental Disease*. 2007; 195:521–531.10.1097/01.nmd.0000253843.70149.9a [PubMed: 17568301]
- Öst L-G. Coping techniques in the treatment of anxiety disorders: Two controlled case studies. *Behavioural Psychotherapy*. 1985; 13:154–161.10.1017/S0141347300010107
- Öst L-G. Applied relaxation: Description of a coping technique and review of controlled studies. *Behaviour Research and Therapy*. 1987; 25(5):397–409.10.1016/0005-7967(87)90017-9 [PubMed: 3318800]
- Öst L-G. Applied relaxation vs progressive relaxation in the treatment of panic disorder. *Behaviour Research and Therapy*. 1988; 26(1):13–22.10.1016/0005-7967(88)90029-0 [PubMed: 3277613]
- Öst L-G, Breitholtz E. Applied relaxation vs. cognitive therapy in the treatment of generalized anxiety disorder. *Behaviour Research and Therapy*. 2000; 38:777–790.10.1016/S0005-7967(99)00095-9 [PubMed: 10937426]
- Öst L-G, Jerremalm A, Johansson J. Individual response patterns and the effects of different behavioral methods in the treatment of social phobia. *Behaviour Research and Therapy*. 1981; 19:1–16.10.1016/0005-7967(81)90107-8 [PubMed: 7225032]

- Öst L-G, Johansson J, Jerremalm A. Individual response patterns and the effects of different behavioral methods in the treatment of claustrophobia. *Behaviour Research and Therapy*. 1982; 20:445–460.10.1016/0005-7967(82)90066-3 [PubMed: 6758757]
- Roemer L, Orsillo SM. Expanding our conceptualization of and treatment for generalized anxiety disorder: Integrating mindfulness/acceptance-based approaches with existing cognitive-behavioral models (Featured article). *Clinical Psychology: Science and Practice*. 2002; 9:54–68.10.1093/clipsy/9.1.54
- Russell RK, Sipich JF. Cue-controlled relaxation in the treatment of test anxiety. *Journal of Behavior Therapy and Experimental Psychiatry*. 1973; 4:47–49.10.1016/0005-7916(73)90038-4
- Safran, JD.; Segal, ZV. *Interpersonal process in cognitive therapy*. New York: Basic Books; 1990.
- Salters-Pedneault K, Tull MT, Roemer L. The role of avoidance of emotional material in the anxiety disorders. *Applied and Preventive Psychology*. 2004; 11:95–114.10.1016/j.appsy.2004.09.001
- Siev J, Chambless DL. Specificity of treatment effects: Cognitive therapy and relaxation for generalized anxiety and panic disorders. *Journal of Consulting and Clinical Psychology*. 2007; 75:513–522.10.1037/0022-006X.75.4.513 [PubMed: 17663606]
- Tarrier N, Main CJ. Applied relaxation training for generalized anxiety and panic attacks: The efficacy of a learnt coping strategy on subjective reports. *The British Journal of Psychiatry*. 1986; 149:330–336.10.1192/bjp.149.3.330 [PubMed: 3535980]
- Twohig MP, Hayes SC, Plumb JC, Pruitt LD, Collins AB, Hazlett-Stevens H, Woidneck MR. A randomized clinical trial of acceptance and commitment therapy versus progressive relaxation training for obsessive-compulsive disorder. *Journal of Consulting and Clinical Psychology*. 2010; 78:705–716.10.1037/a0020508 [PubMed: 20873905]
- Wells A, Carter K. Preliminary tests of a cognitive model of generalized anxiety disorder. *Behaviour Research and Therapy*. 1999; 37:585–594.10.1016/S0005-7967(98)00156-9 [PubMed: 10372471]
- Wolpe, J. *Psychotherapy by reciprocal inhibition*. Palo Alto, CA: Stanford University Press; 1958.
- Wolpe, J.; Lazarus, AA. *Behavior therapy techniques: A guide to the treatment of neuroses*. Elmsford, NY: Pergamon Press; 1966.