

Experiential Avoidance in Chronic Tic Disorders: An Online Survey and Pilot Treatment
Study Using Habit Reversal and Acceptance and Commitment Therapy

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Dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor
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ABSTRACT

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Abstract

Among some researchers, there is an emerging conceptualization of chronic tic disorders (CTDs) as conditions that are partially rooted in avoidance of tic-related private experiences (i.e., painful or difficult thoughts and feelings) and internal sensations (i.e., premonitory urges to tic). The first specific aim of the present research was to investigate the possibility that experiential avoidance is related to tic severity and perceived quality of life in individuals with CTDs. The second aim was to determine whether the efficacy of Habit Reversal Training (HRT), the most prevalent and effective behavioral intervention for CTDs to date, might be enhanced by combining it with Acceptance and Commitment Therapy (ACT), an intervention that directly targets experiential avoidance. These aims were addressed by conducting two related studies. Study I, an online survey, included 239 adults ($M = 37.6$ years; $SD = 13.8$ years) who reported having been previously diagnosed with a CTD. Results showed that levels of premonitory urges, as well as both general and tic-specific experiential avoidance, were significantly positively related to tic severity. General and tic-specific experiential avoidance were also significantly negatively related to perceived quality of life. Psychometric analyses of two novel measures developed for Study I (i.e., the Yale Global Tic Severity Scale–Self-Report Version and the Acceptance and Action Questionnaire–Tic-Specific Version) demonstrated excellent internal consistency and convergent

validity. Study II, a multi-site pilot investigation, involved 13 adolescents ($M = 15.4$ years; $SD = 1.3$ years) who were treated with either HRT alone or a novel HRT+ACT intervention. Results suggest that the HRT+ACT treatment is feasible, highly acceptable to both patients and parents, and as effective as HRT alone at reducing tic severity from pre-treatment through week 22 follow-up. Participants in both groups reported clinically significant post-treatment decreases in general and tic-specific experiential avoidance and improvements in overall functioning. Researchers concluded that experiential avoidance plays an important role in tic expression and overall functioning for individuals with CTDs. Results support additional development and testing of the promising HRT+ACT intervention, to evaluate its efficacy alone and in comparison to other relevant psychosocial and pharmacological interventions.

Dedication

To the unheard masses who struggle with mental illness and the healers who seek to comfort them. Your courage and quiet strength never fail to inspire me.

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1. Brief Summary and Specific Aims of the Project

Chronic tic disorders (CTDs) – including Tourette Syndrome (TS), Chronic Motor Tic Disorder, and Chronic Vocal Tic Disorder – have long been regarded by both researchers and clinicians as disorders of involuntary movement. For much of the last 50 years, CTDs have been considered primarily neurological disorders, ones that are not good candidates for behavioral intervention. Attitudes, however, are beginning to change. Though clinicians have traditionally believed that tics could only be treated with neuroleptic medications (Marcks, Woods, Teng, & Twohig, 2004), new research indicates that environmental contingencies play an important role in tic expression (Conelea & Woods, 2008a; Conelea & Woods, 2008b; Dingfelder, 2006; Himle & Woods, 2006; Himle, Woods, & Bunaciu, 2008; Meidinger et al., 2005; Woods et al., 2008; Woods, Walther, Bauer, Kemp, & Conelea, 2009). Drugs have shown promise as a first-line treatment (e.g., Arana-Lechuga et al., 2008), but outcomes are not ideal. Furthermore, side effects associated with antipsychotic drug treatment for tics are abysmal – everything from weight gain to fatigue to cognitive dulling (Correll, 2008; Dingfelder, 2006; Swain, Scahill, Lombroso, King, & Leckman, 2007). The time is ripe for an alternative treatment. Based on promising developments in nonpharmacological treatments for tic disorders, the National Institute of Mental Health recently awarded a grant to researchers at Johns Hopkins, UCLA, the University of Wisconsin–Milwaukee, Yale, Harvard, and Wilford

Hall Medical Center in San Antonio, Texas, to test a behavioral technique – known as the Comprehensive Behavioral Intervention for Tics (CBIT) program – for treating TS in both adults and children (Dingfelder, 2006).

Non-pharmacological treatments for tic disorders have included conditioning techniques, awareness training, massed negative practice, relaxation training, hypnosis, biofeedback, and habit reversal (Singer, 2005). However, few of these have been adequately assessed in terms of their effectiveness. Habit Reversal Training (HRT) is one exception, being the most prevalent and effective treatment identified in recent reviews of behavioral interventions for individuals with tic disorders (Armada & Cuesta, 2007; Carr & Chong, 2005; Chang, Piacentini, & Walkup, 2007; Cook & Blacher, 2007). HRT for tics (Azrin & Nunn, 1973; Azrin & Peterson, 1990) involves 3 primary components: (1) awareness training, in which the patient's awareness of his or her tics is increased, to facilitate better self-control; (2) competing response training, in which the patient is instructed to engage in a competing motor pattern every time he or she has the urge to tic; and (3) social support training, in which the patient is encouraged to enlist the support of family, friends, and/or mentors to praise and support him or her throughout the treatment. Over 30 studies evaluating HRT for tic and habit disorders have been published, with tic reductions ranging from 52% to 97% following HRT treatment (Peterson, 2007). While these results are certainly encouraging, they also indicate that up to 48% of tics have not responded to this particular intervention. At present, HRT is

classified as a *probably efficacious* treatment for nail biting and thumb sucking by the Task Force on Promotion and Dissemination of Psychological Procedures; however, it has not yet been classified as such for the treatment of tics (Task Force on Promotion and Dissemination of Psychological Procedures, 1995). Additional research is needed to determine whether and how HRT for tic disorders works (i.e., the mechanism through which the treatment exerts its influence), and whether its efficacy might be enhanced by combining it with other types of treatment. Such efforts may encourage the use and acceptability of non-pharmacological treatments for CTDs (Franklin & Himle, 2007; Woods, Conelea, & Walther, 2007).

The most common misbelief cited in opposition to treating CTDs with behavioral interventions is that tics are involuntary (Dewey, Tupper, & Bottos, 2004). On the contrary, phenomenological reports suggest that anywhere from 64% (Banaschewski, Woerner, & Rothenberger, 2003) to 92% (Leckman, Walker, & Cohen, 1993) of individuals with TS feel their tics are controllable to some degree. Many of these indicate that their tics are either fully or partially a voluntary response to premonitory urges, private (internal) sensations experienced just prior to tic occurrence. In one survey of 135 subjects with tic disorders, age 8 to 71 years, 93% of respondents reported awareness of such premonitory urges (Leckman et al., 1993); others have reported similarly high percentages of 77% (Kurlan, Lichter, & Hewitt, 1989) and 82% (Cohen & Leckman, 1992). These sensations are often experienced as a sensory urge for motor or vocal discharge,

and can be as debilitating as the tics themselves (Banaschewski et al., 2003; Turtle & Robertson, 2008). For example, Cohen (1992) found that 57% of subjects surveyed about sensory phenomena associated with their TS described the antecedent urges as more bothersome than the actual tics. The urges are variously described as a feeling of energy, pressure, itching, or aching immediately preceding a tic (Woods, Piacentini, Himle, & Chang, 2005). It is believed that performance of the tic satisfies the urge and relieves related emotional tension. In other words, "tics occur not because patients with Tourette's are impaired in inhibiting such a prepotent movement tendency; rather, they choose not to inhibit the urge to move or vocalize because of the mounting tension associated with such inhibition" (Li, Chang, Hsu, Wang, & Ko, 2006, p. 417).

Woods, Himle, Piacentini, & Scahill (2005) and Himle (2007) have proposed a neurobehavioral model of TS in which the negative physical and social consequences produced by tics both aid in establishment of awareness of the tics and result in the private, premonitory urge acquiring an aversive stimulus function. According to the model, children with TS begin to develop awareness of their tics as a result of feedback such as painful physical consequences or teasing by peers. Just as an animal who has learned that a green light predicts the delivery of a shock will rapidly learn to press a lever to escape the presence of the green light when illuminated (McAllister & McAllister, 1962), a child with TS who is experiencing physical or emotional pain as a result of ticcing will begin to associate the private, premonitory urge with the

aversiveness of the tics' consequences. Escape from the aversive antecedent urge reliably predicting the occurrence of a tic will then become reinforcing. From a behavioral perspective, the premonitory urge diminishes after the tic has been completed, and this dissipation is sensed as relief (Conelea & Woods, 2008a; Himle, 2007; Scahill, Leckman, & Marek, 1995; Turtle & Robertson, 2008). It is, thus, entirely possible that tics are negatively reinforced via the reduction of the unpleasant premonitory urge, contingent upon engaging in the tic.

If the negative reinforcement model of tics is valid and workable in an explanatory sense, then an intervention aimed at (1) increasing patients' willingness to experience otherwise aversive premonitory urges and associated thoughts and feelings, and (2) changing the fundamental relationship patients have with their urges, could be a valuable addition to the HRT protocol. Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999) is a unique, empirically based, behavioral intervention that uses acceptance and mindfulness strategies, together with commitment and behavior change strategies, to increase psychological flexibility. Psychological flexibility involves contacting the present moment fully as a conscious human being, and based on what the situation affords, changing or persisting in behavior in the service of chosen values. ACT flies in the face of the assumption that if something feels bad, one should try to get rid of it by acting on it directly. In contrast, ACT assumes that difficult private experiences (e.g., unpleasant thoughts, feelings, and sensations) do not tend to

disappear by avoiding, giving in, or trying to get rid of them (Wilson & Hayes, 1996). In the realm of tic disorders, things like distraction or ticing may bring temporary relief from an aversive premonitory urge, but as any sufferer of tics knows, the unpleasant premonitory sensations tend to return. The rule, “I must avoid my distressing feelings,” simply does not work in the long run. Such a directive only promotes psychological inflexibility and the use of negative thoughts and emotions as reasons for not moving in otherwise valued life directions. An adolescent with a CTD who avoids social activities with peers, hesitates to answer the phone when it rings, or doesn’t volunteer in class – for fear of ticing in front of others – is allowing the aversive private experiences associated with his or her tics to prevent him or her from pursuing otherwise valued activities. ACT patients gain the skills to recontextualize and accept these private events, develop greater clarity about personal values, and commit to needed behavior change.

Experiential avoidance has been implicated in the maintenance of other body-focused repetitive behaviors (BFRBs), a group of disorders that includes such “nervous habits” as hair pulling, skin picking, and nail biting. Building on this assumption, acceptance-based principles have subsequently been used to successfully treat disorders involving BFRBs. Experiential avoidance is the opposite of acceptance. More specifically, it is (a) an unwillingness to be in contact with negatively evaluated thoughts, feelings, and bodily sensations and (b) strategic attempts to alter the form, frequency, or situations that elicit these experiences, even when this struggle causes harm (Hayes et

al., 1999). Begotka, Woods, & Wetterneck (2004) conducted an anonymous survey of 436 adults with trichotillomania (TTM), to examine the relationship between experiential avoidance and TTM severity. Negative emotions (e.g., anxiety, tension, boredom, sadness) often precede pulling episodes and are temporarily reduced as an immediate consequence of pulling (Diefenbach, Mouton-Odum, & Stanley, 2002). This led Begotka et al. to hypothesize that TTM may function as a means to escape from or avoid aversive private experiences. As expected, the authors found a significant positive correlation between experiential avoidance and the frequency and severity of hair pulling. They concluded that a clinical intervention such as ACT, which encourages patients to discard their experientially avoidant behaviors, would likely be helpful in the alleviation of TTM.

Following the Begotka et al. (2004) study, an HRT+ACT intervention with TTM individuals resulted in significant reductions in hair pulling severity, impairment ratings, experiential avoidance, and anxiety and depressive symptoms compared to a waitlist control (Twohig & Woods, 2004; Woods, Wetterneck, & Flessner, 2006).

Furthermore, in an investigation of ACT for chronic skin picking, participants reached near-zero levels of picking by post-treatment, as measured by both self-reports and objective ratings of photographs of the damaged areas (Twohig, Hayes, & Masuda, 2006). Once again, reductions in anxiety, depression, and experiential avoidance were found for most participants as a result of the intervention. The aforementioned study

results are consistent with a conceptualization of BFRBs, including tics, as behaviors that are at least partially rooted in avoidance of private experiences and internal sensations.

The first specific aim of the current research was to investigate the possibility that experiential avoidance moderates the relationship between levels of premonitory urges and either tic severity and/or functional impairment in individuals with CTDs. The second specific aim of the present research was to determine whether HRT for CTDs works, and whether its efficacy might be enhanced by combining it with ACT. These aims were addressed by conducting two related studies, similar to the sequence of investigations just described for TTM (Begotka et al., 2004; Twohig & Woods, 2004; Woods et al., 2006). In the first study, addressing aim one, over 600 adults (age 18 or over) who reported having a formal diagnosis of TS, Chronic Motor Tic Disorder, or Chronic Vocal Tic Disorder and an onset of tics prior to 18 years of age completed an online survey that included measures of premonitory urges, experiential avoidance, tic severity, and overall functioning. This work was completed as part of a joint venture with the University of Wisconsin–Milwaukee and the Tourette Syndrome Association’s Medical Advisory Board. Two new measures were developed for use in this first study: a tic-specific version of the Acceptance and Action Questionnaire (AAQ-9; Hayes et al., 2004), and a self-report version of the Yale Global Tic Severity Scale (YGTSS; Leckman et al., 1989). The AAQ-9 is a measure of experiential avoidance that is often used in outcome studies of ACT, while the YGTSS is the most commonly used, clinician-rated

scale for assessing tic severity. A tic-specific version of the AAQ-9 and a self-report version of the YGTSS are unique contributions to the tic disorder literature and to researchers and clinicians working with CTDs. Psychometric evaluations of both new measures were conducted as part of the first study. The data from the online survey were then used to examine relationships among premonitory urges, experiential avoidance, tic severity, and functional impairment and to draw hypotheses about the function of experiential avoidance in the maintenance and exacerbation of CTDs.

In the second study, aim two was addressed. This study was completed in collaboration with researchers from Duke University Medical Center and the University of Pennsylvania School of Medicine, as part of the BEhavioral Treatment of Tics Study (BETTS) funded by the Tourette Syndrome Association. BETTS was designed to be a preliminary treatment development study, combining ACT with HRT to create a novel behavioral intervention for CTDs. As in the online survey study, individuals with a diagnosis of either TS, Chronic Motor Tic Disorder, or Chronic Vocal Tic Disorder were eligible to participate; however, the final group of participants consisted exclusively of individuals with TS. At each site, approximately half of the participants were treated with HRT, while the other half were treated with the HRT+ACT experimental intervention. Measures were filled out by both participants and clinicians at multiple time points, facilitating an in-depth look at the process of therapeutic change over time. As a result of the research activities described here, investigators at Duke and Penn were

able to develop the collaboration and infrastructure needed for a future, large-scale, clinical trial in which the efficacy of HRT and HRT+ACT can be directly compared, both with and without medication. Collectively, it is hoped that these studies will improve knowledge about behavioral interventions for CTDs, which may yield broader improvements in treatment access and quality of care for those who suffer from CTDs.

2. Background and Significance

2.1 Overview

The current investigation begins with a review of recent research on the conceptualization and treatment of tic disorders. First, the epidemiology and phenomenology of CTDs are summarized, and a very brief overview of changing conceptualizations of tic disorders through time is provided. Treatments for tics and the rationale for using behavioral interventions are then presented. Following a review of the research on Habit Reversal Training (HRT) – the most empirically supported behavioral intervention employed in the treatment of CTDs – concise descriptions of HRT and its possible mechanisms of action are given. In the process, the premonitory urge phenomenon is examined, along with the hypothesized negative reinforcement cycle that may play a role in the maintenance of CTDs. The discussion of premonitory urges lays the groundwork for a proposal that HRT be combined with ACT in the treatment of CTDs. Other examples of HRT+ACT interventions are provided, along with associated empirical support. Finally, justifications for the study design are offered.

2.1.1 Phenomenology and Epidemiology of Tourette Syndrome and Other Tic Disorders

Tics are defined as sudden, repetitive, and stereotyped movements or vocalizations that draw on one or more muscle groups, typically are experienced as being outside voluntary control, and often mimic the appearance of normal movement

or behavior (Leckman, King, & Cohen, 1999). In order to be diagnosed with a Chronic Motor or Vocal Tic Disorder, an individual must possess one or more motor *or* vocal tics (*but not both*) that occur many times a day, nearly every day or intermittently, throughout a period of more than 1 year (*DSM-IV*; APA, 1994). During this period, there must never be a tic-free period of more than 3 consecutive months, and the disturbance must cause marked distress or significant functional impairment. Finally, the age of onset must be earlier than 18 years. For a diagnosis of Tourette's Disorder to be given, the individual must have *both* motor and vocal tics, in addition to the aforementioned criteria.

A typical course for TS involves the emergence of simple tics (e.g., facial, eye blinking, or head/neck tics) around the age of 6 or 7, with a rostral-to-caudal (anterior-to-posterior) progression of increasingly complex motor tics occurring over the next several years (Piacentini, Pearlman, & Peris, 2007). Characteristically, vocal tics appear at age 8 or 9, and complex tics at age 11 or 12. The appearance and intensity of tics experienced by a given individual with TS commonly fluctuate over time, with impairment and dysfunction frequently attenuating with age. For most, tic severity reaches a maximum in early adolescence, followed by a consistent decline over the next decade or so. Studies show that only about 25% of youths with TS will continue to manifest moderate to severe tics into young adulthood (Leckman, Zhang, & Vitale, 1998).

Estimates of the prevalence of TS vary widely, depending on the diagnostic criteria, age range, sample source, and sample size used (Robertson, 2008b). Point prevalence estimates of TS range from 3.1 to 4.9 per 10,000 in adolescents to 10.5 to 13 per 10,000 in children (Piacentini et al., 2007). In community samples, prevalence varies from 0.1% when considering TS exclusively, to 2% when chronic motor or vocal tic disorders are included. For instance, the Great Smoky Mountains Study of psychiatric disorders among youth (Costello et al., 1996) estimated the 3-month weighted prevalence of motor tics, vocal tics, and TS to be 3.53%, 0.75%, and 0.10%, respectively. A recent review of epidemiological studies of TS, including data from 34 worldwide specialists, concluded that a figure of 1% would be a reasonable overall estimate of the international prevalence of TS (Robertson, 2008a). It is an unfortunate reality that a considerable number of these individuals will never present for or receive treatment (Piacentini et al., 2007). Zohar et al. (1999) estimated that the rate of occurrence of tic disorders derived from population samples is at least two orders of magnitude higher than estimates from clinical samples.

The significant proportion of individuals with tic disorders who have not received any form of psychiatric or behavioral treatment is disturbing when one considers the fact that these conditions are strongly associated with a variety of comorbid psychiatric conditions and impairments in psychosocial functioning (Canitano & Vivanti, 2007; Cavanna, Robertson, & Critchley, 2007; Lavoie, Thibault, Stip, &

O'Connor, 2007; Ma, Zhao, Zhao, & Song, 2007; Mol Debes, Hjalgrim, & Skov, 2008; Storch, Merlo, et al., 2007; Storch, Murphy, Chase, et al., 2007; Swain et al., 2007). Point prevalence estimates in clinic samples indicate that obsessive-compulsive disorder (OCD) is present in 40% to 50% of individuals with TS (Kadesjo & Gillberg, 2000; Pitman, Green, Jenike, & Mesulam, 1987), major depression in up to 60% (Wodrich, Benjamin, & Lachar, 1997), and attention-deficit hyperactivity disorder (ADHD) in 20% to 70% (Comings & Comings, 1984; Spencer et al., 1999; Kadesjo & Gillberg, 2000). Other associated difficulties can include demoralization and negative self-esteem, problems with social acceptability and peer relations, family problems, and occupational difficulties (Champion, Fulton, & Shady, 1988; Findley et al., 2003; Hubka, Fulton, Shady, Champion, & Wand, 1988; O'Connor, 2002; Woods, Himle, et al., 2005). CTDs in childhood have also been linked to increased aggression, impulsivity, anxiety disorders, and learning difficulties (Piacentini et al., 2007). Clearly, these are serious conditions that can be quite debilitating. Given the fact that comorbidity is the norm, rather than the exception, an approach to treatment that takes into account such diagnostic complexity is often required (Freeman & Tourette Syndrome International Database Consortium, 2007; Himle et al., 2007; Roessner, Becker, Banaschewski, & Rothenberger, 2007a; Swain et al., 2007).

2.1.2 Changing Conceptualizations of Tic Disorders Through Time

TS was originally conceptualized in the late 19th century as a neurological disorder with organic origins. However, given the lack of effective neurological treatments at the time, and the subsequent popularity and success of psychoanalysis at treating conditions such as hysteria, a psychological model for TS soon predominated (Kushner, 1999; Kusher, 2000; Woods, Piacentini, & Walkup, 2007). The downside of a psychological conceptualization was the insinuation that those with tics simply lacked the willpower to control their symptoms. This misbelief led to a host of intra- and interpersonal problems for individuals suffering from CTDs. In the mid-1960s, with advances in basic brain research, the discovery that antipsychotic medications could effectively reduce tics, and an increasing number of practitioners championing a biological model of TS, the pendulum once again swung back in the direction of a primarily organic/neurological view of tic disorders. This view continued to dominate throughout the latter half of the 20th century. As the body of research on the neurological foundations of TS grew, it became more and more unpopular to even consider psychosocial interventions as appropriate for the treatment of TS symptoms (Woods, Piacentini, et al., 2007).

In opposition to this purely neurological standpoint, a number of modern investigators have come to believe that, while tics are based in dysfunctional biological mechanisms, this biological world inevitably interacts with and is influenced by the

external environment (e.g., Conelea & Woods, 2008a; Dingfelder, 2006; Himle, 2007; Miltenberger, Fuqua, & Woods, 1998; O'Connor, 2002; Turtle & Robertson, 2008; Woods, Himle, et al., 2005). For example, it has been demonstrated that tic frequencies can be modified by reinforcement. Himle and Woods (2005) showed that children as young as 8 years of age can suppress their tics when presented with contingencies such as monetary rewards. They told seven children with TS, ages 8-11, that a manually operated token dispenser had the ability to detect tics (i.e., was a "tic detector"). The children were instructed that the "tic detector" would reward them with a token for every 10-second tic-free interval, and they could later exchange their tokens for money. Unbeknownst to the children, a behind-the-scenes experimenter actually controlled the dispensing of tokens. Participants were directed to suppress their tics using any strategy they found helpful. The experiment involved exposing the children to alternating conditions, in which they were either reinforced for brief tic-free periods (suppression) or not reinforced and told to tic if they needed to (baseline). Results showed that participants exhibited 70% fewer tics during periods in which they were reinforced, compared to baseline periods. In line with such research, numerous investigators have come to believe that tics are at least partially voluntary behaviors (Lang, 1991; Leckman, Walker, & Cohen, 1993; Li et al., 2006; Turtle & Robertson, 2008; Woods & Miltenberger, 1995).

Additional evidence for the impact of psychological factors comes from research demonstrating that tics can be exacerbated by anxiety. Silva, Munoz, Barickman, &

Friedhoff (1995) found that anxiety caused tics to worsen in 78% of children and adolescents with TS. Silva et al. asserted that being anxious is one of the more reliable predictors of tic occurrence. Certain features of anxiety may mimic the physical sensations associated with premonitory urges to tic; anxiety may thus come to elicit the urge through the process of stimulus generalization. Likewise, any situation that heightens interoceptive awareness – such as anxiety – is likely to increase the frequency of tics (Woods, Himle, et al., 2005). Data corroborating the connection between anxiety and premonitory urges comes from Woods, Piacentini, et al. (2005), who found a significant positive correlation between the Premonitory Urge for Tics Scale (PUTS) and the anxiety/depression subscale of the Child Behavior Checklist (CBCL) in youths with TS or another CTD.

It may be the case that the more unwilling a person is to experience anxiety, the more likely it is that physical sensations associated with anxiety will be interpreted negatively, producing a positive feedback loop in which anxious sensations beget even more anxious sensations. If that person also happens to have a CTD, then the more anxious he becomes, the more premonitory urges he is likely to experience, and the more tics he is likely to produce. Consequently, a behavioral intervention focused on increasing willingness to experience difficult private sensations such as anxiety and premonitory urges, may very well have a beneficial impact on tics.

In addition to anxiety, there is evidence showing that the premonitory urge phenomenon becomes correlated with a multitude of other behavioral problem domains – including depression, social difficulties, aggression, withdrawal, and somatic complaints – as individuals with TS get older (Storch, Merlo, et al., 2007; Storch, Murphy, Chase, et al., 2007; Woods, Himle, et al., 2005). This suggests that as TS progresses, it becomes more related to maladaptive psychosocial outcomes.

Finally, there is evidence to suggest that individual cognitive factors may play a role in tic expression. For example, CTDs have been associated with heightened sensory awareness and self-attention, making people who tic keenly aware of their symptoms (O'Connor, 2002). Negative appraisals of tics are also common in those who suffer from tic disorders (e.g., “My tics are bad and embarrassing. I must not tic in front of others, or they will think I’m weird.”). In combination, these two factors tend to exacerbate CTD symptoms by amplifying anxiety in “trigger” situations – often resulting in an increased frequency and intensity of premonitory urges (as previously described). Perfectionistic personal standards about self-image; hyper-vigilance to sensory states; and feelings of frustration, impatience, and dissatisfaction with the self are all associated with tic disorders (O'Connor, 2002). Such associations reinforce the idea that CTDs are not merely biological disorders; they are also shaped by cognitive and situational factors.

In summary, the impact of things like socially imposed rewards, subjective responses to anxiety, and individual cognitive factors on tic expression supports a

conceptualization of tics as at least partially voluntary and influenced by both internal and external environmental variables. The landmark work of Leckman and Cohen (1999) highlighted the need for an integrated biopsychosocial approach to the understanding and treatment of CTDs. Since then, there has been a resurgence of interest in the psychology of CTDs and a movement toward the creation of a comprehensive model that includes both neurobiological and environmental features.

2.1.3 Treatments for Chronic Tic Disorders

Despite growing acknowledgment of the role of psychological and environmental factors in the phenomenology and maintenance of CTDs, most tic disorders are still treated with pharmacotherapeutic agents (Dingfelder, 2006). As summarized by Harrison, Schneider, & Walkup (2007), neuroleptics such as haloperidol, pimozide, and fluphenazine are the best-evaluated and most potent medications indicated for tic suppression, resulting in as much as 70-80% tic reduction (Dingfelder, 2006). Unfortunately, not all CTD patients respond so well to pharmacotherapy; moreover, the side effect burden of these drugs can be considerable, including things like sedation, weight gain, dyskinesia, and cognitive dulling (Correll, 2008). Newer atypical neuroleptics such as risperidone and olanzapine are associated with a lower risk of tardive dyskinesia, but are once again hampered by unpleasant side effects, including weight gain and even new-onset diabetes (Correll, 2008). An added consequence of such

aversive side effects is that they can result in poor medication compliance and early termination of treatment. Furthermore, clinically complex patients may require multiple medication trials in order to determine which medications will provide them with the most benefit, and in which combination. Only a few drugs used to treat TS have been evaluated in placebo-controlled studies (Shavitt, Hounie, Campos, & Miguel, 2006), and there is scant research available on the pharmacological treatment of chronic motor or vocal tic disorders (Peterson, 2007). Taken as a whole, medications for CTDs can be very useful for some patients; however, a significant number of individuals exhibit only a partial response, the side effect burden can be considerable, and there is a subset of patients whose symptoms do not improve with pharmacotherapy.

Given the aforementioned problems with pharmacological interventions for CTDs, and the rising awareness of the importance of psychological and environmental factors in the conceptualization of these disorders, a variety of psychosocial treatment approaches have been developed. These include the following: (1) psychoeducation with supportive therapy, to help individuals with CTDs develop realistic expectations and identify personal strengths while they are simultaneously supported and reassured about the situation (Peterson & Cohen, 1998); (2) contingency management and function-based interventions, which enable individuals to systematically understand and alter external events that increase or decrease tics (see Peterson, 2007, for a review); (3) massed practice, in which the patient purposefully performs the tics with as much

effort as possible for a specified period of time, interspersed with brief periods of rest (e.g., Azrin, Nunn, & Frantz, 1980); (4) relaxation training, such as progressive muscle relaxation (Bergin, Waranch, Brown, Carson, & Singer, 1998; Peterson & Azrin, 1992); (5) hypnosis (Culbertson, 1989; Young & Montano, 1988); (6) awareness training and self-monitoring, combining therapist-assisted identification, description, and monitoring of tics in session with subsequent self-observation and systematic recording of tics by the patient outside of session (see Peterson, 2007, for a review); (7) exposure with response prevention, a proven treatment for OCD that has recently been applied to the treatment of TS (Verdellen, Keijsers, Cath, & Hoogduin, 2004; Woods, Hook, Spellman, & Friman, 2000); and (8) habit reversal, an integrated behavioral therapy that includes aspects of awareness training, relaxation training, competing response training, contingency management, and generalization training (see review below).

Out of all these psychosocial approaches to tic management, Habit Reversal Training (HRT) is the most extensively researched, having been evaluated in about 30 published studies (see reviews by Carr & Chong, 2005; Cook & Blacher, 2007; Miltenberger et al., 1998; Peterson, 2007; Piacentini & Chang, 2005; Swain et al., 2007; and Woods & Miltenberger, 1995). While most of these studies have utilized single-subject research designs, seven have employed randomized between-subjects designs with a control or comparison group (Azrin, Nunn, & Frantz, 1980; Azrin & Peterson, 1990; Deckersbach, Rauch, Buhlmann, & Wilhelm, 2006; O'Connor et al., 2001;

O'Connor, Gareau, & Borgeat, 1997; Verdellen et al., 2004; Wilhelm et al., 2003), and these are reviewed next.

Azrin et al. (1980) conducted the first randomized trial evaluating the efficacy of HRT for the treatment of CTDs. The investigators randomly assigned 22 institutionalized patients with tics to either HRT ($n = 10$) or massed practice ($n = 12$). Participants displayed a wide range of motor and vocal tics, both simple and complex. In the first group, HRT (described in the following section) was used to treat each participant's major or most disruptive tic. Massed practice subjects were instructed to perform their tics in front of a mirror for 30-second periods, during a 1-hour session, while simultaneously saying to themselves, "This is what I am not supposed to do." HRT resulted in an 84% reduction in tics after the first day, compared to a 33% reduction in the massed practice group. At a 4-week follow-up, only 17% of the massed practice patients were tic-free, compared to 80% of the HRT patients. At an 18-month follow-up, 80% of the HRT patients were still tic-free; the massed practice patients were not followed beyond four weeks post-treatment.

Azrin and Peterson (1990) utilized a randomized wait-list control group design to assess the efficacy of HRT for 14 participants with TS, ranging in age from 6 to 36. Subjects were matched on age, tic frequency, and medication usage and were randomly assigned to either immediate or delayed treatment. Tic frequency was measured via two methods: videotapes of participants through one-way mirrors in the clinic, and home

observations by spouses or parents. At the fourth month of the study, which was the last month of the waiting-list period and the third month of treatment for the immediate treatment group, there were statistically significant between-group differences in tic frequency. Wait-list participants exhibited significantly more tics at that time than those who were immediately treated, whether tic counts were obtained at home or in the clinic. In fact, individuals in the wait-list condition displayed a similar or higher number of tics at month four, compared to baseline. At the twelfth month of the study, the mean percent reduction in tics for all participants, regardless of whether they received the immediate or delayed intervention, was 93% at home and 93.5% in the clinic. Improvements occurred for motor as well as vocal tics, for children as well as adults, and for subjects receiving medication for their TS as well as those not doing so.

O'Connor et al. (1997, 2001) carried out two separate studies of HRT for CTDs. In the first study (O'Connor et al., 1997), 14 unmedicated participants were assigned to either HRT ($n = 7$) or a combination of HRT and a cognitive-oriented treatment aimed at modifying anticipations in high-risk tic situations ($n = 7$). The two groups were matched prior to treatment and clinically assessed at post-treatment, 3-month follow-up, and 2-year follow-up. Both HRT and the combined therapy produced significant reductions in tics; the addition of cognitive-behavioral therapy conferred no benefit to patients beyond that associated with HRT alone. The second study conducted by O'Connor et al. (2001) involved the random assignment of 47 CTD participants to an HRT treatment and 22

CTD participants to a 14-to-16-week wait-list control group that subsequently received the active intervention. After 4 months of treatment, 65% of completers said they had 75-100% control over their tics; 52% reported this same level of control at the 2-year follow-up. In contrast, no significant changes in frequency, intensity, or control of tics were reported by the wait-list group. Investigators concluded that HRT is a successful strategy for tic management and is more effective than a wait-list condition.

In 2003, Wilhelm et al. carried out the largest study of HRT for TS that had been conducted up until that time. Thirty-two participants with TS were randomly assigned to 14 sessions of either HRT (mean age 36.2 years) or supportive psychotherapy (mean age 33.2 years). All subjects were either unmedicated or on a stable dose of medication for at least 3 months. At post-treatment, tic severity, as measured by the Yale Global Tic Severity Scale (YGTSS; Leckman et al., 1989), was significantly lower in the HRT group, compared to the supportive psychotherapy group. Furthermore, the overall YGTSS impairment score was reduced by 58% among HRT participants, versus only 16% among supportive psychotherapy participants. Using a nearly identical design, Deckersbach et al. (2006) evaluated the efficacy of HRT versus supportive psychotherapy at reducing tics and improving life satisfaction and psychosocial functioning. Participants were 30 adult outpatients with a DSM-IV (APA, 1994) diagnosis of TS and were once again either unmedicated or on a stable dose of medication. Both treatments resulted in improvements in life satisfaction and

psychosocial functioning; however, only HRT had specific tic-reducing effects (10 out of 15 subjects classified as “much improved” or “very much improved” at post-treatment, compared to only 2 out of 15 in the supportive psychotherapy condition).

Finally, Verdellen et al. (2004) examined the efficacy of HRT as compared to exposure with response prevention in 43 TS patients. Outcome measures included the YGTSS and 15-minute counts of tic frequency both in the clinic and at home. Both treatments resulted in statistically significant improvements on all outcome measures, with no significant differences found between treatment conditions. The lack of disparity between groups at post-treatment is not surprising, given the fact that both interventions are aimed at tic reduction through interruption of stimulus-response sequences. Researchers concluded that, at least in the short term, TS symptoms can be treated effectively with either HRT or exposure with response prevention.

Overall, results of these investigations suggest that HRT is an efficacious intervention for CTDs, producing larger reductions in tic frequency than either massed practice (Azrin et al., 1980), supportive psychotherapy (Deckersbach et al., 2006; Wilhelm et al., 2003), or a wait-list control (Azrin & Peterson, 1990; O'Connor et al., 2001). HRT was found to be equivalent to a combination of HRT with cognitive-behavioral therapy (O'Connor et al., 1997) and to exposure with response prevention (Verdellen et al., 2004) in terms of decreasing tics. However, these studies comparing two active behavioral treatments were significantly underpowered to detect differential

effects. Additional limitations of this set of treatment studies include the exclusive use of patient self-reports as outcomes in one of the investigations (i.e., Azrin et al., 1980), heterogeneity of samples regarding diagnosis and tic profile, comparison to fairly inactive conditions such as wait-list controls, and the presence of concurrent pharmacotherapy as a possible confound (i.e., in those studies where a stable dose of medication was not a requirement for inclusion). Moreover, significant gaps in the HRT literature remain to be filled: (1) there is a lack of large-scale studies comparing HRT to medication alone or their combination, and (2) dismantling studies and more comparisons to active treatments are needed to determine the mechanisms of action of HRT. Nonetheless, results so far are promising, indicating that HRT is effective for both vocal and motor tics, for children as well as adults, for those on medication as well as those who are not, and for tic severity as well as tic frequency. Furthermore, the treatment effect size for HRT is generally comparable to effect sizes obtained in pharmacological studies of TS (Peterson & Azrin, 1993).

2.1.4 Description of Habit Reversal Training (HRT)

An excellent summary of the various procedures used in modern HRT can be found in Piacentini & Chang (2005) and Woods (2001). As originally conceived by Azrin and Nunn (1973), HRT consisted of nine principal intervention components: four procedures to enhance the client's awareness of the habit or tic (i.e., response

description, response detection, early warning, and situation awareness), one to develop a competing response to replace the habit or tic, three to increase and sustain compliance and motivation (i.e., habit inconvenience review, social support procedure, and public display), and one to promote generalization of the skills learned. Following a number of research efforts to identify and refine the active elements of the treatment (e.g., Miltenberger, Fuqua, & McKinley, 1985; Woods, Miltenberger, & Lumley, 1996; Woods & Luiselli, 2007), it was determined that awareness training and the use of a competing response (CR) are the essential components. Social support training was not found to be a necessary ingredient of HRT treatment for CTDs; however, it is relatively easy and inexpensive to administer and may serve to enhance the acceptability and effectiveness of HRT with some clients and their families (Dopfner & Rothenberger, 2007a; Himle, 2007; Himle et al., 2008). A typical course of HRT involves anywhere from 3 to 10 weekly, 1-hour sessions, with subsequent booster sessions as needed.

2.1.4.1 Awareness training

Awareness training is based on the idea that enhanced awareness of tic behaviors facilitates better self-control. The success of HRT depends upon the client knowing exactly when his or her tic is about to happen or is happening, which is why this treatment component typically constitutes the initial intervention in HRT. The basic awareness training techniques involve having the client do the following, in sequence: (1) describe his or her tic in detail and reenact tic movements or vocalizations, (2)

identify and describe any sensations that may precede the tic, (3) verbally acknowledge occurrences of his or her tic as simulated by the therapist during the course of discussions, and finally, (4) verbally acknowledge or somehow point out occurrences of his or her own tic during discussions with the therapist. Premonitory sensations are characterized by the clinician as “warning signs” that help alert the client that his or her tic is about to occur. In addition to the aforementioned in-session techniques, clients may be instructed to complete self-monitoring assignments outside of session, recording instances of ticcing (e.g., with pencil and paper, a video camera, or a hand-held tally counter) to aid in the development of tic awareness.

2.1.4.2 Competing response training

Competing response training is the heart of HRT. A competing response (CR) is a behavior or response that prevents a tic from occurring when performed. In its optimal form, a CR “is designed to be (1) opposite to, or incompatible with, the tic movement, (2) maintained for a brief period of time (about 1 minute), (3) socially inconspicuous, and (4) compatible with normal, ongoing activities” (Peterson, 2007, p. 171). For example, the CR for an elbow-flapping tic might consist of holding the elbow against the side of the body and gently pressing it into the torso. For vocal tics, an effective CR is often rhythmic, deep breathing. The therapist and client collaborate to determine which CR is likely to be most acceptable to and successful for the client for any given tic. Once the therapist and client have chosen a CR for a particular tic, the client is taught how to

implement it. This is first accomplished via clinician modeling and then by having the client demonstrate the CR. Finally, the client is asked to perform the CR after each actual occurrence of the tic or its warning signs, throughout the remainder of the therapy session. Each time the therapist observes the client doing the CR properly, he or she praises the client. Conversely, if the client fails either to implement the CR after ticcing or to execute it correctly, he or she is prompted to do so by the therapist.

2.1.4.3 Social support training

The third element of HRT, as specified by Woods (2001), is social support training. The purpose of this component is to recruit a person or persons in the client's life who will help him or her to carry out the HRT procedures. It is the client's prerogative to select the support person, with input from the therapist. If the client is a child, the support person chosen is often a parent and/or a sympathetic teacher; if an adult, then a spouse, friend, adult child, or relative may be a good choice. Ideally, the support person attends treatment sessions with the client; however, this is not essential. The individual providing support has two primary responsibilities: (1) to acknowledge and praise correct implementation of CRs by the client, and (2) to prompt the correct use of CRs when necessary (e.g., when they see or hear a tic, but the client does not use the CR). The therapist models appropriate ways to perform these responsibilities; the support person should be warm and encouraging, rather than nagging and punitive.

The client should also be consulted regarding the manner in which he or she would like to be supported.

2.1.5 Putative Mechanisms of Action of HRT

Significant progress has been made in the development and implementation of psychosocial treatments for CTDs, but there is still much work to be done in terms of identifying the mechanisms by which they exert their effects. Several mechanisms for HRT have been suggested by researchers. For instance, Sharenow, Fuqua, and Miltenberger (1989) hypothesized that the CR may serve a punishment function, when it is emitted contingent on the tic. The act of self-monitoring may also function as a punisher. Alternatively, tics may be reduced through the enhanced awareness of each tic occurrence promoted by the use of self-monitoring and CRs (Ladouceur, 1979). Another possibility is that the CR functions as a substitute behavior that gradually increases in frequency and eventually replaces the tic (Woods & Miltenberger, 1995).

Woods et al. (1996) sequentially administered up to four components of HRT to a small group of children with motor tics, to try to determine the point at which treatment became effective for each child. The components included in the study were therapist-assisted awareness training in session (as described above in Section 2.1.4.1), self-monitoring with a manual counter outside of session, social support, and the use of a competing response. Interestingly, results varied across individual participants. A

combination of awareness training, social support, and competing response training was effective for half of the children; awareness training alone produced improvements in a quarter of the subjects; and a combination of awareness training and self-monitoring reduced tic frequency in the remaining quarter of the sample. The authors were not able to draw any firm conclusions about the mechanisms of action of the four treatment components, but they did offer two possible explanations for the effects of awareness training. First, this component may constitute an active treatment, in and of itself, that has a direct moderating impact on tics. Second, awareness of the tic may heighten its status as an aversive event, motivating individuals to escape or avoid the tic via suppression.

An alternative means by which HRT may affect tic behaviors is through habituation to the premonitory sensory urge that frequently precedes tics. Many CTD patients describe their tics as voluntary responses to premonitory urges (Leckman et al., 1993). For example, a contemporary physician and researcher with TS recently described his experience with the premonitory urge in a peer-reviewed scientific journal (Turtle & Robertson, 2008):

A tic is most definitely a voluntary action, not “partially voluntary” as I have seen some textbooks describe them. The difference between a tic and a normal action is that a tic happens because of an irrepressible physical urge. This urge comes in the form of a sensation, or almost the premonition of a sensation; a sensation that is somehow incomplete. To complete and resolve the sensation, the tic must be executed, which provides almost instant relief. (p. 451)

In a case report of patients with tic disorders (Kurlan et al., 1989), one long-time sufferer of TS described a slowly developing awareness of “discrete sensations” preceding his tics that immediately translated into a craving for relief; he sought relief in intentional movements “as surely as the movement to scratch an itch is to relieve the itch” (p. 731). Another told of recurring discomfort on the left side of his head and neck that was only relieved by blinking his left eye or shrugging his left shoulder. Yet another experienced differing head sensations, which she felt could only be prevented or relieved by specific phonic tics.

In line with such anecdotal accounts, researchers at the University of Wisconsin–Milwaukee (Himle, 2007; Woods, Himle, et al., 2005) have proposed a neurobehavioral model of TS, in which the biologically based premonitory sensation that precedes a tic transforms from a neutral private event to an unpleasant urge, as a result of becoming associated with the tic and the aversive physical and social consequences produced by the tic. From a behavioral perspective, the premonitory urge usually dissipates after the tic has been performed, and this dissipation is experienced as relief (Scahill et al., 1995). This raises the possibility that tics are negatively reinforced via the reduction in unpleasant, private, premonitory sensations contingent on executing the tic (the so-called “urge-undo” mechanism referred to by Li et al., 2006). The only way to habituate to the urge is to feel it and subsequently prevent the tic from occurring. Woods, Himle, et al. (2005) and Himle (2007) suggest that this is what is happening in HRT; the use of a

CR directly following awareness of an urge blocks the performance of the tic, perhaps forcing habituation. In support of this idea, studies have shown that urge habituation and decreases in tics occur simultaneously (Verdellen et al., 2004; Woods et al., 2000).

HRT for tics has, in fact, been conceptualized by some investigators (Bliss, 1980; Hoogduin, Verdellen, & Cath, 1997; Piacentini & Chang, 2005) as a form of exposure plus response prevention (ERP). ERP has traditionally been used to help individuals with OCD habituate to the aversive affect associated with not performing a ritualistic, compulsive behavior. Similarly, in HRT for CTDs, patients are (a) exposed to the aversive sensory phenomena and urges or feelings of tension that precede their tics and (b) instructed to refrain from behavior (i.e., ticcing) that serves to reduce their discomfort. The primary difference is that HRT teaches the patient to utilize a competing response to impede tic expression, likely resulting in habituation to the unpleasant premonitory urges. In ERP for tics, the same outcome is achieved without the competing response by simply using verbal reminders and/or physical prompts to help the patient resist performing the tic when exposed to situations most likely to elicit the tic.

ERP has been successfully used to treat TS in at least two different case studies. Woods et al. (2000) observed that the highly repetitive behaviors at the heart of diagnostic criteria for TS (i.e., tics) and OCD (i.e., compulsions) are topographically similar (see also Dopfner & Rothenberger, 2007b). Traditionally, tics have been viewed as involuntary, purposeless behaviors, while compulsions are seen as a more purposeful

response to obsessive thoughts and associated anxiety. Both, however, are preceded by unpleasant internal sensations. Based on this fact, Woods et al. hypothesized that the frequent touching of others exhibited by a 16-year-old boy with TS could be treated with ERP, an empirically supported intervention for OCD-related compulsions. In the Woods et al. case study, ERP resulted in a significant decrease in touching attempts, overt anxiety, and subjective anxiety. This suggests that a treatment focused on enhancing patients' tolerance for aversive internal feelings and sensations might produce clinical benefits for individuals with CTDs. A follow-up case study of an 11-year-old boy with TS by Wetterneck & Woods (2006) had a similar outcome. Following acute treatment with ERP, the boy's repetitive behaviors and associated self-reported distress were eliminated. Of note, post-treatment results were not maintained at 3-month follow-up, possibly indicating the need for booster sessions to maintain treatment gains.

In summary, there is theoretical (and some empirical) support for the notion that tics are, at least partially, maintained by a negative reinforcement cycle that enables individuals with CTDs to avoid aversive internal experiences associated with premonitory urges to tic. The urges, which reliably precede tics in a substantial majority of people with TS (Leckman et al., 1993), become aversive through a process of association with (1) the negative social and physical consequences of ticcing, and (2) the related unpleasant emotions generated by these consequences. It then becomes reinforcing to escape from the aversive urge either by ticcing, which causes the urge to

dissipate, or by avoiding situations likely to exacerbate the urge. Such situations include those in which (1) consequences for ticcing are more severe or salient, (2) the person is more aware of his or her bodily sensations, or (3) an internal state is generated that mimics that of the premonitory urge (Woods, Himle, et al., 2005). Indeed, tics have been found to occur more often in situations where social attention for tics is provided (Malatesta, 1990; Watson & Sterling, 1998) and during times of high anxiety or self-reported stress (Silva et al., 1995). The more important an individual feels it is *not* to tic in a given situation, the more vigilant and anxious about ticcing they are likely to become, and the stronger their urges are likely to be, ironically producing the very behavior they are striving to avoid.

2.1.6 The Need for a More Broadly Defined Behavioral Intervention

If the negative reinforcement model of tics presented here (i.e., URGE → TIC → RELIEF) is valid, then the relationship between the aversive premonitory sensations and tic expression may be moderated, in part, by experiential avoidance. Individuals who are highly experientially avoidant should conceivably tic more in the face of their unpleasant premonitory urges – to achieve relief – than those who are not as avoidant. Conversely, individuals who score low on measures of experiential avoidance should have a greater ability to refrain from ticcing in the face of increasing urges. Statistically speaking, there should be a stronger positive correlation between premonitory urges

and tic severity in people who are high in experiential avoidance, compared to those who exhibit low levels of the same construct. Consistent with this hypothesis, psychosocial treatments such as HRT that promote habituation to these distressing premonitory events have been found to be useful for patients with CTDs. However, as reviewed in the preceding section on treatments for tic disorders, the HRT literature is weakened by methodological limitations, a lack of process-oriented investigations aimed at isolating the mechanisms of action of HRT, and a need for studies comparing HRT to either medication or other active psychosocial treatments. Furthermore, HRT only seems to be effective if each tic is treated separately; in other words, there appear to be no generalization effects (Evers & van de Wetering, 1994). The intervention is also heavily behavioral, with more emphasis on tic reduction *per se* than on overall life functioning. One type of therapy that directly targets experiential avoidance and is aimed primarily at enhancing psychosocial functioning, even in the face of aversive symptoms, is Acceptance and Commitment Therapy (ACT; Hayes et al., 1999). A more detailed rationale for combining ACT with HRT in the treatment of CTDs follows.

2.1.7 Why Use Acceptance and Commitment Therapy (ACT) in the Treatment of CTDs?

There are a variety of theoretical reasons for using ACT in the treatment of CTDs. ACT is based on an analysis of language from a functional contextual perspective (Hayes, 1987; Hayes & Wilson, 1994). Briefly, this analysis suggests that humans

consider many of their private sensations, emotions, and thoughts to be aversive. As a result, they frequently try to change or get rid of these private experiences. Such attempts at control tend to be ineffective, though, and paradoxically lead to more of the same sensations, emotions, and thoughts the person was trying to avoid in the first place (Wegner, Schneider, Carter, & White, 1987; Wegner, Schneider, Knutson, & McMahon, 1991). To remedy this, ACT therapists attempt to foster acceptance of unpleasant internal events in their clients, in the service of helping them build a more meaningful life and move in the direction of chosen values. People often use distressing thoughts, emotions, and/or sensations as excuses for not engaging in valued life activities (e.g., “I didn’t go out this weekend, because I was depressed”). A more accepting stance frees one from trying to force mental or emotional change, in favor of being more open to one’s private experiences.

With this more effective approach to dealing with difficult thoughts and feelings, the ACT client can better focus on his or her chosen values and goals in life. The client is then asked to commit to needed behavior change in order to realize his or her goals, despite perhaps continuing to experience aversive private events. In the realm of CTDs, this means patients would be guided to develop more willingness to come in contact with unpleasant premonitory urges and other upsetting thoughts and feelings associated with their tic disorder. The former agenda of eliminating all tics could be abandoned in favor of creating a meaningful life, with or without tics. A side effect of

developing more willingness to experience urges is that the urges would lose their aversive overtone. With the individual then more willing to “surf” his or her urges to tic, the pattern of negative reinforcement maintaining the “URGE → TIC → RELIEF” cycle would likely be disrupted, and the frequency of tics would likely be reduced. Unlike in HRT, where a specific competing response strategy must be developed for each individual tic, the “urge surfing” strategy would theoretically generalize more rapidly, to encompass all tic behaviors.

Another reason to incorporate ACT principles into behavioral treatments for CTDs is to broaden the range of outcomes targeted in the intervention. HRT focuses primarily on symptom reduction *per se*, aiming almost exclusively to decrease the frequency and severity of tics. While this is certainly a worthwhile goal, it downplays the fact that the tics, themselves, and are merely a part of the overall clinical picture. Individuals with CTDs often present with multiple psychiatric and psychosocial sequelae that impair everyday functioning. As a result, a treatment directed solely at reducing tics is likely to miss the ultimate target – restoring relatively normal, satisfying functioning for the patient (Cook & Blacher, 2007). It is argued here that ACT-based approaches remedy this problem via their promotion of self-acceptance and values-consistent action in a variety of life domains. All of this is designed to increase the patient’s active engagement in a life of his or her choosing – regardless of the presence

or absence of tics. Perhaps Turtle stated it best in his personal account of TS (Turtle & Robertson, 2008):

I have gained greater acceptance of how I am with my tics and it simply doesn't bother me that much any more. This is how I am, tics and all, and if you don't like it, tough. This means I don't try to control the tics any more and so they aren't as bad as they used to be. Any active control of my tics, however, is, to this day, almost impossible. I have only achieved control through having less desire for it. (p. 451)

Aside from theoretical and anecdotal reasons to employ ACT in the treatment of CTDs, there is some empirical evidence to support the proposition that ACT might be an effective intervention for body-focused repetitive behaviors (BFRBs). In a series of clinical studies, Woods and colleagues tested the use of ACT+HRT for trichotillomania (TTM). First, Begotka et al. (2004) surveyed 436 adults with TTM to examine the relationship between experiential avoidance and TTM severity. Results showed a significant positive correlation between these two constructs, as expected from the ACT model of BFRBs. More experientially avoidant individuals tended to exhibit more severe TTM. A subsequent preliminary investigation of ACT+HRT with 6 adults (Twohig & Woods, 2004) resulted in near-zero levels of hair pulling at post-treatment for 4 out of 6 participants. Gains were largely maintained for the 4 subjects who completed a 3-month follow-up assessment, with 3 out of 4 reporting near-zero levels of hair pulling. Finally, Woods et al. (2006) conducted a randomized controlled trial comparing ACT+HRT to a wait-list control in the treatment of 25 adults with TTM. Significant reductions were

found for the active treatment group in hair pulling severity, impairment ratings, experiential avoidance, anxiety, and depression, compared to the wait-list control. Once again, results were generally maintained at 3-month follow-up; self-reports of hair pulling severity were significantly higher than at post-treatment, but overall TTM impairment did not increase from post-treatment to follow-up. In a separate study of ACT for chronic skin picking, Twohig et al. (2006) reported near-zero levels of picking by post-treatment for most participants, along with reductions on measures of anxiety, depression, and experiential avoidance. While gains were not fully maintained at 3-month follow-up, all participants rated the intervention as socially acceptable.

Overall, the four studies just described provide empirical justification for developing and testing an HRT+ACT protocol for the treatment of CTDs, which are also considered to be body-focused, urge-driven, repetitive behaviors. As part of the current project, the author collaborated with researchers from Duke University and the University of Pennsylvania, as well as Dr. Kelly Wilson (one of the original creators of ACT), to develop such a protocol. An outline of the resulting HRT+ACT intervention for CTDs is provided in the following section on “Research Design and Methods.”

2.1.8 Some Comments on the Design of Study II

The research described here is primarily a preliminary treatment development and feasibility study, based on the stage model of behavioral therapies research

recommended by Onken, Blaine, & Battjes (1997) and Rounsaville, Carroll, and Onken (2001). Acknowledging the large amount of preparation needed to conduct full-scale efficacy trials, these authors demarcated three separate stages in a rigorous scientific process that progresses from initial clinical innovation through efficacy research to effectiveness research. Stage I consists of pilot/feasibility testing, manual writing, and training program development for new and experimental treatments. Stage II consists of randomized clinical trials to evaluate the efficacy of manualized, pilot-tested treatments that have shown promise in earlier Stage I studies. Finally, Stage III comprises generalization and implementation studies to assess the transportability of Stage II treatments to real-world clinical settings. The current project constitutes Stage I research, being aimed largely at developing and testing a new HRT+ACT treatment for CTDs. Consequently, the BETTS treatment development study utilized a non-randomized, quasi-experimental design. The overall design of the research is similar to that utilized by Curry and colleagues (2003) in the development and pilot-testing of a cognitive-behavioral intervention for depressed, substance-abusing adolescents. Investigators in this study constructed a novel intervention, Family and Coping Skills (FACS) therapy, by reviewing relevant treatment manuals for adolescent depression and substance abuse, writing the integrated FACS manuals, having the manuals reviewed by five experts in adolescent depression and substance abuse, and testing the new treatment with small groups of six and then seven participants. Similarly, the present research

involved a review of HRT, ACT, and HRT+ACT manuals currently in existence, collaborative construction of an HRT+ACT manual for CTDs, a review of the manual by an expert panel (see discussion in section on “Research Design and Methods”), and a pilot test of the new HRT+ACT intervention with a total of 13 participants. The project was further strengthened by the inclusion of an “HRT only” comparison group and the use of surveys to help answer questions about processes of change and mechanisms of action.

Despite having limited statistical power, the small sample size of Stage I studies has some advantages. Ideographic research methods and designs are integrally connected to behavior-analytic theory, allowing for a more detailed look at processes of change over time, permitting a stronger test of theory-based therapies, enabling more robust causal inferences, and facilitating the identification of active treatment components. Although larger group studies are often used to test behavioral approaches to treatment, aggregation of data is a limitation given the individualized approach of behavioral psychology (Barlow, Hayes, & Nelson, 1984; Kazdin, 1982; Woods, Himle, et al., 2005). Barlow et al. (1984) argued that an intervention’s effectiveness in real-world practice settings is unlikely to be determined via large-scale, clinical studies alone. Single-subject designs utilizing repeated measures are also needed, because “variability due to sources other than treatment can be identified at the level of the individual, and thus more reliable rules can be generated that relate particular client or therapist

characteristics to outcome” (p. 66). In the area of CTDs, specifically, there have recently been calls for smaller, more focused studies that would allow for the elucidation of treatment mechanisms and the analysis of individual-level variables mitigating treatment response (e.g., Cook & Blacher, 2007; Franklin & Himle, 2007). As such, the small sample size used in the project delineated here is considered to be *both* a strength and a weakness.

Finally, a comment is warranted on the selection of middle adolescence through young adulthood as the eligible age range for the research (versus childhood through early adolescence). Longitudinal naturalistic studies of tic disorders show that, for most individuals, tic severity reaches a maximum in early adolescence, followed by a consistent decline in symptoms over time, with only about 25% continuing to experience moderate-to-severe tics into young adulthood (Piacentini et al., 2007). The need for treatment development and evaluation is thus more marked for those individuals who will go on to suffer from a chronic tic disorder beyond early adolescence. In addition, most of the randomized controlled trials of HRT conducted thus far have utilized adult samples. Employing an age range that included older adolescents and young adults facilitated comparisons between the current project and existing published studies.

3. Hypotheses

This dissertation was intended to be an investigation of the role played by experiential avoidance in the manifestation of CTDs, as well as a preliminary test of an experimental treatment designed to target experiential avoidance and thereby improve functioning for individuals with CTDs. It was hypothesized that experiential avoidance would moderate the relationship between premonitory urges and tic severity (Woods, Piacentini, et al., 2005). To evaluate this hypothesis, participants in the first study completed self-report questionnaires to provide information on the strength and frequency of their premonitory urges, their level of experiential avoidance (both in general and specifically related to their tics), the severity of their tics, and their overall functioning or quality of life. This information was used to examine relationships among the variables assessed. In the second study, investigators tested the hypothesis that a treatment explicitly aimed at reducing experiential avoidance (i.e., a combination of ACT and HRT) would be both acceptable to individuals with CTDs and effective at enhancing their functioning. To facilitate treatment comparisons and help elucidate mechanisms of action, a separate group of CTD participants received HRT alone. Repeated measures of premonitory urges, experiential avoidance, and global functioning were administered on a session-by-session basis for both treatment groups. In addition, Independent Evaluators (IEs) assessed tic severity at multiple points

throughout the acute treatment, maintenance, and follow-up phases. The following sections delineate the primary hypotheses of the research.

3.1 Study I: Online Survey

1. There will be a significant linear relationship between levels of premonitory urges (X_1) and tic severity (Y). Furthermore, there will be a significant linear relationship between levels of experiential avoidance (X_2) and tic severity (Y). There will also be an interaction effect between levels of premonitory urges and experiential avoidance ($X_1 * X_2$), such that the relationship between urges and tic severity will be stronger for individuals with higher levels of experiential avoidance.
2. There will be a significant linear relationship between levels of premonitory urges (X_1) and functional impairment (Y). Furthermore, there will be a significant linear relationship between levels of experiential avoidance (X_2) and functional impairment (Y). There will also be an interaction effect between levels of premonitory urges and experiential avoidance ($X_1 * X_2$), such that the relationship between urges and functional impairment will be stronger for individuals with higher levels of experiential avoidance.

3.2 Study II: *BETTS Treatment Study*

3. Participants receiving an HRT intervention will exhibit significant reductions in CTD symptoms and significant improvements in global functioning post-treatment. No change in levels of experiential avoidance is hypothesized.
4. At post-treatment, participants receiving an HRT+ACT intervention will exhibit greater reductions in CTD symptoms and improvements in global functioning than will those receiving HRT alone. In addition, HRT+ACT participants will show significant, post-treatment reductions in experiential avoidance.

4. Research Design and Methods

4.1 Study I: Online Survey

4.1.1 Participants

Participants for the first study, involving the online survey, were required to be 18 years of age or older, to reside in the U.S.A., to be able to read and understand English, and to have been diagnosed with Tourette Syndrome or another chronic tic disorder (*DSM-IV*; APA, 1994). The Behavior Therapy and Research Laboratory (BTRL) at the University of Wisconsin–Milwaukee posted the survey online with the help of www.surveymonkey.com (an online company aiding researchers in the development of web-based surveys). The Tourette Syndrome Association (TSA) assisted with recruitment in two ways. First, data were collected through the establishment of a link to the survey via the TSA website (www.tsa-usa.org). The TSA website is owned by the TSA and is considered a public domain. Although anyone can view the website, many individuals who suffer from TS visit the site. Second, an email describing the purpose of the study was sent to the leaders of local TSA chapters. The email contained both a direct link to the survey and a description of how the survey could be accessed via the TSA website. While over 600 participants meeting the aforementioned inclusion criteria logged in to the online survey and answered at least one question, not all participants completed all measures. For example, only 239 participants completed the AAQ-9. This resulted in markedly unequal sample sizes among variables, leading to loss of power

and loss of precision of significance testing in statistical analyses. As such, only those participants who completed the AAQ-9, at a minimum, were included in the final analyses. Table 1 shows characteristics of the original, full sample, compared to the restricted sample used in the final analyses.

Table 1: Study I (Online Survey): Characteristics of Original, Full Sample Compared to Restricted Sample of Participants Who Completed the AAQ-9

	<i>n</i>	Mean Score	Standard Deviation
Original Full Sample (N = 667)			
Age (years)	667	35.5	13.3
PUTS	545	22.8	6.5
YGTSS-SR	568	32.2	10.4
AAQ-9	239	33.7	9.8
AAQ-T	502	35.1	11.9
PQoL	490	6.6	1.8
Sample of Only Those Who Completed the AAQ-9 (N = 239)			
Age (years)	239	37.6	13.8
PUTS	226	22.1	6.6
YGTSS-SR	225	31.5	10.1
AAQ-9	239	33.7	9.8
AAQ-T	225	34.2	12.6
PQoL	223	6.8	1.8

Note. PUTS = Premonitory Urge for Tics Scale; YGTSS-SR = Yale Global Tic Severity Scale – Self-Report Version; AAQ-9 = Acceptance and Action Questionnaire; AAQ-T = Acceptance and Action Questionnaire – Tic-Specific Version; PQoL = Perceived Quality of Life Scale.

4.1.2 Measures

All measures used as part of Study I are included in Appendix A.

Demographics. At the beginning of the online survey, each participant was asked to specify his/her gender, age, and ethnicity. Although the ethnicity question was multiple-choice in nature, participants had an opportunity to choose an “other” category and provide a written description if a particular choice was not available on the form.

Premonitory Urge for Tics Scale (PUTS). The PUTS (Woods, Piacentini, Himle, & Chang, 2005) is a 10-item self-report questionnaire designed to assess for the presence of premonitory sensory urges common in persons with CTDs. Higher scores represent greater levels of premonitory urges. A study of individuals with CTDs (Woods, Piacentini, et al., 2005) indicated that the PUTS was internally consistent ($\alpha = .81$) and temporally stable ($r = .86, p < .01$) at 2 weeks.

Acceptance and Action Questionnaire (AAQ-9). The AAQ-9 (Hayes et al., 2004) is a 9-item measure of experiential avoidance and is often used in treatment outcome studies of ACT. The concept of experiential avoidance is related to various individual characteristics, including fusion or overidentification with negative thoughts and feelings, negative self-references, excessively negative evaluations of private experiences, a high need for emotional and cognitive control, and an inability to take needed action in the face of private events. A significant pre-post decrease in AAQ-9 scores suggests that the subject has become less experientially avoidant and, thus, more

open to experiencing aversive private events. Experiential avoidance has been implicated in a wide range of clinical problems and disorders. In line with this conceptualization, the AAQ-9 has been shown by Hayes and colleagues (2004) to correlate strongly ($p < .05$) with the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994), a measure of thought suppression; the Global Severity Index of the Symptom Checklist-90-R (SCL-90-R; Derogatis, 1994); the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983); the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996); the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988); and the Trauma Symptom Inventory (TSI; Briere, 1995). Furthermore, the AAQ-9 has been shown to be internally consistent ($\alpha = .70$) and to have good convergent and divergent validity (Hayes et al., 2004).

Acceptance and Action Questionnaire – Tic-Specific Version (AAQ-T). The AAQ-T is a 15-item measure designed by the author and Dr. Scott Compton of Duke University to specifically assess tic-related experiential avoidance. The measure is closely based on the AAQ-9, described above, and is similar in format. Psychometric testing of the AAQ-T was conducted as part of the online survey project. Please refer to Section 5: “Results” for a more detailed description of scale development and the results of psychometric analyses.

Yale Global Tic Severity Scale – Self-Report Version (YGTSS-SR). The YGTSS-SR was created by the author for the purposes of the online survey, utilizing feedback from Dr.

Scott Compton at Duke University and survey collaborators at the University of Wisconsin–Milwaukee. It is closely based on the original Yale Global Tic Severity Scale (YGTSS; Leckman et al., 1989), which is a clinician-rated scale used to assess tic severity in both children and adults. On the YGTSS, motor and phonic tics are rated separately from 0 to 5 on several scales including number, frequency, intensity, complexity, and interference. Thus Motor and Phonic Tic scores can range from 0 to 25; the combined Total Tic Score ranges from 0 to 50. There is also an Impairment score that rates the overall burden due to tics. The Impairment scale yields a single score from 0 to 50, with higher scores indicating higher levels of overall impairment associated with tics. The YGTSS has demonstrated excellent psychometric properties with solid internal consistency, excellent inter-rater reliability, and excellent convergent and divergent validity (Leckman et al., 1989; Storch, Murphy, Fernandez, et al., 2007). Please refer to Section 5: “Results” for a more detailed description of YGTSS-SR scale development and the results of psychometric analyses.

Perceived Quality of Life Scale (PQoL). The PQoL is a quality of life measure based on human needs theory (Maslow, 1943; Doyal and Gough, 1991) that assesses one’s level of satisfaction across several domains of life, including physical and mental health, social functioning, and community involvement. The scale consists of 19 items, plus a single global item, and has been widely applied to a number of different patient and general population groups. In terms of its criterion validity, the PQoL has been shown to

correlate significantly with the Sickness Impact Profile and the Psychological General Well-Being Index (Patrick, Danis, Southerland, & Hong, 1988); the Whiston Hospital Questionnaire (Jones, Hussey, & Griffiths, 1993); the Profile of Mood States (Jones, Griffiths, Macmillan, & Palmer, 1994); and the Nottingham Health Profile (Hurel, Loirat, Saulnier, Nicolas, & Brivat, 1997). Its internal reliability has also been reported (Cronbach's $\alpha = 0.88$; Patrick et al., 1988).

4.1.3 Procedure

The first step in developing the online survey consisted of constructing and testing the self-report version of the YGTSS (i.e., the YGTSS-SR) and the tic-specific version of the AAQ-9 (i.e., the AAQ-T). Items on the YGTSS-SR were written by modifying the original YGTSS wording to support a self-report format. For example, instead of presenting a checklist of simple motor tics without explanation, the self-report version is preceded by the following instructions: "Please place a check mark next to the simple motor tic(s) you have had during the past week. Check all that apply." Items on the AAQ-T were written by combining relevant items from both the AAQ-9 and the Avoidance and Fusion Questionnaire for Youth (AFQ-Y; Greco, Lambert, & Baer, 2008) and rewording them to relate specifically to experiences associated with having a chronic tic disorder. For example, the item, "When I feel depressed or anxious, I am unable to take care of my responsibilities," from the AAQ-9 became, "When I feel

depressed or anxious about my tics, I am unable to take care of my responsibilities,” on the AAQ-T.

The two revised questionnaires were piloted by presenting them to 5 individuals without tics (recruited from the author’s psychology colleagues at Duke University) and 5 individuals with tics (recruited from personal contacts at the national TSA office). These individuals were asked which items, if any, were hard to understand; whether the questions were easy to read; whether they had any problems answering the questions; and whether the items covered the necessary scope, frequency, severity, and impairment associated with tics. Confusing or problematic items were discarded or rewritten before inclusion in the final versions of the YGTSS-SR and the AAQ-T.

All recruited individuals electing to participate in the online survey as part of the first phase of data collection were directed to the survey either by following the link on the TSA website or by going directly to the survey link (https://www.surveymonkey.com/s.aspx?sm=X_2bx_2b8RocCCBAKzsphe791g_3d_3d). Participants filled out the survey in a setting of their choosing. Once participants reached the survey, they read an informed consent document and were provided with a yes/no statement to substitute for a signature on the consent form. This yes/no box was located next to the phrase, “Filling out this survey indicates that I am at least 18 years old and that I am giving my consent to be a participant in this study.” Data were saved by SurveyMonkey each time a participant clicked the “Next” button at the bottom of a

page. A participant was free to skip questions or to not complete the survey; however, all responses saved up until the point of exiting were retained in the SurveyMonkey database. Only individuals who reported having a formal diagnosis of TS, Chronic Motor Tic Disorder, or Chronic Vocal Tic Disorder and an onset of tics prior to 18 years of age were included in the data analysis. Unfortunately, there was no way to confirm the veracity of these self-reported diagnoses, and this is a limitation of Study I. However, given that participants were recruited exclusively through the TSA website and TSA-sponsored mailings, it is reasonable to assume that most (if not all) did in fact suffer from a CTD. As evidence of this, Table 2 shows the minimum and maximum number of tics and YGTSS-SR total score reported by participants included in the final sample. All of these individuals reported having had at least two distinct tics during the week prior to completing the online survey, with a minimum YGTSS-SR total score of 10.

Table 2: Number of Tics and Overall Tic Severity of Participants in Study I (Online Survey)

	<i>n</i>	Range	Minimum	Maximum
Total number of tics reported on YGTSS-SR	237	10	2	12
YGTSS-SR total score	225	49	10	59

Note. YGTSS-SR = Yale Global Tic Severity Scale – Self-Report Version.

The survey itself, designed by researchers at the University of Wisconsin–Milwaukee, Duke University, and TSA’s Medical Advisory Board, consisted of 17 self-report questionnaires. However, only 5 of these questionnaires (assessing premonitory urges to tic, general and tic-related experiential avoidance, tic severity, and overall functioning or quality of life) were selected and utilized by the author for the purposes of the current project. Data were used for two objectives: (1) to investigate possible connections among these variables – in particular, whether level of experiential avoidance moderated the relationship between premonitory urges and either tic severity or functional impairment, and (2) to complete psychometric evaluations of the new measures created as part of the survey research (i.e., the tic-specific version of the AAQ and the self-report version of the YGTSS). Please refer to the “Statistical Analyses” section below for a more detailed description of how data were handled.

4.1.4 Statistical Analyses

First, descriptive and exploratory analyses were conducted to examine and compare levels of premonitory urges, experiential avoidance, tic severity, and quality of life by gender, age, and ethnicity. Ethnicity was coded using the following categories: a) White/Caucasian, b) African-American, c) Hispanic/Latino, d) Asian, e) Native American or Alaskan Native, f) Native Hawaiian or Other Pacific Islander, g) Multi-racial, or h) Other. The goal of these analyses was to determine if there were differences

between subgroups on these measures. For instance, awareness of premonitory urges may vary with age. Furthermore, the degree of avoidance of private feelings, thoughts, and sensations may vary with ethnicity, depending on cultural norms for processing and relating to negative emotional/cognitive content. These initial analyses were comprised mainly of examinations of means and standard deviations, as well as simple *t*-test comparisons.

Psychometric parameters were estimated for each of the new measures used in Study I (i.e., the AAQ-T and the YGTSS-SR). First, a pre-test procedure was employed to assess the “face validity” and readability of the new items; various psychology colleagues at Duke and individuals with a tic disorder were enlisted to help with this task (see “Procedure” section above for a more detailed explanation). A coefficient alpha was calculated as a measure of the reliability of the instruments. Item-scale correlations were also assessed, to help determine whether any items should be dropped. The convergent validity of the AAQ-T was inspected by first correlating it with the measure on which it was based (i.e., the AAQ-9). It was also expected to correlate with self-reported tic severity (i.e., the YGTSS-SR), level of premonitory urges (i.e., the PUTS), and quality of life (i.e., the PQoL). Self-reported tic severity (i.e., the YGTSS-SR) was expected to correlate with level of premonitory urges (i.e., the PUTS), quality of life (i.e., the PQoL), and both general and tic-specific experiential avoidance (i.e., the AAQ-9 and the AAQ-T).

Hypothesis 1 was tested by running a multiple linear regression on the survey data, with premonitory urges (measured by the PUTS) and experiential avoidance (measured by the AAQ-9 and AAQ-T) as the predictor variables and tic severity (measured by the YGTSS-SR) as the outcome variable. The relationship among these variables was modeled and tested in accordance with the regression procedures outlined by Cohen, Cohen, West, & Aiken (2003). The coefficient β associated with each predictor variable was tested using a t -statistic, to assess for main effects. The model was then extended to include the interaction between premonitory urges and experiential avoidance. To examine the interaction effect, the significance of the coefficient β in the interaction term was tested using a t -statistic.

Hypothesis 2 was investigated by running a multiple linear regression, in the manner just described, substituting quality of life (measured by the PQoL) as the outcome variable. Once again, all main effects and a possible interaction effect were tested with a t -statistic.

4.1.5 Statistical Power

Taking into account the most complex analyses from Study I, with approximately 225 participants and an alpha of .05, the regression analysis using two predictors had a power of about 0.70 to detect a conservatively small regression coefficient (β) of .15. For a slightly larger regression coefficient (β) of .25, the power

increased to over 0.98. These calculations were done based on regression power equations in Cohen, Cohen, West and Aiken (2003). Therefore, the sample size obtained in the online survey provided enough power to detect even a small main effect.

4.2 Study II: *BETTS Treatment Study*

4.2.1 Participants

Participants for the second study, involving the pilot treatment study, consisted of 13 individuals, ages 14-18, who met all inclusion criteria. Those ages 14 to 17 were considered adolescents, while the one participant who was 18 years of age was considered an adult. Inclusion criteria were as follows: a) between the ages of 14 and 25 at the time of evaluation, b) primary DSM-IV diagnosis of CTD (either TS, Chronic Motor Tic Disorder, or Chronic Vocal Tic Disorder) established by the ADIS-RLV (for adolescents) or ADIS-IV-L (for adults); c) YGTSS Total Score > 14 if the primary diagnosis was TS or Chronic Vocal Tic Disorder, or YGTSS Total Score > 10 if the primary diagnosis was Chronic Motor Tic Disorder; d) continuous symptom duration of at least 12 months; e) ability to be treated in an outpatient setting; and f) for adolescents, presence of a parent or guardian who could participate in treatment and serve as an additional reporter of symptoms. Individuals were deemed ineligible for participation if they met any of the following exclusion criteria: a) primary psychiatric diagnosis other than CTD; b) bipolar illness; c) pervasive developmental disorder; d) estimated child Full Scale IQ < 80, as determined by the vocabulary and block design subtests of the

WISC-IV (for ages 14 to 17) or WAIS-III (for ages 18 to 25); e) thought disorder; f) acute suicidality; g) substance dependence; h) concurrent psychotherapy; or i) unstable dose (< 3 months duration) of concomitant pharmacotherapy. Participants for this phase of the research were recruited via print and other media advertisements; mailings (both paper and e-mail) to TSA members from personal contacts at national and regional TSA offices; and psychoeducational presentations at the Duke Child and Family Study Center and other local clinics and health agencies (e.g., the Duke Movement Disorders Clinic and the Wake County Department of Health and Human Services).

4.2.2 Therapists

The first participants recruited at each site were treated with HRT only, as the HRT+ACT treatment was still in the development phase. The lack of randomization to treatment condition is a limitation of Study II. However, this is typical of Stage I research consisting of pilot/feasibility testing, manual writing, and training program development for new and experimental treatments.

At the Duke site, the author (a female, Master's level, clinical psychology doctoral candidate with five years of predoctoral experience) treated three participants in the HRT group and three in the HRT+ACT group. A newly licensed, male, PhD level clinical psychologist (two years' postdoctoral experience) conducted the treatment for one additional participant in the HRT group.

There were a total of three therapists at the Penn site. The site's primary investigator – a licensed, male, PhD level clinical psychologist with 21 years of clinical experience – treated two HRT participants and one HRT+ACT participant. A newly licensed, female, PhD level clinical psychologist (10 years' clinical experience) provided the treatment for two additional participants, one from each group. A licensed, female adult/child psychiatrist (MD degree) with two years of clinical experience treated the remaining HRT+ACT participant.

4.2.3 Measures

Measures used as part of Study II are included in Appendix B. The PUTS, AAQ-9, and AAQ-T, which were used in Study I and described in Section 4.1.2 above, are included in Appendix A. The WISC-IV, WAIS-III, ADIS-RLV, and ADIS-IV-L were not included in Appendix B, due to their considerable length. Table 3 specifies the relationship among measures, corresponding symptom domains, source of ratings, and timing of administration.

Demographics. Participants' demographic information – such as age, grade level, gender, race, and treatment history – was gathered at Gate B by administering the *Conners-March Developmental Questionnaire* (CMDQ; Conners & March, 1996). These data were reviewed by the intake clinician and used for sample description purposes.

Table 3: Schedule of Assessments for Study II (BETTS Treatment Study)

MEASURE	Domain	Who	Gates A, B	Week 0 (Baseline, Gate C)	Week 5	Week 10 (Acute TX)	Week 14	Week 18 (Maintenance)	Week 22 (Naturalistic Follow-up)
Phone screen	In/Exclusion	SC	X						
CMDQ, IQ, TX history	Caseness	P, IE, SC	X						
ADIS-RLV or ADIS-IV-L	Comorbidity	IE	X			X		X	X
YGTSS	Tic comorbidity	IE	X	X	X	X	X	X	X
CGI*	Tic impairment	IE		X	X	X	X	X	X
CGAS*, WSAS	Functional impairment	IE, C, P		X	X	X	X	X	X
PUTS*	Tic phenomenology	C		X	X	X	X	X	X
CSQ	Consumer satisfaction	C, P				X			X
MASC or BAI	Anxiety	C		X		X		X	
BDI	Depression	C		X		X		X	
AAQ-9*	Process	C		X	X	X	X	X	X
AAQ-T*	Process	C		X	X	X	X	X	X

Note. SC = Study Coordinator; C = Child; IE = Independent Evaluator; P = Parent; CMDQ = Conners-March Developmental Questionnaire; IQ = Intelligence Quotient; TX = Treatment; ADIS-RLV = Anxiety Disorders Interview Schedule for DSM-IV, Research and Lifetime Version for Children and Parents; ADIS-IV-L = Anxiety Disorders Interview Schedule for DSM-IV, Lifetime; YGTSS = Yale Global Tic Severity Scale; CGI = Clinical Global Impression; CGAS = Children’s Global Assessment Scale; WSAS = Work and Social Adjustment Scale; PUTS = Premonitory Urge for Tics Scale; CSQ = Consumer Satisfaction Questionnaire; MASC = Multidimensional Anxiety Scale for Children; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; AAQ-9 = Acceptance and Action Questionnaire; AAQ-T = Acceptance and Action Questionnaire – Tic-Specific Version.

* At each therapy session, therapists completed a CGI and CGAS, and patients completed a PUTS, AAQ-9, and AAQ-T.

Wechsler Intelligence Scale for Children–Fourth Edition (WISC-IV). The WISC-IV (Wechsler, 2003) Vocabulary and Block Design subtests were used to provide a brief (15-30 minutes) individually administered estimate of intellectual functioning for adolescents. Adolescents with a scaled score below 6 on either subtest were to be administered the entire WISC-IV battery, to provide a better estimate of intelligence. However, this was not necessary for any of the recruited participants.

Wechsler Adult Intelligence Scale-Third Edition (WAIS-III). The WAIS-III (Wechsler, 1997) Vocabulary and Block Design subtests were used to provide a brief (15-30 minutes) individually administered estimate of intellectual functioning for young adults. Young adults with a scaled score below 6 on either subtest were to be administered the entire WAIS-III battery, to provide a better estimate of intelligence. However, this was not necessary for any of the recruited participants.

Yale Global Tic Severity Scale (YGTSS). Please refer to description in Section 4.1.2 on measures from Study I. To clarify, the self-report version (i.e., the YGTSS-SR) was used in the online survey, whereas the clinician-rated version (i.e., the original YGTSS) was used in the BETTS study and administered by the Independent Evaluator (IE).

The Anxiety Disorders Interview Schedule for DSM-IV, Research and Lifetime Version for Children and Parents (ADIS-RLV). The ADIS-RLV (W. K. Silverman & Albano, unpublished manuscript) is an expanded version of the Child Version of the ADIS. The ADIS-RLV is a semi-structured diagnostic interview that assesses the major DSM-IV

anxiety, mood, and externalizing disorders, present and lifetime, including new sections on bipolar disorder, tic disorders, pervasive developmental disorders, and substance abuse disorders. The ADIS-RLV includes a clinical severity rating (CSR), based on an 8-point scale (0 = not present, 4 = clinically significant, 8 = very significant), for each DSM-IV diagnosis. Psychometric analyses have not yet been conducted on the ADIS-RLV; however, it is heavily based upon the ADIS-IV, which has been shown to possess favorable psychometric properties (Brown, DiNardo, Lehman, & Campbell, 2001; Silverman, Saavedra, & Pina, 2001). The ADIS-RLV was only administered to adolescent participants.

The Anxiety Disorders Interview Schedule for DSM-IV, Lifetime (ADIS-IV-L). The ADIS-IV-L (Brown, DiNardo, & Barlow, 1994) is a structured interview designed to assess for current and lifetime episodes of anxiety disorders. In addition, sections to assess current mood, somatoform, and substance use disorders are included because of their high comorbidity rate with anxiety disorders and because the presenting symptomatology of these disorders is often quite similar to that of the anxiety disorders. The ADIS-IV also contains screening questions for psychotic and conversion symptoms and familial psychiatric history. (It does not assess for tic disorders; however, in the present study, CTDs were either diagnosed or ruled out using the clinician-rated version of the YGTSS.) The Anxiety Disorders Interview Schedule for DSM-IV-L contains all of the sections included in the ADIS-IV. However unlike the ADIS-IV, the ADIS-IV-L has

been designed to establish past (lifetime) diagnoses as well. The ADIS-IV has demonstrated good-to-excellent inter-rater reliability, with kappa coefficients ranging from 0.67 to 0.86 for the various anxiety disorders (Brown, DiNardo, Lehman, & Campbell, 2001). The ADIS-IV-L was only administered to young adult participants.

Clinical Global Impression (CGI). The 7-point CGI Severity (CGI-S) and CGI Improvement (CGI-I) scales (Guy, 1976) were used to evaluate severity and change in CTD symptoms over time. In the version of the CGI-S used in the present study, 1 = normal, not at all ill; 2 = borderline mentally ill; 3 = mildly ill; 4 = moderately ill; 5 = markedly ill; 6 = severely ill; and 7 = among the most extremely ill. In the version of the CGI-I used in the present study, 1 = very much improved; 2 = much improved; 3 = minimally improved; 4 = no change; 5 = minimally worse; 6 = much worse; and 7 = very much worse. To be classified as a responder, the patient had to receive a CGI score of 1 or 2 from the Independent Evaluator (IE). Manualized guidelines were provided to the IE, for the purpose of anchoring CGI-S and CGI-I ratings to YGTSS scores and levels of associated impairment due to CTD symptoms. These guidelines are included in Appendix C.

Children's Global Assessment Scale (CGAS). The CGAS (Shaffer et al., 1983) provides a measure of global impairment and functioning over the previous month. The scale ranges from 1 (lowest) to 100 (highest) functioning. Green and colleagues (1994) provide evidence for the psychometric soundness of the CGAS and suggest that ratings

obtained in clinical contexts may reflect evaluations of functional competence rather than symptom severity. In the present study, both the IE and the individual therapist assigned CGAS scores.

Premonitory Urge for Tics Scale (PUTS). Please refer to description in Section 4.1.2 on measures from Study I.

Work and Social Adjustment Scale (WSAS). The WSAS (Marks, Connolly, & Hallam, 1973) is a simple 5-item self-report measure of functional impairment attributable to an identified problem. Domains measured are work/school, home management, social leisure, private leisure, and relationships. Each domain is rated on a scale from 0 to 8, with higher scores denoting more disability. The WSAS has been shown to be reliable, valid, and sensitive to change (Mundt, Marks, Shear, & Greist, 2002).

Multidimensional Anxiety Scale for Children (MASC). The MASC (March, 1997) is a self-report questionnaire for children and adolescents that assesses four broad anxiety domains. The domains measured by the MASC include physical symptoms, social anxiety, harm avoidance, and separation/panic. It has 39 items, which are scored from 0 (statement “never true about me”) to 3 (statement “often true about me”). The MASC shows acceptable internal consistency (scores ranging from .60 to .85), test-retest reliability (scores ranging from .77 to .79), and validity (March, Parker, Sullivan, Stallings, & Connors, 1997). The measure was included in the present study, in light of

previous research suggesting a possible relationship between CTDs and anxiety. The MASC was only administered to adolescent participants.

Beck Anxiety Inventory (BAI). The BAI (Beck & Steer, 1990) is a 21-item scale specifically designed to assess symptoms associated with anxiety in adults. Each BAI item is rated on a 4-point scale: 0 (“not at all”) to 3 (“severely”, “I could barely stand it”). The sum score of all the BAI items ranges from 0 to 63. The BAI is a widely used measure of anxiety symptoms with documented reliability and validity (Beck, Epstein, Brown, & Steer, 1988; Beck & Steer, 1990). The BAI was only administered to young adult participants.

Beck Depression Inventory (BDI). The BDI (Beck, Steer, & Garbin, 1988) is a self-report measure of symptoms of depression and is one of the most widely used outcome measures in clinical trials of depression. The BDI is a 21-item questionnaire assessing cognitive, affective, motivational and vegetative symptoms of depression. The BDI was administered to both adolescent and young adult participants.

Acceptance and Action Questionnaire (AAQ-9). Please refer to description in Section 4.1.2 on measures from Study I.

Acceptance and Action Questionnaire – Tic-Specific Version (AAQ-T). Please refer to description in Section 4.1.2 on measures from Study I.

Consumer Satisfaction Questionnaire (CSQ). To assess subject satisfaction and acceptability of the interventions, investigators used a questionnaire previously

developed in other pilot projects to assess subject and parent satisfaction, perceived benefit, whether the subject would recommend the intervention to others, and whether the rationale of the protocols was understood. The CSQ has not been evaluated for its psychometric properties.

4.2.4 Procedure

The second phase of data collection took place as part of the BEhavioral Treatment of Tics Study (BETTS) conducted by Dr. Martin Franklin at the University of Pennsylvania School of Medicine and Dr. Scott Compton at Duke University Medical Center, with funding from the Tourette Syndrome Association Research Award Program to develop and test a novel behavioral intervention that combined HRT with ACT for adolescents and young adults with CTDs. Dr. Compton and the author traveled to the University of Pennsylvania in August of 2006 to meet with Dr. Franklin and to receive training in how to conduct HRT from Dr. Douglas Woods, an expert in the use of HRT with CTDs in adolescents and young adults. Dr. Woods is also an authority on psychosocial treatment of CTDs using a combination of HRT and ACT. He agreed to serve as an expert consultant to both the Duke and Penn groups during the course of the BETTS project. Dr. Steven Hayes and Dr. Kelly Wilson, two of the primary developers of ACT, also agreed to serve as consultants. In June of 2007, Dr. Wilson met with researchers from both sites to aid in development of the HRT+ACT protocol.

Recruited individuals who were interested in taking part in the BETTS study proceeded through three assessment “Gates.” First, they completed a telephone screening, during which the study was described to them (or to their parents, if they were adolescents), and they were screened for possible inclusion. Individuals passing this “Gate A” were directed to come to the Duke Child and Family Study Center (or the Center for the Treatment and Study of Anxiety at Penn) for a more extended psychiatric assessment. If they passed this “Gate B” diagnostic assessment and were deemed eligible for the study, they were invited back for a baseline visit (“Gate C”), during which they provided week 0, or baseline, data and began open treatment. A total of 13 participants between the ages of 14 and 18 were treated as part of the study – six at one site and seven at the other. Acute treatment with HRT involved 8 therapy sessions over the course of 10 weeks, followed by two booster sessions during the maintenance phase, at weeks 14 and 18. Treatment with HRT+ACT followed a similar time line, except the acute phase involved 10 therapy sessions over 10 weeks.

Therapy sessions were videotaped, allowing for checks on therapists’ adherence to the protocol. Adherence monitoring is critical to research on behavioral interventions, to ensure that subjects receiving a treatment are, in fact, getting the treatment advertised (Markowitz, Spielman, Scarvalone, & Perry, 2000). As part of the current research, a form measuring therapists’ adherence to either the HRT or HRT+ACT protocol was created. This form and the accompanying raters’ manual were adapted from a line of

similar adherence rating forms and manuals used in various ACT and other studies (e.g., Hayes, 2007; Kohlenberg, Luoma, Bunting, & Hayes, 2003; Pierson, Gifford, Smith, Bunting, & Hayes, 2004; Twohig, 2005). As is the case with these previous forms, the form employed in the present study includes both modality-specific and non-modality-specific items. The modality-specific items describe key factors discriminating the delivery of HRT+ACT from the delivery of HRT (e.g., the use of techniques designed to promote cognitive defusion or to assist patients in identifying valued goals in various areas of life functioning). The non-modality specific scale items describe therapeutic elements common to both treatments (e.g., the use of awareness training, competing response, and social support techniques). Each item is rated on a 5-point Likert-type scale, taking into account both frequency and extensiveness of the behavior rated. A rating of 1 indicates that the behavior was not present, while ratings of 2 and above represent increasing amounts of the behavior. The rating scale used in Study II is located in Appendix D. The accompanying raters' manual is located in Appendix E.

The capacity of the new adherence measure to serve as an indicator of treatment integrity and discriminability was determined by gathering independent ratings of videotaped sessions at the Duke site. Two independent evaluators (the author and a separate evaluator recruited from among the author's psychology colleagues) used the new form to rate a random sample of 10 videotaped therapy sessions; the tapes consisted of 5 randomly selected sessions from the HRT group and 5 randomly selected

sessions from the HRT+ACT group. Raters were not blinded to treatment assignment prior to viewing the videotapes, which is a limitation of Study II. The independent ratings were used to determine inter-rater reliability and the overall level of therapists' adherence to the treatment protocol. (Please refer to the "Results" section below for the outcome of these analyses.)

All assessments in the BETTS study were conducted by trained, experienced Independent Evaluators (or IEs), who were blind to the details of participants' treatment. Five IEs were used at the Duke site: four licensed, PhD level clinical psychologists and one Master's level clinical psychology doctoral candidate. Three IEs were used at the Penn site: one licensed, PhD level clinical psychologist, one child psychiatrist (MD degree), and one Master's level psychology doctoral candidate. Major assessments (3-4 hours each) took place at Gate C (baseline), the end of acute treatment (week 10), and the end of the maintenance phase (week 18). All patients were also invited to participate in a naturalistic follow-up assessment with an IE at week 22, one month after the end of treatment. At each of these major assessment points, participants completed a psychiatric diagnostic interview, an interview about their CTD symptoms, and several other questionnaires related to their functional impairment and mood status. Briefer assessments (30-45 minutes each) of CTD symptoms and functional impairment took place at weeks 5 and 14. In addition to the IE assessments, at each therapy session during the acute and maintenance phases, a brief evaluation of functional impairment

and severity/change in CTD symptoms was conducted by the therapist, and patients completed brief assessments of functional impairment and CTD symptoms.

4.2.5 Treatments

4.2.5.1 HRT Protocol

The HRT treatment used in Study II and described in this section was adapted from Woods (2001). It involved an 8-session acute protocol plus two follow-up sessions. Session 1 began with the therapist presenting a neurobehavioral model of tics and the rationale for HRT that flows directly from the theoretical model. The therapist and patient also collaborated in creating a tic hierarchy, and the patient was given instructions in self-monitoring of tics. Session 2 focused on awareness training and the development of a specific competing response for one tic from the hierarchy, chosen by the client. Patients typically selected their most bothersome tic as the one they would like to target first; however, the actual order in which tics are targeted during the course of HRT is unimportant. Awareness training involved describing the tic and the sensations and behaviors preceding the tic, learning how to identify tic simulations by the therapist, and then acknowledging the actual or simulated tic exhibited by the participant. Competing response training involved teaching the patient to engage in a behavior that was physically incompatible with the tic or made the tic difficult to occur. A habit inconvenience review was also conducted in Session 2. This involved the therapist and patient (a) reviewing in detail all the ways in which the patient's tics had

resulted in inconveniences, embarrassment, disruption, and difficulties, and (b) considering the potential benefits and advantages of reducing or eliminating tics. A written summary of the habit inconvenience review was created for use in subsequent sessions. Sessions 3 and 4 involved continued awareness and competing response training, along with self-monitoring instructions for other tics on the hierarchy. In the fourth session, deep breathing training was introduced. Session 5 involved the therapist and patient continuing to work on all treatment elements described earlier, along with the initiation of progressive muscle relaxation. Session 6, the last of the weekly sessions, involved review and continuation of previous treatment elements, as well as relapse prevention. Sessions 7 and 8, which were delivered on weeks 8 and 10, respectively, entailed additional relapse prevention training. In these sessions, ongoing difficulties with tics and with implementing treatment procedures were discussed. Booster sessions were conducted at weeks 14 and 18 and continued the review of residual and emergent symptoms, use of treatment strategies, and anticipation of factors likely to predict increases in urges and in tic severity and intensity (e.g., stress).

4.2.5.2 HRT+ACT Protocol

The HRT+ACT treatment used in Study II and summarized in this section is included in Appendix F. It involved a 10-session acute protocol plus two follow-up sessions, combining aspects of Acceptance and Commitment Therapy (Hayes et al., 1999) and Habit Reversal Therapy (Woods & Miltenberger, 1995). The final manual drew

heavily from the combined Acceptance and Commitment Therapy/Habit Reversal Training (ACT/HRT) protocol developed by Woods and colleagues for the treatment of adult trichotillomania (Woods, Wetterneck, & Flessner, 2006) and the acceptance-based behavior therapy developed by Roemer and Orsillo (2007) for Generalized Anxiety Disorder (GAD).

During Session 1, the therapist presented the neurobehavioral model of tics to the patient, along with an overview of the HRT+ACT treatment and therapeutic expectations. The therapist and patient also created a tic hierarchy, and the patient was introduced to the concept of self-monitoring. Session 2 involved the implementation of HRT procedures (awareness training, competing response training, and social support training) with one of the patient's most bothersome tics. A habit inconvenience review was also conducted. Session 3 entailed a review of the HRT techniques and their implementation with a second tic, followed by training in relaxation strategies. Session 4 provided a more formal introduction to ACT, focusing specifically on the concepts of mindfulness and values. Mindfulness was described as non-judgmental, present-moment awareness – a useful tool to promote acceptance of private experiences and willingness to engage in valued action. The patient was also prompted to identify his/her values in life domains where tics had been causing interference. In Session 5, the focus was on isolating the patient's perceived barriers to achieving valued goals, particularly those involving attempts to control urges to tic, emotions surrounding

ticcing, or other unpleasant private events. The ineffectiveness of the control-based strategies was highlighted, as a means of encouraging the patient to be open to more acceptance-oriented approaches to the problem. Session 6 continued the promotion of acceptance and willingness as alternative ways to manage private events. This was accomplished primarily through experiential exercises and the use of metaphorical examples. The goal of Session 7 was to begin changing the way the patient had been interacting with or relating to thoughts and feelings. Utilizing various cognitive defusion exercises, the therapist invited the patient to view a private event as merely something to be experienced – not something to be fused with and taken as constituting his/her identity. In Session 8, the concepts of willingness and cognitive defusion were revisited, with the goal of strengthening the patient's acceptance of unpleasant urges/thoughts/feelings and reinforcing his/her commitment to the course of therapy. During Session 9, the concept of commitment was broadened to include commitment to valued action in diverse life domains, as well as commitment to a course in therapy. The patient was helped to commit to specific, achievable behaviors or actions consistent with his/her previously identified values. Finally, Session 10 involved a review of the HRT and ACT interventions presented during the course of treatment and the commencement of relapse prevention procedures. Special attention was paid to the concepts of willingness, defusion, acceptance of urges, and commitment to valued action. Sessions 11 and 12 occurred one month and two months, respectively, after the

end of acute treatment. These follow-up meetings provided additional review of the therapeutic interventions and instruction in relapse prevention.

4.2.6 Statistical Analyses

First, descriptive and exploratory analyses were conducted to examine and compare levels of premonitory urges, experiential avoidance, tic severity, and overall functioning by gender, age, ethnicity, and treatment group at baseline. Ethnicity was coded according to the CMDQ (Conners & March, 1996), using the following categories: a) White, not of Hispanic origin, b) Black, not of Hispanic origin, c) Hispanic, d) Native Asian or Pacific Islander, e) American Indian or Alaskan Native, or f) Other. As in Study I, the online survey, the goal of these analyses was to determine if there were differences between subgroups on these measures. These initial analyses were comprised mainly of examinations of means and standard deviations, as well as simple *t*-test comparisons.

Additional psychometric analyses were conducted on the AAQ-T, the measure of tic-specific experiential avoidance. In Study II, the AAQ-T was expected to correlate with measures of anxiety (i.e., the MASC and BAI), depression (i.e., the BDI), functional impairment (i.e., the CGAS and WSAS), and tic severity (i.e., the YGTSS). As such, correlations between scores on the new instrument and the aforementioned scales were calculated. The original plan of analysis was to combine MASC and BAI results using Fisher's *z*-transformation. However, only one of the participants was over the age of 17 and, therefore, completed the BAI. All other participants were aged 17 or under and

completed the MASC. Thus, there was insufficient BAI data to calculate a valid correlation coefficient, making it impossible to combine MASC and BAI results with a Fisher's z-transformation. In the final analysis, only the MASC results were used.

Hypothesis 3 and Hypothesis 4 were tested using two different approaches. First, plots of each subject's tic severity, functional impairment, and experiential avoidance scores were constructed to visually inspect response trends across time (from baseline through the naturalistic follow-up). In addition, combined plots were used to visually compare response trends between the HRT and HRT+ACT groups. For example, plots of all subjects' response trends within a group were placed on the same graph, with different symbols used to represent each subject. The average response trend for each treatment group was also calculated and plotted.

Along with the more standard, single-subject approach just described to analyze the BETTS data, a series of mixed between-within subjects repeated-measures ANOVAs were conducted to assess for differences in tic severity, functional impairment, and experiential avoidance over time and between the HRT and HRT+ACT groups. BETTS was primarily designed to be a feasibility and treatment development study. As such, it was not sufficiently powered to conduct traditional significance testing. Despite the small sample size, the repeated measures ANOVAs were conducted for exploratory purposes. Furthermore, it was possible to derive some estimate of effect size for use in a subsequent randomized, controlled trial.

4.2.7 Statistical Power

As mentioned above, Study II was primarily designed to be an investigation of treatment development and feasibility, with provisions for only limited exploratory hypothesis testing. As such, the study was not powered to detect a specific between-group effect size. However, with a sample size of 13 (combining the Duke and Penn participants), the repeated-measures ANOVA had a power of 0.80 to detect any large effects on the order of 0.90, which is equivalent to 51.6% of non-overlap of the HRT group's scores with the HRT+ACT group's scores (Cohen, 1988).

5. Results

5.1 Study I: Online Survey

5.1.1 Pilot-Testing of the YGTSS-SR and the AAQ-T

The self-report version of the YGTSS, and the tic-specific version of the AAQ, were pilot-tested by interviewing five individuals with TS and five individuals without a current or past diagnosis of any CTD (the non-CTD group). Each interviewee had been previously asked to review the modified questionnaires. Potential TS interviewees were identified with the help of contacts at the national TSA office. They were subsequently contacted via email and invited to participate in a 10-15-minute phone interview, regarding their impressions of the new measures. The average age of individuals with TS who completed an interview was 17.2 years ($SD = 3.9$). Three of these interviewees (60%) were male, while the remaining two (40%) were female. All were either currently enrolled in high school or had previously completed a high school degree. Participants in the non-CTD group were recruited from among researchers' colleagues at the Duke Child and Family Study Center in Durham, North Carolina, allowing for face-to-face interviews. Non-CTD volunteers had an average age of 23.4 years ($SD = 0.9$) and no history of a tic disorder. The non-CTD group was comprised of three females (60%) and two males (40%), all of whom had completed at least a high school degree.

Each of the 10 interviewees were provided with blank copies of the YGTSS-SR and AAQ-T and asked to review them carefully, prior to being interviewed. In

particular, TS participants were asked to consider whether the questionnaires were easy to read and follow; which items, if any, were hard to understand; whether they had any problems answering the questions; whether they felt the items covered the necessary scope, frequency, and severity of tics and tic-related symptoms; and whether they had any suggestions for refining the questionnaires. Non-CTD participants were asked whether the questionnaires were easy to read and follow, whether any of the items were difficult to understand, and whether they had any suggestions for improving the measures.

5.1.1.1 Overall Impressions

In general, interviewees' impressions of the two self-report instruments were extremely favorable. All 10 individuals (100%) commented in some way on the questionnaires' clarity and ease of comprehension. For example, one 15-year-old male with a history of both TS and OCD stated, "I have taken many surveys on OCD and Tourette's, and these were very good!" Others pronounced the measures "simple to read," "pretty straightforward," and "very self-explanatory." Remarks such as these were an indicator of success to researchers, whose original goal was to render the questionnaires understandable at a 7th or 8th grade reading level or lower. (Note: Microsoft Word readability statistics indicate that the final version of the YGTSS-SR is readable at a grade level of 7.6, while the AAQ-T is readable at a grade level of 5.1.)

There did not appear to be substantive differences between the TS and non-CTD groups, in terms of their overall impressions of the new instruments. However, individuals with a history of tics were able to comment specifically on whether the items, as a whole, adequately captured the experience of having a tic disorder. All five of the interviewees with a history of TS felt that the YGTSS-SR and AAQ-T, together, presented a comprehensive picture of the types of symptoms and associated impairment that can occur as part of struggling with a CTD.

5.1.1.2 Yale Global Tic Severity Scale – Self-Report Version (YGTSS-SR)

The Yale Global Tic Severity Scale (YGTSS; Leckman et al., 1989) provides an evaluation of the number, frequency, intensity, complexity, and interference of motor and vocal tics. It is intended to be administered by a clinician and, as such, contains language that may be perceived as confusing or even incomprehensible to the lay person. Our primary goal in developing a “user friendly” self-report version of the scale was to increase its range of application (e.g., to encompass online surveys of individuals with CTDs). Thus, it was important that the YGTSS-SR cover essentially the same information as the original scale, but in a format that was clear and easy to understand – with or without a clinical background.

Interviews with both TS and non-CTD volunteers support the conclusion that the self-report version of the YGTSS is comprehensible to adolescents and young adults without clinical expertise in the area of tic disorders. However, interviewees frequently

had more comments and suggestions pertaining to the YGTSS-SR than to the shorter AAQ-T. Non-CTD participants admitted to being unfamiliar with many of the tic-related phenomena referred to in the YGTSS-SR items. Nonetheless, they praised the use of specific examples to clarify terms (e.g., defining “copropraxia” as “the use of obscene or forbidden gestures, such as extending the middle finger”). TS participants also found such examples to be “helpful,” making associated questions “easy to understand.”

Three of the interviewees with tics had few comments on the YGTSS-SR, being generally satisfied with its appearance and content. For instance, one 15-year-old male said he had “no problem answering the questions,” while another 15-year-old male said he found the YGTSS-SR to be “much easier” and “more applicable” to his own life than the AAQ-T. A 17-year-old female with TS described the measure as “very comprehensive” and “not hard to understand.” The remaining two CTD participants remarked on the questionnaire’s cumbersome length and intricate level of detail; however, they also praised the clarity of the wording and the thoroughness of the instrument’s scope. One of these two individuals, a 24-year-old female whose tics began at age 12, suggested reorganizing the measure so that all questions about motor tics appear in one section, while all questions about vocal tics appear in another section. However, since none of the other interviewees offered a similar suggestion, the remark was deemed a matter of stylistic preference, and no such changes were made in the final version of the YGTSS-SR. The same 24-year-old also noted a limitation of the tic

symptom checklists at the front of the questionnaire – in particular, the checklists for complex motor tics and complex vocal tics. She observed that someone filling out the measure could have a complex tic comprised of a combination of movements from the different categories listed (e.g., a complex motor tic involving both a head gesture and a shoulder movement). To resolve this issue, an “Other” category was added at the end of each symptom checklist, with space provided for the person to write in a description of any tics that do not fit neatly into the pre-specified categories.

Feedback on the YGTSS-SR from participants without a history of tics was also generally positive. Several mentioned that they liked the use of a visual continuum, or scale, on the items asking completers to describe the frequency, intensity, and complexity of their tics, along with associated interference and impairment. (Note that one interviewee with TS also commented favorably on this feature.) A couple of the non-CTD participants were divided, however, on their opinion of the verbal anchors used to illustrate various points on each continuum. One 24-year-old female expressed a desire for greater verbal elaboration of the categories on the scales, while a 22-year-old male said he found the anchors “too wordy.” In general, researchers felt that, given the length and degree of description required by the YGTSS-SR, the fewer words needed to convey the meaning of the items, the better. Since the overwhelming majority of interviewees (both non-CTD volunteers and those with TS) portrayed the instrument as clear and comprehensible, no changes were made to the verbal anchors on the scales. Finally, one

23-year-old interviewee in the non-CTD group remarked on the multiple domains of functioning encompassed by the question on overall impairment. She wondered how someone who was functioning well in one domain (e.g., family relationships) but poorly in another (e.g., school or work) would answer the question. It is true that this is a difficulty inherent in rating overall impairment; however, a principal goal of researchers was to make the self-report instrument as similar as possible to the original YGTSS, facilitating comparisons among past and future studies using the instruments. The overall impairment question on the original YGTSS comprises multiple domains of functioning; thus, a choice was made to retain this feature in the self-report version. Furthermore, instructions preceding the item clearly ask the respondent to place a check mark next to the category that best describes the overall level of impairment caused by their tics during the past week. As such, their response is intended to reflect their functioning in a composite of life domains.

5.1.1.3 Acceptance and Action Questionnaire – Tic-Specific Version (AAQ-T)

The Acceptance and Action Questionnaire (AAQ-9; Hayes et al., 2004) was designed to measure the construct of experiential avoidance and has often been used in treatment outcome studies of ACT. In particular, the AAQ-9 is intended to assess the degree to which a given individual avoids or resists unpleasant thoughts, emotions, and physical sensations. Avoidance of such private experiences has been implicated in a wide range of clinical problems and disorders (Hayes et al., 1996), and researchers in the

present study suspected that tic disorders were no exception. A tic-specific version of the AAQ-9 was, thus, developed in an attempt to assess the nature of an individual's relationship with the cognitive and emotional sequelae of their tic disorder. This relationship can be categorized along a continuum from "accepting" to "avoidant" and may have a significant impact on the outward functioning of those with CTDs.

Reactions to the tic-specific version of the AAQ were much more succinct and uniform across the 10 interviewees, compared to feedback on the YGTSS-SR. Only one participant, a 15-year-old male with TS, found the AAQ-T to be "much harder" to apply to his own life than the YGTSS-SR. Asked to elaborate, he explained that he suffers from severe OCD and is more concerned with and occupied by his OCD-related symptoms on a daily basis than his tic-related symptoms. As such, his TS has taken a backseat to his OCD, which is the primary focus of his emotional and cognitive struggles. Another 15-year-old with TS also felt that the items on the AAQ-T were less relevant to him than those on the YGTSS-SR; however, he was quick to add that he knows other people with tics "who do act like that." The observations of the two aforementioned interviewees were not regarded as problematic by researchers. The AAQ-T scores of these individuals would still be valid; they would simply place the boys closer to the "accepting" end of the "accepting-avoidant" continuum previously described. The remaining three participants with TS found the AAQ-T easy to understand and had few suggestions for improving it. Those suggestions that were offered were idiosyncratic and not

representative of the interviewees, as a whole (e.g., feeling that the wording of the phrase “magic wand” in item #11 might be “too juvenile”).

Respondents in the non-CTD group had similarly favorable impressions of the AAQ-T, overall. One person described it as “totally fine,” while another stated that she could think of no suggestions for improving the instrument. The remaining three non-CTD participants were generally satisfied with the questionnaire but proposed changing the wording of a few specific items, to clarify their meaning further. Each of these three interviewees had a problem with a different item, and none of their suggestions overlapped. A 24-year-old male said he had to read item #4 (“I don’t try out new things if I’m afraid I will tic”) twice before he felt he had an adequate understanding of its meaning. A 22-year-old male took issue with the phrase “bad tic day” in item #8 (“I stop doing things that are important to me when I’m having a bad tic day”), noting that the meaning of this phrase is subjective and does not distinguish between frequency and intensity of tics. Lastly, a 24-year-old female thought that item #6 (“I often catch myself thinking about how I’ve handled situations in which I’ve ticed and what I would do differently next time”) was too wordy. While each of the aforementioned concerns is valid, they do not appear to be common, based on the interviewees’ remarks as a whole. Some level of subjectivity is unavoidable when developing a psychological assessment tool. During the creation of the AAQ-T, researchers strove to produce a measure with

the least amount of ambiguity. It seems reasonable to conclude, based on the collective results of the 10 interviews, that this goal was achieved.

5.1.1.4 Summary

Results from the pilot-testing interviews suggest that, on the whole, both the YGTSS-SR and the AAQ-T are acceptable, comprehensive, and understandable to both individuals with tics and their asymptomatic 'normal' counterparts. Researchers engaged in a significant amount of careful thought and discussions with colleagues during the development phase of these two new measures, which appears to have been valuable. As a result of these preliminary efforts, few to no changes were required in the final versions. On the YGTSS-SR, an "Other" category was added at the end of the checklists for complex motor tics and complex vocal tics, enabling responders to write in a description of any of their tics that did not fit neatly into the pre-specified categories. On the AAQ-T, no revisions were deemed necessary. A copy of the final versions of the YGTSS-SR and AAQ-T used in the present research project can be found in "Appendix A".

5.1.2 Demographic Characteristics of the Final Sample

The final sample ($N = 239$) included in statistical analyses for Study I, the online survey, had a mean age of 37.6 years ($SD = 13.8$ years). Approximately 67% of participants were male ($n = 161$), while about 33% ($n = 78$) were female. Ethnic characteristics of the sample are displayed in Table 4.

Table 4: Ethnic Characteristics of Participants in Study I (Online Survey)

Ethnicity	Frequency	Percent
White/Caucasian	211	88.3
African-American	4	1.7
Hispanic/Latino	8	3.3
Asian	4	1.7
Native American or Alaskan Native	3	1.3
Native Hawaiian or Other Pacific Islander	1	.4
Multi-racial	2	.8
Other	4	1.7
Missing data	2	.8
Total	239	100.0

5.1.3 Descriptive Statistics and Correlations Among Survey Measures

The sample size, mean, and standard deviation for each measure included in the online survey can be found in Table 1 (under Section 4.1.1 “Participants”). Pearson product-moment correlation coefficients were calculated for all possible pairings of survey measures and are displayed in Table 5. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There were statistically significant correlations between the YGTSS-SR and the PUTS, AAQ-9, AAQ-T, and PQoL, respectively. All correlations were in the expected direction. In other words, higher levels of tic severity were associated with (a) higher levels of premonitory urges, general experiential avoidance, and tic-specific experiential avoidance and (b) lower levels of perceived quality of life. In addition, the PUTS was

Table 5: Correlations Among Scores on Survey Measures

MEASURE		YGTSS-SR	PUTS	AAQ-9	AAQ-T	PQoL
YGTSS-SR	Pearson Correlation	1	.31**	.21**	.47**	-.18**
	<i>n</i>	225	212	225	211	210
PUTS	Pearson Correlation	.31**	1	.20**	.30**	-.04
	<i>n</i>	212	226	226	213	212
AAQ-9	Pearson Correlation	.21**	.20**	1	.64**	-.60**
	<i>n</i>	225	226	239	225	223
AAQ-T	Pearson Correlation	.47**	.30**	.64**	1	-.52**
	<i>n</i>	211	213	225	225	211
PQoL	Pearson Correlation	-.18**	-.04	-.60**	-.52**	1
	<i>n</i>	210	212	223	211	223

Note. YGTSS-SR = Yale Global Tic Severity Scale – Self-Report Version; PUTS = Premonitory Urge for Tics Scale; AAQ-9 = Acceptance and Action Questionnaire; AAQ-T = Acceptance and Action Questionnaire – Tic-Specific Version; PQoL = Perceived Quality of Life Scale.

** $p < .01$ (two-tailed).

significantly correlated with the AAQ-9 and AAQ-T, such that higher levels of premonitory urges were associated with higher levels of both general and tic-specific experiential avoidance. As anticipated, general experiential avoidance (measured by the AAQ-9) was strongly positively correlated with tic-specific experiential avoidance (measured by the AAQ-T) and strongly negatively correlated with quality of life (measured by the PQoL). Tic-specific experiential avoidance was also negatively correlated with quality of life, such that higher scores on the AAQ-T were associated with lower scores on the PQoL.

5.1.4 Demographic Comparisons of Scores on Survey Measures

A series of independent-samples *t*-tests were conducted to compare scores on survey measures by major demographic variables. Table 6 shows means and standard deviations of scores on the PUTS, YGTSS-SR, AAQ-9, AAQ-T, and PQoL by gender, age, and ethnicity. There were no significant differences in scores for males and females on measures of premonitory urges [PUTS; $t(224) = -.53, p = .60$ (two-tailed)]; tic severity [YGTSS-SR; $t(223) = -1.96, p = .051$ (two-tailed)]; general experiential avoidance [AAQ-9; $t(237) = -.54, p = .59$ (two-tailed)]; or perceived quality of life [PQoL; $t(221) = .36, p = .72$ (two-tailed)]. There was a marginally significant difference in tic-specific experiential avoidance between males and females [AAQ-T; $t(223) = -2.02, p = .04$ (two-tailed)], with females reporting higher levels of this construct.

There were no significant differences in scores for participants above and below the median age of the final sample (i.e., 36 years) on measures of premonitory urges [PUTS; $t(224) = -1.30, p = .19$ (two-tailed)]; tic severity [YGTSS-SR; $t(223) = .94, p = .35$ (two-tailed)]; tic-specific experiential avoidance [AAQ-T; $t(223) = -.23, p = .82$ (two-tailed)]; or perceived quality of life [PQoL; $t(221) = 1.49, p = .14$ (two-tailed)]. There was a significant difference in general experiential avoidance between older and younger participants [AAQ-9; $t(237) = -2.27, p = .02$ (two-tailed)], with those younger than the median age reporting higher levels of this construct.

Table 6: Means and Standard Deviations of Scores on Survey Measures by Gender, Age, and Ethnicity

Measure	GENDER		AGE		ETHNICITY	
	Males	Females	Median Age and Above (≥ 36 years)	Below Median Age (< 36 years)	White/Caucasian	Minority
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
PUTS	21.9 (6.7)	22.4 (6.5)	21.5 (6.8)	22.6 (6.4)	21.9 (6.3)	23.1 (8.0)
YGTSS-SR	30.6 (10.2)	33.5 (9.6)	32.1 (9.6)	30.9 (10.6)	31.0 (9.9)	34.5 (10.9)
AAQ-9	33.4 (9.8)	34.2 (9.6)	32.3 (9.4)*	35.2 (9.9)*	33.4 (9.8)	36.1 (9.2)
AAQ-T	33.1 (12.5)*	36.7 (12.4)*	34.1 (12.5)	34.4 (12.8)	34.5 (12.7)	32.7 (11.3)
PQoL	6.9 (1.8)	6.8 (1.8)	7.0 (1.7)	6.7 (1.9)	6.8 (1.8)	6.9 (2.2)

Note. PUTS = Premonitory Urge for Tics Scale; YGTSS-SR = Yale Global Tic Severity Scale – Self-Report Version; AAQ-9 = Acceptance and Action Questionnaire; AAQ-T = Acceptance and Action Questionnaire – Tic-Specific Version; PQoL = Perceived Quality of Life Scale.

* $p < .05$ (two-tailed).

There were no significant differences in scores between White/Caucasian participants and those from ethnic minority groups on measures of premonitory urges [PUTS; $t(222) = .83, p = .41$ (two-tailed)]; tic severity [YGTSS-SR; $t(221) = 1.59, p = .11$ (two-tailed)]; general experiential avoidance [AAQ-9; $t(235) = 1.33, p = .19$ (two-tailed)]; tic-specific experiential avoidance [AAQ-T; $t(221) = -.66, p = .51$ (two-tailed)]; or perceived quality of life [PQoL; $t(220) = .24, p = .81$ (two-tailed)].

5.1.5 Psychometric Analyses of the YGTSS-SR and the AAQ-T

5.1.5.1 Yale Global Tic Severity Scale – Self-Report Version (YGTSS-SR)

Cronbach's alpha coefficient was computed for the YGTSS-SR. For the current sample ($N = 224$), the overall internal consistency of the YGTSS-SR was excellent ($\alpha = .90$). Corrected item-scale correlations were also assessed, to determine whether any items should be dropped. Table 7 shows item-scale correlations for each of the eleven items included in the calculation of the total YGTSS-SR score, along with the impact on Cronbach's alpha of removing each item from the scale. Since all item-scale correlations were reasonably high, and none of the individual items would have raised the final alpha value if removed, all items were retained in the final version of the scale.

Table 7: Yale Global Tic Severity Scale – Self-Report Version: Item-Scale Correlations and Impact of Item Deletions on Internal Consistency ($N = 224$)

Item	Corrected Item-Scale Correlation	Cronbach's Alpha If Item Deleted
Number of Motor Tics	.50	.90
Number of Vocal Tics	.63	.89
Frequency of Motor Tics	.46	.90
Frequency of Vocal Tics	.64	.89
Intensity of Motor Tics	.61	.89
Intensity of Vocal Tics	.71	.88
Complexity of Motor Tics	.67	.89
Complexity of Vocal Tics	.74	.88
Interference of Motor Tics	.66	.89
Interference of Vocal Tics	.73	.88
Overall Impairment	.61	.89

Convergent validity was inspected by examining Pearson product-moment correlations between the YGTSS-SR and other survey measures. As shown in Table 5 and described in Section 5.1.3, the YGTSS-SR correlated with the PUTS, AAQ-9, AAQ-T, and PQoL. All correlations were in the predicted direction and were statistically significant at the $p < .01$ level.

5.1.5.2 Acceptance and Action Questionnaire – Tic-Specific Version (AAQ-T)

Cronbach's alpha coefficient was computed for the AAQ-T. For the current sample ($N = 225$), the overall internal consistency of the AAQ-T was excellent ($\alpha = .90$). Item-scale correlations were also assessed, to determine whether any items should be dropped. Table 8 shows item-scale correlations for each of the fifteen items included in the calculation of the total AAQ-T score, along with the impact on Cronbach's alpha of removing each item from the scale. All item-scale correlations were reasonably high, except for item number fifteen ("Whenever I feel the urge to tic, I tic."). Deleting this item would have increased the final alpha value only marginally (from .90 to .91), and there were theoretical reasons to retain the item as a measure of tic-specific experiential avoidance (avoidance of unpleasant urges, in particular). Thus, all of the original items, including item number fifteen, were retained in the final version of the scale.

Convergent validity was inspected by examining Pearson product-moment correlations between the AAQ-T and other survey measures. As shown in Table 5 and described in Section 5.1.3, the AAQ-T correlated with the YGTSS-SR, PUTS, AAQ-9, and

PQoL. All correlations were in the predicted direction and were statistically significant at the $p < .01$ level.

Table 8: Acceptance and Action Questionnaire – Tic-Specific Version: Item-Scale Correlations and Impact of Item Deletions on Internal Consistency (N = 225)

Item	Corrected Item-Scale Correlation	Cronbach's Alpha If Item Deleted
1. My life won't be good until my tics are under control.	.72	.89
2. My negative thoughts and feelings about my tics mess up my life.	.73	.89
3. The bad things I think about myself because I tic must be true.	.71	.89
4. I don't try out new things if I'm afraid I will tic.	.70	.89
5. I do all I can to make sure I don't tic in front of other people.	.50	.90
6. I often catch myself thinking about how I've handled situations in which I've ticced and what I would do differently next time.	.57	.90
7. I can't stand the feeling/sensation I have right before I tic.	.56	.90
8. I stop doing things that are important to me when I'm having a bad tic day.	.68	.89
9. When I feel depressed or anxious about my tics, I am unable to take care of my responsibilities.	.60	.90
10. I wish I could get my anxiety and worries about my tics under control.	.72	.89
11. I wish I could wave a magic wand to make all of my tics go away.	.46	.90
12. I feel embarrassed by my tics.	.65	.89
13. I can't be a good friend when I feel upset about my tics.	.66	.89
14. When I compare myself to other people who tic, it seems that most of them are handling their tics better than I am.	.52	.90
15. Whenever I feel the urge to tic, I tic.	.17	.91

5.1.6 Regression Analyses

A set of multiple linear regressions were employed to assess the ability of measures of premonitory urges (i.e., the PUTS), tic-specific experiential avoidance (i.e., the AAQ-T), and general experiential avoidance (i.e., the AAQ-9) to predict self-reported tic severity (measured by the YGTSS-SR). Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. Because scores on the AAQ-9 and AAQ-T were highly correlated (see Table 5 in Section 5.1.3; $r = .64$, $n = 225$, $p < .01$), which would have violated the assumption of multicollinearity, these two predictors were separated in regression analyses. Demographic variables (i.e., age, gender, and ethnicity) were not included as covariates in hypothesis testing, since none were found to be associated with self-reported tic severity (Table 6).

Regression results utilizing self-reported tic severity as the dependent variable are summarized in Table 9. To assess for main effects, the PUTS and AAQ-T were first used to predict YGTSS-SR scores (Model 1). A second regression was then conducted, using centered predictors and extending the model to include the interaction between the PUTS and AAQ-T (Model 2). Finally, two additional regressions were run in the manner just described, substituting the AAQ-9 for the AAQ-T (Models 3 and 4). Level of premonitory urges and tic-specific experiential avoidance were both found to be strong predictors of self-reported tic severity; general experiential avoidance was found to be a

Table 9: Summary of Multiple Linear Regression Analyses for Variables Predicting Self-Reported Tic Severity (YTGSS-SR) (N = 225)

MODEL	R ²	Variable [†]	Unstandardized Coefficients		Standardized Coefficients	t
			B	Standard Error	β	
1	.25	PUTS	.27	.10	.18**	2.84
		AAQ-T	.33	.05	.41***	6.53
2 (using centered predictors)	.25	Step 1				
		PUTS	.27	.10	.18**	2.75
	AAQ-T	.33	.05	.41***	6.34	
	.25	Step 2				
		PUTS	.27	.10	.18**	2.63
		AAQ-T	.33	.05	.41***	6.33
	PUTS x AAQ-T	-.00	.01	-.02	-.30	
3	.12	PUTS	.42	.10	.27***	4.12
		AAQ-9	.16	.07	.15*	2.28
4 (using centered predictors)	.12	Step 1				
		PUTS	.42	.10	.27***	4.12
	AAQ-9	.16	.07	.15*	2.28	
	.12	Step 2				
		PUTS	.42	.10	.28***	4.19
		AAQ-9	.16	.07	.16*	2.35
	PUTS x AAQ-9	.01	.01	.08	1.28	

Note. YGTSS-SR = Yale Global Tic Severity Scale – Self-Report Version; PUTS = Premonitory Urge for Tics Scale; AAQ-T = Acceptance and Action Questionnaire – Tic-Specific Version; AAQ-9 = Acceptance and Action Questionnaire

[†] Sample sizes for predictor variables are as follows: PUTS = 226; AAQ-T = 225; AAQ-9 = 239; PUTS x AAQ-T = 213; PUTS x AAQ-9 = 226.

* $p < .05$; ** $p < .01$; *** $p < .001$.

weaker, yet still statistically significant, predictor. There were no significant interaction effects among predictor variables. However, upon visual inspection, there appeared to be a trend toward more elevated levels of tic severity at higher levels of premonitory urges for more experientially avoidant participants, compared to less experientially avoidant individuals (Figure 1).

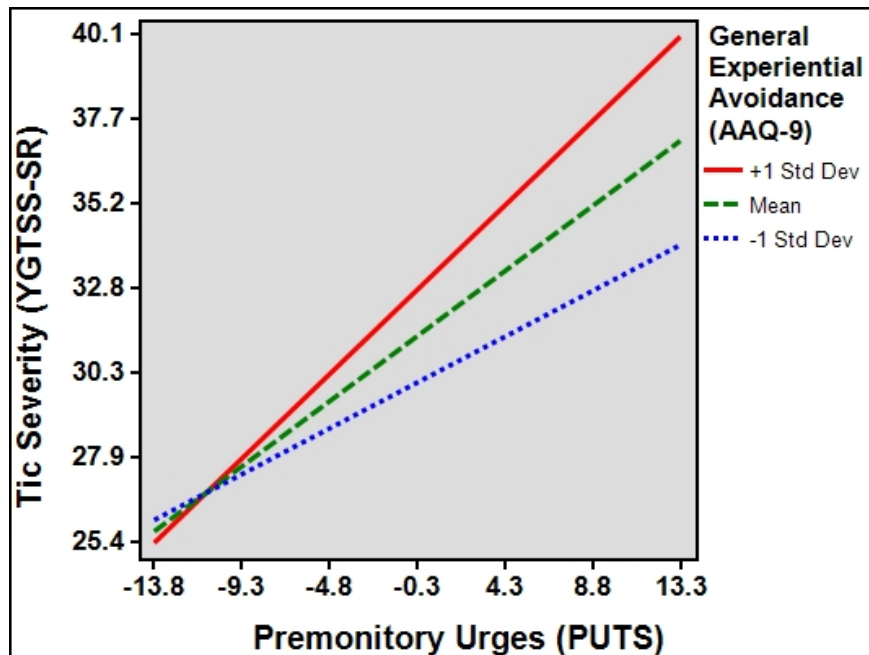


Figure 1: Relationship Between Self-Reported Tic Severity and Premonitory Urges at Various Levels of General Experiential Avoidance

A second set of multiple linear regressions were employed to assess the ability of the PUTS, AAQ-T, and AAQ-9 to predict perceived quality of life (measured by the PQoL). Preliminary analyses were conducted to ensure no violation of the assumptions

of normality, linearity, multicollinearity, and homoscedasticity. Once again, because scores on the AAQ-9 and AAQ-T were highly correlated, these two predictors were separated in regression analyses. Demographic variables (i.e., age, gender, and ethnicity) were not included as covariates in hypothesis testing, since none were found to be associated with perceived quality of life (Table 6).

Regression results utilizing perceived quality of life as the dependent variable are summarized in Table 10. To assess for main effects, the PUTS and AAQ-T were first used to predict PQoL scores (Model 1). A second regression was then conducted, using centered predictors and extending the model to include the interaction between the PUTS and AAQ-T (Model 2). Finally, two additional regressions were run in the manner just described, substituting the AAQ-9 for the AAQ-T (Models 3 and 4). Both general and tic-specific experiential avoidance were found to be very strong predictors of perceived quality of life; level of premonitory urges was a weak and less consistent predictor. There were no significant interaction effects among predictor variables.

Table 10: Summary of Multiple Linear Regression Analyses for Variables Predicting Perceived Quality of Life (PQoL) (N = 223)

MODEL	R ²	Variable [†]	Unstandardized Coefficients		Standardized Coefficients	t
			B	Standard Error	β	
1	.28	PUTS	.04	.02	.13*	2.06
		AAQ-T	-.08	.01	-.56***	-9.00
2 (using centered predictors)	.28	Step 1				
		PUTS	.04	.02	.13*	2.01
	AAQ-T	-.08	.01	-.56***	-8.76	
	.29	Step 2				
		PUTS	.03	.02	.11	1.74
AAQ-T		-.08	.01	-.55***	-8.64	
	PUTS x AAQ-T	-.00	.00	-.07	-1.14	
3	.37	PUTS	.02	.02	.08	1.46
		AAQ-9	-.12	.01	-.62***	-10.96
4 (using centered predictors)	.37	Step 1				
		PUTS	.02	.02	.08	1.46
	AAQ-9	-.12	.01	-.62***	-10.96	
	.37	Step 2				
		PUTS	.02	.02	.08	1.44
AAQ-9		-.12	.01	-.62***	-10.93	
	PUTS x AAQ-9	.00	.00	-.02	-.29	

Note. PQoL = Perceived Quality of Life Scale; PUTS = Premonitory Urge for Tics Scale; AAQ-T = Acceptance and Action Questionnaire – Tic-Specific Version; AAQ-9 = Acceptance and Action Questionnaire

[†] Sample sizes for predictor variables are as follows: PUTS = 226; AAQ-T = 225; AAQ-9 = 239; PUTS x AAQ-T = 213; PUTS x AAQ-9 = 226.

* $p < .05$; ** $p < .01$; *** $p < .001$.

5.2 Study II: BETTS Treatment Study

5.2.1 Characteristics of the Study Sample

The final sample ($N = 13$) for Study II, the BETTS treatment study, had a mean age of 15.4 years ($SD = 1.3$ years), with a range of 14 to 18 years. Approximately 85% of participants were male ($n = 11$), while about 15% ($n = 2$) were female. Ethnic characteristics of the sample were as follows: approximately 77% ($n = 10$) of participants identified themselves as “White, not of Hispanic origin,” 15% ($n = 2$) as “Black, not of Hispanic origin,” and the remaining 8% ($n = 1$) as “Other.” All participants had a primary DSM-IV diagnosis of Tourette’s Disorder. Participants’ comorbid diagnoses at baseline are listed in Table 11.

Table 11: Comorbid Diagnoses of Study II Participants

Subject ID	Comorbid Diagnoses
Duke University	
1001	social phobia
1002	ADHD, dysthymia, specific phobia
1005	ADHD
1006	<i>none</i>
1007	<i>none</i>
1009	<i>none</i>
1010	ADHD, obsessive compulsive disorder, social phobia
University of Pennsylvania	
1	ADHD
2	<i>none</i>
3	ADHD
4	ADHD, GAD, major depressive disorder
5	GAD, major depressive disorder
6	<i>none</i>

Note. ADHD = attention deficit hyperactivity disorder; GAD = generalized anxiety disorder.

5.2.2 Demographic Comparisons of Scores on Study II Measures

A series of independent-samples *t*-tests were conducted to compare scores on treatment study measures at baseline by major demographic variables. Table 12 shows means and standard deviations of scores on the AAQ-9, AAQ-T, PUTS, WSAS (both patient-reported and parent-reported), and YGTSS by gender, age, and ethnicity. There were no significant differences in scores for males and females on measures of general experiential avoidance [AAQ-9; $t(11) = -1.85, p = .09$ (two-tailed)]; tic-specific experiential avoidance [AAQ-T; $t(11) = -1.53, p = .16$ (two-tailed)]; premonitory urges [PUTS; $t(11) = -1.00, p = .34$ (two-tailed)]; patient-reported functioning [WSAS; $t(11) = -.01, p = .99$ (two-tailed)]; parent-reported functioning [WSAS; $t(11) = -.04, p = .97$ (two-tailed)]; or tic severity [YGTSS-SR; $t(11) = .31, p = .76$ (two-tailed)].

There were no significant differences in scores for participants above and below the median age of the final sample (i.e., 15 years) on measures of general experiential avoidance [AAQ-9; $t(11) = .31, p = .77$ (two-tailed)]; tic-specific experiential avoidance [AAQ-T; $t(11) = -.34, p = .74$ (two-tailed)]; premonitory urges [PUTS; $t(11) = .02, p = .99$ (two-tailed)]; patient-reported functioning [WSAS; $t(11) = .39, p = .70$ (two-tailed)]; or tic severity [YGTSS-SR; $t(11) = -1.49, p = .17$ (two-tailed)]. There was a significant difference in parent-reported functioning [WSAS; $t(11) = -3.56, p = .00$ (two-tailed)], with parents reporting worse functioning for participants younger than the median age.

There were no significant differences in scores between White/Caucasian participants and those from ethnic minority groups on measures of general experiential avoidance [AAQ-9; $t(11) = 1.68, p = .12$ (two-tailed)]; tic-specific experiential avoidance [AAQ-T; $t(11) = 1.71, p = .12$ (two-tailed)]; premonitory urges [PUTS; $t(11) = -.23, p = .83$ (two-tailed)]; patient-reported functioning [WSAS; $t(11) = -.38, p = .71$ (two-tailed)]; parent-reported functioning [WSAS; $t(11) = .52, p = .61$ (two-tailed)]; or tic severity [YGTSS-SR; $t(11) = .98, p = .35$ (two-tailed)].

Table 12: Means and Standard Deviations of Scores on Study II Measures at Baseline by Gender, Age, and Ethnicity

Measure	GENDER		AGE		ETHNICITY	
	Males	Females	Median Age and Above (≥ 15 years)	Below Median Age (< 15 years)	White/Caucasian	Minority
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
AAQ-9	34.0 (7.5)	44.5 (6.4)	36.1 (8.8)	34.5 (7.3)	33.7 (7.2)	42.0 (8.9)
AAQ-T	18.7 (11.3)	32.0 (11.3)	20.0 (13.8)	22.5 (7.3)	17.9 (11.0)	30.3 (11.2)
PUTS	24.0 (9.4)	31.0 (4.2)	25.1 (10.3)	25.0 (6.9)	25.4 (9.8)	24.0 (7.8)
WSAS (Patient) [†]	10.8 (8.6)	10.9 (0.2)	11.4 (7.1)	9.5 (10.5)	11.3 (8.1)	9.3 (8.6)
WSAS (Parent) [†]	6.7 (7.5)	6.9 (2.7)	3.5 (3.1)**	14.0 (7.9)**	6.2 (7.7)	8.6 (3.5)
YGTSS	23.9 (9.7)	21.5 (13.4)	21.0 (10.5)	29.3 (4.2)	22.1 (10.5)	28.3 (4.6)

Note. AAQ-9 = Acceptance and Action Questionnaire; AAQ-T = Acceptance and Action Questionnaire – Tic-Specific Version; PUTS = Premonitory Urge for Tics Scale; WSAS = Work and Social Adjustment Scale; YGTSS = Yale Global Tic Severity Scale.

[†] Higher scores on the WSAS indicate worse functioning; lower scores indicate better functioning.

** $p < .01$ (two-tailed).

5.2.3 Changes in Participants' Scores on Study II Measures From Pre-Treatment Through Follow-Up

Table 13 displays mean scores at baseline for the principal measures used in the BETTS study. There were no significant pre-treatment differences in scores between the HRT and HRT+ACT groups on measures of general experiential avoidance [AAQ-9; $t(11) = -.10, p = .92$ (two-tailed)]; tic-specific experiential avoidance [AAQ-T; $t(11) = -1.32, p = .22$ (two-tailed)]; premonitory urges [PUTS; $t(11) = -1.94, p = .08$ (two-tailed)]; patient-reported functioning [WSAS; $t(11) = -.46, p = .65$ (two-tailed)]; parent-reported functioning [WSAS; $t(11) = -1.77, p = .10$ (two-tailed)]; or tic severity [YGTSS-SR; $t(11) = -.26, p = .80$ (two-tailed)].

Table 13: Mean Scores at Baseline for the HRT and HRT+ACT Groups

Measure	HRT ($n = 7$)	HRT+ACT ($n = 6$)
	Mean (SD)	Mean (SD)
AAQ-9	35.4 (8.8)	35.8 (8.0)
AAQ-T	16.9 (13.6)	25.3 (8.5)
PUTS	21.0 (10.3)	29.8 (4.4)
WSAS (Patient) [†]	9.9 (5.2)	12.0 (10.6)
WSAS (Parent) [†]	3.9 (3.9)	10.1 (8.4)
YGTSS	22.9 (11.2)	24.3 (8.6)

Note. AAQ-9 = Acceptance and Action Questionnaire; AAQ-T = Acceptance and Action Questionnaire – Tic-Specific Version; PUTS = Premonitory Urge for Tics Scale; WSAS = Work and Social Adjustment Scale; YGTSS = Yale Global Tic Severity Scale.

[†] Higher scores on the WSAS indicate worse functioning; lower scores indicate better functioning.

The means and standard deviations of scores on all Study II measures can be found in Table 14, which summarizes combined data from the total sample ($N = 13$) at various time points. Changes in scores across time generally trended in the expected direction for each of the constructs measured. From pre-treatment through the week 22 follow-up, decreases were observed in general and tic-specific experiential avoidance (i.e., AAQ-9 and AAQ-T), depressive symptoms (i.e., BDI), severity of CTD symptoms (i.e., CGI-S and YGTSS), and anxiety (i.e., MASC). During the same time period, improvements were observed in overall functioning (i.e., CGAS and WSAS) and CTD symptoms (i.e., CGI-I). There was little change in participants' mean level of premonitory urges (i.e., PUTS) – an independent variable that was not explicitly targeted by either intervention – throughout the course of the study.

Table 14: Mean Scores (and Standard Deviations) of Study II Measures at Various Time Points (All $n = 13$)

Measure	Baseline	End of Acute Treatment (Week 10)	End of Maintenance Phase (Week 18)	Follow-Up (Week 22)
AAQ-9	35.6 (8.1)	30.2 (8.3)	29.6 (10.1)	26.9 (7.8)
AAQ-T	20.8 (11.9)	12.5 (9.7)	11.9 (7.8)	10.8 (7.5)
BDI	7.8 (7.6)	3.5 (3.8)	3.8 (5.6)	†
CGAS (Therapist)	61.8 (11.9)	73.8 (15.1)	82.6 (7.2)	†
CGAS (IE)	64.4 (7.7)	71.2 (10.7)	76.7 (8.9)	79.0 (9.7)
CGI-S (Therapist)	4.4 (1.0)	3.4 (1.4)	2.7 (0.9)	†
CGI-S (IE)	4.4 (0.6)	3.3 (1.4)	3.1 (1.3)	2.5 (1.0)
CGI-I (Therapist)*	†	2.2 (0.8)	1.8 (0.6)	†
CGI-I (IE)*	†	2.9 (1.3)	2.8 (1.2)	2.1 (1.0)
MASC	29.3 (14.0)	22.9 (17.8)	18.1 (19.0)	†
PUTS	25.1 (9.1)	20.2 (13.2)	24.7 (11.0)	24.6 (11.3)
WSAS (Patient)*	10.8 (7.9)	4.8 (4.9)	4.2 (6.0)	2.2 (3.5)
WSAS (Parent)*	6.7 (6.9)	6.1 (6.8)	4.6 (5.3)	3.0 (3.2)
YGTSS	23.5 (9.7)	21.2 (11.3)	18.3 (11.3)	13.3 (9.0)

Note. AAQ-9 = Acceptance and Action Questionnaire; AAQ-T = Acceptance and Action Questionnaire – Tic-Specific Version; BDI = Beck Depression Inventory; CGAS = Children’s Global Assessment Scale; CGI-S = Clinical Global Impression – Severity Scale; CGI-I = Clinical Global Impression – Improvement Scale; CSQ = Consumer Satisfaction Questionnaire; IE = Independent Evaluator; MASC = Multidimensional Anxiety Scale for Children; PUTS = Premonitory Urge for Tics Scale; WSAS = Work and Social Adjustment Scale; YGTSS = Yale Global Tic Severity Scale.

† Data was not collected at time point.

* Higher WSAS scores indicate worse functioning, while lower scores indicate better functioning. Higher CGI-I scores indicate less improvement in tic symptoms, while lower scores indicate more improvement.

5.2.4 Consumer Satisfaction

Ratings of satisfaction and acceptability of the interventions (i.e., CSQ) were high, as reported by both patients and parents, at both the end of acute treatment (week 10) and at follow-up (week 22). The maximum possible CSQ score was 32, and the range of individual CSQ scores obtained was 24 to 32. There were no statistically significant differences in consumer satisfaction between the HRT and HRT+ACT groups, at either week 10 or week 22, as reported by either patient or parent (Table 15).

Table 15: Consumer Satisfaction Questionnaire (CSQ) Scores for the BETTS Treatment Study

Time Point	Treatment Group	<i>n</i>	Reporter	Mean (<i>SD</i>)	<i>t</i> (<i>df</i>)	<i>p</i>
Week 10	HRT	7	Patient	31.4 (0.9)	1.74 (11)	.11
	HRT+ACT	6	Patient	30.4 (1.0)		
Week 10	HRT	7	Parent	29.7 (2.2)	-.61 (11)	.56
	HRT+ACT	6	Parent	30.3 (1.5)		
Week 22	HRT	7	Patient	31.2 (1.9)	.07 (11)	.95
	HRT+ACT	6	Patient	31.1 (0.7)		
Week 22	HRT	7	Parent	28.8 (2.9)	-1.80 (11)	.10
	HRT+ACT	6	Parent	31.1 (1.3)		

Note. HRT = Habit Reversal Training; ACT = Acceptance and Commitment Therapy.

5.2.5 Additional Psychometric Analyses of the AAQ-T

To supplement the psychometric analyses of the AAQ-T conducted as part of Study I, additional analyses were carried out using the treatment study data. Table 16 shows Pearson product-moment correlations between the AAQ-T and other Study II measures at baseline, end of acute treatment (week 10), end of the maintenance phase (week 18), and follow-up (week 22).

Table 16: Correlations Between the AAQ-T and Other Study II Measures

MEASURE		AAQ-T			
		Baseline	Week 10	Week 18	Week 22
AAQ-9	Pearson Correlation	.55	.29	.58*	.60*
BDI	Pearson Correlation	.27	.50	.72**	†
CGAS (Therapist)	Pearson Correlation	-.36	.00	-.28	†
CGAS (IE)	Pearson Correlation	.42	-.36	-.05	.04
MASC	Pearson Correlation	.25	.77**	.67*	†
PUTS	Pearson Correlation	.52	.72**	.58*	.50
WSAS (Patient)	Pearson Correlation	.26	.69**	.73**	.66*
WSAS (Parent)	Pearson Correlation	.27	.54	.64*	.64*
YGTSS	Pearson Correlation	-.25	.25	.37	.44

Note. AAQ-9 = Acceptance and Action Questionnaire; AAQ-T = Acceptance and Action Questionnaire – Tic-Specific Version; BDI = Beck Depression Inventory; CGAS = Children’s Global Assessment Scale; IE = Independent Evaluator; MASC = Multidimensional Anxiety Scale for Children; PUTS = Premonitory Urge for Tics Scale; WSAS = Work and Social Adjustment Scale; YGTSS = Yale Global Tic Severity Scale.

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

† Correlation was not measured at time point.

5.2.6 Response Trends Over Time by Treatment Group

The following series of figures shows aggregated plots of mean response trends over time by treatment group (as well as combined plots of individual participants' response trends) on principal outcome measures used in the BETTS study. Figures 2 and 3 track trends in general experiential avoidance (i.e., AAQ-9 scores). Figures 4 and 5 track tic-specific experiential avoidance (i.e., AAQ-T scores). Figures 6 and 7 show trends in tic severity (i.e., YGTSS scores). Lastly, figures 8, 9, and 10 display change over time in overall functioning (i.e., WSAS scores). In each figure, the vertical reference line at week 10 marks the end of the acute treatment period.

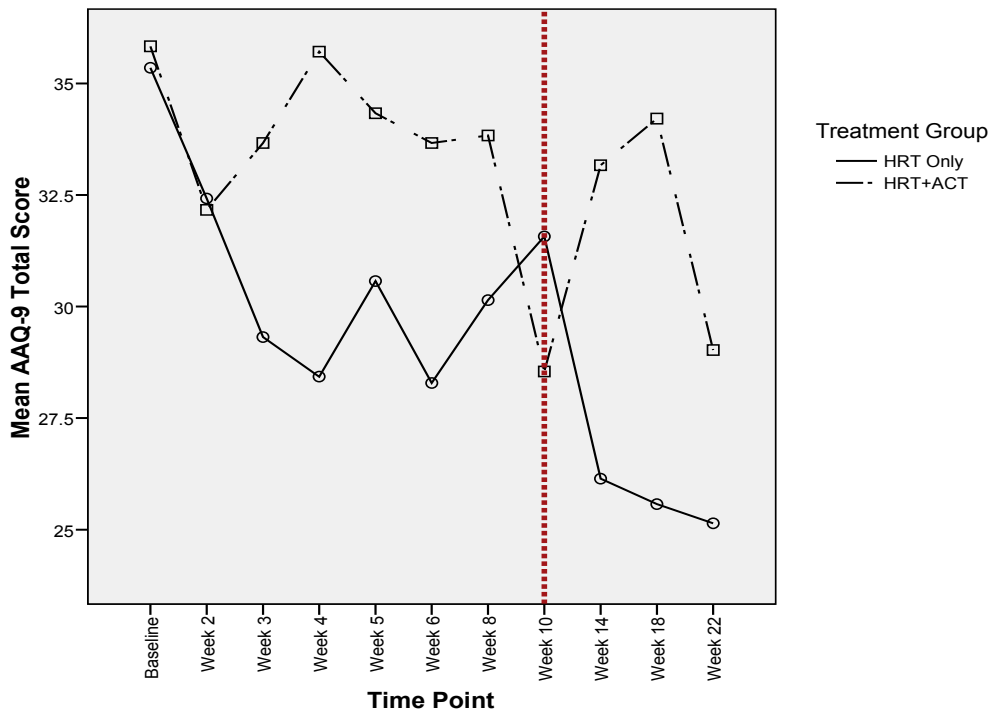


Figure 2 : Mean General Experiential Avoidance (AAQ-9) Scores Over Time for the HRT vs. HRT+ACT Groups

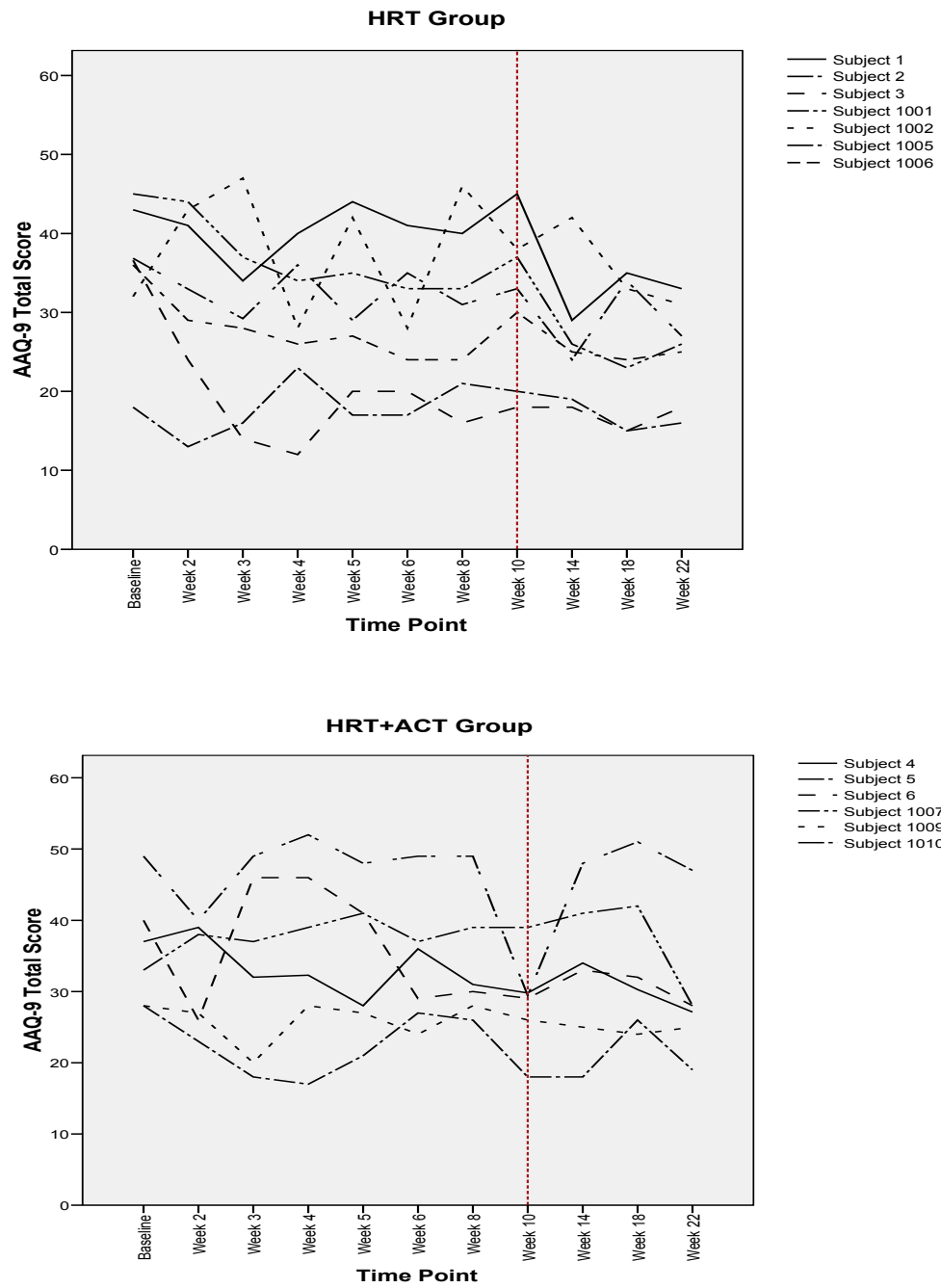


Figure 3: Individual Participants' General Experiential Avoidance (AAQ-9) Scores Over Time for the HRT vs. HRT+ACT Groups

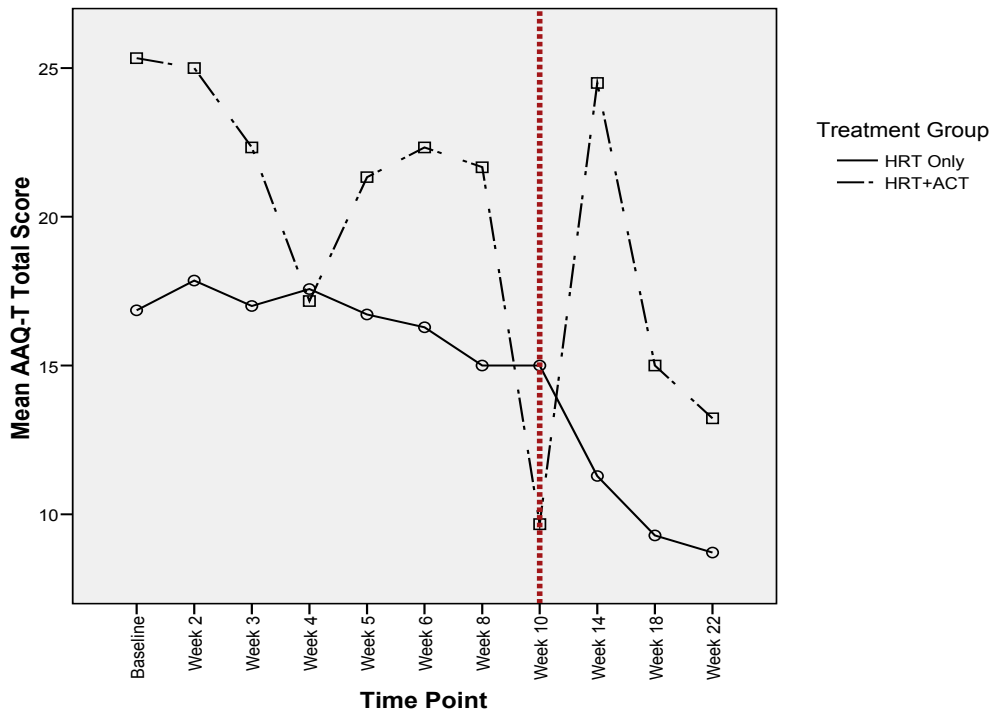


Figure 4: Mean Tic-Specific Experiential Avoidance (AAQ-T) Scores Over Time for the HRT vs. HRT+ACT Groups

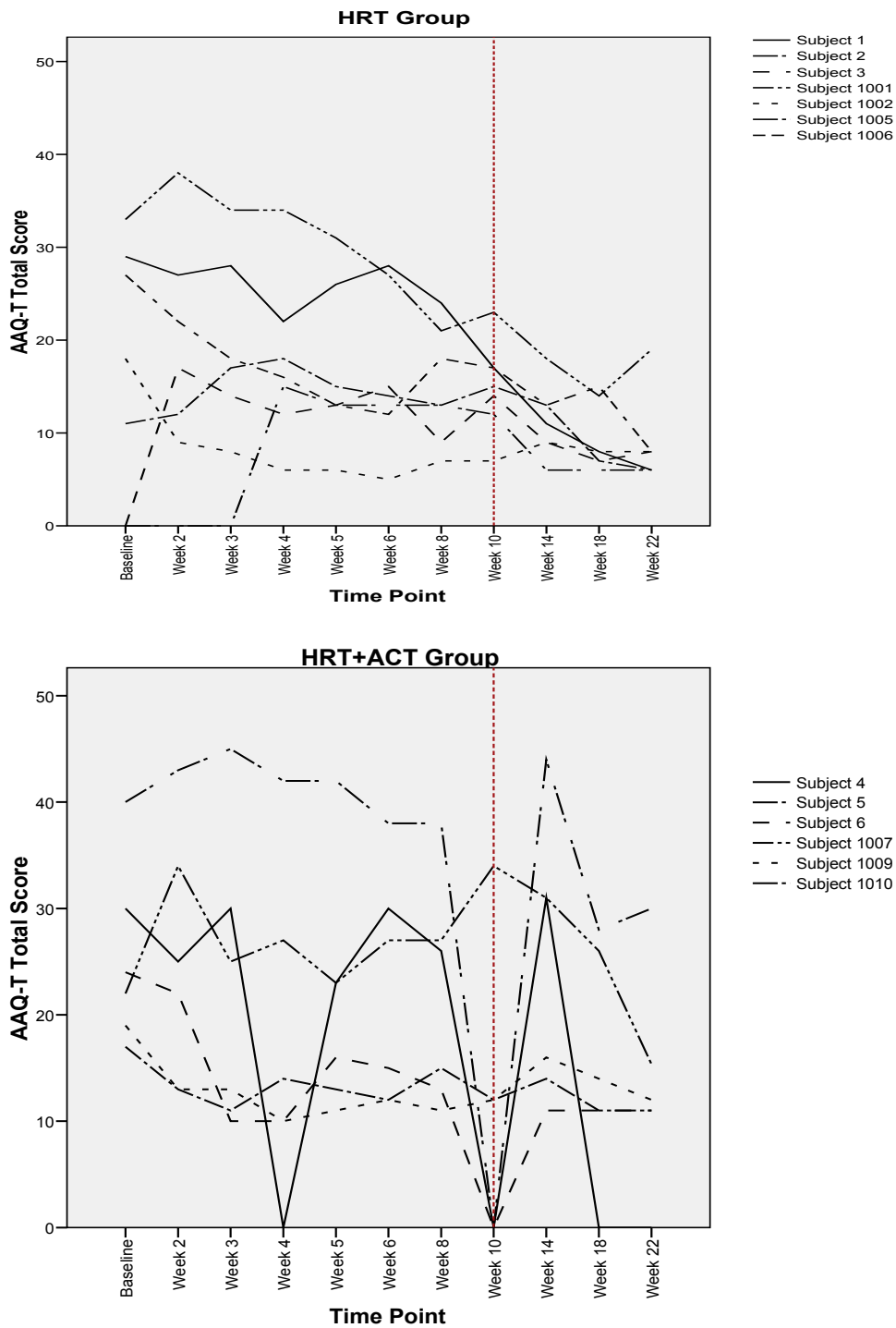


Figure 5: Individual Participants' Tic-Specific Experiential Avoidance (AAQ-T) Scores Over Time for the HRT vs. HRT+ACT Groups

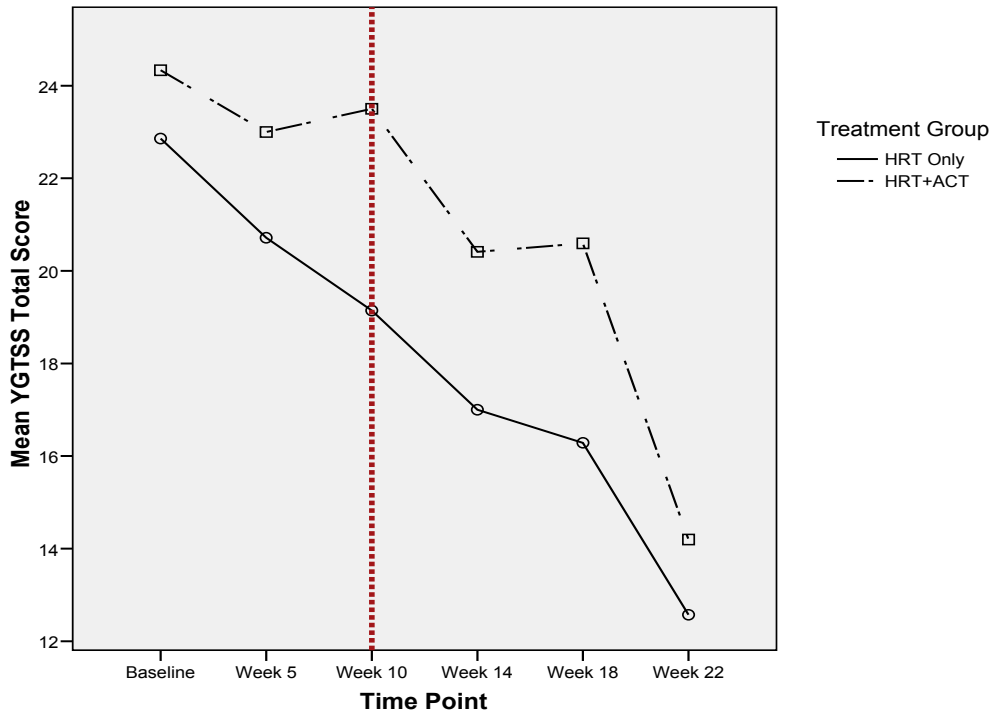


Figure 6: Mean Tic Severity (YGTSS) Scores Over Time for the HRT vs. HRT+ACT Groups

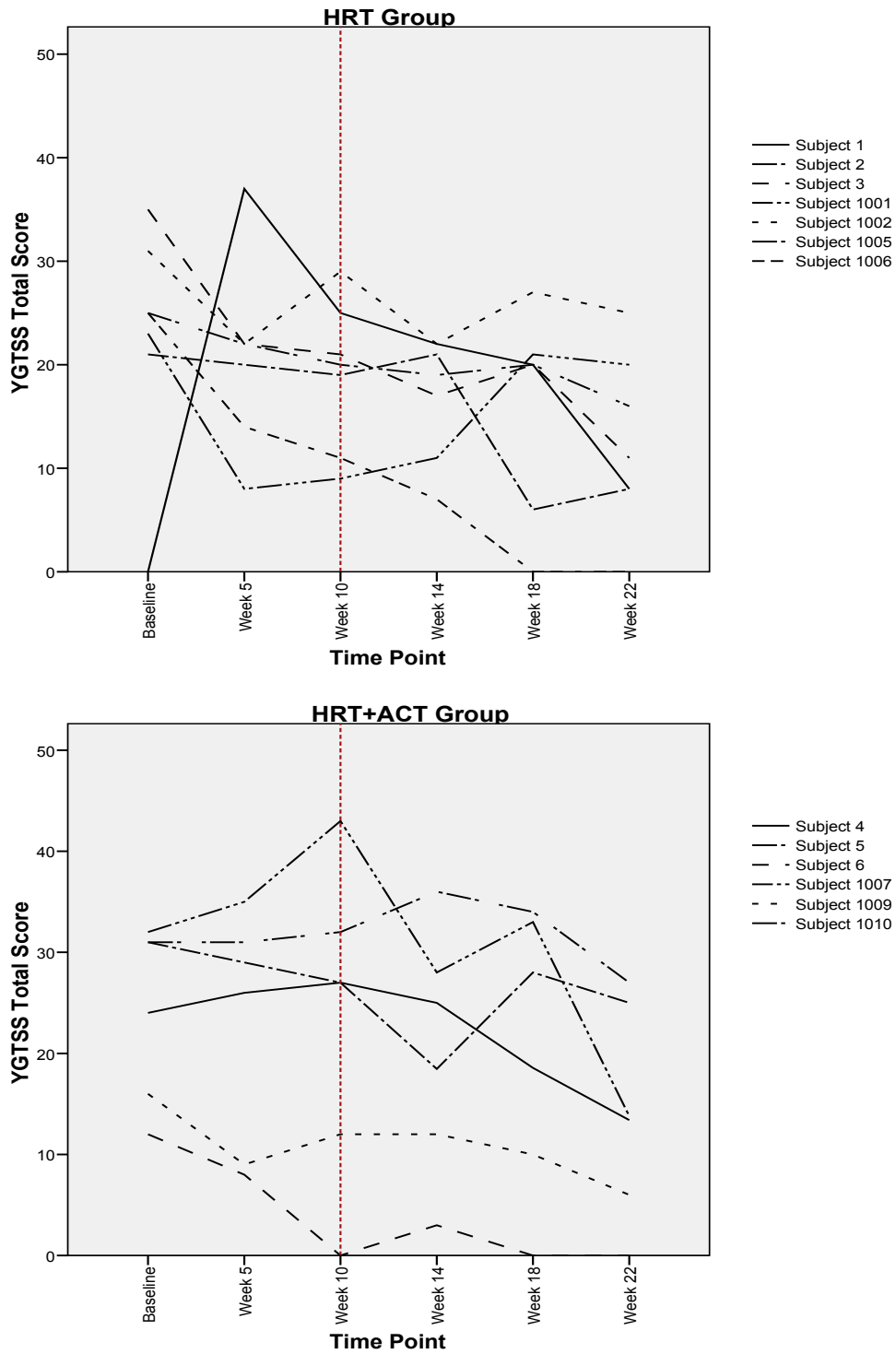


Figure 7: Individual Participants' Tic Severity (YGTSS) Scores Over Time for the HRT vs. HRT+ACT Groups

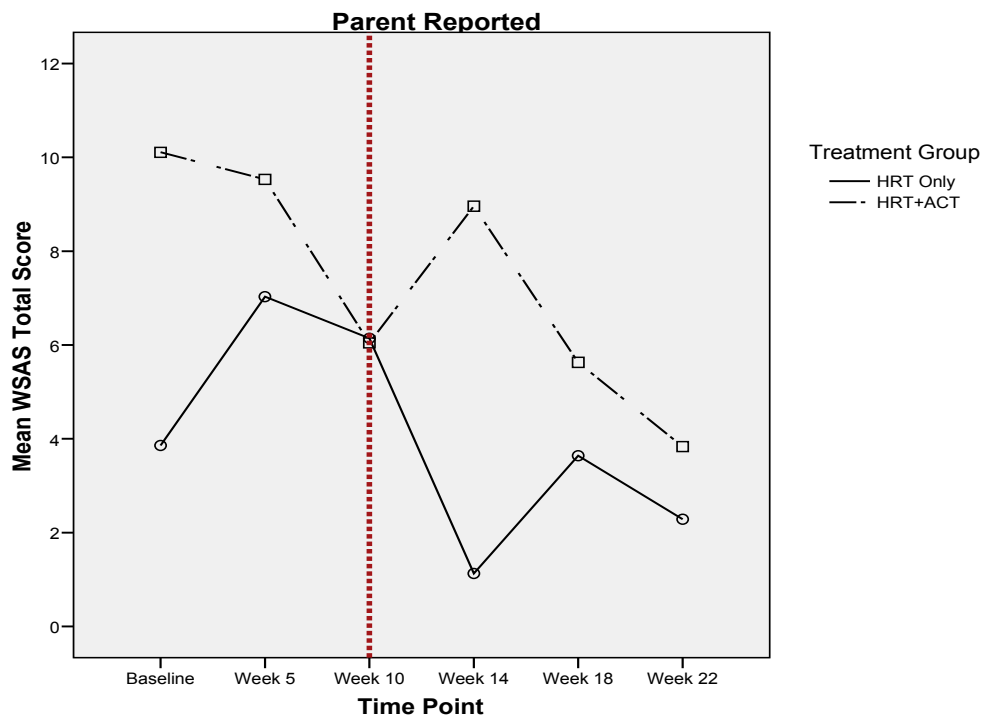
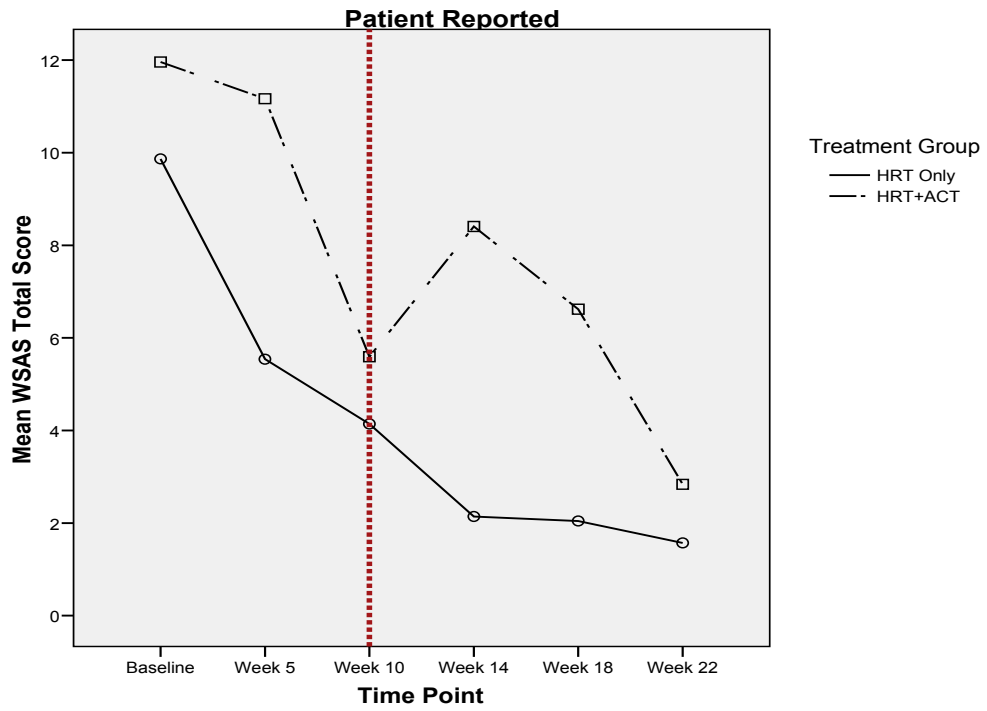


Figure 8: Mean Patient- and Parent-Reported Overall Functioning (WSAS) Scores Over Time for the HRT vs. HRT+ACT Groups

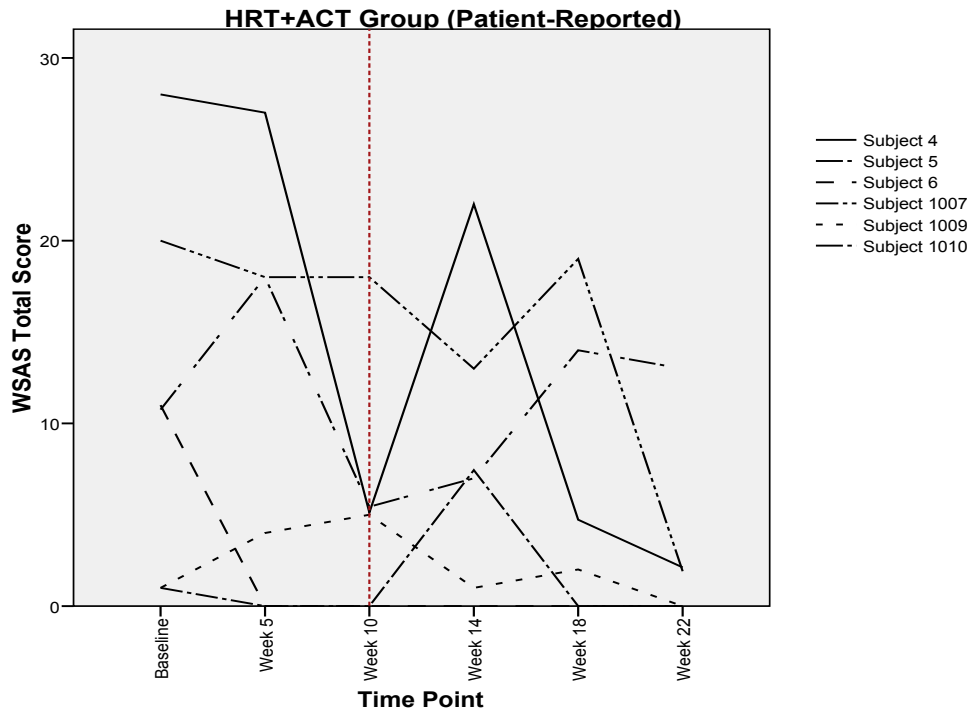
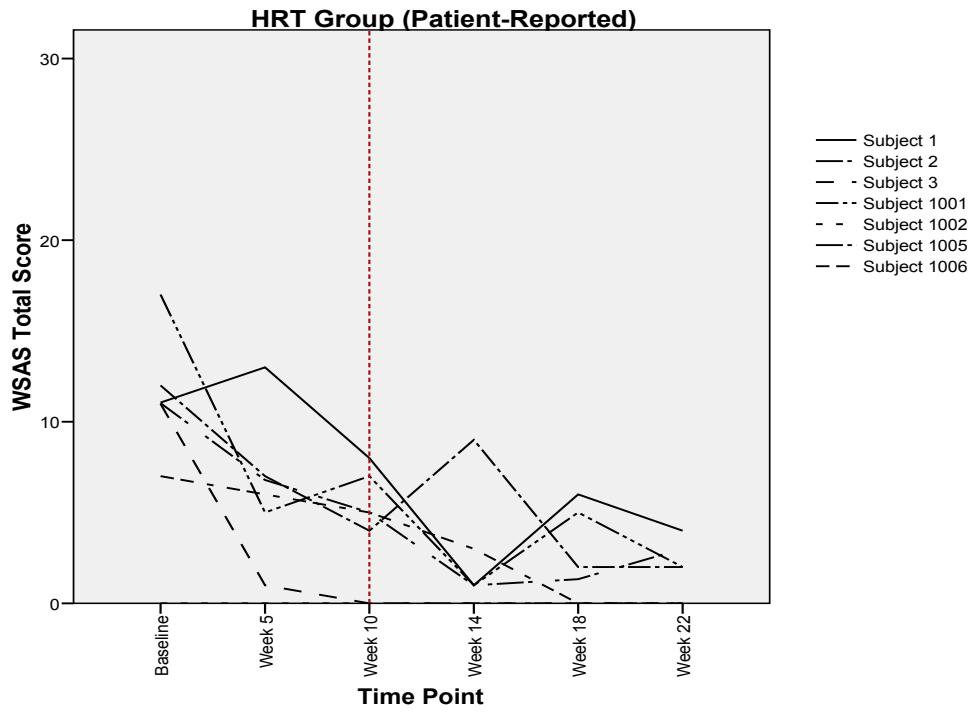


Figure 9: Individual Participants' Self-Reported Overall Functioning (WSAS) Scores Over Time for the HRT vs. HRT+ACT Groups

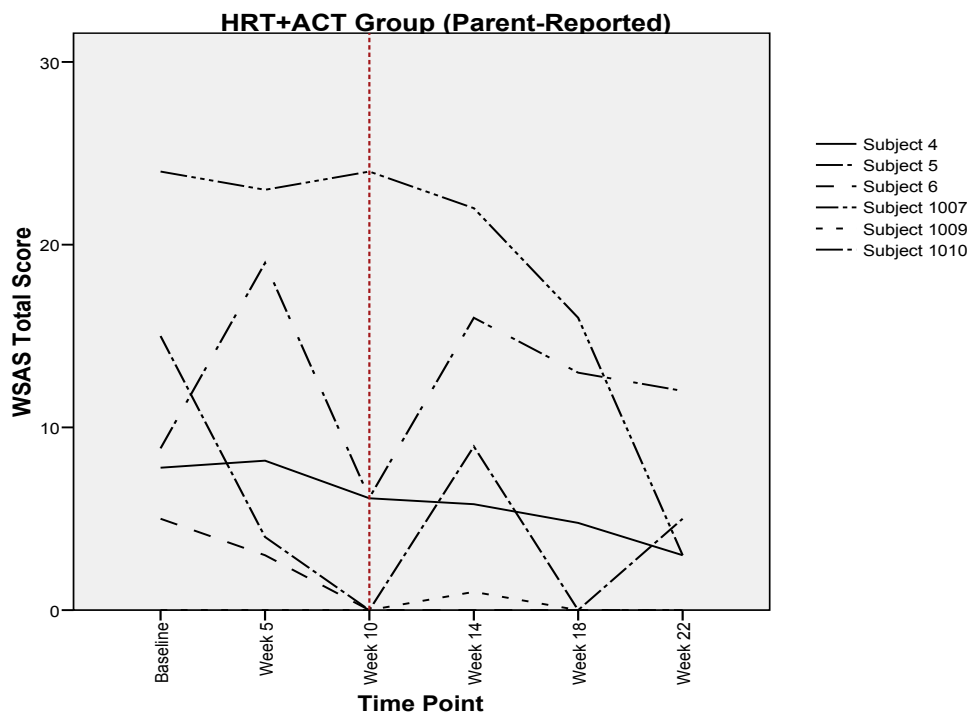
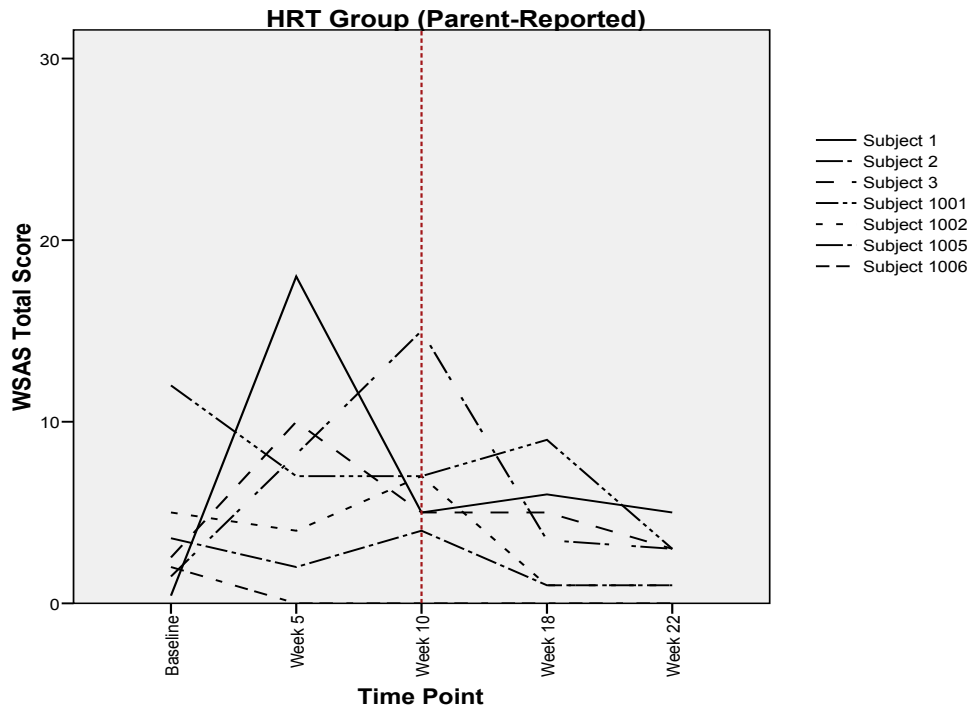


Figure 10: Individual Participants' Overall Functioning (WSAS) Scores Over Time for the HRT vs. HRT+ACT Groups, as Reported by Parents

5.2.7 Mixed Between-Within Subjects Repeated Measures ANOVAs

Means and standard deviations of scores on principal outcome measures at various time points in the BETTS treatment study were shown in Table 14. A series of mixed between-within subjects repeated measures analyses of variance (ANOVAs) were conducted to assess the impact of the HRT and HRT+ACT interventions on participants' tic severity, general and tic-specific experiential avoidance, and overall functioning.

Tic severity, as measured by YGTSS scores, was evaluated at six different time points – baseline and weeks 5, 10, 14, 18, and 22. There was no significant interaction between treatment group and time [Wilks' Lambda = .90, $F(5, 7) = .16$, $p = .97$, partial eta squared = .10], suggesting no difference in the effectiveness of the two treatments at reducing tic severity. There was a significant main effect for time [Wilks' Lambda = .25, $F(5, 7) = 4.23$, $p = .04$, partial eta squared = .75], with both the HRT and HRT+ACT groups showing reductions in YGTSS scores across the six time periods (Table 14; Figure 6). The main effect comparing the two types of interventions was not significant [$F(1, 11) = .37$, $p = .55$, partial eta squared = .03].

General experiential avoidance, as measured by AAQ-9 scores, was measured at 11 different time points – baseline and weeks 2-6, 8, 10, 14, 18, and 22. There was no significant interaction between treatment group and time [Wilks' Lambda = .31, $F(10, 2) = .44$, $p = .85$, partial eta squared = .69], suggesting no difference in the effectiveness of the two treatments at reducing general experiential avoidance. Nor was there a

statistically significant main effect for time [Wilks' Lambda = .02, $F(10, 2) = 8.73$, $p = .11$, partial eta squared = .98], despite the fact that reductions in mean AAQ-9 scores were observed in both the HRT and HRT+ACT groups from baseline through follow-up (Table 14; Figure 2). The main effect comparing the two types of interventions was not significant [$F(1, 11) = .62$, $p = .45$, partial eta squared = .05].

Tic-specific experiential avoidance, as measured by AAQ-T scores, was also assessed at 11 different time points – baseline and weeks 2-6, 8, 10, 14, 18, and 22. There was no significant interaction between treatment group and time [Wilks' Lambda = .22, $F(10, 2) = .72$, $p = .71$, partial eta squared = .78], suggesting no difference in the effectiveness of the two treatments at reducing tic-specific experiential avoidance. Nor was there a statistically significant main effect for time [Wilks' Lambda = .15, $F(10, 2) = 1.17$, $p = .55$, partial eta squared = .85], despite the fact that reductions in mean AAQ-T scores were observed in both the HRT and HRT+ACT groups from baseline through follow-up (Table 14; Figure 4). The main effect comparing the two types of interventions was not significant [$F(1, 11) = 1.28$, $p = .28$, partial eta squared = .10].

Overall functioning, as measured by patient-reported WSAS scores, was assessed at six different time points – baseline and weeks 5, 10, 14, 18, and 22. There was no significant interaction between treatment group and time [Wilks' Lambda = .49, $F(5, 7) = 1.46$, $p = .31$, partial eta squared = .51], suggesting no difference in the effectiveness of the two treatments at improving overall patient-reported functioning. Nor was there a

statistically significant main effect for time [Wilks' Lambda = .38, $F(5, 7) = 2.28$, $p = .16$, partial eta squared = .62], despite the fact that improvements in mean patient-reported WSAS scores were observed in both the HRT and HRT+ACT groups from baseline through follow-up (Table 14; Figure 8). (Recall that lower scores on the WSAS indicate better functioning.) The main effect comparing the two types of interventions was not significant [$F(1, 11) = 1.71$, $p = .22$, partial eta squared = .14].

Overall functioning, as measured by parent-reported WSAS scores, was also assessed at six different time points – baseline and weeks 5, 10, 14, 18, and 22. There was no significant interaction between treatment group and time [Wilks' Lambda = .47, $F(5, 7) = 1.58$, $p = .28$, partial eta squared = .53], suggesting no difference in the effectiveness of the two treatments at improving overall parent-reported functioning. Nor was there a statistically significant main effect for time [Wilks' Lambda = .32, $F(5, 7) = 3.05$, $p = .09$, partial eta squared = .69], despite the fact that improvements in mean parent-reported WSAS scores were observed in both the HRT and HRT+ACT groups from baseline through follow-up (Table 14; Figure 8). (Recall that lower scores on the WSAS indicate better functioning.) The main effect comparing the two types of interventions was not significant [$F(1, 11) = 1.44$, $p = .26$, partial eta squared = .12].

5.2.8 Therapists' Adherence to the Treatment Protocol

As part of Study II, a scale was developed to rate therapists' adherence to the HRT and HRT+ACT treatment protocols (see Appendix D). The scale consisted of 13

items, divided into three subscales: HRT Items, ACT Items, and Anti-ACT Items. Each item was rated on a 5-point, Likert-type scale. Ten videotaped sessions were randomly selected and rated separately by the author and a co-rater. There were a total of 130 items to be rated by each of the two raters. Inter-rater reliability was found to be excellent (intraclass correlation coefficient = .92). On over 97% of the items, the two raters' ratings were either identical or within one point of each other.

To assess the overall level of therapists' adherence to the treatment protocols, independent samples *t*-tests were conducted to determine whether there were differences in ratings on the "ACT Items" subscale between treatment groups. It was hypothesized that items on this subscale would receive higher ratings for videotapes from the HRT+ACT group, compared to those from the HRT group. Table 17 summarizes results of these analyses. There was a significant difference between groups on scores for each of the five items on the "ACT Items" subscale. Furthermore, this difference was in the predicted direction (i.e., in each case, the mean rating was higher in the HRT+ACT group than in the HRT group).

Table 17: Ratings of Therapists' Use of ACT-Consistent Topics and Techniques in the HRT vs. HRT+ACT Groups (All N = 10)

Item	Treatment		Mean	SD	<i>t</i>	<i>p</i>
	Group					
Values & Goals	HRT		1.3	0.5	-4.14	.001
	HRT+ACT		3.1	1.3		
Creative Hopelessness	HRT		1.1	0.3	-4.88	.000
	HRT+ACT		2.5	0.9		
Willingness / Acceptance	HRT		1.3	0.5	-5.34	.000
	HRT+ACT		3.8	1.4		
Defusion	HRT		1.0	0.0	-5.67	.000
	HRT+ACT		2.7	0.9		
Committed Action	HRT		1.3	0.5	-4.24	.002
	HRT+ACT		3.6	1.6		

Note. HRT = Habit Reversal Training; ACT = Acceptance and Commitment Therapy.

Items on the “Anti-ACT” subscale consisted of techniques that were not part of either the HRT or HRT+ACT protocol and were more consistent with traditionally defined cognitive therapy. A separate set of *t*-tests were conducted to assess whether the mean scores on any of the “Anti-ACT” subscale items were significantly different from ‘1’ (a rating of ‘1’ = ‘Not at all’, indicating that the variable described by the item never explicitly occurred during the course of the session being rated). Table 18 summarizes results of these analyses. Note that the ‘Cognitive Therapy Rationale’ item could not be subjected to a *t*-test, since its mean value was exactly ‘1’ and its standard deviation was, therefore, zero. Only one of the four items on the “Anti-ACT” subscale (i.e.,

'Thoughts/Feelings Cause Action') had a mean that was significantly different from the test value of '1'. However, this mean (1.3) was still quite low relative to the entire 5-point range of the Likert scale and was considered an acceptable deviation from the expected value of '1'.

Table 18: Ratings of Therapists' Use of Topics and Techniques That Were Inconsistent With Either of the Treatments (All N = 20)

Test Value = 1				
Item	Mean	SD	<i>t</i>	<i>p</i>
Challenging Cognitions	1.1	0.2	1.00	.33
Avoidant Change Strategies	1.1	0.2	1.00	.33
Cognitive Therapy Rationale *	1.0	0.0	---	---
Thoughts/Feelings Cause Action	1.3	0.5	2.85	.01

* *t* could not be computed because the standard deviation is zero.

6. Discussion

6.1 Study I: Online Survey

Study I, the online survey, was designed to be an investigation of the role played by experiential avoidance in CTDs – whether simply as a correlate of tic severity and functioning, or as a moderator of the relationship between premonitory urges and these outcome variables. It was hypothesized that experiential avoidance would be significantly linearly related to both tic severity and functioning, as measured by perceived quality of life. It was further hypothesized that level of premonitory urges would be significantly linearly related to tic severity and functioning. Results from Study I largely support these hypotheses.

In multiple linear regression analyses, premonitory urges and tic-specific experiential avoidance, together, explained approximately 25% of the variance in tic severity among survey participants. Furthermore, each of these two predictor variables contributed significantly to the prediction of the dependent variable, with the strongest unique contribution made by tic-specific experiential avoidance ($\beta = .41$). When general experiential avoidance was substituted for tic-specific experiential avoidance, however, only 12% of the variance in tic severity was explained by the regression model. Both level of premonitory urges and general experiential avoidance made significant, unique contributions to the explanation of variance, but the latter variable was a weak predictor ($\beta = .15$) compared to tic-specific experiential avoidance in the first model.

Overall, these results are consistent with prior research linking the premonitory urge phenomenon to tic expression (Leckman et al., 1993; Woods, Piacentini, et al., 2005). In Study I, higher levels of urges were associated with elevated tic severity. Results also showed a significant positive relationship between experiential avoidance and tic severity. Combined, these outcomes are consistent with the neurobehavioral model of CTDs proposed by Woods, Himle, et al. (2005) and Himle (2007), which suggests that tics are negatively reinforced via the reduction in unpleasant, private, premonitory sensations contingent on executing the tic. It may be the case that more experientially avoidant individuals, particularly those who seek to avoid tic-specific distress, consciously or unconsciously tic in order to gain relief from their urges, which are often perceived as intolerable (Cohen, 1992).

While tic severity is certainly an important consideration in CTD research, an equally important (although less symptom-specific) outcome of interest is the overall functioning of the individual with a CTD. As with all disorders that have a psychological component, variability exists in terms of the manner in which individuals cope with and are impacted by their tics, even when holding tic severity constant. For this reason, perceived quality of life (as measured by the PQoL) was included as a separate dependent variable in Study I. Experiential avoidance, whether general or tic-specific, was once again shown to be a strong predictor in multiple linear regression analyses. Higher levels of avoidance were clearly associated with lower scores on the

PQoL. This is consistent with previous research linking experiential avoidance to increased psychopathology and poorer functioning (e.g., Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Hayes et al., 2004).

In contrast, regression analyses produced mixed results regarding the relationship between premonitory urges and quality of life. In the first model, in which the PUTS and AAQ-T combined to predict about 28% of the variance in PQoL scores, the PUTS was shown to be a weak but statistically significant unique predictor ($\beta = .13$). When the AAQ-9 was substituted for the AAQ-T in the regression model, the overall R^2 increased from .28 to .37; however, level of premonitory urges was no longer a significant predictor of variance in quality of life scores. Moreover, the regression coefficient for the PUTS in the first model was in the positive direction, suggesting that higher levels of urges were associated with better quality of life. While there is no good theoretical explanation for this odd and unexpected directional effect, a couple of possibilities exist. First, the statistically significant result from the first model may have constituted a false positive (or Type I) error. Second, it could be the case that general experiential avoidance explained so much of the variance in PQoL scores in the second model ($\beta = -.62$), that level of premonitory urges no longer made a sufficiently unique contribution. However, this seems unlikely, given the fact that the regression coefficient associated with tic-specific experiential avoidance in the first model was similarly high ($\beta = -.56$). No published quantitative research was located pertaining to the relationship

between premonitory urges and perceived quality of life. However, tic severity, which is correlated with premonitory urges (Table 5), has been linked to lower quality of life scores in tic patients, compared to healthy controls (Storch, Merlo, et al., 2007).

Anecdotal evidence from individuals with CTDs also suggests that more frequent and severe urges are detrimental to quality of life (Kurlan et al., 1989; Turtle & Robertson, 2008). Results from the present study contradict these previous findings. Additional research is needed to clarify the relationship between premonitory urges and quality of life in individuals with CTDs.

In addition to exploring the relationship of experiential avoidance and premonitory urges to outcome variables, Study I was designed to extend previous research by examining potential interaction effects between these constructs. It was hypothesized that the relationship between urges and tic severity (and between urges and quality of life) would be stronger for individuals with higher levels of experiential avoidance. In other words, the more experiential avoidance a survey participant reported, the more severe his or her tics were expected to be in the face of rising levels of urges. Similarly, such individuals were expected to report even lower quality of life ratings at higher levels of urges, compared to less experientially avoidant participants. These hypotheses were not supported in multiple regression analyses. There were no significant interaction effects detected in any of the regression models. It is possible that a larger sample than the one employed in Study I would be required to detect such

effects. In support of this idea, Figure 1 shows a possible trend toward higher levels of self-reported tic severity at higher levels of premonitory urges for those participants who reported more general experiential avoidance. On the other hand, it may be that individuals with varying levels of avoidant behavior respond similarly to increases in urges, in terms of tic severity and perceived quality of life. Regardless, it is clear from the regression analyses that experiential avoidance, whether general or tic-specific, is related to tic expression and overall functioning in some manner. As such, results from Study I support the inclusion of a treatment component addressing experiential avoidance in interventions for CTDs.

For the most part, none of the independent or dependent variables in Study I were found to vary significantly with age, gender, or ethnicity; however, there were two notable exceptions (Table 6). First, females endorsed slightly more tic-specific experiential avoidance than their male counterparts. The literature on experiential avoidance does not provide an explanation for this difference. A closer inspection of Table 6 supplies a clue. Females reported higher levels of tic severity, and this difference approached statistical significance ($p = .05$). Since tic-specific experiential avoidance was strongly positively correlated with tic severity in the present study (Table 5), it follows that females would report higher levels of both constructs than males. There is no evidence in the CTD literature to support the notion that females with CTDs suffer from

more frequent and severe tics, in general, than males. This is likely a manifestation of normal sample variability.

A second demographic difference was found in terms of general experiential avoidance. Participants below the median age of 36 years reported slightly higher levels of general experiential avoidance than older participants. One reasonable explanation for this might be that younger individuals have had less time to adapt to the special challenges presented by their CTDs. Older individuals may have had more time to hone their coping mechanisms for dealing with difficult tic-related experiences and may, therefore, be somewhat less avoidant. However, younger and older participants in the present study did not differ in terms of tic-specific experiential avoidance. As such, the age-related difference in general experiential avoidance may simply be another manifestation of normal variability within the total sample. Another possibility is that, while younger and older participants had learned to cope about equally well with their tics, older individuals had become more adept at coping with difficult life experiences, in general.

Psychometric analyses of the two new measures developed for the study (the YGTSS-SR and the AAQ-T) revealed excellent internal consistency reliability and convergent validity (see Section 5.15). Furthermore, during the course of pilot-testing and questionnaire development, both measures were judged as acceptable, comprehensive, and understandable to both individuals with tics and their

asymptomatic 'normal' counterparts. Without the self-report version of the YGTSS, research such as the online survey described here would have been less feasible, and certainly less comparable to past studies. Similarly, the tic-specific version of the AAQ provides researchers and clinicians with a more precise, targeted method of assessing tic-related symptomatology. It is hoped that these novel measures will serve as useful tools in the CTD community and among those investigating and treating CTDs. Further research in scale development should include direct comparison of the YGTSS-SR with the original YGTSS within a clinical sample.

Any consideration of the generalizability of results from Study I is complicated by the fact that data from epidemiological studies of CTDs vary widely, depending on the source, age, and sex of the sample; the experimental procedures; and the diagnostic system employed. While it is true that the majority of individuals with tics are youths, up to 25% of youths with a tic disorder will continue to manifest moderate to severe tics into adulthood (Leckman, Zhang, & Vitale, 1998). The current research was intended to constitute an investigation of factors influencing *chronic* tic disorders, or those that do not abate by the time the individual has reached adulthood. As such, the mean age of 37.6 years in the present study was not deemed a problematic issue. In terms of gender, epidemiological studies of CTDs have reported male-female ratios ranging from 3:1 to 5:1 (Piacentini et al, 2007). Compared to these estimates, the gender split of 67.4% males to 32.6% females in the online survey would appear to overestimate the proportion of

females with CTDs in the general population. However, Peterson and colleagues (2001) conducted a prospective, longitudinal study of 976 individuals, in which 195 participants either had tics at baseline or developed them during the course of the 17-year study. Of those 195 people, 54% were male and 46% were female. These figures are more comparable to the gender ratio observed in the present research. As for ethnicity, the CTD literature provides extremely limited guidance, and most of the existing data is vague. Chronic motor and vocal tics and TS have been observed all over the world, suggesting CTDs are not culture bound (Swain et al., 2007). There is consistent evidence that tic disorders occur more frequently in European Americans than African Americans or Latinos (see review in Piacentini et al., 2007). Beyond these observations, however, more specific information does not yet seem to have been published. The sample of participants in the online survey from the research described here included some diversity in terms of ethnicity (Table 4). White/Caucasian individuals constituted over 88% of the total sample, though, and minority groups may have been underrepresented. More epidemiological research is needed to fill this significant gap in the CTD literature.

It should be noted that Study I had several methodological limitations. First and foremost, all data was obtained by self-report of the participants, without the benefit of corroborating evidence from additional reporters (such as family members, primary providers, or other clinicians). In addition, all data was collected in a cross-sectional manner, providing a snapshot of the study sample at a single point in time. It was,

therefore, not possible to track changes in individual characteristics over time, and results from the present study should not be used to comment on developmental trends in CTDs across the life span. Another limitation was the size of the sample. While large enough to easily detect main effects of predictors on outcome variables, the study may not have been adequately powered to detect interaction effects among predictors. Finally, future CTD researchers should strive to include more ethnic diversity in their samples, to help elucidate similarities and differences in tic-related factors among various ethnic groups.

6.2 Study II: *BETTS Treatment Study*

Study II was primarily intended to be a feasibility and development study, combining key ingredients of the most effective behavioral intervention for CTDs to date (i.e., HRT) with an intervention component (i.e., ACT) designed to address the relationship between experiential avoidance and tic expression observed in Study I. Results of this pilot project suggest that the novel HRT+ACT treatment is feasible, highly acceptable to both patients and parents, and effective at reducing tic severity from pre-treatment through week 22 follow-up. The size of this latter effect was comparable to that seen in a group of individuals treated with HRT alone. Additionally, from baseline through follow-up, participants in the HRT+ACT group reported decreases in both general and tic-specific experiential avoidance, and improvements in overall functioning

(although these decreases were not statistically significant or different from those observed in the HRT group).

As part of Study II, it was hypothesized that: (1) participants receiving the HRT intervention would exhibit significant reductions in CTD symptoms and significant improvements in global functioning post-treatment, (2) the HRT participants would exhibit no change in levels of experiential avoidance, (3) participants receiving the HRT+ACT intervention would display greater reductions in CTD symptoms and improvements in overall functioning than those receiving HRT alone, and (4) the HRT+ACT participants would show significant post-treatment reductions in experiential avoidance. Results from Study II only partially support these hypotheses. Both the HRT and HRT+ACT interventions had a considerable impact on tic severity over time, as shown by significant reductions in participants' YGTSS scores. However, the degree of this effect was not statistically different between the two treatment groups. There was no statistically significant pre- to post-treatment effect on global functioning or experiential avoidance, in either the HRT or HRT+ACT group. Nonetheless, as Table 14 and Figures 2, 4, and 8 show, there was a visually observable (although non-significant) trend toward improved functioning and decreased avoidance over time, for both groups. There was no evidence to suggest that participants receiving the HRT+ACT intervention displayed greater reductions in CTD symptoms and experiential avoidance – or greater improvements in overall functioning – than those receiving HRT alone. In fact,

inspection of visual response trends over time suggest the HRT group may have done better, in terms of these outcomes, than the HRT+ACT group.

There are several possible reasons why the HRT group, on the whole, may have scored slightly better on outcome measures than the HRT+ACT group. First of all, HRT is a well-established, empirically supported treatment that is relatively straightforward to learn and implement, even for clinicians with low-to-moderate levels of experience. It involves concrete, behavioral techniques that are limited in depth and scope. All of the clinicians conducting the HRT treatment had at least some familiarity with the intervention, and many had used it to treat patients prior to the beginning of Study II. In contrast, the novel HRT+ACT treatment involved concepts and techniques that were arguably more complex and abstract than those employed in HRT (e.g., values identification, defusion from painful thoughts and feelings, promotion of willingness and acceptance, and commitment to action in various life domains). Clinicians were not familiar with the HRT+ACT treatment prior to the study, and at least one therapist had no experience in ACT-based protocols. For these reasons, it is quite possible that the HRT+ACT intervention was implemented with less skill and consistency than the HRT intervention. Given this possibility, it is even more impressive that therapeutic effects were observed in the HRT+ACT participants and that these effects did not differ significantly from those seen in the HRT group.

Another potential reason for the seemingly enhanced response in the HRT group may be that these participants were less severely impaired from the start. Although no statistically significant pre-treatment differences were detected between the HRT and HRT+ACT groups, the mean scores at baseline for the HRT group were lower in terms of general and tic-specific experiential avoidance, premonitory urges, and tic severity (Table 13). Furthermore, the HRT participants, on the whole, scored better on a measure of overall functioning at baseline, compared to the HRT+ACT participants (whether by patient or parent report). It is, thus, possible that the HRT group was less impaired to begin with and maintained this relative difference throughout the course of the study.

Finally, it is possible that there is a lag in the impact of the HRT+ACT intervention, compared to HRT alone. Patients may have had more difficulty initially understanding and implementing the ACT-based concepts, which are more abstract and may require more practice to achieve mastery. A closer look at Figures 2-10, detailing individual and mean response trends over time, supports this notion. Participants in the HRT+ACT group were first introduced to ACT concepts and techniques at week 4. In many of the plots (particularly those detailing mean response trends), a plateau in response can be observed in the HRT+ACT group around that time, whereas the HRT group frequently continued to improve during the same period. As time progressed, though, the HRT+ACT participants began to “catch up” to the HRT participants. If this is indeed what transpired, additional relapse prevention studies following participants

beyond week 22 may be necessary to capture the full effect of the HRT+ACT intervention.

Other factors that may have hindered the study's ability to detect treatment effects and differential outcomes between the HRT and HRT+ACT groups include the small sample size and high variability in the data. Both of these factors negatively impacted statistical power. Moreover, there was substantial comorbidity in the total sample (Table 11), with eight of the 13 participants meeting criteria for at least one non-CTD diagnosis at baseline. Five of these eight participants also displayed subclinical symptoms of other non-CTD disorders. While such a high degree of comorbidity may have contributed to the observed variability in the data, it is also true that comorbidity is the norm among CTD sufferers (Canitano & Vivanti, 2007; Cavanna et al., 2007; Lavoie et al., 2007; Ma et al., 2007; Mol Debes et al., 2008; Storch, Merlo, et al., 2007; Storch, Murphy, Chase, et al., 2007; Swain et al., 2007). As such, results from the current study may be more generalizable to individuals typically presenting for treatment at clinics in the broader community.

There were no significant differences in scores on Study II measures across demographic variables, with one exception. Parents reported worse functioning at baseline for participants younger than the median sample age, compared to older participants (Table 12). This is in spite of the fact that younger and older participants reported similar levels of functioning at this same time point. It may be the case that

parents of younger adolescents with CTDs have had less time to cope with the realities of their child's chronic condition and, consequently, overestimate the effect it may be having on their child's functioning. Conversely, younger individuals have had less time to develop adaptive coping skills to deal with their CTDs and may, in fact, be functioning more poorly. These same adolescents have also had less time to experience the physical and social consequences of their CTDs and may judge them as less severe than their older counterparts, leading to a wider margin of difference between patient and parent reports of functioning.

Convergent validity of the novel measure of tic-specific experiential avoidance (i.e., the AAQ-T) was demonstrated in Study I, using the data from the online survey. In that study, which included a much larger sample size, the AAQ-T was shown to correlate significantly with measures of general experiential avoidance (i.e., the AAQ-9), premonitory urges (i.e., the PUTS), tic severity (i.e., the YGTSS-SR), and functioning (i.e., the PQoL). As an added check on validity, researchers were interested in assessing whether the AAQ-T would correlate significantly with measures of these same constructs in Study II, despite its small sample size. Table 16 shows that the AAQ-T did correlate significantly with general experiential avoidance (i.e., the AAQ-9), premonitory urges (i.e., the PUTS), and overall functioning (i.e., the WSAS) at various time points and in the expected direction. However, these correlations were not consistently observed across all time points. Furthermore, at no point in time did the AAQ-T correlate

significantly with the YGTSS. The small sample size, highly variable data, and low statistical power likely explain these inconsistent results. Given these obstacles, the significant correlations that *were* observed (and at least partially replicate results from Study I) seem to reflect positively on the convergent validity of the AAQ-T.

The BETTS treatment study was hampered by a number of methodological limitations. First and foremost, it was a preliminary feasibility and treatment development study with a small sample size and was not sufficiently powered to conduct traditional significance testing. Second, interventions were conducted sequentially at each site (i.e., the first set of patients recruited received HRT, while the second set received HRT+ACT), resulting in a lack of randomization to treatment condition. Third, due to the sequential administration of treatments, therapists, patients, family members, and IE's were not blind to treatment assignment. The same held true for the two individuals rating therapists' adherence to the treatment protocols. Despite these weaknesses, Study II had several strengths. These included comparison of the experimental HRT+ACT intervention to an active treatment (i.e., HRT), the use of multiple reporters (i.e., patient, parent, therapist, and IE), and the application of repeated measures to provide a more in-depth look at processes of change over time.

The principal contribution of the BETTS study is a manualized, pilot-tested intervention (i.e., HRT+ACT) that shows promise in the treatment of CTDs. Building on results from the present study, productive avenues of future research include the use of

a randomized clinical trial to evaluate the efficacy of the HRT+ACT treatment, in comparison to other relevant psychosocial and pharmacological interventions. The incorporation of a larger, more ethnically diverse sample will likely enhance the generalizability of results from such a trial. In addition, uncertainty persists regarding the mechanisms of action of HRT and HRT+ACT. Dismantling studies are needed to provide answers to these unresolved questions.

7. Implications of the Current Research

Chronic tic disorders (CTDs) affect up to 1 in 100 individuals. Given the serious side effects associated with pharmacotherapy for tics, and the partial response to medication commonly seen in those who receive treatment, there is a need to develop psychosocial interventions to enhance outcomes among individuals suffering from CTDs. Habit Reversal Training (HRT) is the most extensively researched psychosocial intervention for CTDs. However, as noted earlier, there is a lack of large-scale studies comparing HRT to medication alone or their combination; furthermore, dismantling studies and comparisons to active treatments are needed to determine the mechanisms of action of HRT. As a result of the research activities described here, investigators at Duke and Penn were able to develop the collaboration and infrastructure needed for a future large-scale clinical trial in which the efficacy of HRT and other behavioral interventions can be directly compared, both with and without medication. Investigators hope this project will enable them to draw further conclusions about the mechanisms of action of the HRT and HRT+ACT treatments, contributing important process data to the CTD literature. Ultimately, the research teams at Duke and Penn seek to advance knowledge about behavioral interventions for CTDs, yielding improvements in treatment access and quality of care for those who suffer from these debilitating disorders.

Appendix A: Measures From Study I (Online Survey)

Acceptance and Action Questionnaire Tic-Specific Version (AAQ-T)

Instructions: We want to know more about what you think, how you feel, and what you do about your tics. Read each sentence. Then, circle a number between 0-4 that tells **how true** each sentence is for you.

	Not At All True	A Little True	Pretty True	True	Very True
1. My life won't be good until my tics are under control.	0	1	2	3	4
2. My negative thoughts and feelings about my tics mess up my life.	0	1	2	3	4
3. The bad things I think about myself because I tic must be true.	0	1	2	3	4
4. I don't try out new things if I'm afraid I will tic.	0	1	2	3	4
5. I do all I can to make sure I don't tic in front of other people.	0	1	2	3	4
6. I often catch myself thinking about how I've handled situations in which I've ticced and what I would do differently next time.	0	1	2	3	4
7. I can't stand the feeling/sensation I have right before I tic.	0	1	2	3	4
8. I stop doing things that are important to me when I'm having a bad tic day.	0	1	2	3	4
9. When I feel depressed or anxious about my tics, I am unable to take care of my responsibilities.	0	1	2	3	4
10. I wish I could get my anxiety and worries about my tics under control.	0	1	2	3	4
11. I wish I could wave a magic wand to make all of my tics go away.	0	1	2	3	4
12. I feel embarrassed by my tics.	0	1	2	3	4
13. I can't be a good friend when I feel upset about my tics.	0	1	2	3	4
14. When I compare myself to other people who tic, it seems that most of them are handling their tics better than I am.	0	1	2	3	4
15. Whenever I feel the urge to tic, I tic.	0	1	2	3	4

Acceptance and Action Questionnaire (AAQ-9)

INSTRUCTIONS: Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
Never True	Very Seldom True	Seldom True	Sometimes True	Frequently True	Almost Always True	Always True

1.	I am able to take action on a problem even if I am uncertain what is the right thing to do.	1	2	3	4	5	6	7
2.	I often catch myself daydreaming about things I've done and what I would do differently next time.	1	2	3	4	5	6	7
3.	When I feel depressed or anxious, I am unable to take care of my responsibilities.	1	2	3	4	5	6	7
4.	I rarely worry about getting my anxiety, worries, and feelings under control.	1	2	3	4	5	6	7
5.	I'm not afraid of my feelings.	1	2	3	4	5	6	7
6.	When I evaluate something negatively, I usually recognize that this is just a reaction, not an objective fact.	1	2	3	4	5	6	7
7.	When I compare myself to other people, it seems that most of them are handling their lives better than I do.	1	2	3	4	5	6	7
8.	Anxiety is bad.	1	2	3	4	5	6	7
9.	If I could magically remove all the painful experiences I've had in my life, I would do so.	1	2	3	4	5	6	7

Premonitory Urge for Tics Scale (PUTS)

Please answer the following questions. Try to be very honest when you answer them. Circle the number that best describes how you feel.

	Not at all true	A little true	Pretty much true	Very much true
1. Right before I do a tic, I feel like my insides are itchy.	1	2	3	4
2. Right before I do a tic, I feel pressure inside my brain or body.	1	2	3	4
3. Right before I do a tic, I feel “wound up” or tense inside.	1	2	3	4
4. Right before I do a tic, I feel like something is not “just right.”	1	2	3	4
5. Right before I do a tic, I feel like something isn’t complete.	1	2	3	4
6. Right before I do a tic, I feel like there is energy in my body that needs to get out.	1	2	3	4
7. I have these feelings almost all the time before I do a tic.	1	2	3	4
8. These feelings happen for every tic I have.	1	2	3	4
9. After I do the tic, the itchiness, energy, pressure, tense feelings, or feelings that something isn’t “just right” or complete go away, at least for a little while.	1	2	3	4
10. I am able to stop my tics, even if only for a short period of time.	1	2	3	4

Yale Global Tic Severity Scale – Self-Report Version (YGTSS-SR)

MOTOR TIC SYMPTOM CHECKLIST

Note: Motor tics involve rapid, recurring, and/or uncontrollable movements.

- **SIMPLE MOTOR TICS**

(1) Do you have simple motor tics (i.e., tics involving only one muscle group)?

YES NO

If NO, please skip to the following section on “Complex Motor Tics”.

If YES, please place a check mark next to the simple motor tic(s) you have had during the **PAST WEEK**. Check all that apply.

- Eye blinking (e.g., rapid closing and opening of eyelids)
- Eye movements (e.g., eye darting or eye rolling)
- Nose movements (e.g., nose twitching)
- Mouth movements (e.g., mouth opening or puckering lips)
- Facial grimace (e.g., scrunching of the face muscles)
- Head jerks/movements (e.g., rapid turning or shaking of head)
- Shoulder shrugs (e.g., rapid raising and then dropping of the shoulders)
- Arm movements (e.g., arm flapping or arm jerking)
- Hand movements (e.g., hand flexing or rapid finger movements)
- Abdominal tensing (e.g., tightening the muscles in the stomach area)
- Leg, foot, or toe movements (e.g., foot tapping, leg jerking, or toe scrunching)
- Other (describe): _____
- Other (describe): _____

- **COMPLEX MOTOR TICS**

(2) Do you have complex motor tics (i.e., a series or combination of tics involving more than one muscle group)?

YES NO

If NO, please skip to the following section on “Simple Vocal Tics”.

If YES, please place a check mark next to the complex motor tic(s) you have had during the **PAST WEEK**. Check all that apply.

- o Eye movements (e.g., eye blinking in combination w/ eye rolling)
- o Mouth movements (e.g., lip smacking in combination w/ mouth twitching)
- o Facial movements or expressions (e.g., grimacing in combination w/ nose twitching)
- o Head gestures or movements (e.g., head jerking combined w/ neck rolling)
- o Shoulder movements (e.g., a combination of shoulder shrugs, lifts, and rolls)
- o Arm movements (e.g., a combination of arm flapping and rotating)
- o Hand movements (e.g., a combination of hand flexing and finger twirls)
- o Writing tics (e.g., repeating words while writing)
- o Bending or gyrating (e.g., twisting or bending at the waist)
- o Rotating (e.g., twirling around in a circle)
- o Leg or foot or toe movements (e.g., extending leg while flexing foot)
- o Blocking (e.g., having difficulty starting to move, or a sudden interruption in the normal flow of movement)
- o Tic-related compulsive behaviors (e.g., touching, tapping, grooming, evening-up)
- o Copropraxia (obscene or forbidden gestures) (e.g., extending the middle finger)
- o Self-abusive behavior (e.g., punching or kicking oneself)
- o Paroxysms of tics (a fit, attack, or violent outburst of many tics in a row): duration _____ seconds
- o Disinhibited behavior (behavior that is hard to control and happens on impulse) (e.g., touching people or adjusting the crotch area) (describe): _____

- o Other (describe): _____

VOCAL TIC SYMPTOM CHECKLIST

Note: Vocal tics involve rapid, recurring, and/or uncontrollable vocal outbursts.

• **SIMPLE VOCAL TICS**

(3) Do you have simple vocal tics (i.e., fast, “meaningless” sounds)?

- YES NO

If NO, please skip to the following section on “Complex Vocal Tics”.

If YES, please place a check mark next to the simple vocal tic(s) you have had during the **PAST WEEK**. Check all that apply.

- o Sounds, noises
Check all that apply:
 - o coughing
 - o throat clearing
 - o sniffing
 - o animal or bird noises
- o Other (list): _____

• **COMPLEX VOCAL TICS**

(4) Do you have complex vocal tics (i.e., tics involving language, in the form of words, phrases, and/or statements)?

- YES NO

If NO, please skip to the following section on “Number of Different Types of Tics”.

If YES, please place a check mark next to the complex vocal tic(s) you have had during the **PAST WEEK**. Check all that apply.

- o Syllables (e.g., “fu” or “sh”) (please list):

- o Words (please list):

- o Coprolalia (e.g., swearing or saying obscene or inappropriate words or remarks) (please list): _____
- o Echolalia (e.g., repeating things said by another person)
- o Palalalia (e.g., repeating phrases at an increasingly rapid rate)
- o Blocking (e.g., difficulty starting to speak, or a sudden interruption in the normal flow of speech)
- o Disinhibited speech (e.g., speaking impulsively or insulting others) (please describe):

- o Other speech abnormalities (e.g., stammering, stuttering, or overly rapid speech) (please describe): _____

NUMBER OF DIFFERENT TYPES OF TICS

(5) Please place a check mark next to the category that best describes the number of different types of **MOTOR TICS** you have had during the **PAST WEEK**.

- None
- A single simple tic (i.e., a tic involving only one muscle group)
- Multiple distinct simple tics (2 – 5)
- Multiple distinct simple tics (more than 5)
- Multiple distinct simple tics, plus at least one complex tic (i.e., a series or combination of tics involving more than one muscle group)
- Multiple distinct simple tics, plus several (more than 2) complex tics

(6) Please place a check mark next to the category that best describes the number of different types of **VOCAL TICS** you have had during the **PAST WEEK**.

- None
- A single simple tic (i.e., a tic involving only one muscle group)
- Multiple distinct simple tics (2 – 5)
- Multiple distinct simple tics (more than 5)
- Multiple distinct simple tics, plus at least one complex tic (i.e., a series or combination of tics involving more than one muscle group)
- Multiple distinct simple tics, plus several (more than 2) complex tics

FREQUENCY OF TICS

(7) Please place a check mark next to the category that best describes the frequency of your **MOTOR TICS** (that is, how often they have occurred) during the **PAST WEEK**. Mark 'NONE' if you have not had any motor tics.

- NONE** No motor tics are present.

RARELY
Tics occur rarely and not on a daily basis. Tic-free periods are common.

OCCASIONALLY

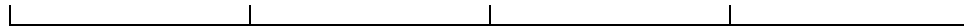
FREQUENTLY

ALMOST ALWAYS

ALWAYS
Tics are present nearly all the time. Tic-free periods are rare.

(8) Please place a check mark next to the category that best describes the frequency of your **VOCAL TICS** (that is, how often they have occurred) during the **PAST WEEK**. Mark 'NONE' if you have not had any vocal tics.

NONE No vocal tics are present.

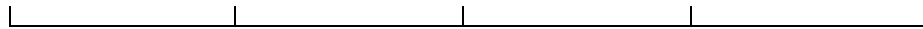


- | | | | | |
|--|-----------------------|-----------------------|-----------------------|--|
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| RARELY | OCCASIONALLY | FREQUENTLY | ALMOST ALWAYS | ALWAYS |
| Tics occur rarely and not on a daily basis. Tic-free periods are common. | | | | Tics are present nearly all the time. Tic-free periods are rare. |

INTENSITY OF TICS

(9) Please place a check mark next to the category that best describes the intensity of your **MOTOR TICS** (that is, their force or strength) during the **PAST WEEK**. Mark 'ABSENT' if you have not had any motor tics.

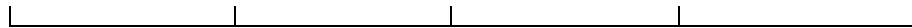
ABSENT No motor tics are present.



- | | | | | |
|--|-----------------------|-----------------------|-----------------------|---|
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| MINIMAL | MILD | MODERATE | MARKED | SEVERE |
| Tics cannot be seen or heard, and are typically not noticed by others. | | | | Tics are extremely forceful or exaggerated, call attention to you, and may result in physical injury. |

(10) Please place a check mark next to the category that best describes the intensity of your **VOCAL TICS** (that is, their force or strength) during the **PAST WEEK**. Mark 'ABSENT' if you have not had any vocal tics.

ABSENT No vocal tics are present.



- | | | | | |
|--|-----------------------|-----------------------|-----------------------|--|
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| MINIMAL | MILD | MODERATE | MARKED | SEVERE |
| Tics cannot be seen or heard, and are typically not noticed by others. | | | | Tics are extremely forceful or exaggerated and call attention to you because of their forceful nature. |

COMPLEXITY OF TICS

(11) Please place a check mark next to the category that best describes the complexity of your **MOTOR TICS** during the **PAST WEEK**. Mark 'NONE' if you have not had any motor tics or if all tics have been clearly 'simple' in nature (i.e., sudden, brief, and involving only one muscle group).

- NONE** No motor tics are present, or all motor tics have been clearly 'simple' in nature.

- | | | | | |
|-----------------------------------|--|---|--|---|
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| BORDERLINE | MILD | MODERATE | MARKED | SEVERE |
| Most tics are 'simple' in nature. | Some tics are clearly 'complex' but are easily hidden. | Some tics are very 'complex' and difficult to hide, but could be passed off as normal behavior. | Some tics are very 'complex' and difficult to hide, and could NOT be easily passed off as normal behavior. | Tics are impossible to hide and involve lengthy episodes of unusual behavior. |

(12) Please place a check mark next to the category that best describes the complexity of your **VOCAL TICS** during the **PAST WEEK**. Mark 'NONE' if you have not had any vocal tics or if all tics have been clearly 'simple' in nature (i.e., involving only fast, meaningless sounds).

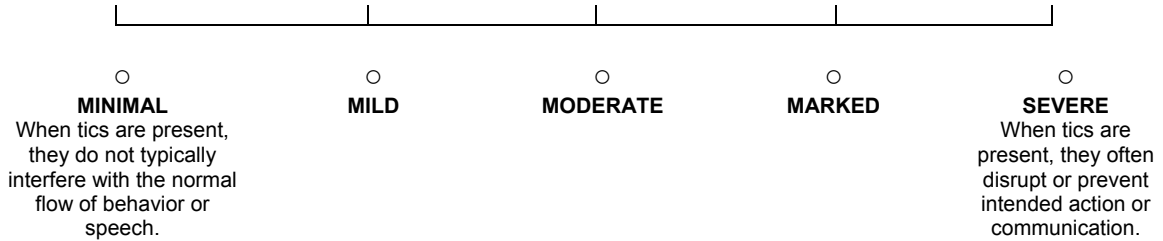
- NONE** No vocal tics are present, or all vocal tics have been clearly 'simple' in nature.

- | | | | | |
|-----------------------------------|--|---|--|---|
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| BORDERLINE | MILD | MODERATE | MARKED | SEVERE |
| Most tics are 'simple' in nature. | Some tics are clearly 'complex' but are easily hidden. | Some tics are very 'complex' and difficult to hide, but could be passed off as normal behavior or speech. | Some tics are very 'complex' and difficult to hide, and could NOT be easily passed off as normal behavior or speech. | Tics are impossible to hide and involve lengthy episodes of unusual behavior or speech. |

INTERFERENCE OF TICS

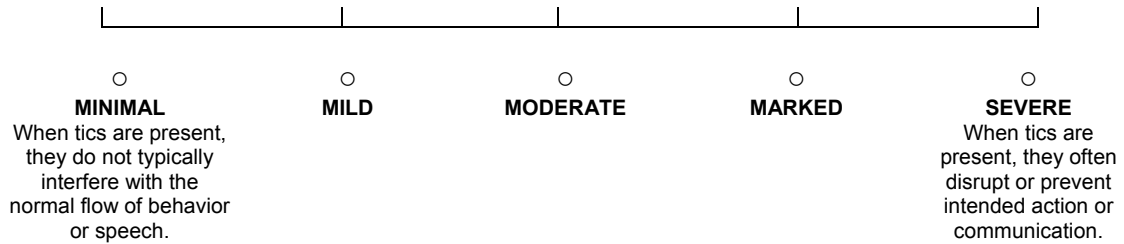
(13) Please place a check mark next to the category that best describes the level of interference of your **MOTOR TICS** in your life (that is, how much they "got in the way" of your usual activities) during the **PAST WEEK**. Mark 'NONE' if you have not had any motor tics, or if they have caused no interference.

- NONE** No motor tics are present, or my motor tics have not interfered with my usual activities.



(14) Please place a check mark next to the category that best describes the level of interference of your **VOCAL TICS** in your life (that is, how much they “got in the way” of your usual activities) during the **PAST WEEK**. Mark ‘NONE’ if you have not had any vocal tics, or if they have caused no interference.

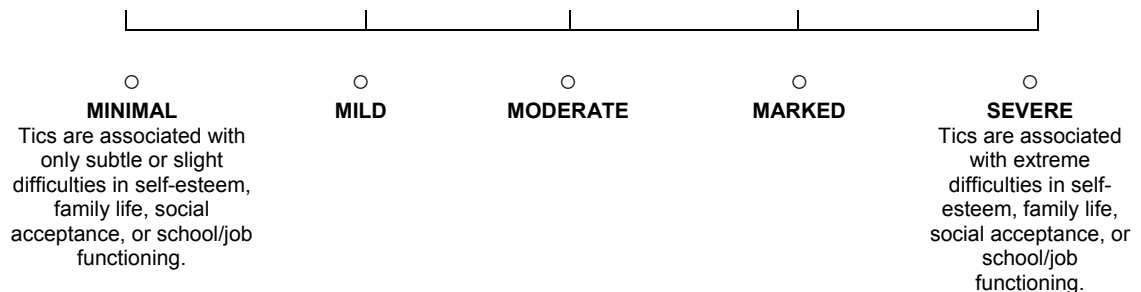
- NONE** No vocal tics are present, or my vocal tics have not interfered with my usual activities.



OVERALL IMPAIRMENT

(15) Please place a check mark next to the category that best describes the overall level of impairment caused by your tics (that is, how much your tics have made your life more difficult and/or affected your relationships) during the **PAST WEEK**. Mark ‘NONE’ if you have not had any tics, or if you feel your tics have not impaired your functioning to any degree.

- NONE** No tics are present, or my tics have not impaired my functioning.



Perceived Quality of Life Scale

We would like to know how satisfied you are with different aspects of your life. Each item below has a scale where “0” is Extremely Dissatisfied and “10” is Extremely Satisfied. [For each item, mark an in the box of the number that shows your own level of satisfaction.]

How dissatisfied or satisfied are you with:

1. Your physical health (the health of your body)?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

2. How well you care for yourself, for example, preparing meals, bathing, or shopping?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

3. How well you think and remember?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

How dissatisfied or satisfied are you with:

4. The amount of walking you do?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

5. How often you get outside the house, for example, going into town, using public transportation or driving?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

6. How well you carry on a conversation, for example, speaking clearly, hearing others, or being understood?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

7. The kind and amount of food you eat?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

How dissatisfied or satisfied are you with:

8. How often you see or talk to your family and friends?

Extremely dissatisfied												Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

9. The help you get from your family and friends, for example, helping in an emergency, fixing your house, or doing errands?

Extremely dissatisfied												Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

10 . The help you give to your family and friends?

Extremely dissatisfied												Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

11 . Your contribution to your community, for example, a neighborhood, religious, political or other group?

Extremely dissatisfied												Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

How dissatisfied or satisfied are you with:

12 . Your retirement or current job?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

13. The kind and amount of recreation or leisure you have?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

14. Your level of sexual activity or lack of sexual activity?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

15. The way your income meets your needs?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

How dissatisfied or satisfied are you with:

16 . How respected you are by others?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

17. The meaning and purpose of your life?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

18 . The amount of variety in your life?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

19 . The amount and kind of sleep you get?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

20. How happy are you?

Extremely dissatisfied											Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Appendix B: Measures From Study II (BETTS Treatment Study)

CONNERS-MARCH DEVELOPMENTAL QUESTIONNAIRE

Developed by

C. Keith Conners, Ph.D.
John S. March, M.D., M.P.H.

Dear Parents: Having you carefully fill in this form now will help us to reduce the time and cost of gathering this information at our office. We appreciate your cooperation and patience.

Child's Name: _____ Age: _____ Today's Date: ___/___/___

Address: _____ City: _____

State: _____ Zip: _____ How Long, at this Address? _____

Child's Sex: _____ Child's Birthplace: _____ Birthdate: ___/___/___

Child's Race: (please check) American Indian or Alaskan Black, not of Hispanic origin

Hispanic Native Asian or Pacific Islander White, not of Hispanic origin

Person Completing this Form: _____ Relation to Child: _____

Bio Father's Name: _____ Age: _____ Education: _____

Employed: _____ Work Phone: _____

Type of work: _____ Home Phone: _____

Bio Mother's Name: _____ Age: _____ Education: _____

Employed: _____ Work Phone: _____

Type of work: _____ Home Phone: _____

Other relatives or persons living in the home:

Is your child adopted? No Yes

If yes, please describe the circumstances of the adoption:

How long have you been married? _____ Dates:

Divorced? _____
Separated? _____
Unmarried? _____ (dates living together)

Previous Marriage(s) (describe): _____

School Information:

Name of School: _____ Phone Number: _____

Teacher's Name: _____ Grade: _____

Type of School: Public Private Special

List previous schools, dates attended and indicate overall performance (academic and behavioral):

_____	Performance:	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Good
_____	Performance:	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Good
_____	Performance:	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Good
_____	Performance:	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Good
_____	Performance:	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Good
_____	Performance:	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Good
_____	Performance:	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Good
_____	Performance:	<input type="checkbox"/> Poor	<input type="checkbox"/> Fair	<input type="checkbox"/> Good

Grades repeated _____ Grades skipped _____ Expelled? No Yes If Yes, # of times? _____

Any known learning disabilities? No Yes If Yes, explain: _____

Medication History:

Has your child ever taken psychiatric medications? No Yes If yes, please list:

	Medication	Medication
Drug Name		
Given by Whom		
When Started		
When Stopped		
For What Problems?		
Dose		
Benefits		
Side Effects		
Results		

Cont'd...	Medication	Medication
Drug Name		
Given by Whom		
When Started		
When Stopped		
For What Problems?		
Dose		
Benefits		
Side Effects		
Results		

Cont'd...	Medication	Medication
Drug Name		
Given by Whom		
When Started		
When Stopped		
For What Problems?		
Dose		
Benefits		
Side Effects		
Results		

Therapy History

Has your child ever received mental health related therapy? No Yes
(If no, please skip to page 10, otherwise please continue.)

Cognitive Behavioral Therapy (CBT)

Has your child ever received CBT? No Yes

If yes, did it include more than 12 sessions of Exposure/Response treatment, including assigned homework? No Yes

How would you describe the effectiveness of this treatment?

Much improvement Some improvement No improvement

Please describe any CBT interventions your child has previously received:

Please use the following chart to describe all therapies your child has previously received.

	Therapy	Therapy
Type of Therapy		
Given by Whom		
For what problems?		
When Started		
When Stopped		
How Often		
Benefits		
Adverse Effects		
Results		

Cont'd...	Therapy	Therapy
Type of Therapy		
Given by Whom		
For What Problems		
When Started		
When Stopped		
How often		
Benefits		
Adverse Effects		
Results		

If there are more therapies, please continue on the next page...

Therapy History cont...

Cont'd...	Therapy	Therapy
Type of Therapy		
Given by Whom		
For what problems?		
When Started		
When Stopped		
How Often		
Benefits		
Adverse Effects		
Results		

Pregnancy

While you were pregnant with this child, were you under a doctor's care? No Yes

Check any that apply for this pregnancy:

- | | Describe |
|--|-----------------|
| <input type="checkbox"/> Anemia | _____ |
| <input type="checkbox"/> Elevated Blood Pressure | _____ |
| <input type="checkbox"/> Toxemia | _____ |
| <input type="checkbox"/> Swollen Ankles | _____ |
| <input type="checkbox"/> Kidney Disease | _____ |
| <input type="checkbox"/> Bleeding | _____ |
| <input type="checkbox"/> Measles | _____ |
| <input type="checkbox"/> German Measles | _____ |
| <input type="checkbox"/> Flu | _____ |
| <input type="checkbox"/> Strep Throat | _____ |
| <input type="checkbox"/> Other Virus | _____ |
| <input type="checkbox"/> Other Illness | _____ |
| <input type="checkbox"/> Nausea or Vomiting | _____ |
| <input type="checkbox"/> Injury | _____ |
| <input type="checkbox"/> Take Medication(s) | _____ |

- Emotional Problems _____
- Threatened Miscarriage _____
- Premature Labor _____
- Severe Emotional Distress _____
- Smoked During Pregnancy _____
- Drank Alcohol During Pregnancy _____

Birth History:

Mother's Age at Time of Birth: _____ years Father's Age at Time of Birth: _____ years

How many hours from first contractions to birth? _____ What did the baby weigh? ___ lbs. ___ oz.

Were you given medication? No Yes

Were you under anesthesia during childbirth?

No Yes Don't Know

If yes: Local Spinal General

Was labor induced? No Yes

Was induced labor planned? No Yes

Was this a breech (feet first) delivery? No Yes

Was the delivery unusual in any way? No Yes

How? _____

Did you have a cesarean? No Yes

If Yes, describe any complications: _____

Did you have twins? No Yes

If Yes, which was born first? _____

Did this baby have: breathing problems? No Yes

cord around the neck? No Yes

Was this baby's color normal? No Yes Don't Know

No Yes Don't Know

Was oxygen used for the baby? No Yes Don't Know

If Yes, for how long? _____

Was the baby premature? No Yes How much? _____

Did you take the baby home with you from the hospital? No Yes How long after? _____

Did you have problems with feeding? No Yes

If Yes, please describe: _____

Was the baby normally active? No Yes

Developmental History: *(Answer as best as you can remember)*

- Motor Development (Sitting, Crawling, Walking) Normal Fast Slow
- Speech and Language Normal Fast Slow
- Handedness Left Right Both
- Self-help Skills (dressing, brushing, toileting, hygiene) Average Slow Fast

Temperament (Infancy, Toddler, Pre-School): **Check any that apply**

- Shy or Timid Fearful Impulsive Rocking
- Stubborn Cautious Poor sleep Head banging
- Affectionate Underachieve Curious Into everything
- Temper Outbursts Overactive Tore up toys more than normal
- Wanted to be left alone Easy to manage Slow to warm up
- Dare-devil More interested in things than in people Happy
- Aggressive Poor eating Blank spells Falling spells

- Bowel Trained: Average Early Late
- Bladder Trained: Average Early Late
- Eating Behavior: Picky Eats too much Overeats sugar/carbohydrates

Family Psychiatric History:

(Please note: Major Depression, Bipolar Disorder, Obsessive-Compulsive Disorder, Tic Disorders, other Anxiety Disorders, Schizophrenia, Substance Abuse, Suicide Attempts, and other Psychiatric problems)

Has the child's **mother or mother's relatives** had similar or other psychiatric problems? No Yes
If Yes, please describe, including treatment: _____

Has the child's **father or father's relatives** had similar or other psychiatric problems? No Yes
If Yes, please describe, including treatment: _____

Does the child's **brother(s) or sister(s)** have any psychiatric problems? No Yes
If Yes, please describe, including treatment: _____

Medical History of Child: Has your child had any of the following? Check any that apply:

- | | Date(s) |
|---|----------------|
| <input type="checkbox"/> Measles | _____ |
| <input type="checkbox"/> German Measles | _____ |
| <input type="checkbox"/> Mumps | _____ |
| <input type="checkbox"/> Chicken Pox | _____ |
| <input type="checkbox"/> Whooping Cough | _____ |
| <input type="checkbox"/> Diphtheria | _____ |
| <input type="checkbox"/> Flu | _____ |
| <input type="checkbox"/> Strep Throat | _____ |
| <input type="checkbox"/> Meningitis | _____ |
| <input type="checkbox"/> Encephalitis | _____ |
| <input type="checkbox"/> Hay Fever | _____ |
| <input type="checkbox"/> Abscessed Ears | _____ |
| <input type="checkbox"/> Tubes in Ears | _____ |
| <input type="checkbox"/> Allergy/Asthma | _____ |
| <input type="checkbox"/> Convulsions | _____ |
| <input type="checkbox"/> Head Injuries | _____ |
| <input type="checkbox"/> Other Injuries | _____ |
| <input type="checkbox"/> Other Illnesses | _____ |
| <input type="checkbox"/> Problem with Hearing | _____ |
| <input type="checkbox"/> Problems with Vision | _____ |
| <input type="checkbox"/> Other | _____ |

Does your child take any current medication for a medical illness? No Yes

If Yes, please describe: _____

Is there anything else you would like us to know about your child before we meet together?

Signature _____ Date _____

Yale Global Tic Severity Scale (Clinician Rated Version)

MOTOR TIC SYMPTOM CHECKLIST (Check motor tics present during **past week**)

- **Simple Motor Tics** (Rapid, Darting, “Meaningless”):

- Eye blinking
- Eye movements
- Nose movements
- Mouth movements
- Facial grimace
- Head jerks/movements
- Shoulder shrugs
- Arm movements
- Hand movements
- Abdominal tensing
- Leg, foot, or toe movements
- Other (describe): _____
- Other (describe): _____

- **Complex Motor Tics** (Slower, “Purposeful”):

- Eye movements
- Mouth movements
- Facial movements or expressions
- Head gestures or movements
- Shoulder movements
- Arm movements
- Hand movements
- Writing tics
- Dystonic postures
- Bending or gyrating
- Rotating
- Leg or foot or toe movements
- Blocking
- Tic related compulsive behaviors (touching, tapping, grooming, evening-up)
- Copropraxia
- Self-abusive behavior
- Paroxysms of tics (displays), duration ____ seconds
- Disinhibited behavior (describe): _____
- Other (describe): _____

PHONIC SYMPTOM CHECKLIST (Check phonic tics present over the **past week**)

- **Simple Phonic Symptoms** (Fast, “Meaningless” Sounds):
 - Sounds, noises (circle: coughing, throat clearing, sniffing, or animal or bird noises)
 - Other (list): _____
 - **Complex Phonic Symptoms** (Language: Words, Phrases, Statements):
 - Syllables (list): _____
 - Words (list): _____
 - Coprolalia (list): _____
 - Echolalia
 - Palalalia
 - Blocking
 - Speech atypicalities (describe): _____
 - Disinhibited speech (describe)*: _____
- *Do not include disinhibitions in ratings of tic behaviors

NUMBER	Motor	Phonic	
None	<input type="radio"/>	<input type="radio"/>	0
Single tic	<input type="radio"/>	<input type="radio"/>	1
Multiple discrete tics (2-5)	<input type="radio"/>	<input type="radio"/>	2
Multiple discrete tics (>5)	<input type="radio"/>	<input type="radio"/>	3
Multiple discrete tics plus at least one orchestrated pattern of multiple simultaneous or sequential tics where it is difficult to distinguish discrete tics	<input type="radio"/>	<input type="radio"/>	4
Multiple discrete tics plus several (>2) orchestrated paroxysms of multiple simultaneous or sequential tics that where it is difficult to distinguish discrete tics	<input type="radio"/>	<input type="radio"/>	5

FREQUENCY	Motor	Phonic	
NONE No evidence of specific tic behaviors	<input type="radio"/>	<input type="radio"/>	0
RARELY Specific tic behaviors have been present during previous week. These behaviors occur infrequently, often not on a daily basis. If bouts of tics occur, they are brief and uncommon	<input type="radio"/>	<input type="radio"/>	1
OCCASIONALLY Specific tic behaviors are usually present on a daily basis, but there are long tic-free intervals during the day. Bouts of tics may occur on occasion and are not sustained for more than a few minutes at a time.	<input type="radio"/>	<input type="radio"/>	2
FREQUENTLY Specific tic behaviors are present on a daily basis. Tic free intervals as long as 3 hours are not uncommon. Bouts of tics occur regularly but may be limited to a single setting.	<input type="radio"/>	<input type="radio"/>	3
ALMOST ALWAYS Specific tic behaviors are present virtually every waking hour of every day, and periods of sustained tic behaviors occur regularly. Bouts of tics are common and are not limited to a single setting.	<input type="radio"/>	<input type="radio"/>	4
ALWAYS Specific tic behaviors are present virtually all the time. Tic free intervals are difficult to identify and do not last more than 5 to 10 minutes at most.	<input type="radio"/>	<input type="radio"/>	5

INTENSITY	Motor	Phonic	
ABSENT	<input type="radio"/>	<input type="radio"/>	0
MINIMAL INTENSITY Tics not visible or audible (based solely on patient's private experience) or tics are less forceful than comparable voluntary actions and are typically not noticed because of their intensity.	<input type="radio"/>	<input type="radio"/>	1
MILD INTENSITY Tics are not more forceful than comparable voluntary actions or utterances and are typically not noticed because of their intensity.	<input type="radio"/>	<input type="radio"/>	2
MODERATE INTENSITY Tics are more forceful than comparable voluntary actions but are not outside the range of normal expression for comparable voluntary actions or utterances. They may call attention to the individual because of their forceful character	<input type="radio"/>	<input type="radio"/>	3
MARKED INTENSITY Tics are more forceful than comparable voluntary actions or utterances and typically have an "exaggerated" character. Such tics frequently call attention to the individual because of their forceful and exaggerated character	<input type="radio"/>	<input type="radio"/>	4
SEVERE INTENSITY Tics are extremely forceful and exaggerated in expression. These tics call attention to the individual and may result in risk of physical injury (accidental, provoked, or self-inflicted) because of their forceful expression	<input type="radio"/>	<input type="radio"/>	5

COMPLEXITY	Motor	Phonic	
NONE If present, all tics are clearly "simple" (sudden, brief, purposeless) in character.	<input type="radio"/>	<input type="radio"/>	0
BORDERLINE Some tics are not clearly "simple" in character.	<input type="radio"/>	<input type="radio"/>	1
MILD Some tics are clearly "complex" (purposive in appearance) and mimic brief "automatic" behaviors, such as grooming, syllables, or brief meaningful utterances such as "ah huh," "hi" that could be readily camouflaged.	<input type="radio"/>	<input type="radio"/>	2
MODERATE Some tics are very "complex" (more purposive and sustained in appearance) and may occur in orchestrated bouts that would be difficult to camouflage but could be rationalized or "explained" as normal behavior or speech (picking, tapping, saying "you bet" or "honey", brief echolalia).	<input type="radio"/>	<input type="radio"/>	3
MARKED Some tics are very "complex" in character and tend to occur in sustained orchestrated bouts that would be difficult to camouflage and could not be easily rationalized as normal behavior or speech because of their duration and/or their unusual, inappropriate, bizarre or obscene-character (a lengthy facial contortion, touching genitals, echolalia, speech atypicalities, longer bouts or saying "what do you mean" repeatedly, or saying "fu" or "sh").	<input type="radio"/>	<input type="radio"/>	4
SEVERE Some tics involve lengthy bouts of orchestrated behavior or speech that would be impossible to camouflage or successfully rationalize as normal because of their duration and/or extremely unusual inappropriate, bizarre or obscene character (lengthy displays or utterances often involving copropraxia, self-abusive behavior, or coprolalia).	<input type="radio"/>	<input type="radio"/>	5

INTERFERENCE	Motor	Phonic	
NONE	<input type="radio"/>	<input type="radio"/>	0
MINIMAL When tics are present, they do not interrupt the flow of behavior or speech.	<input type="radio"/>	<input type="radio"/>	1
MILD When tics are present, they occasionally interrupt the flow of behavior or speech.	<input type="radio"/>	<input type="radio"/>	2
MODERATE When tics are present, they frequently interrupt the flow of behavior or speech.	<input type="radio"/>	<input type="radio"/>	3
MARKED When tics are present, they frequently interrupt the flow of behavior or speech, and they occasionally disrupt intended action or communication.	<input type="radio"/>	<input type="radio"/>	4
SEVERE When tics are present, they frequently disrupt intended action or communication.	<input type="radio"/>	<input type="radio"/>	5

IMPAIRMENT		
NONE	<input type="radio"/>	0
MINIMAL When tics are present, they do not interrupt the flow of behavior or speech.	<input type="radio"/>	10
MILD When tics are present, they occasionally interrupt the flow of behavior or speech.	<input type="radio"/>	20
MODERATE When tics are present, they frequently interrupt the flow of behavior or speech.	<input type="radio"/>	30
MARKED When tics are present, they frequently interrupt the flow of behavior or speech, and they occasionally disrupt intended action or communication.	<input type="radio"/>	40
SEVERE When tics are present, they frequently disrupt intended action or communication.	<input type="radio"/>	50

	Number	Frequency	Intensity	Complexity	Interference
A. Motor Tics					
B. Phonic Tics					
C. Total Impairment					

Beck Depression Inventory

Directions: On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the **past week, including today!** Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one.
Be sure to read all the statements in each group before choosing.

1. 0 I do not feel sad.
1 I feel sad.
2 I am sad all the time and I can't snap out of it.
3 I am so sad or unhappy that I can't stand it.

2. 0 I am not particularly discouraged about the future
1 I feel discouraged about the future.
2 I feel I have nothing to look forward to.
3 I feel that the future is hopeless and that things cannot improve.

3. 0 I do not feel like a failure.
1 I feel I have failed more than the average person.
2 As I look back on my life, all I can see is a lot of failures.
3 I feel I am a complete failure as a person.

4. 0 I get as much satisfaction out of things as I used to.
1 I don't enjoy things the way I used to.
2 I don't get real satisfaction out of anything anymore.
3 I am dissatisfied or bored with everything.

5. 0 I don't feel particularly guilty.
1 I feel guilty a good part of the time.
2 I feel quite guilty most of the time.
3 I feel guilty all of the time.

6. 0 I don't feel I am being punished.
1 I feel I may be punished.
2 I expect to be punished.
3 I feel I am being punished.

7. 0 I don't feel disappointed in myself.
1 I am disappointed in myself.
2 I am disgusted with myself.
3 I hate myself.

8. 0 I don't feel I am any worse than anybody else.
1 I am critical of myself for my weaknesses or mistakes.
2 I blame myself all the time for my faults.
3 I blame myself for everything bad that happens.
9. 0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.
10. 0 I don't cry anymore than usual.
1 I cry more now than I used to.
2 I cry all the time now.
3 I used to be able to cry, but now I can't cry even though I want to.
11. 0 I am no more irritated now than I ever was.
1 I get annoyed or irritated now more easily than I used to.
2 I feel irritated all the time now.
3 I don't get irritated at all by the things that used to irritate me.
12. 0 I have not lost interest in other people.
1 I am less interested in other people than I used to be.
2 I have lost most of my interest in other people.
3 I have lost all of my interest in other people.
13. 0 I make decisions about as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions than before.
3 I can't make decisions at all anymore.
14. 0 I don't feel I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel that there are permanent changes in my appearance that make me look unattractive.
3 I believe that I look ugly.
15. 0 I can work about as well as before.
1 It takes extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.
16. 0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
3 I wake up several hours earlier than I used to and cannot get back to sleep.

17. 0 I don't get more tired than usual.
1 I get tired more easily than I used to.
2 I get tired from doing almost anything.
3 I am too tired to do anything.
18. 0 My appetite is no worse than usual.
1 My appetite is not as good as it used to be.
2 My appetite is much worse now.
3 I have no appetite at all anymore.
19. 0 I haven't lost much weight, if any lately.
1 I have lost more than 5 pounds.
2 I have lost more than 10 pounds.
3 I have lost more than 15 pounds.
I am purposely trying to lose weight by eating less.
Yes _____ No _____
20. 0 I am no more worried about my health than usual.
1 I am worried about physical problems such as aches and pains or upset stomach or constipation.
2 I am very worried about physical problems and it's hard to think of much else.
3 I am so worried about physical problems, that I cannot think about anything else.
21. 0 I have not noticed any recent change in my interest in sex.
1 I am less interested in sex than I used to be.
2 I am much less interested in sex than I used to be.
3 I have lost interest in sex completely.

Multidimensional Anxiety Scale for Children

Instructions: This form is about how you might have been thinking, feeling or acting recently. For each question, please check how often the statement is true for you. Remember that there are no right or wrong answers, just answers about how you might have been feeling recently.

0 never true about me	1 rarely true about me	2 sometimes true about me	3 often true about me
----------------------------------	-----------------------------------	--------------------------------------	----------------------------------

- | | | | | | |
|-----|---|---|---|---|---|
| 1. | I feel tense or uptight | 0 | 1 | 2 | 3 |
| 2. | I usually ask permission | 0 | 1 | 2 | 3 |
| 3. | I worry about other people laughing at me..... | 0 | 1 | 2 | 3 |
| 4. | I get scared when my parents go away | 0 | 1 | 2 | 3 |
| 5. | I have trouble getting my breath | 0 | 1 | 2 | 3 |
| 6. | I keep my eyes open for danger..... | 0 | 1 | 2 | 3 |
| 7. | The idea of going away to camp scares me..... | 0 | 1 | 2 | 3 |
| 8. | I get shaky or jittery | 0 | 1 | 2 | 3 |
| 9. | I try hard to obey my parents and teachers..... | 0 | 1 | 2 | 3 |
| 10. | I'm afraid that other kids will make fun of me..... | 0 | 1 | 2 | 3 |
| 11. | I try to stay near my mom and dad | 0 | 1 | 2 | 3 |
| 12. | I get dizzy or faint feelings | 0 | 1 | 2 | 3 |
| 13. | I check things out first | 0 | 1 | 2 | 3 |
| 14. | I worry about getting called on in class | 0 | 1 | 2 | 3 |
| 15. | I'm jumpy..... | 0 | 1 | 2 | 3 |
| 16. | I'm afraid other people will think I'm stupid..... | 0 | 1 | 2 | 3 |
| 17. | I keep the light on at night | 0 | 1 | 2 | 3 |
| 18. | I have pains in my chest..... | 0 | 1 | 2 | 3 |
| 19. | I avoid going places without my family..... | 0 | 1 | 2 | 3 |
| 20. | I feel strange, weird, or unreal | 0 | 1 | 2 | 3 |
| 21. | I try to do things other people will like | 0 | 1 | 2 | 3 |
| 22. | I worry about what other people think of me | 0 | 1 | 2 | 3 |
| 23. | I avoid watching scary movies and TV shows | 0 | 1 | 2 | 3 |
| 24. | My heart races or skips beats | 0 | 1 | 2 | 3 |

	0	1	2	3
	never true about me	rarely true about me	sometimes true about me	often true about me
25. I stay away from things that upset me.....	0	1	2	3
26. I sleep next to someone from my family.....	0	1	2	3
27. I feel restless and on edge.....	0	1	2	3
28. I try to do everything exactly right.....	0	1	2	3
29. I worry about doing something stupid or embarrassing.....	0	1	2	3
30. I get scared riding in the car or on the bus.....	0	1	2	3
31. I feel sick to my stomach.....	0	1	2	3
32. If I get upset or scared, I let someone know right away.....	0	1	2	3
33. I get nervous if I have to perform in public.....	0	1	2	3
34. Bad weather, the dark, heights, animals, or bugs scare me.....	0	1	2	3
35. My hands shake.....	0	1	2	3
36. I check to make sure things are safe.....	0	1	2	3
37. I have trouble asking other kids to play with me.....	0	1	2	3
38. My hands feel sweaty or cold.....	0	1	2	3
39. I feel shy.....	0	1	2	3

Beck Anxiety Inventory

Directions: Below is a list of common symptoms of anxiety. Please carefully read each statement in the list. Indicate how much you have been bothered by each symptom during the **past week, including today**, by placing an **X** in the corresponding space in the column next to each symptom.

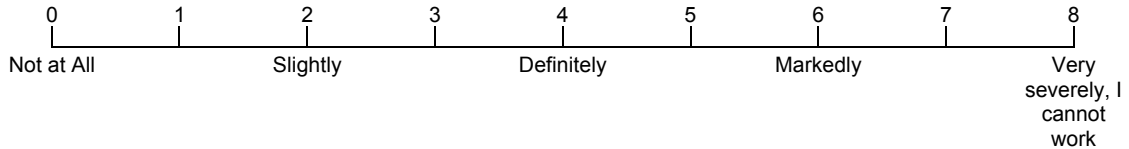
	NOT AT ALL	MILDLY It did not bother me much.	MODERATELY Y It was very unpleasant, but I could stand it.	SEVERELY I could barely stand it.
1. Numbness or tingling.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Feeling hot.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Wobbliness in legs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Unable to relax	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Fear of the worst happening.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Dizzy or lightheaded.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Heart pounding or racing.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Unsteady.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Terrified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Nervous.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Feelings of choking.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Hands trembling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Shaky.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Fear of losing control.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Difficulty breathing.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Fear of dying.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Scared.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Indigestion or discomfort in abdomen.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Faint.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Face flushed.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Sweating (not due to heat).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Work and Social Adjustment Scale (Child Version)

INSTRUCTIONS: People's problems sometimes affect their ability to do certain day-to-day tasks in their lives. To rate your problems look at each section and determine on the scale provided how much your problem affects your ability to carry out the activity. Once you have decided on a number, circle it. Then proceed to the next stage.

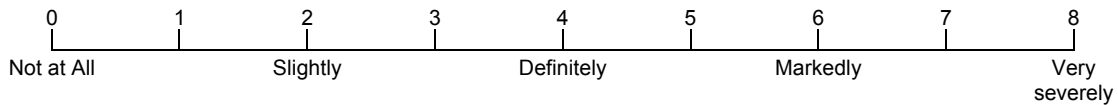
WORK

Because of my tic disorder, my ability to work is impaired.



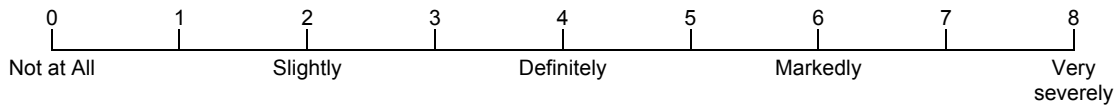
HOME MANAGEMENT

Because of my tic disorder, my home management (cleaning, tidying, shopping, cooking, looking after home or children, paying bills) is impaired.



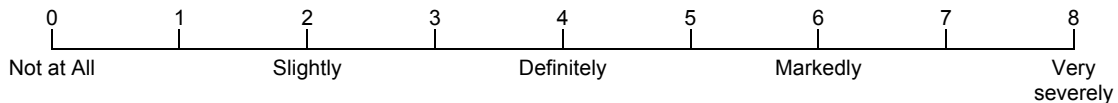
SOCIAL LEISURE ACTIVITIES

Because of my tic disorder, my social leisure activities (with other people, such as parties, clubs, outings, visits, dating, home entertainment) are impaired.



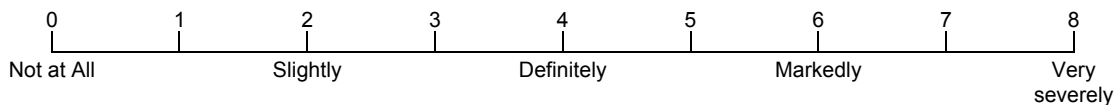
PRIVATE LEISURE ACTIVITIES

Because of my tic disorder, my private leisure activities (done alone, such as reading, gardening, collecting, sewing, walking alone) are impaired.



FAMILY AND RELATIONSHIPS

Because of my tic disorder, my ability to form and maintain close relationships with others, including those I live with, is impaired.

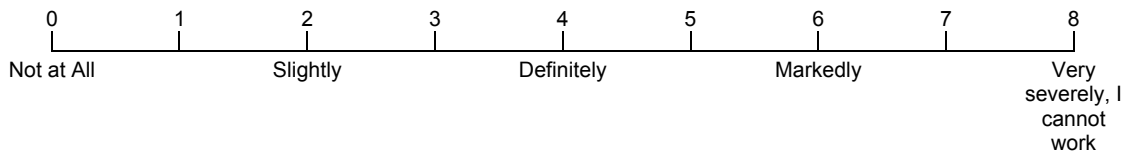


Work and Social Adjustment Scale (Parent Version)

INSTRUCTIONS: People's problems sometimes affect their ability to do certain day-to-day tasks in their lives. To rate your child's problems, look at each section and determine on the scale provided how much your child's problem affects his or her ability to carry out the activity. Once you have decided on a number, circle it. Then proceed to the next stage.

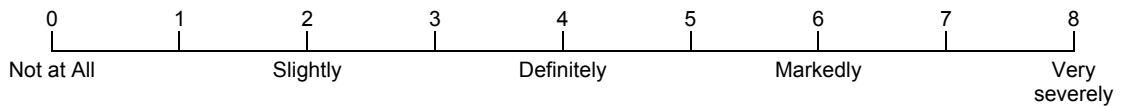
WORK

Because of my child's tic disorder, his or her ability to work is impaired.



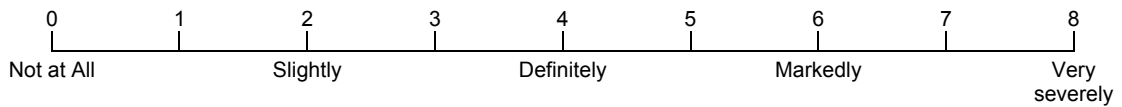
HOME MANAGEMENT

Because of my child's tic disorder, his or her home management (cleaning, tidying, shopping, cooking, looking after home or children, paying bills) is impaired.



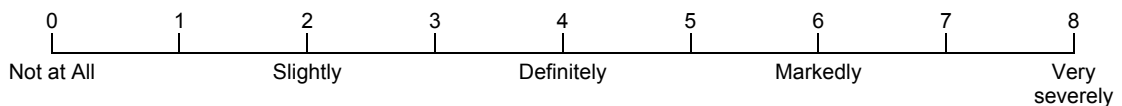
SOCIAL LEISURE ACTIVITIES

Because of my child's tic disorder, his or her social leisure activities (with other people, such as parties, clubs, outings, visits, dating, home entertainment) are impaired.



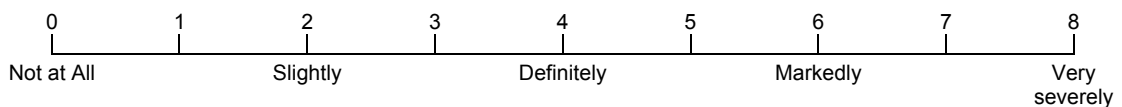
PRIVATE LEISURE ACTIVITIES

Because of my child's tic disorder, his or her private leisure activities (done alone, such as reading, gardening, collecting, sewing, walking alone) are impaired.



FAMILY AND RELATIONSHIPS

Because of my child's tic disorder, his or her ability to form and maintain close relationships with others, including those he or she lives with, is impaired.



Consumer Satisfaction Questionnaire (Child Version)

Please help us improve our program by answering some questions about the services you have received. We are interested in your honest opinions, whether they are positive or negative. Please answer all of the questions. We also welcome your comments and suggestions. Thank you very much, we really appreciate your help.

1. How would you rate the quality of care you have received?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excellent	Good	Fair	Poor

2. Did you get the kind of help you wanted?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No, definitely not	No, not really	Yes, generally	Yes, definitely

3. To what extent has the program met your needs?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Almost all of my needs have been met	Most of my needs have been met	Only a few of needs have been met	None of my needs have been met

4. If a friend were in need of similar help, would you recommend the program to him/her?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No, definitely not	No, not really	Yes, generally	Yes, definitely

5. How satisfied are you with the amount of help you have received?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quite dissatisfied	Indifferent or mildly dissatisfied	Mostly satisfied	Very satisfied

6. Has the help you received helped you to deal more effectively with your problem?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yes, it has helped a great deal	Yes, it has helped somewhat	No, it did not really help	No, it seemed to make things worse

7. In an overall, general sense, how satisfied are you with the help you have received?

- Very satisfied Mostly satisfied Indifferent or mildly dissatisfied Quite dissatisfied

8. If you were to seek help again for your problem, would you come back to our program?

- No definitely not No, I don't think so Yes, I think so Yes, definitely

Consumer Satisfaction Questionnaire (Parent Version)

Please help us improve our program by answering some questions about the services you and your child have received. We are interested in your honest opinions, whether they are positive or negative. Please answer all of the questions. We also welcome your comments and suggestions. Thank you very much, we really appreciate your help.

1. How would you rate the quality of care you and your child have received?

Excellent Good Fair Poor

2. Did you and your child get the kind of help you wanted?

No, definitely not No, not really Yes, generally Yes, definitely

3. To what extent has the program met your needs and those of your child?

Almost all of my needs have been met Most of my needs have been met Only a few of needs have been met None of my needs have been met

4. If a friend's child were in need of similar help, would you recommend the program to him/her?

No, definitely not No, not really Yes, generally Yes, definitely

5. How satisfied are you with the amount of help you and your child have received?

Quite dissatisfied Indifferent or mildly dissatisfied Mostly satisfied Very satisfied

6. Has the help you received helped you to deal more effectively with your child's problem?

Yes, it has helped a great deal Yes, it has helped somewhat No, it did not really help No, it seemed to make things worse

7. In an overall, general sense, how satisfied are you with the help you and your child have received?

- | | | | |
|--------------------------|--------------------------|------------------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Very satisfied | Mostly satisfied | Indifferent or mildly dissatisfied | Quite dissatisfied |

8. If you were to seek help again for your child's problem, would you come back to our program?

- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| No definitely not | No, I don't think so | Yes, I think so | Yes, definitely |

Children's Global Assessment Scale

Please use the following anchors to rate the adolescent's most impaired level of general functioning in the **past week** by selecting the **lowest level** which describes his/her functioning on a hypothetical continuum of health-illness. Use intermediary levels (e.g., 035, 058) when needed. Rate actual functioning regardless of treatment or prognosis. The examples of behavior provided are only illustrative and are not required for a particular rating. Record your rating in the CGAS field below. Do not circle rating.

Level of functioning score: _____

- 100-91 Superior functioning: in all areas (at home, at school and with peers), involved in a range of activities and has many interests (e.g., has hobbies or participates in extracurricular activities or belongs to an organized group such as Scouts, etc.). Likeable, confident, "everyday" worries never get out of hand. Doing well in school. No symptoms.
- 90-81 Good functioning in all areas: Secure in family, school, and with peers. There may be transient difficulties and "everyday" worries that occasionally get out of hand (e.g., mild anxiety associated with an important exam, occasional "blow-ups" with siblings, parents or peers).
- 80-71 Slight impairment in functioning: No more than slight impairment in functioning at home, at school, or with peers. Some disturbance of behavior or emotional distress may be present in response to life stresses (e.g., parental separations, deaths, birth of a sibling), but these are brief and interference with functioning is transient. Such children are only minimally disturbing to others and are not considered deviant by those who know them.
- 70-61 Moderate impairment in functioning in at least one area: Some difficulty in a single area, but generally functioning pretty well (e.g., sporadic or isolated anti-social acts, such as occasionally playing hooky or petty theft; consistent minor difficulties with school work, mood changes of brief duration; fears and anxieties which do not lead to gross avoidance behavior; self doubts). Has some meaningful interpersonal relationships. Most people who do not know the child well would not consider him/her deviant, but those who do know him/her well might express concern.
- 60-51 Moderate impairment in functioning in most areas: Variable functioning with sporadic difficulties or symptoms in several but not all social areas. Disturbance would be apparent to those who encounter the child in a dysfunctional setting or time but not to those who see the child in other settings.
- 50-41 Moderate degree of interference in functioning in most social areas or severe impairment in one area: such as might result from, for example, suicidal preoccupations and ruminations, school refusal and other forms of anxiety, obsessive rituals, major conversion symptoms, frequent anxiety attacks, frequent episodes of aggressive or other anti-social behavior with some preservation of meaningful relationships.
- 40-31 Major impairment in functioning in several areas and unable to function in one of these areas: i.e., disturbed at home, at school, with peers, or in the society at large (e.g., persistent aggression without clear instigation; markedly withdrawn and isolated behavior due to either mood or thought disturbance, suicidal attempts with clear lethal intent). Such children are likely to require special schooling and/or hospitalization or withdrawal from school (but this is not a sufficient criterion for inclusion in this category).
- 30-21 Unable to function in almost all areas: (e.g., stays at home, in ward or in bed all day without taking part in social activities) OR severe impairment in reality testing OR serious impairment in communication (e.g., sometimes incoherent or inappropriate).
- 20-11 Needs considerable supervision: to prevent hurting others or self (e.g., frequently violent, repeated suicide attempts) OR to maintain personal hygiene OR gross impairment in all forms of communication (e.g., severe abnormalities in verbal and gestural communication, marked social aloofness, stupor, etc.).
- 10-01 Needs constant supervision (24-hour care): due to severely aggressive or self-destructive behavior or gross impairment in reality testing, communication, cognition, affect, or personal hygiene.

Clinical Global Impression

Clinical Global Impression: Severity of Illness						
<i>Considering your total clinical experience with this particular population, how ill is the subject at this present time?</i>						
1	2	3	4	5	6	7
Normal, not at all ill	Borderline mentally ill	Mildly ill	Moderately ill	Markedly ill	Severely ill	Among the most extremely ill

Clinical Global Impression: Global Improvement						
<i>Compared to the subject's condition prior to treatment, how would you evaluate him or her now, over the previous week?</i>						
1	2	3	4	5	6	7
Very much improved	Much improved	Minimally improved	No change	Minimally worse	Much worse	Very much worse

Appendix C: Guidelines for CGI-S and CGI-I Scoring

A. Overview

The following guidelines link the YGTSS total tic score and the concepts of impairment and improvement to be ascertained on the CGI-S and CGI-I scores across three domains of functioning (home, school/work, and peers). The YGTSS score provides an estimation of deviance from normal that includes (implicitly and explicitly) the concept of associated impairment due to CTD symptoms. However, the concept of impairment allows for the possibility of adequate functioning (e.g., “holding it together at school”), despite the presence of significant CTD symptoms. Based on the YGTSS score and a clinically sensitive interview to ascertain the extent to which the subject experiences impairment due to his/her CTD, the IE should generate a best-estimate CGI-S and CGI-I score, which should reflect the subject’s current (over the past week) clinical status in light of the overall trajectory of change since baseline (Gate C), including consideration of the previous assessments’ CGI-S and YGTSS ratings.

Because BETTS is a study of treatments for CTDs, and the CGI-S, CGI-I, and YGTSS are the primary outcome measures for CTDs in the study, the IE should be especially careful to focus on CTDs only when composing CGI scores. Other factors unrelated to CTDs, such as other externalizing or internalizing disorders, family functioning, neighborhood problems, or difficulties at school should not be considered. For example, when rating the CGI-S for a patient with an IQ of 80 who struggles in school, the IE should consider the impact of struggling in school on the CTD and, in turn, the impact of the CTD on school performance; but the impact of a low IQ *per se* should not be considered relative to age- and gender-matched peers, who are a reference group only for the absence of a CTD.

Finally, it is important to remember that the CGI score is a clinician-rated measure. While rules for anchoring the CGI scores are provided, it is incumbent on the IE to assign a CGI score that he/she believes provides the best estimate of the patient’s status relative to the CTD and not to slavishly follow numerical anchors, even if they marginally diverge from the IE’s judgment.

B. Guidelines for making CGI-Severity ratings

These guidelines for scoring the CGI-S use YGTSS ranges that were derived from: (1) the NIH- and TSA-funded Comprehensive Behavioral Intervention for Tics (CBIT) study, currently being conducted at Johns Hopkins, UCLA, and the University of Wisconsin at Milwaukee, (2) the BETTS entry criteria with respect to YGTSS and CTD inclusion criteria, and (3) the response metric inherent in the YGTSS itself. **Note that the suggested YGTSS anchors are not mandatory, but rather guidelines for the expected relationship between the YGTSS and the CGI-S.** However, CGI-S scores

usually should not be more than one point lower or higher than the suggested YGTSS range.

Discounting the not assessed point, the CGI-S is a 7-point scale generally anchored as follows:

GLOBAL SEVERITY

0 = Not assessed	4 = Moderately ill
1 = Normal, not at all ill	5 = Markedly ill
2 = Borderline mentally ill	6 = Severely ill
3 = Mildly ill	7 = Among the most extremely ill

Specific Anchors:

1. Normal, not at all ill (No one would consider the person affected)
 - None or only rare tics.
 - YGTSS Total Tic Score = 0 to 6
2. Borderline mentally ill (Occasional symptoms, but not clinically meaningful)
 - Occasional tic symptoms. The participant and others may not be aware of symptoms.
 - There is no impairment/distress from tic symptoms and no need for others (caretakers, peers, teachers, co-workers, etc.) to provide assistance/accommodation/support.
 - YGTSS Total Tic Score = 7 to 13
3. Mildly ill (Clear symptoms and may meet DSM-IV-TR diagnostic criteria, but lack impairment/distress)
 - Subject has tics, but tics are usually noticeable only to people who know the participant well.
 - Impairment/distress due to tics is minimal and there is no need for others (caretakers, peers, teachers, co-workers, etc.) to provide assistance/accommodation/support.
 - YGTSS Total Tic Score = 14 to 21
4. Moderately ill (**Disorder with SMALL severity and impairment**)
 - Clear tic symptoms, noticeable to those who know the participant and occasionally noticeable to others.

- Impairment due to tics may be minimal in that the subject functions independently, but tics may be distressing, a source of embarrassment, and require some assistance/accommodation/support at least some of the time.
 - YGTSS Total Tic Score = 22 to 28
5. **Markedly ill (Disorder with MEDIUM severity and impairment)**
- Clear tics symptoms, occurring in all settings and frequently noticeable to others. Tics may interfere with everyday activities at least sometimes.
 - Impairment/distress due to tics is such that the subject can function independently, but may often need assistance/accommodation/support in order to function.
 - YGTSS Total Tic Score = 29 to 35
6. **Severely ill (Disorder with LARGE severity and impairment)**
- Clear tics symptoms in all settings, easily noticed by others and frequently interfering with activities of everyday living; may elicit comments.
 - Impairment due to tics is such that the subject's capacity to function independently is threatened, distress may be prominent; often needs assistance accommodation/support.
 - YGTSS Total Tic Score = 36 to 42
7. **Among the most extremely ill (Disorder with EXTRA LARGE severity and impairment)**
- Tic symptoms among the most severe observed in clinical populations.
 - Impairment due to tics is such that the participant cannot function in routine roles without regular assistance/accommodation/support.
 - YGTSS Total Tic Score = 43 to 50

C. Guidelines for making CGI-Improvement ratings

GLOBAL IMPROVEMENT

- | | |
|------------------------|---------------------|
| 0 = Not assessed | 4 = No change |
| 1 = Very much improved | 5 = Minimally worse |
| 2 = Much improved | 6 = Much worse |
| 3 = Minimally improved | 7 = Very much worse |

The following definitions of the CGI-I require the rater to classify response in tic severity and related impairment compared to baseline (Gate C). Thus, clinically *significant* improvement implies that the patient's tics are reduced in one or more of the following dimensions: frequency, number, intensity, and/or level of interference in everyday life – compared to baseline (Gate C).

A CGI-I score of 1 or 2 defines positive response; a CGI-I score of 3 defines a partial response. CGI-I scores of 4 or worse define non-response. To assign the score, the IE should consider the following question: *Compared to tic severity at baseline (Gate C), how much has the participant changed?* Rate total improvement whether or not, in your judgment, it is due entirely to treatment.

1. Very much improved (**Treatment was very effective**)

- Tic symptoms have improved to a degree that a **substantial improvement** has occurred. The improvement has a readily discernible impact on tic severity and impairment/distress, both subjectively and as observed by others.

2. Much improved (**Treatment was effective**)

- Tic symptoms have improved to a degree that a **significant improvement** has occurred. The improvement has had a significant impact on tic severity and impairment/distress.
- The current dose and approach to treatment is considered effective in reducing symptoms and change is obvious to the participant and those who know the participant well – but there may still be room for improvement.

3. Minimally improved (**Treatment is not clearly effective; more intensive or longer study treatment is needed to result in additional benefit**)

- Tic symptoms may show **some improvement**, as evidenced by modestly decreased tic severity and impairment/distress.
- The treatment is not clearly effective and may not be sufficient at the current dose or duration. A larger dose of treatment, longer duration of treatment, or minor adaptation of the approach may be needed to enhance the benefit of the treatment.

4. No change (**Treatment ineffective**)

- There is no improvement in tic severity or impairment/distress compared to the baseline state (Gate C).

5. Minimally worse

- There is some worsening over the baseline state (Gate C) in the target symptoms.

6. Much worse

- The patient's condition is worse, such that new treatments need to be considered to address the worsening of symptoms.

7. Very much worse

- The patient's condition is much worse, such that a new approach to treatment needs to be considered urgently, to address the worsening of symptoms.

Appendix D: Adherence Rating Scale for Study II

HRT vs. HRT/ACT for CTDs: Scale for Rating Therapist's Adherence to Treatment Manual *

Client ID: _____ Session/Week: _____ Therapist: _____
Date Rated: _____ Rater: _____

HRT Items	Rating
1) Awareness Training - Creation of tic hierarchy - Describing, simulating, and/or identifying tics - Instruction in (or review of) self-monitoring	1 2 3 4 5
2) Competing Response Training - Explanation of competing response - Selection/development of competing response - Competing response simulation/practice - Problem-solving re: difficulties w/ competing response	1 2 3 4 5
3) Social Support Training - Identification of support person - Discussion of support person's duties - Facilitation of communication between client & support person	1 2 3 4 5
4) Ancillary Techniques - Habit Inconvenience Review - Relaxation Training	1 2 3 4 5

ACT Items	Rating
5) Values & Goals - Discussion of client's values and goals	1 2 3 4 5
6) Creative Hopelessness/Workability/Control is Problem - Explore client's efforts to control thoughts and feelings - Explore the impact of previous efforts to control or avoid	1 2 3 4 5
7) Willingness/Acceptance - Experiential acceptance - Exploration of feelings/sensations - Mindfulness of current experiences - Out of session acceptance skills practice (e.g., "urge surfing")	1 2 3 4 5
8) Deliteralization/Defusion - Deliteralization/defusion - Feelings/thoughts DO NOT lead to actions - Self as context/mindfulness of self as separate from thoughts/feelings/sensations	1 2 3 4 5
9) Committed Action - Making and keeping commitments to valued activities	1 2 3 4 5

Anti-ACT Items					
10) Challenging Cognitions - Changing content of thoughts - Substituting positive thoughts	1	2	3	4	5
11) Experientially Avoidant Change Strategies - Avoid or control - Reassurance in order to reduce experience	1	2	3	4	5
12) Cognitive Therapy Rationale	1	2	3	4	5
13) Thoughts and Feelings Cause Action - Feelings/thoughts lead to action - Relate improvement to cognitive change	1	2	3	4	5

* RATE FOR FREQUENCY AND EXTENSIVENESS:	
<i>A rating of:</i>	<i>Would indicate:</i>
<u>1 = Not at all</u>	The variable never explicitly occurred.
<u>2 = A little</u>	The variable occurred at least once (and may have occurred a few times) but was not addressed in an in-depth manner.
<u>3 = Somewhat</u>	The variable occurred several times and/or was addressed at least once by the therapist in a moderately in-depth manner.
<u>4 = Considerably</u>	The variable occurred with relatively high frequency and was addressed by the therapist in a moderately in-depth manner.
<u>5 = Extensively</u>	The variable occurred with great frequency and was addressed by the therapist in a very in-depth manner.
<p>For the frequency and extensiveness of ratings, the starting point for rating each item on the scale is "1." The rater should assign a rating of greater than "1" only if he/she hears examples of the behavior specified in the items. The rater should be careful not to start rating from the midpoint ("3") out.</p>	

Appendix E: Adherence Raters' Manual for Study II

HRT vs. HRT/ACT for CTDs TREATMENT STUDY: ADHERENCE RATERS' MANUAL

Stephanie H. Best, M.A.

NOTE – This manual was adapted by Stephanie H. Best from a line of adherence manuals used in various ACT and other studies. It is heavily based on the following:

Twohig, M. P. (2005). Adherence raters' manual for ACT for OCD treatment study.

Pierson, H., Gifford, E. V., Smith, A. A., Bunting, K., & Hayes, S. C. (2004). Adherence raters' manual for NIDA ACT/bupropion smoking cessation treatment study.

Kohlenberg, B., Luoma, J., Bunting, K., & Hayes, S. C. (2003). Adherence raters' manual for stigma treatment study.

Hayes, S. C. (2007). Adherence raters' manual for ACT vs. CAU prevention study.

GENERAL GUIDELINES

1. RATE OBSERVABLE THERAPIST BEHAVIORS:

Items refer to the therapist's behavior, not the client's behavior or the client's responses. In rating the therapist's behavior, the rater should consider what the therapist actually attempted to do, not whether those attempts were met with success or failure. Variables must have explicitly occurred. Do not rate a variable as having occurred if this occurrence was not explicit but only implied. Raters should have specific examples in mind to substantiate their ratings. Always consider the entire session when rating an item.

2. RATE THERAPIST FACILITATION:

Although the rater's task is to rate the therapist's behavior, the client may initiate a behavior on his or her own, with only limited therapist involvement. The relevant item(s) on the rating scale should not necessarily receive a lower rating in this case. Ratings should reflect the degree to which the therapist facilitated the behavior being measured. Facilitation refers to the degree to which the therapist actively encouraged or prompted the client in a specific activity, rather than merely acting as a passive recipient of the client's self-initiated behavior.

3. CONFIDENTIALITY:

All videotapes and rating scores are confidential material. While watching tapes and rating sessions, please ensure that you do so in a place where others (including family members and friends) cannot see or hear the sessions. The tapes are to be handled like private psychiatric charts. Do not leave tapes or rating material unattended. Do not discuss the content of sessions with anyone other than project staff. This is done to ensure the confidentiality of all clients and therapists.

4. RATE FOR FREQUENCY AND EXTENSIVENESS:

<i>A rating of:</i>	<i>Would indicate:</i>
<u>1 = Not at all</u>	The variable never explicitly occurred.
<u>2 = A little</u>	The variable occurred at least once (and may have occurred a few times) but was not addressed in an in-depth manner.
<u>3 = Somewhat</u>	The variable occurred several times and/or was addressed at least once by the therapist in a moderately in-depth manner.
<u>4 = Considerably</u>	The variable occurred with relatively high frequency and was addressed by the therapist in a moderately in-depth manner.
<u>5 = Extensively</u>	The variable occurred with great frequency and was addressed by the therapist in a very in-depth manner.

For the frequency and extensiveness of ratings, the starting point for rating each item on the scale is “1.” The rater should assign a rating of greater than “1” only if he/she hears examples of the behavior specified in the items. The rater should be careful not to start rating from the midpoint (“3”) out.

5. AVOID HALOED RATINGS:

The Adherence Rating Scale is designed for the purpose of describing the therapist’s behavior in the session. In order to use the Adherence Rating Scale correctly, it is essential that the rater rate what actually occurred, and not what ought to have occurred. Therefore, the rater must be sure to apply the same standards for rating an item regardless of:

- (1) the type of therapy the rater thinks he/she is rating;
- (2) other behaviors the therapist engaged in during the session;
- (3) ratings given to other items;
- (4) how skilled the rater believes the therapist to be;
- (5) how much the rater likes the therapist.

6. RATE EVERY ITEM BY CIRCLING WHOLE NUMBERS:

This scale is designed so that every item is rated for every therapy session. Do not leave any item blank. Although raters may be tempted to give a score between whole numbers (e.g., 4.5) only whole numbers are acceptable scores. Thus, please record only whole numbers for each variable.

Most of the 13 main items on the scale have sub-items, which are indented and listed below the main heading. Rate the main item, as a whole. The sub-items are not rated separately, but instead factor into the rating given to the main item they are listed under. The therapist's behavior does NOT need to be differentiated among sub-items. If the therapist's behavior falls under any one of the sub-items, it counts as an example of the heading item. (For instance, if a therapist's behavior falls under 'exploration of feelings' or 'mindfulness of current experiences,' it is just considered an example of Willingness/Acceptance.) All sub-items listed under a main heading will not necessarily occur during a given session.

7. USE THE MANUAL DURING EACH RATING:

In order to prevent rater drift, we strongly recommend that all raters read the manual's description of each item each time a session is rated. Because of the complexity of the scale items, it is essential that the rater be completely familiar with the definitions of variables before rating them.

Use the manual for specific examples: Examples are provided in the manual and are to be used as guidelines for rating therapist behavior. The examples are only guidelines for rating an item. The rater is expected to exercise his/her judgment when using the examples to guide his/her rating.

Use the manual to clarify subtle differences between items: Because the items may overlap in terms of breadth of coverage, the same therapist behaviors, which are appropriately rated in one item, may also apply to another item. The rater should be careful to rate each item distinctly (i.e., the rater should consider the extent to which the behavior specified in that item occurred and should not consider other similar items when doing so). The rater should use the manual as a guide to clarify subtle differences between items.

8. TAKE NOTES BEFORE RATING:

Only entire sessions will be rated. Therefore, do not rate any items on the scale until the entire session has been watched. We recommend that the rater take notes while watching the session. This enhances accuracy of the ratings (because raters will be reminded of information which is relevant to rating the items) and keeps the rater focused on what actually occurred in the session. Because raters are asked to make many fine distinctions, it is essential that the rater watch the session carefully and without distraction.

SESSION OCCURRENCES: RATING ITEMS

1. **AWARENESS TRAINING:** Awareness training is based on the idea that enhanced awareness of tic behaviors facilitates better self-control. The success of HRT depends upon the client knowing exactly when his/her tic is about to happen or is happening, which is why this treatment component typically constitutes the initial intervention in HRT.
 - A. **Creation of Tic Hierarchy:** To what extent did the therapist work with the client to create a comprehensive list of the client's current tics? The client should also be asked to rate how bothersome or distressing each tic is, relative to the others. Tics are then rank ordered from least to most distressing (or frequent, etc.). This list is reviewed periodically throughout treatment, to provide a systematic and immediate method for identifying treatment gains and areas of difficulty. The tic hierarchy also serves as the mechanism by which tics are selected for institution of awareness training and competing response training.
 - B. **Describing, Simulating, and/or Identifying Tics:** To what extent did the therapist work with the client to help him/her recognize and react to episodes of ticcing or antecedent stimuli (e.g., premonitory urges)? The therapist should also provide the client with a rationale for awareness training prior to its induction.

Example:

Th: The first part of HRT is designed to teach you to know when you are ticcing. We are going to make you aware of when it is happening. Because the rest of the treatment depends on you knowing exactly when the ticcing is about to happen or has happened, this is a very important part of the treatment. We'll do a number of exercises so that by the time you leave today, you will be very 'aware' of your ticcing.

The item is intended to evaluate the extent to which the therapist assisted the client in describing a tic of his/her choice from the hierarchy, describing the sensations and behaviors that precede the tic, acknowledging therapist simulations of the tic, and acknowledging real or simulated occurrences of the tic exhibited by the client.

- C. **Instruction in (or Review of) Self-Monitoring:** Throughout the HRT portion of the treatment, the therapist should ask the client to monitor his/her tics. This provides ongoing data to the therapist regarding the client's ticcing and helps to keep the client invested in the therapeutic endeavor.

Example:

Th: For the next few weeks, I'm going to ask you to monitor your tics for me. This will help both of us to understand your unique pattern of ticcing and provide us with a baseline we can use to measure future progress. During the next week, I'd like you to take this form (therapist hands patient the self-monitoring form) and record any ticcing you do during a 30-60 minute period each day. Ideally, you should choose a period when your tics are likely to happen, and you should try to self-monitor at roughly the same time each day. At the end of the week, I'd like you to bring your completed self-monitoring form back to me, and we will go over it.

Included under this item are instances where the therapist goes over the completed self-monitoring form from the previous week with the client.

2. COMPETING RESPONSE TRAINING

A. Explanation of Competing Response: Competing response (CR) training is at the center of any HRT intervention. To what extent did the therapist introduce and explain the CR to the client?

Example:

Th: We're now going to learn something called the competing response. In here we'll call these your 'exercises.' The purpose of these exercises is to give you something to prevent you from ticcing. After you do this long enough, your body learns that the tic doesn't need to occur and eventually the ticcing stops. I'll show you the new behavior in a few minutes. When doing your exercises, it is important that you hold the competing response for at least 1 minute each time you have an urge to tic. Now let's talk about some possible competing responses for your tic.

B. Selection/Development of Competing Response: To what extent did the therapist brainstorm with the client about possible competing responses for his/her tic? The therapist should offer various suggestions but should also ask the client for suggestions, particularly at more advanced stages of treatment. It is important for the therapist to inquire about whether the client thinks a potential CR will work for him/her when he/she has to do it for real. The therapist should listen carefully to the client's concerns and incorporate these into the selection of the CR.

C. Competing Response Simulation/Practice: To what extent did the therapist attempt to teach the CR to the client and assist him/her in practicing it? This could be accomplished first via clinician modeling and then by having the client demonstrate

the CR. Finally, the client should be asked to perform the CR after each actual occurrence of the tic or its warning signs (i.e., urges to perform the tic). Each time the therapist observes the client doing the CR properly, he/she should praise the client. Conversely, if the client fails either to implement the CR after ticcing or to execute it correctly, he/she should be prompted to do so by the therapist.

D. Problem-Solving re: Difficulties w/ Competing Response: To what extent did the therapist inquire about difficulties the client may have had with implementing a given CR? To receive a high rating for this item, the therapist should also have engaged in problem-solving with the client, with the aim of either adjusting the CR or identifying an alternate CR for the tic in question.

3. SOCIAL SUPPORT TRAINING: The purpose of this component of the treatment is to recruit a person who is significant in the client's life, to aid in the implementation of the awareness training and competing response procedures. Note that the following items can and should still be rated even if the support person is unable to physically attend the session. In this case, the therapist should discuss (and perhaps role-play) the support person's duties with the client, enabling the client to convey this information to the support person at a later time.

A. Identification of Social Support Person: To what extent did the therapist instigate and assist in the process of identifying a social support person for the client (e.g., a parent, spouse, adult child, relative, or close friend)? The therapist should aid the client in deciding on who will function as the support person. The client should be encouraged to invite the support person to come to sessions.

B. Discussion of Support Person's Duties: To what extent did the therapist facilitate a discussion (ideally, with the support person present) of the support person's primary responsibilities? The therapist should describe these duties as: (1) acknowledging and praising correct implementation of CRs by the client, and (2) prompting the correct use of CRs when necessary (e.g., when they see or hear a tic, but the client does not use the CR). The therapist should model appropriate ways to perform these responsibilities, emphasizing that the support person should be warm and encouraging, rather than nagging and punitive. The client should also be consulted regarding the manner in which he/she would like to be supported.

Example (if the support person is present):

Th: (To support person): The support person has two main purposes. One is to let Joe know when he's doing a good job with his exercises and the other is to remind him to do the exercises when he forgets about them. When you see Joe do the exercises, you should acknowledge his efforts by saying something like "Nice job" or "Way to go." But as with most people, he'll probably

forget to use his exercises every once in a while. When this happens, we need you to help him remember. If you see Joe tic, but he doesn't do his exercises, then you need to remind him to do so.

Example (if the support person is not present):

Th: (To client): The support person has two main purposes. One is to let you know when you're doing a good job with your exercises and the other is to remind you to do the exercises when you forget about them. When your support person sees you doing the exercises, they should acknowledge your efforts by saying something like "Nice job" or "Way to go." But as with most people, you'll probably forget to use your exercises every once in a while. When this happens, we need your support person to help you remember. If they see you tic, but you don't do your exercises, then they need to remind you to do so. Let's practice what this might look like.

After discussion of the support person's responsibilities, the therapist should lead the client (and support person, if present) in some sort of role-playing exercise, as a means of practicing the types of interactions that will be required throughout treatment.

- C. Facilitation of Communication Between Client & Support Person:** To what extent did the therapist work with the client (and support person, if present) to resolve conflicts and/or other difficulties arising in the course of the support person fulfilling his/her duties? This frequently takes the form of the client feeling annoyed with the support person (e.g., viewing his/her actions as nagging) and/or the support person feeling frustrated or confused about how to best interact with the client. The therapist should assist in resolving any communication difficulties and problem-solving if any changes in strategy are required.

4. ANCILLARY TECHNIQUES

- A. Habit Inconvenience Review:** To what extent did the therapist help the client generate a list of all the negative consequences and features of their tics (e.g., embarrassing, painful, disruptive, need to come to clinic, etc.). This list is called the "Tic Hassles List" and should be revisited occasionally when improvement in the client's tics render a list item obsolete.
- B. Relaxation Training:** To what extent did the therapist introduce relaxation to the client as a means of reducing stress, calming the nervous system, and assisting with the management of tics? The therapist should emphasize that there are numerous

relaxation methods and activities (e.g., deep breathing, progressive muscle relaxation) and find out what relaxes the patient, in general. An assessment of how often the client is engaging in relaxing activities should be made. If relaxation is occurring infrequently, the therapist should do some problem-solving with the client around the issue of introducing more regular relaxation into his/her life. As an example, the therapist may conduct an experiential progressive muscle relaxation exercise. The client may also be given a CD or audio file of the exercise to take home.

5. VALUES AND GOALS

- A. Discussion of Client's Values and Goals:** To what extent did the therapist help the client discuss his/her *values* in various areas of life (e.g., family relations, friendships, career/education, recreation, spirituality), as well as *goals* based on the client's stated values?

This question is intended to evaluate whether the therapist worked on helping the client clarify and establish what his/her values are, along with goals based on these values. Values are ongoing patterns of activity that have intrinsic worth to the client, are not achievable in a finite sense, and have no foreseeable end (e.g., being a caring, dependable friend). Goals involve behaviors that can be completed and serve to support and reinforce values (e.g., serving as your friend's best man, even though you might fear ticcing during the wedding ceremony). Did the therapist remind the client of his/her values during therapy and use them to help the client focus on the direction he/she wants his/her life to go? Did the therapist help the client use his/her values as motivators to identify and pursue specific goals consistent with his/her valued life direction?

This item is intended to evaluate whether the therapist focused on the client acting effectively and choosing to act effectively. This would not include situations where the therapist scolded the client or tried to get him/her to do something. Rather, this includes situations where the therapist helped the client clarify his/her values and choose to act in accordance with them.

Examples:

Th: What do you want to be about?

Th: What do you want for its own sake, just because that is what matters to you?

Th: How can you live effectively by moving in this direction in your life right now?

Th: How does this relate to your values/goals/living effectively?

Cl: *I really want to do well on this Biology exam.*
Th: *Well, that's your little want--I see that you may want that in the moment. What are some of your bigger wants? What I mean by that is, what do you want long-term?*
Cl: *I suppose I want to get good grades and graduate, so I can go to college.*

6. CREATIVE HOPELESSNESS/WORKABILITY/CONTROL IS PROBLEM

A. Efforts to Control Thoughts and Feelings: To what extent did the therapist identify the client's current efforts to try to *control* his/her thoughts or feelings as a problematic agenda, including identifying specific instances where the client attempts this (i.e., trying to control thoughts and feelings)?

This question is intended to evaluate whether the therapist discussed the nature of the agenda of trying to control thoughts and feelings (i.e., preventing one from having certain feelings or thoughts) and problems with this effort.

Examples:

Th: *If you don't want to have it, you've got it.*

Th: *Control works in the world outside the skin, but not in the world inside the skin.*

Th: *Could you stop being anxious if I hooked you up to a polygraph and put a gun to your head?*

Th: *Could you stop ticcing if I offered you money to do it?*

Th: *When you're trying to control your thoughts and urges, you can think of them like waves – you can surf through them. Think about a wave. It has about a three- minute hang time. If you try to control it, you'll never be able to ride it out. You can't block a wave from coming. When you try to control thoughts and urges, they just get more intense – they don't go away.*

Th: *Don't think about a purple monkey sitting in that chair.*
Cl: *I can't.*
Th: *That's exactly my point.*

B. Explore the Impact of Previous Efforts to Control or Avoid: To what extent did the therapist discuss or remind the client of the client's *history* of attempts to solve his/her problems and/or the emotional and situational *consequences* of this

unsuccessful behavior (e.g., “How has that worked for you?” and/or “Is that like you?”)?

This question is intended to evaluate whether the therapist attempted to help the client make contact with the lessons of his/her past behavior. This can include the painful costs of failing to change, as well as discussing the strategies he/she has used in the past that involve efforts to control or avoid uncomfortable emotions, thoughts, or sensations. The therapist’s general purpose would be to set the stage for learning a new approach by identifying the need for change.

The therapist's assessment of historical coping strategies and the success or failure of these strategies should be rated on this item.

Note: To receive a high rating on this item, the therapist should identify the ineffective change strategy, as well as emphasize the consequences of using this strategy.

Examples:

Th: (In response to client’s discussion of ineffective control strategy): Is that familiar?

Th: And how has that worked for you in the past?

Th: (Using the ‘tug-of-war’ metaphor in a way that identifies the client’s typical response to a stressful situation.)

Th: (Exploring the costs of avoiding activities because the client is afraid of ticcing, e.g., emotional costs, impact on relationships, roads not taken, etc.)

Cl: I know quite a few people can control their tics with will power alone. In fact, I personally have had some success in the past this way.

Th: And . . . you're here now, so obviously that hasn't really worked for you.

7. WILLINGNESS/ACCEPTANCE

A. Experiential Acceptance: To what extent did the therapist facilitate the client’s willingness to *contact* and *accept* difficult feelings, thoughts, memories and/or bodily sensations, both in session and outside of session?

This question is intended to evaluate whether the therapist worked on creating a context wherein the client could experience negative

thoughts/feelings/memories/bodily sensations in session and/or encouraged the client to put him/herself in emotionally intense situations outside of session. Presence of client emotion is not enough. The client feeling his/her emotion must be encouraged by the therapist. In other words, it must occur as a result of interventions and attitudes expressed by the therapist. This includes situations wherein the client initiates expression of feelings if the therapist actively encourages this expression.

Examples:

Th: Say in this hand I hold the ability to move forward in your life, and in the other one I hold avoiding feeling bad. Which do you choose?

Th: This is a safe place to let yourself feel what's there.

Th: Can you give yourself permission to have that feeling?

Th: Why don't we try going there and feeling what is there to be felt?

Th: Are you willing to have it (a bad feeling or thought), even if you don't want it?

Th: How are you doing?

Cl: This is really hard. I've been miserable all week.

Th: Great! What's that like?

B. Exploration of feelings/sensations: To what extent did the therapist help the client to explore his/her feelings or physical sensations related to current symptoms, or clarify affect states as related to ticcing *or* other target problems?

This item refers to the extent to which the therapist facilitated discussion that clarified the client's feeling state or physical sensations (e.g., attempts to help the client put his feelings and sensations into words, or discriminate sensations associated with urges to tic from states of affect such as anxiety). This may include clarification or exploration of feelings in an interpersonal situation.

Examples:

Th: It sounds like the situation at school made you angry, and after school you went home and ticced a lot. I wonder what the connection is between anger and ticcing for you?

Cl: My tics were really bothering me yesterday, and I don't know why.

Th: What were you doing right before the tics started?

Cl: I was at school.

Th: What was going on at school?
Cl: I was nervous about trying out for the school play, and then I bombed the audition.
Th: What was going through your mind or what were you feeling?

This item would be rated greater than “1” if the therapist helped the client label his/her feelings and/or sensations. To be rated highly, the therapist needs to thoroughly explore the relationship between feelings, behavior, and urges to tic or other target problems and distinguish between feelings that are associated with ticcing versus other affect states.

Examples:

Cl: I'm noticing that I'm having urges to tic as we're talking right now.
Th: Can you describe what thoughts, feelings and physical sensations you're having right now?
Cl: Well, it feels kind of jittery, and I'm having thoughts like, "I can't stand this."
Th: Great describing. Just sit with that experience for a moment.

C. Mindfulness of Current Experiences: To what extent did the therapist facilitate noticing and awareness of the client's current experiences?

This includes physical sensations, emotions, and any experience with a focus on the present moment. This includes negative feelings as well as positive feelings, as long as the focus is on experiencing the present moment. The therapist may talk about something the client is experiencing in session, or about experiencing in the present moment at a time other than in the current session.

Examples:

Th: So in that moment you were completely aware and not struggling with your experience.

Th: Let's try something. Close your eyes for a moment. Try to tune into any thoughts you might be having right now... any feelings... any physical sensations. See if you can just be present with whatever's there to be experienced... right now... in this moment... even if it feels hard.

Cl: Yesterday I had this experience where I really wanted to tic, but instead of feeling like I had to get rid of that feeling, I felt the urge.
Th: That is exactly what we are talking about, staying right in the moment and feeling and noticing what is there to be felt.

D. Out of Session Acceptance Skills Practice: To what extent did the therapist encourage the client to experience difficult urges, thoughts, feelings, memories and/or bodily sensations in his/her daily life outside of session?

Out of session acceptance skills practice is in the service of building skills in order to deal with unpleasant thoughts and feelings. This item refers to the extent to which the therapist attempted to help the client, in a sense, “build a muscle.”

For a high rating, the therapist must have helped the client talk openly about difficult urges, thoughts, feelings, memories and/or bodily sensations the client experiences in his/her daily life outside of session. The therapist also must have helped the client interpret those urges, thoughts, feelings, memories and/or bodily sensations. The therapist should have also discussed how the practice of acceptance is in the service of building a skill set for dealing with uncomfortable private experiences.

A low rating would be given if the therapist only touched upon those areas without going into detail as to how the client can cope with urges to tic by experiencing and understanding those feelings.

Examples:

Th: Tell me about your feelings and the bodily sensations you are experiencing as a result of trying to ride out your urges to tic. It's ok to have the feelings and sensations because it means you are aware of what's going on. By knowing yourself, you can find ways to cope with them.

Cl: When things get really tough at home, I usually just start ticcing.

Th: Let's talk about your urge to tic. What thoughts, feelings or bodily sensations were you experiencing when you felt the urge to tic?

8. DELITERALIZATION/DEFUSION

A. Deliteralization/Defusion: To what extent did the therapist use, teach, or remind the client of language conventions aimed at helping him/her remember that thoughts and feelings are just thoughts and feelings and not necessarily reality (i.e., ‘but’ versus ‘and,’ and/or “I am having the thought/feeling/evaluation that...,” and/or “thank your mind for that,” etc.)?

This question is intended to evaluate whether the therapist helped the client to identify thoughts as thoughts and not necessarily as reality. Thoughts are just words, even long-held beliefs. If thoughts are seen for what they are (just thoughts), choices can be made as to whether or not they should actually be acted upon. This may include discussions about the limitations of language, in general, as well as reminders to the client to see particular thoughts and feelings as just thoughts and feelings,

distinct from established facts. The therapist might discuss deliteralization as “mind chatter” or separating private experiences (thoughts and feelings) from reality.

Examples:

Th: OK, and that is a thought you are describing isn't it? Thank your mind for that!

Th: Say the word 'milk' really fast.

Cl: Milk, milk, milk, milk, milk, milk...

Th: Notice how the meaning of 'milk' disappeared? The word 'milk' is just a word; the milk isn't inherent in the word, it is in the meaning we give it.

Th: So how is, "Gosh, I'm never going to be able to do this!" different from, "I really will be able to do this!"?

Cl: They're both thoughts.

Th: Right, they're just thoughts. Thoughts are different from what you do. Can you have the thought, "Gosh, I'm never going to be able to do this!" and do it anyway?

B. Feelings/Thoughts DO NOT Lead to Actions: To what extent did the therapist identify that a client’s feeling/thought does not lead him/her to behave in certain ways? For example, if the therapist does not accept the client’s rationale for ticcing related to thoughts and feelings (e.g., “Whenever I get anxious, I have to tic”), then the therapist is identifying that the particular thought/feeling does not lead to action.

This item measures the extent to which the therapist highlighted that the client’s behavior is not the result of thoughts/feelings but rather that the client has the ability to observe private experiences and urges and not act on them.

Examples:

Cl: When I feel overwhelmed, I have a lot of urges to tic and, therefore, the only way I can figure that I'll be able to quit ticcing is to restructure my life such that I have fewer responsibilities.

Th: 'Overwhelmed' is something that you experience, but it isn't you.

Cl: I know we've talked about that, but...

Th: You can have the urge to tic when you feel overwhelmed, but notice that feeling overwhelmed doesn't necessarily require you to tic - you could have the experience and sit with it.

Th: It's like when you have road rage - you can have a thought that you want to curse and run someone off the road, but you don't do it.

Th: Have you ever been angry enough at your brother to strike him?
Cl: Yes, but I never would!
Th: Exactly! You can have the thought or urge to do it, but the thought itself doesn't cause you to actually hit your brother. In those moments you act in accordance with your values, not with your thoughts.

C. Self As Context/Mindfulness Of Self As Separate From

Thoughts/Feelings/Sensations: To what extent did the therapist facilitate the client's sense of *self-awareness* or self-identification as the *context* in which all of his/her thoughts, feelings and evaluations occur, i.e., the place from which he/she can *observe* all of his/her thoughts and feelings versus identifying his/her thoughts and feelings as who he/she is (e.g., talk about the "observer self")?

This question is intended to evaluate whether the therapist worked on the client's sense of relationship with him/herself. In particular, to what extent did the therapist encourage the client to relate to him/herself from a more complete and profound perspective, rather than basing his/her sense of self on the fluctuating status of his/her momentary feelings and thoughts?

Exercises that target getting the client focused on feeling his/her body and noticing physical sensations, thoughts, and feelings that are occurring in the moment (e.g. *mindfulness* or *centering* exercises) should be rated on this item.

Examples:

Th: You are the perspective from which you can observe all of your thoughts and feelings.

Th: Notice that you are not just your thoughts and feelings; you are the place from which you observe all of your thoughts and feelings.

Th: At the deepest level of your experience, you are like the chessboard, and all of your thoughts and feelings are like the pieces. You are in contact with all of the pieces, black and white. You are the board that contains them all, but you are more than any of the pieces.

Cl: It's difficult for me to quit ticcing. I feel like a failure.

Th: Notice that you're having that thought right now. That thought is one of many experiences contained within you, but it is not specifically you. Think of it this way: you are the container for your experiences. Your experiences can be held within you, but they are not the container itself: the experiences are not you.

9. COMMITTED ACTION

- A. Making and Keeping Commitments to Valued Activities:** To what extent did the therapist encourage the client to generate and/or keep his/her *commitments* in any or all aspects of his/her life?

This question is intended to evaluate whether the therapist focused on the client choosing to act effectively. The therapist should have helped the client make and keep commitments to behave in accordance with his/her values and goals and to track his/her commitments to do so *in concrete terms*. This can include looking at the reasons the client uses to avoid acting in alignment with his/her values and challenging these reasons by not supporting the client's belief that those reasons control his/her behavior. Essentially, any discussion where the client and therapist addressed targets of therapy and how the client is going to participate in working on these targets should be rated.

Examples:

Cl: I couldn't keep my commitments from last week.

Th: Why is that?

Cl: I got scattered and stressed and ended up ticcing more than I should've without even realizing it in the moment. When I went to record the number of tics on the self-monitoring sheet, I then noticed that I wasn't able to follow our plan.

Th: Well, what should we do to help you be more conscious of your behavior throughout the day?

Cl: I'll just do better, I guess.

Th: Why don't we talk through a plan about how specifically you're going to stay focused this week and agree on it.

Th: You have stated that you want to live a healthier life. What are things you can commit to doing this week to begin to move in that direction?

10. CHALLENGING COGNITIONS

- A. Changing Content of Thoughts:** To what extent did the therapist encourage the client to think something different than what the client was already thinking?

This item should be rated greater than "1" if the therapist says something that indicates the client should think one thing, instead of another thought that has been presented. This item is intended to measure the degree to which the therapist tried to replace the content of a client's thoughts with other content.

Examples:

Cl: I don't think I am ever going to be able to stop ticcing.
Th: Hmm... is there any other way you could think about that?

Cl: I was having the thought that I am not good enough to be able to follow through.
Th: Don't say that! You are good enough.

B. Substituting Positive Thoughts: To what extent did the therapist attempt to help the client practice possible rational responses to his/her negative thoughts or beliefs?

This item measures how much the therapist facilitated daily life or in-session practice of rational responses to a negative thought or belief of the client's.

In order to receive a high rating on this item, the therapist must facilitate in-session or daily life practice by role-playing, assigning homework, or rehearsing various rational responses. Briefly assigning a task for practicing rational responding without extensively practicing in-session or extensively discussing a daily life assignment should receive a low rating.

Examples:

Cl: I think that I'm no good at anything!
Th: Is that likely the case, that you're no good at anything? How reasonable do you think that statement is?
Cl: Well, that's how it feels sometimes...
Th: ...And how rational is that thought?

11. EXPERIENTIALLY AVOIDANT CHANGE STRATEGIES

A. Avoid or Control: To what extent did the therapist encourage the client to avoid or control his/her thoughts, feelings, memories or bodily sensations? This can include instances where the therapist appears to do something designed to make the client “feel better” or prevent him/her from “feeling bad.”

This item would be rated highly if the therapist immediately moves to problem-solving when a client's feelings, thoughts, memories and/or bodily sensations come up. A low rating would be given if the therapist encourages sticking with difficult thoughts, feelings, memories and/or bodily sensations.

Examples of therapist promoting avoidance or control strategies (HIGH rating):

Th: *You should try doing activities you enjoy, to distract yourself from the depressing thoughts.*

Cl: *I feel out of control sometimes when I can't tic.*

Th: *Don't feel bad. Lots of people with tics feel that way.*

Cl: *I've been miserable since I've quit ticcing in response to my urges.*

Th: *I understand. How can we make this easier for you?*

Cl: *I usually tic when I'm at my Dad's house, so I avoid going over there.*

Th: *That's probably a good idea.*

Example of therapist promoting a more accepting/willing approach (LOW rating):

Cl: *I usually tic when I'm at my Dad's house, so I avoid going over there.*

Th: *Given that we're just getting started, that's OK in the short run, but our ultimate goal is for you to be able to have urges and expose yourself to triggers for ticcing and not act on them.*

Note: This last example warrants a low rating in the “Experientially Avoidant Change Strategies” category on the adherence scale, because the therapist explains that the long-term goal is not to avoid triggers for ticcing (i.e., places, uncomfortable sensations, etc.).

B. Reassurance in Order to Reduce Experience: To what extent did the therapist reassure the client in a way that supported the client not feeling what he/she was feeling?

This item is intended to measure the extent to which the therapist offered reassurance that was not merely supportive but was intended to reduce the client's affect or current experience. Therapist behaviors rated on this item include behaviors that show an unwillingness on the part of the therapist to experience what the client is experiencing.

Examples:

Cl: *I have been feeling really miserable lately.*

Th: *It's ok. You will feel better soon.*

Cl: *I am not sure I can handle this. I just feel so lost all the time, like something is really missing. (crying)*

Th: *Don't cry. It will be alright.*

12. COGNITIVE THERAPY RATIONALE: To what extent did the therapist provide a rationale that emphasizes the importance of evaluating the accuracy of the client's cognitions (beliefs, thoughts, etc.) and changing inaccurate cognition *in order to* alleviate the client's ticcing and associated symptoms? Also, the therapist does not provide or state other possibilities for the cause of the client's tics or associated behaviors or affective symptoms.

The purpose of this item is to measure how extensively the therapist discussed:

- (1) the importance of evaluating the accuracy of the client's cognitions, *and*
- (2) the possibility of changing the client's inaccurate cognitions for the purpose of alleviating his/her urges, tics, and/or associated distress.

In order for this item to be rated greater than "1," the therapist must make the connection between evaluating/changing cognitions and alleviating tics and/or associated symptoms (e.g., anxiety, depression). This connection must either be explicit or strongly implied.

This item should *not* receive a rating *greater than* "1" if:

- (1) the therapist states that he/she would be focusing on evaluating/changing the client's cognitions simply because it would be good to get them straightened out, and did not at least imply that doing so would serve to alleviate the client's symptoms.

Examples:

Th: When a person has a tic disorder, they are frequently overrun with negative thoughts and beliefs, which are often inaccurate. In order to reduce the associated anxiety and depression, it is very important to take a careful look at how accurate those thoughts and beliefs really are. Maybe we can find a more realistic way to look at the troublesome situation.

The above example should receive a rating of greater than "1" because the therapist explicitly stated that the purpose of evaluating/changing cognitions was to reduce the client's emotional distress.

Th: We're certainly going to want to help you stop ticcing. As a result, we will focus on your thoughts about your tics, to make sure there aren't times when you're viewing things inaccurately. If we discover there are times when your beliefs are not in line with the way things really are, we will

work to correct your beliefs so they're more accurate. How does that plan sound to you?

The above example should receive a rating of greater than “1.” The therapist *implied* a connection between evaluating/changing cognitions and alleviating the client’s ticcing.

This item measures the extent to which the therapist offered a rationale for therapy that emphasizes that evaluation and changing inaccurate cognitions (thoughts, beliefs, etc.) would be helpful in alleviating the client’s unwanted symptoms.

13. THOUGHTS AND FEELINGS CAUSE ACTION

- A. Feelings/Thoughts Lead to Action:** To what extent did the therapist state or suggest that a client’s thoughts or feelings may lead to certain behavior? For example, did the therapist accept the client’s rationale for ticcing related to feelings or thoughts (e.g., “Whenever I get anxious, I have to tic.”)?

To receive a high rating on this item, the therapist must have identified and explored the client’s feelings or thoughts that may have lead to certain aspects of the client’s behavior. The therapist must put forth a feeling or thought that led the client to tic, or explicitly agree with or support the client's rationale.

This item would be rated lower if the therapist only went over the client’s feelings or thoughts, without relating the consequent behavior to the feelings or thoughts.

Example:

Th: I think the unbearable tension you feel when you're nervous causes you to tic in those kinds of situations.

- B. Relate Improvement to Cognitive Change:** To what extent did the therapist relate improvement in the client’s symptoms or in daily life problems to changes in the client’s beliefs or automatic thoughts?

This measures how much the therapist made a connection between improvement the client has experienced and changes that have occurred in the client’s beliefs, thoughts or underlying assumptions. The changes in beliefs, thoughts or assumptions do not have to be directly caused by therapeutic efforts to change these cognitive phenomena. “Improvement” here refers to a reduction in the client’s symptomatology (e.g., tics and/or associated affect) *or* improvements in other areas of the client’s daily life.

Examples:

The following example should receive a rating greater than “1,” because the therapist related improvement the client experienced in his family life to changes in his underlying assumptions:

Th: How are things going between you and your parents and between you and your brother?

Cl: My relationship with my parents is much better now than it was. I'm getting along better with my brother too.

Th: What do you attribute those improvements to?

Cl: I guess the reason I'm getting along with my parents better now is that I'm not as quick to take offense at what they say as I used to be.

Th: I remember that when they said something that was at all critical, it triggered a set of beliefs you had about your worthlessness. I also remember that you felt bad in those situations, and your reaction was producing strain on your relationship with them. It sounds like the absence of those kinds of beliefs has resulted in your getting along better with them. Is that how you see it?

The following example should receive a rating greater than “1,” because the therapist related improvement the client experienced in his family life to changes in his automatic thoughts:

Th: How are things going between you and your parents and between you and your brother?

Cl: My relationship with my parents is much better now than it was. I'm getting along better with my brother, too.

Th: What do you attribute those improvements to?

Cl: I guess the reason I'm getting along with my parents better now is that I'm not as quick to take offense at what they say as I used to be.

Th: I remember that when they said something that was at all critical, it triggered automatic thoughts like, "Get off my back; can't you see I'm doing the best I can?" that led you to feel defensive and angry. Your reaction was producing strain on your relationship with them. It sounds like the absence of those thoughts has resulted in your getting along better with them. Is that how you see it?

Appendix F: HRT+ACT Treatment Manual

Habit Reversal Training + Acceptance and Commitment Therapy for Chronic Tic Disorders: A Treatment Manual Developed for the BEhavioral Treatment of Tics Study (BETTS)

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General Overview of Treatment

The current manual describes a 10-session protocol combining aspects of Habit Reversal Therapy (HRT; Azrin & Nunn, 1973; Azrin & Peterson, 1990; Woods & Miltenberger, 1995) and Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, and Wilson, 1999) for the treatment of adolescents and young adults with Chronic Tic Disorders (CTDs).

Theoretical Premise for HRT/ACT

CTDs are viewed as complex disorders with both neurological and psychological bases. At one level, CTDs have biological underpinnings and involve habitual behaviors that may, at times, be outside of the person's awareness. On another level, there is growing evidence that tics serve an emotion regulation function and are sensitive to a variety of environmental factors. For example, many individuals with a CTD endorse voluntarily performing their tics in response to unpleasant urges or sensations that immediately precede the occurrence of a tic. Attempts to resist the performance of the tic are described by patients as leading to an intensification of this premonitory urge. The comprehensive, integrated model of CTDs acknowledges that tics and associated features have a neurobiological substrate, emerging from abnormal genetic and/or neurological factors. However, tics do not occur in a vacuum; they occur in the real world. As such, tic symptom expression reflects an underlying neurobiology that both influences and is influenced by a person's external and internal environments. Essentially, the *environment*, in interaction with the underlying *neurobiology*, shapes tic expression in a context-dependent fashion.

The current combination of HRT and ACT stems from this conceptualization of CTDs as neurobehavioral disorders. The HRT component is designed to address the habitual aspects of ticcing; ACT is designed to address the emotion regulation aspects of ticcing, while placing an emphasis on the patient as a whole and not just as someone who tics. More specifically, ACT is designed to (1) alter the function of thoughts and feelings surrounding the ticcing, and (2) alter the function of the ticcing urge from something that must be acted upon to something that could simply be experienced. In this respect, ACT removes the emotional control aspect of ticcing from the disorder, as the patient learns to experience (rather than control) associated emotions, thoughts, and urges.

HRT focuses on increasing the patient's awareness of his or her tics and teaches the person to utilize a competing behavior instead of ticcing. The HRT intervention complements the ACT procedure by asking the person with the CTD

to actively prevent the use of their habitual urge control strategy (i.e., ticcing). By preventing the ticcing, the person with the CTD is encouraged to experience, rather than avoid, his or her ticcing-related private events.

General Format of Treatment

HRT/ACT is intended to be implemented in 10, 1-hour sessions over the course of 10 weeks, with two subsequent monthly booster sessions. Sessions 1-3 involve the implementation of HRT, and sessions 4-9 involve the implementation of ACT. Session 10 reviews previous material and incorporates relapse prevention techniques. In the first session, an overview of treatment is provided, and the patient is educated about the neurobehavioral model of CTDs.

All sessions after Session 1 follow a similar outline that includes:

- Completion of ongoing assessment instruments
- Experiential centering exercise (*not applicable to sessions 1-3*)
- Review of patient's understanding of material from previous session
- Reactions to material from previous session
- Review of homework assignments from previous session
- Review of experiences since previous session
- Introduction of new topic or information
- Assignment of homework

Therapist Prerequisites

The therapist should be familiar with the theoretical underpinnings of ACT. These areas will not be elaborated in this manual. This manual is intended to provide the therapist with an outline of each session. It is highly suggested that the HRT/ACT therapist be familiar with the procedures prior to each session.

Session 1: Assessment & Orientation

General Rapport Building

Spend a few minutes getting to know the patient (and parent(s), if applicable). Ask the patient to describe their hobbies, where they live, where they go to school (or work), and their family. The goal of this conversation is to build rapport and to let the patient know you are interested in things about them other than just their tics.

In addition to asking about the patient, let them know something about you. Describe things like how long you have been helping people with tic disorders, what your credentials are, and what you do for fun. Strive to be warm, empathetic, and accepting.

General Assessment

The function of the general assessment is to get a sense of what the patient's tics are like. The manual will fit, no matter what the patient's particular tics are. However, it is useful to know what the particular tics are and what seems to trigger them, in order to properly apply the manual.

- Ask the patient to describe their tics. There will likely be many different tics. Have the patient indicate what the main one(s) are. Ask how long tics have been a problem. What other treatment(s) has the patient tried? What techniques work to control their tics? Have they ever had periods of time when they did not have tics? Try to get a sense of all the different things the patient does to get rid of their tics once they are present.
- What are the situations in which the patient tics most often? What occasions seem to bring out their tics?
- What are the situations the patient avoids because of their tics?

Assessment of Motivation

Spend some time getting to know why the patient is in treatment. The goal here is to assess motivation for treatment. Why are they participating in the treatment? How will getting control of their tics make their life better?

Commitment to a Course of Treatment

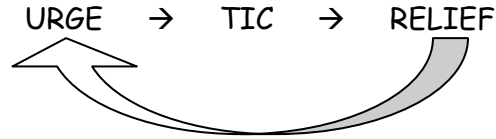
The treatment of tic disorders, for some, can be difficult and require a lot of work. Also, in a number of cases, the outcomes of HRT/ACT are not seen until later in the treatment. The patient should be warned of this and encouraged to participate in the entire treatment, without judging the treatment prematurely or impulsively.

"A fundamental treatment like this is best done by carving out some space within which to work. Especially if we end up stirring up old issues, sometimes it might look like we are going backward, when we are really going forward. It's like exercise; sometimes good things hurt a bit. I believe that patients should hold therapists accountable; I'm not asking for a blank check. If we are moving ahead, you will know it and we will both see it in your life. It's just that we can't be sure of this on a week-to-week basis. So what I would like is a period of time - say 10 sessions. Let's push ahead for that amount of time no matter what - even if you really want to quit. One of the reasons I find this important is that, if you do not really engage in these 10 sessions, you will not really know whether this treatment is useful or not."

Neurobehavioral Model of Tics

The therapist should present the neurobehavioral model of CTDs on which the HRT/ACT treatment is founded. To do so, the therapist should say the following:

"Tic disorders have neurological roots, but they are also influenced by the world around them. You've probably noticed that your tics seem to worsen in certain situations and get better in others. That's because our brains both influence *and* are influenced by our environment. The way you think and feel about your tics can also affect how and when they are expressed. For example, many people with tics feel an unpleasant urge or sensation just before ticcing. After they tic, the unpleasant feeling goes away temporarily. On the other hand, if they try to resist ticcing, the urge often intensifies. Some individuals describe voluntarily performing their tics in response to these unpleasant urges or sensations, in order to get relief from them. This ends up trapping the person with tics in a vicious cycle, through no fault of his (her) own:



The relief achieved by ticcing in the face of unpleasant urges makes this cycle incredibly reinforcing to the brain. Every time this cycle is allowed to go through to completion, it makes it even more likely that the next time an unpleasant urge arises, the person will tic in an effort to make it go away. This process doesn't even have to take place at a conscious level of awareness. It is simply the way in which humans learn and respond to their environment."

"For the first few sessions of our work together, I am going to teach you some strategies to help you interrupt this vicious cycle. We will be using something called Habit Reversal Training, or HRT. HRT is specifically designed to stop this habitual pattern of behavior in its tracks. We will first work on helping you to become more aware of your urges. Then, instead of using your current strategy to control the urges (that is, ticcing), you will be coached to use a competing response to actively prevent the tic. This will eventually help you to experience, rather than avoid, the internal sensations preceding your tics."

Overview of HRT/ACT Treatment

The therapist should briefly describe the basic premise of the HRT/ACT treatment. This summary should give the patient a general notion of the process of treatment over the next 10 weeks. The therapist should say the following:

"As we just discussed, tics involve the perception of the urge to tic *and* the tic itself. To help you cope more effectively with your tics we will use two different (on some level) types of treatment strategies. Next week, and for the next 3 sessions, we will start dealing with tics by focusing on what we call a "competing response." During the fourth session, we will start asking you to look at your thoughts, feelings, emotions, and urges a little differently. During this time, we may actually talk very little about your tics and different ways to stop them. During week 10, we'll review what we have learned and discuss ways for you to keep your progress going."

"During each of our sessions, I'll ask be asking you to do work in session and homework outside of session. Even if you feel that a specific exercise is silly, or doesn't pertain to you, I'll ask you to withhold judgment and participate fully in the exercises. You never know what may end up benefiting you. Do you have any questions?"

Creation of a Tic Hierarchy

At this point in the session, the therapist works with the patient to create a comprehensive list of the patient's current tics. The patient is then asked to rate how bothersome or distressing each tic is on a 1-to-10 scale (10 = most bothersome). For some younger patients or those denying any tic-associated distress, it may be necessary to have the patient rate his or her tics based on frequency of occurrence, rather than distress, or to use a different rating metric (e.g., 1-to-5 instead of 1-to-10). Tics are then rank ordered from least to most distressing (or frequent, etc.). This list is reviewed and tics are re-rated at the beginning of each HRT session, to provide a systematic and immediate method for identifying treatment gains and areas of difficulty. The tic hierarchy also serves as the mechanism by which tics are selected for institution of awareness training and competing response training.

Introducing Self-Monitoring and Assigning Homework

Throughout the HRT/ACT treatment, the patient will be asked to monitor his or her tics. This is intended to serve two purposes. First, it will provide ongoing data to the therapist regarding the patient's ticcing. Second, it will keep the patient invested in the therapeutic endeavor. To introduce the monitoring and assign the homework for the first week, the therapist should say the following:

"For the next few weeks, I'm going to ask you to monitor your tics for me. This will help both of us to understand your unique pattern of ticcing and provide us with a baseline we can use to measure future progress. During the next week, I'd like you to take this form (*therapist hands patient the self-monitoring form*) and record any ticcing you do during a 30-60 minute period each day. Ideally, you should choose a period when your tics are likely to happen, and you should try to self-monitor at roughly the same time each day. It can be helpful to select a support person who will simultaneously monitor your tics when you do. By comparing the two sets of data, we will be better able to determine how aware you are of your tics. Note that I do not want you to stop whatever you are doing in order to self-

monitor. You should continue with your normal activities. Simply keep the self-monitoring sheet nearby so you can record each incident of ticcing. At the end of the week, I'd like you to bring your completed self-monitoring form back to me, and we will go over it. Remember, there is no "right" or "wrong" way to do this. Just try your best, and we'll set aside time during our next session to troubleshoot any difficulties you may experience. Any questions?"

TIC SELF-MONITORING FORM

Name: _____

INSTRUCTIONS:

Record the number of tics you do during a 30-60 minute period each day. Ideally, you should choose a period when your tics are likely to happen, and you should try to self-monitor at roughly the same time each day. It can be helpful to select a support person who will simultaneously monitor your tics when you do. *Do not* stop whatever you are doing in order to self-monitor. You should continue with your normal activities. Simply keep the self-monitoring sheet nearby so you can record each incident of ticcing. Use additional sheets as needed. At the end of the week, bring your completed self-monitoring form(s) back to your therapist.

Description of Tic ↓	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
	Date:	Date:	Date:	Date:	Date:	Date:	Date:
	Time:	Time:	Time:	Time:	Time:	Time:	Time:

Session 2: Introduction to HRT

Weekly Check-In

Check to see how the patient's week went. Check for external stressors such as difficulties at school (or work) or in the family. These areas will not be directly targeted but are useful because they can affect treatment. Check the rate of the tics and check to see if any new ones appeared. Basically, see how things are for the patient out of session.

Review Reaction to Last Session

Ask the patient if he or she had any reactions to the last session. This gives the patient an opportunity to ask questions or share reactions to the material from the last session. Any reaction is fine. The therapist should be compassionate, because engaging in this therapy can be difficult.

Review Homework and Problem Solve

If the patient did not complete the homework, the therapist should assess the variables that got in the way. Very likely, the same variables that get in the way of the patient experiencing the tic or premonitory urge and choosing not to act on it are the same ones that got in the way of the patient doing the homework. Try to help bring these variables to the patient's attention. The patient may have not completed the homework because it was too emotionally difficult, he/she did not make the time, or he/she did not want to. All of these have an avoidance component to them. Help the patient see that part of the thing that got in the way was that he/she had to do something that was difficult and did not feel good. This is very much like the struggle the patient is in when the premonitory urge occurs and the patient must 'decide' to engage in the tic or not. Again, this should not be done in a blaming fashion. The purpose is to help the patient see that a large part of our behavior is guided by avoiding unpleasant activities.

Habit Inconvenience Review (or the "Tic Hassles List")

Ask the patient to help you generate a list of all the negative consequences and negative features of his/her tics (i.e., embarrassing, painful, disruptive, need to come to clinic, etc.). This list is called the "Tic Hassles List", and it is revisited occasionally when improvement in the patient's tics render a list item obsolete, or when the patient is having a lapse in motivation. In addition to breaking down the patient's denial of symptoms and enhancing motivation for treatment, the "Tic Hassles List" also helps move the patient in the direction of exploring the

consequences of his/her tic disorder and developing a more realistic acceptance of his/her condition.

Review Hierarchy

Review the tic hierarchy developed during Session 1. Make any modifications to the rank ordering, as necessary. Ask the patient if he/she has experienced any new tics this past week or if there were any tics he/she failed to mention last week. Include these in the hierarchy.

HRT Training

There are three main components of HRT Training: (1) awareness training, (2) competing response training, and (3) social support training. The implementation of each of these three areas is illustrated below.

HRT Component One: Awareness Training

The purpose of awareness training is to get the participant to recognize and react to episodes of ticcing or antecedent stimuli. The participant should be provided with a rationale for awareness training prior to its induction. An example of a rationale follows:

"The first part of HRT is designed to teach you to know when you are ticcing. We are going to make you aware of when it is happening. Because the rest of the treatment depends on you knowing exactly when the ticcing is about to happen or has happened, this is a very important part of the treatment. We'll do a number of exercises so that by the time you leave today, you will be very 'aware' of your ticcing."

Awareness training involves describing one tic of the participant's choice from his or her hierarchy, describing the sensations and behaviors that precede the tic, acknowledging therapist simulations of the tic, and acknowledging real or simulated occurrences of the tic exhibited by the participant. Each of these specific procedures is outlined below. These procedures work best when the chosen tic is particularly bothersome to the patient. This tends to enhance the patient's motivation and provide for better outcomes.

Describing the tic. This is accomplished by having the participant give a detailed description of what the tic sounds like and looks like. If the participant fails to describe a key feature of the tic, the therapist should point this out.

Although there are no objective criteria to gauge when the response description procedure has been correctly implemented, the clinician should feel that the

person's ticcing and other behavior occurring at the time of the ticcing have been described in thorough detail. When this has been accomplished, the clinician and participant should begin the next procedure, describing preceding sensations and behaviors.

Describing preceding sensations and behaviors. The purpose of this procedure is to have the participant cue in on premonitory sensations and behaviors that may inform him or her that the tic is about to occur. These premonitory sensations and behaviors should be called "warning signs," and the topic could be introduced as follows:

"To be really aware of a problem, you not only need to be able to describe the problem, but you also need to be able to know when the problem is about to happen. In the case of ticcing, your body is probably giving you warning signs before you tic to let you know it is about to happen. What I want you to do next is to really think about warning signs your body is giving you that let you know the tic is about to occur. These signs can either be things you do or things you feel."

There may be both internal and external warning signs that a tic is about to occur. Internal warning signs take the form of privately experienced premonitory urges or sensations. These are variously described by individuals with CTDs as tension, itching, a build-up of energy or pressure, or a feeling that something isn't "just right." Premonitory sensations may be localized or more broadly distributed, and the level of awareness of these sensations varies from person to person. External warning signs are publicly visible motions that constitute the very beginning of the tic sequence. In many cases, the tic sequence may occur too rapidly for the individual to be able to recognize that it has just begun. For more complex tics involving a variety of movements, however, such warning signs may be more relevant and useful. Regardless of the exact nature of the warning signs, the clinician should work with the participant to establish the particular warning signs he or she may experience. If the participant denies experiencing warning signs, the clinician should point out a few common examples and ask the participant if he or she experiences any of those sensations. If the participant still denies the presence of warning signs, the clinician should move to the next awareness training procedure, acknowledging therapist simulated tics.

Acknowledging therapist simulated tics. The purpose of this procedure is to help the participant begin acknowledging the ticcing. In this procedure, the participant will be asked to verbally acknowledge occurrences of his or her own tics as simulated by the clinician. A rationale could be given as follows:

"The next thing we're going to do is begin the process of acknowledging your ticcing. We're going to start this by having you point out ticcing in me. We're doing this because sometimes it's easier

for people to get the hang of this when they're watching someone else instead of themselves. During the next few minutes, we'll have a conversation about a topic of your choice. During the course of our discussion, I'll be acting out some of your tics. As soon as you see me do one, I want you to raise your right index finger and say 'There's one.'"

This process of awareness continues until the participant has successfully acknowledged the presence of at least 4 out of 5 therapist simulations. When the participant correctly identifies the simulated ticcing, the therapist should provide praise for correct acknowledgement. When the clinician simulates ticcing, but that simulation is not followed by the participant's acknowledgement, the clinician should point out to the participant that a tic has just occurred. The clinician should then remind the participant of the instructions. Allowing the patient to select the topic of conversation has the added benefit of conveying that the clinician views him or her as a whole person, and not just as "someone who tics."

After the participant has successfully attained the 4 out of 5 correct acknowledgements of simulated tics, he or she is ready to do the final step in awareness training. This step is acknowledging self-ticcing.

Acknowledging self-ticcing. This procedure will be nearly identical to the previous procedure, but the participant will be asked to point out occurrences of his or her own tics. The most difficult part of this procedure is getting the participant to exhibit actual ticcing. Often, the participant does not exhibit tics during this procedure. In such cases, the clinician will ask the participant to simulate his or her own ticcing. The procedure can be introduced to the participant as follows:

"You did an excellent job pointing out my 'ticcing.' Now I want you to start pointing out some of your own ticcing. We're going to talk about different things for the next 10 minutes or so. Right after you tic, I want you to again raise your right index finger and say 'There's one.'"

Again, the therapist should provide praise for correct acknowledgement, and feedback and repeated instructions when the participant fails to acknowledge ticcing that has occurred. This process should continue until the participant has correctly acknowledged 4 out of 5 ticcing episodes. Upon completion of the four awareness training procedures, the participant is ready to begin the primary component of HRT, Competing Response Training.

HRT Component Two: Competing Response Training

Competing response (CR) training is at the center of any HRT intervention. When introducing the general principle of a CR, be sure to choose a CR that is acceptable to the patient. Obviously, forcing an unwanted CR often translates into poor treatment compliance. One way of introducing the CR and asking about its acceptability is:

"We're now going to learn something called the competing response. In here we'll call these your 'exercises.' The purpose of these exercises is to give you something to prevent you from ticcing (or to interrupt a burst of subsequent tics if one has already occurred). After you do this long enough, your body learns that the tic doesn't need to occur, and eventually the ticcing stops. I'll show you the new behavior in a few minutes."

"When doing your exercises, it is important that you hold the competing response for at least 1 minute each time you have an urge to tic, you catch yourself starting to tic, or you notice that you just ticced. Now let's talk about some possible CR's for your tic."

Brainstorm about possible competing responses and then demonstrate for the patient.

"Well, you've seen the CR that you'll be expected to do whenever you feel an urge to tic, you catch yourself ticcing, or you notice that you just ticced. Remember to hold the CR for 1 minute each time. Before we continue, I want to make sure that you're comfortable with these exercises. I know the behavior may not feel natural yet, and that is to be expected. You will feel more comfortable with time. What I'm more interested in, is if you think it will work for you when you have to do it for real. Do you foresee any situations in which the new behavior won't be possible or would be embarrassing or uncomfortable?"

At this point, you should listen carefully to any of the patient's concerns. If there are none, the clinician should proceed. However, if concerns are present, the patient and clinician should try to develop strategies to manage the concerns. If the problems with the chosen competing response are insurmountable, the clinician should choose another competing response.

The patient should be taught to implement the competing response for 1 minute, contingent on occurrences of the urge to tic, the beginning of the tic sequence, or the tic itself. This can be introduced as follows:

"Well, you've seen me do this, now it's your turn. We've already reviewed the exercises, and you seem to be doing them very well. Now we need to use the exercises to reduce your ticcing. Remember, there are three times when I want you to use your exercises for one full minute: 1) as soon as you feel the urge to tic, 2) as soon as you start to tic, or 3) when you notice a tic has just occurred. As soon as any of these three things happen, you should begin your exercises."

"What I'd like you to do is pretend to start ticcing and then do the competing response for 1 full minute."

The patient should be asked to demonstrate the competing response after simulated urges to tic or tic movements. If he/she does this correctly, the clinician should praise the patient. However, if the clinician recognizes that the patient is doing something incorrectly, he or she should provide corrective feedback to the patient.

HRT Component Three: Social Support Training

After the awareness training and competing response training have been successfully implemented, the patient is ready to begin the third procedure of HRT. This is the social support component. The purpose of this component is to recruit a person who is significant in the patient's life, to aid in the implementation of the CR procedures.

Social support training involves three phases: 1) identifying the support person, 2) training the support person to praise/acknowledge correct implementation of the competing response exercises, and 3) training the support person to prompt the correct use of the competing response.

A parent, spouse, adult child, other relative, or close friend may serve as a useful support person. The patient should be encouraged to make the decision about who will function as the support person. Ideally, the support person should come to this session. It may be useful to briefly discuss the idea of a support person with the patient in the previous session, so he or she can invite the support person to this session. With the support person present, the clinician and patient should describe the basic idea of the intervention. In doing so, the clinician may say something such as...

"Thanks for agreeing to help us out with Josh's ticcing. Josh and I have been working on making him more aware of when he does his tics. We've also been working on doing exercises that help him reduce his ticcing. This is what his exercises look like. He's been told to use

these exercises for 1 minute each time he feels the urge to tic, starts to tic, or notices he has just ticced."

At this point, the therapist should ask the patient to demonstrate the competing response for the support person. When this has been done, the clinician should describe the responsibilities of the support person. This could be presented as follows:

"The support person has two main jobs. One is to let Josh know when he's doing a good job with his exercises and the other is to remind him to do the exercises when he forgets about them. Let's start by talking about how to let Josh know when he's doing well."

The clinician should then tell the patient and support person to acknowledge the correct implementation of the competing response by the patient. The following instructions could be given.

"(To support person)... When you see Josh do the exercises, you should acknowledge his efforts by saying something like, 'Nice job' or 'Way to go.' "

The therapist should take care to model this for the support person by asking the patient to simulate feeling an urge to tic and then do his competing response, after which the therapist should praise the patient for doing the exercises correctly. Once the therapist has modeled the correct use of praise, the patient should again be asked to simulate an urge and correctly implement the competing response. However, this time the support person will be asked to give feedback to the patient. The clinician should praise the support person for his or her efforts and offer corrective feedback, if necessary.

After the support person has successfully learned to praise the correct use of the competing response, he or she should be instructed in how to prompt the patient to use the exercises when the support person sees ticcing, but does not see the patient use the exercises. This concept could be introduced as follows:

"Right now, Josh is supposed to start his exercises as soon as he feels the urge to tic, starts ticcing, or notices he has just ticced. But as with most people, he'll probably forget to use his exercises every once in a while. When this happens, we need you to help him remember. If you see Josh tic, but he doesn't do his exercises, then you need to remind him to do so."

As with training the support person to praise the correct use of the competing response, the clinician should again ask the patient to simulate having an urge to tic. However, this time the patient should be instructed to tic instead of using the

exercises. When the patient tics, but does not use the exercises, the clinician should model the behavior of prompting the patient to use the exercises. The clinician should say something such as....

"Josh, I just noticed that you ticced, but you didn't do your exercises. Don't forget to use your exercises."

Once the therapist has modeled the correct way to prompt the use of the exercises, the support person should be asked to prompt the use of the exercises after the patient has simulated ticcing without using the associated competing response. It is important for the support person's words and tone to be experienced by the patient as encouraging, rather than punitive or pressuring. The patient's feedback should be solicited to ensure this is the case. Again, the clinician should praise the support person for his or her efforts and offer corrective feedback, if necessary.

Assign Homework

During the upcoming week, the patient should be asked to monitor the frequency **solely** of the tic that he or she chose to work on as part of the CR training. The patient will also be asked to engage in the associated competing response whenever he or she experiences a premonitory urge to tic, starts to tic, or has just ticced. The patient will be asked to engage in the CR for 1 full minute.

Session 3: HRT Review / Relaxation Training

Weekly Check-In

Check to see how the patient's week went. Check for external stressors such as difficulties at school (or work) or in the family. These areas will not be directly targeted but are useful because they can affect treatment. Check the rate of the tics and check to see if any new ones appeared. Basically, see how things are for the patient out of session.

Review Reaction to Last Session

Ask the patient if he or she had any reactions to the last session. This gives the patient an opportunity to ask questions or share reactions to the material from the last session. Any reaction is fine. The therapist should be compassionate, because engaging in this therapy can be difficult.

Review Homework and Problem Solve

Review the self-monitoring homework assigned at the end of last session. Notice if there are any similarities to or differences from the previous week's monitoring data, and use these observations to identify environmental contingencies for ticcing. If the parent was also monitoring the patient's tics, review his/her data to check for inconsistencies with the patient's data. If the parent's tic counts are significantly higher than the patient's, additional awareness training may be needed.

If the patient did not complete the homework, the therapist should assess the variables that got in the way. Very likely, the same variables that get in the way of the patient experiencing the premonitory urge to tic without acting on it are the same ones that got in the way of the patient doing the homework. Try to help bring these variables to the patient's attention. The patient may have failed to complete the homework because it was too emotionally difficult, he/she did not make the time for it, or he/she did not want to do it. All of these excuses have an avoidance component to them. Help the patient see that part of what got in the way was that he/she had to do something that was difficult and did not feel good. This is very much like the struggle the patient is in when the premonitory urge occurs and the patient must decide whether to engage in the tic or not. Again, this discussion should not be done in a blaming fashion. The purpose is to help the patient see that a large part of our behavior is guided by avoiding unpleasant activities.

Continue Competing Response (CR) Training

Ask the patient to select another tic from his/her hierarchy, and conduct CR training specifically focused on that tic. The procedures are essentially the same as those described in the previous session.

Relaxation Training

Introduce relaxation to the patient as a means of reducing stress, calming the nervous system, and assisting with the management of tics. Emphasize that there are numerous relaxation methods and activities. Find out what relaxes the patient, in general, first. Assess how often the patient is engaging in relaxing activities. If relaxation is occurring infrequently, do some problem solving with the patient around the issue of introducing more regular relaxation into his/her life. As an example, do an experiential progressive muscle relaxation exercise. The patient may be given a CD or audio file of the exercise to take home.

Assign Homework

This week, the patient should monitor the frequency of the **two** tics he/she has been working on during the past two sessions. The patient should be asked to engage in the appropriate CR whenever he/she experiences a premonitory urge to do either of the tics, begins to do one of them, or notices one of them has just occurred. The patient will be asked to engage in the CR for 1 full minute. Finally, he/she should engage in relaxation practice on at least 3 occasions during the upcoming week.

Session 4: Introduction to ACT – Mindfulness & Values Work

Experiential Centering Exercise

The purpose of the centering exercise is to: (1) set aside the clutter of day-to-day mind chatter and get the therapist and participant “in the room” and (2) focus the participant and therapist on their shared task. The therapist can introduce the exercise by saying something such as:

“I'd like to begin today's session with a short exercise designed to center us and bring us more fully into the present moment. In this treatment, we will talk about the role of awareness as a valuable tool to help us make changes in our lives. In particular, we will focus on a special kind of awareness called mindfulness. Mindfulness is non-judgmental, present-moment awareness of what is going on inside of us and around us. We often live our lives focused on things other than what is happening in the moment - worrying about the future, ruminating about the past, or focusing on what is coming next, rather than what is right in front of us. Sometimes we focus on what we are thinking and feeling, and we become very critical of our thoughts and feelings, trying to either change them or distract ourselves, because judgmental awareness can be very painful. Being mindful falls between these two extremes - we pay attention to what is happening inside of us and around us, we acknowledge events and experiences as what they are, and we allow things we can't control to be as they are, while we focus our attention on the task at hand. Let's try an example of this now.”

Have the participant make him/herself comfortable in the chair and close his/her eyes. Begin with focusing instructions (slowly, pausing between each statement):

“Notice the way you are sitting in the chair. Notice where your body is touching the chair. Now begin to bring your attention to your breath. Notice how the air enters your body, where it travels, and how it leaves your body. Notice the parts of your body that move as you are breathing. Notice where you feel the breath in your body. It might be your nostrils... the back of your throat... your chest... or your belly. Just gently let your awareness rest on the place where you feel your breath. *(pause)* Each time your mind wanders, notice that, and gently bring your awareness back to your breath. Notice the in-

breath... and the out-breath... *(give client some time to focus without you talking)* Now gently bring your focus back to the room, to the way you are sitting in your chair, and open your eyes when you are ready."

Discuss the participant's experience of mindfulness practice in session. Provide him or her with the "What is Mindfulness" handout (see attached), to be reviewed during the upcoming week.

Reactions to Previous Material

The therapist should ask the participant to share his/her thoughts about, and reactions to, the topics discussed in Session 3.

Review of Homework Assignment and CTD Experiences Since Session 3

The therapist should praise the participant for engaging in the self-monitoring process and for practicing his/her CR's. The therapist should point out the importance of continued monitoring and practicing of his/her CR's. Patterns and trends in the data should be discussed, and the therapist should ask the participant why he/she thinks certain trends in the tics may have developed (e.g., "Why do you think you ticed so often that day?"). The therapist should note the answers to such questions, as the participant's responses may serve as useful information in later sessions.

If the participant did not comply with self-monitoring, or refused to or was unable to use his/her CR's, barriers to compliance should be explored, the importance of compliance stressed, and a plan formulated to assure success with future assignments.

Valuing

At this point in the session, the therapist should say something such as:

"So far in treatment we have focused on ways of managing your tics. Now we are going to shift emphasis a little and begin to talk about how tics and other negative emotions/thoughts/feelings get in the way of your life and perhaps prevent you from doing things that are important to you."

"A really important part of this treatment is reconnecting with things in life that are important to you. We call these things values."

"Values refer to the things in life that matter to you, the ways of being that you associate with a meaningful and satisfying life. Valued

domains can include things such as family relationships, friendships, career/education, etc. Although we may value certain activities or experiences, tics and other negative emotions can make it hard for us to act in ways that are consistent with our values.”

“We will be talking in depth about values throughout our work together. This week I want you to take some time to think about some areas of valued living and how your tics or other negative emotions may have gotten in the way of living the life you want to be living.”

The clinician should guide the participant in an assessment of his/her values and goals, along with the barriers that stand in the way of living a life consistent with these values and goals. The therapist will go over the instructions for the ‘Values Assessment Form’ (see attached) in detail and make sure the client understands what is being asked of him/her. After reviewing the instructions, ask the participant to determine which of the areas in his/her life are affected by the ticcing. The participant is free to pick as many or as few areas as he/she feels are relevant. The clinician should briefly review areas the participant left out of the values assessment, to be certain that the patient’s tics are not even indirectly preventing him/her from achieving or realizing values and goals in these areas. Ask the patient to jot down some ideas about his/her values in each life domain. This can be started in session and completed later as homework:

“Take time to write whatever comes to mind. This is just an opportunity to begin to become aware of what matters to you, and what you want to be engaged in. There are no right or wrong answers. We will work with whatever comes up. Notice anything that gets in the way of writing, as well.”

After the ‘Values Assessment Form’ has been discussed, the participant and therapist should go over the ‘Values Narrative Form’ (see attached) and the ‘Values Assessment Rating Form’ (see attached). The participant can begin to fill out these forms with the therapist, in session; he or she will be asked to complete them as part of this week’s homework assignment.

Uncovering the System

In the process of discussing the participant’s behavior that is directed toward accomplishing valued goals, it should become apparent which specific behaviors are preventing success. In the case of a CTD, individuals typically have a value of living a happy and full life. Barriers to living such a life include negative emotional experiences and physical discomfort, both of which the participant may believe are caused by the ticcing. After identifying barriers to the pursuit of the

participant's valued life directions and the accomplishment of valued goals, the therapist and participant should begin to examine the strategies used to control or eliminate the barriers. This will be the focus of Session 5.

The therapist and participant should have a discussion at the end of the values session, pertaining to becoming overly focused on where the participant is, in respect to values and goals during the course of therapy. The "Path Up the Mountain Metaphor" should help to demonstrate this:

PATH UP THE MOUNTAIN METAPHOR

Suppose you are taking a hike in the mountains. You know how mountain trails are constructed, especially if the slopes are steep. They wind back and forth; often they have "switchbacks," which make you literally walk back and forth, and sometimes a trail will even drop back below a level you had reached earlier. If I asked you at a number of points on such a trail to evaluate how well you are accomplishing your goal of reaching the mountaintop, I would hear a different story every time. If you were in a switchback mode, you would probably tell me that things weren't going well, that you were never going to reach the top. If you were in a stretch of open territory where you could see the mountaintop and the path leading up to it, you would probably tell me things are going very well. Now imagine that we are across the valley with binoculars, looking at people hiking on this trail. If we were asked how they are doing, we would have a positive progress report every time. We would be able to see that the overall direction of the trail, not what it looks like at any given moment, is the key to progress. We would see that following this crazy, winding trail is exactly what leads to the top.

This metaphor may be useful throughout the course of therapy, during times when participants feel they are not making progress, or when they are evaluating themselves based on a "struggle" they lost with intense urges to tic. At these times, the therapist can suggest that they are evaluating themselves during times when they are on switchbacks in the path.

Assign Homework

The participant should continue to monitor the frequency of his/her most bothersome tics for 30-60 minutes each day. The participant will be asked to engage in an appropriate competing response (CR) when he/she experiences one of the warning signs of the tics, starts to tic, or notices he/she has just ticced. The participant will be asked to engage in the CR for 1 full minute.

The participant should complete the 'Values Assessment Form', the 'Values Narrative Form,' and the 'Values Assessment Rating Form' (see attached).

The participant should also review the "What is Mindfulness" handout (see attached).

What is Mindfulness?

In this treatment, we will talk about the role of awareness as a first step toward helping us make changes in our lives. In particular, we will focus on a special kind of awareness called mindfulness. The term mindfulness comes from Eastern spiritual and religious traditions (like Zen Buddhism), but psychology has begun to recognize that mindfulness (removed from the spiritual and religious context) may be used to improve physical and emotional well-being. Although many of the ideas we suggest here will be consistent with Eastern philosophies and traditions, we will not be focusing on the religious or spiritual parts of mindfulness, and we believe this approach can be useful no matter what your religious or spiritual preference.

Mindfulness is non-judgmental (or compassionate), present-moment awareness of what is going on inside of us and around us. We often live our lives focused on things other than what is happening in the moment – worrying about the future, ruminating about the past, or focusing on what is coming next, rather than what is right in front of us. And it is useful that we can do a number of things without paying attention to them. We can walk without thinking about walking, which allows us to talk to the person with whom we're walking without having to think, "Now I should lift up this foot." However, this ability to do things automatically, without awareness, also allows us to lose touch with what is happening right in front of us. We can develop habits (such as avoiding conflict) that we aren't aware of and that may not be in line with our broader goals.

Sometimes we do pay close attention to what we are thinking and feeling, and we become very critical of our thoughts and feelings, trying to either change them or distract ourselves, because judgmental awareness can be very painful. For example, we might notice while we are talking to someone new that our voice is wavering, or we aren't speaking clearly, and think, "I'm such an idiot! What is wrong with me? If I don't calm down, this person will never like me!"

Being mindful falls between these two extremes – we pay attention to what is happening inside of us and around us, we acknowledge events and experiences as what they are, and we allow things we can't control to be as they are, while we focus our attention on the task at hand. For example, when talking to someone new we might notice those same changes in our voice, take a moment to reflect ("This is how it is now; there go my thoughts again"), and gently bring our attention back to the person and our conversation. This second part of mindfulness, letting go of the need to critically judge and change our inner experience, is particularly tricky. In fact, often being mindful involves practicing being non-judgmental about our tendency to be judgmental!

We think being mindful is a personal experience that can bring some flexibility to your life, and we will work together to find the best ways to apply this approach.

Here are a few points about mindfulness:

Mindfulness is a process.

We do not achieve a final and total state of mindfulness. It is a way of being in one moment that comes and goes. Mindfulness is losing our focus 100 times and returning to it 101 times.

Mindfulness is a habit.

Just like we have learned to go into “automatic pilot” by practicing it over and over, we can learn mindfulness through practice. The more we practice, the easier it can be to have moments of mindfulness.

Mindfulness activities come in many different forms.

People engage in formal mindfulness practices, like meditation, yoga, and tai chi. These practices can take hours, even days. People can also be mindful for a moment – attending to their breath at any point during the course of their day and noticing their experience. All forms of mindfulness practice can be beneficial – we will focus most on briefer, day-to-day practice within treatment, but you may find that you also want to seek other, more formal modes of mindfulness practice outside of therapy or once therapy ends.

Mindfulness brings us more fully into our lives.

Sometimes, especially early in treatment, we will practice mindfulness in ways that seem very relaxing and removed from the stressors of our daily lives. But the ultimate goal is to use mindfulness to keep us more fully in our lives and to improve our overall life satisfaction. Mindfulness can allow us to pause and ready ourselves for some event (e.g., focusing on our breathing for a moment **before** we answer the phone), and to bring us more fully into an event (e.g., being present and focused in the moment when we are interacting with someone, rather than thinking about what they may be thinking or worrying about what might be coming next).

Discuss this handout with your therapist when you next meet and be sure to raise any questions that arise for you. Try introducing some mindfulness activities into your life, like meditation, yoga, or simply deciding to take a mindful walk or notice the sky on your way into work or school.

Values Assessment Form

The following are areas of life that are valued by some people. Not everyone has the same values, and this work sheet is not a test to see whether you have the “correct” values. Describe your values as if no one will ever read this work sheet. As you work, think about each area in terms of the concrete goals you may have and in terms of more general life directions. For instance, you may value getting married as a concrete goal and being a loving spouse as a valued direction. The first example, getting married, is something that could be completed. The second example, being a loving spouse, does not have an end. You could always be more loving, no matter how loving you already are. Work through each of the life domains. Some of the domains overlap. You may have trouble keeping family separate from marriage/intimate relations. Do your best to keep them separate. Your therapist will provide assistance when you discuss this goals and values assessment. Clearly number each of the sections and keep them separate from one another. You may not have any valued goals in certain areas; you may skip those areas and discuss them directly with your therapist. It is also important that you write down what you would value if there were nothing in your way. We are not asking what you think you could realistically get, or what you or others think you deserve. We want to know what you care about, what you would want to work toward, in the best of all situations. While doing the work sheet, pretend that magic happened and anything is possible.

1. **Marriage/couples/intimate relations.** In this section, write down a description of the person you would like to be in an intimate relationship. Write down the type of relationship you would want to have. Try to focus on your role in that relationship.
2. **Family relations.** In this section, describe the type of brother/sister, son/daughter, father/mother you want to be. Describe the qualities you would want to have in those relationships. Describe how you would treat the other people if you were the ‘ideal you’ in these various relationships.
3. **Friendships/social relations.** In this section, write down what it means to you to be a good friend. If you were able to be the best friend possible, how would you behave toward your friends? Try to describe an ideal friendship.
4. **Career/employment.** In this section, describe what type of work you would like to do. This can be very specific or very general. (Remember, this is in an ideal world.) After writing about the type of work you would like to do, write about why it appeals to you. Next, discuss what kind of worker you would like to be with respect to your employer and co-workers. What would you want your work relations to be like?

5. **Education/personal growth and development.** If you would like to pursue an education, formally or informally, or to pursue some specialized training, write about that. Write about why this sort of training or education appeals to you.
6. **Recreation/leisure.** Discuss the type of recreational life you would like to have, including hobbies, sports, and leisure activities.
7. **Spirituality.** We are not necessarily referring to organized religion in this section. What we mean by spirituality is whatever that means to you. This may be as simple as communing with nature, or as formal as participating in an organized religious group. Whatever spirituality means to you is fine. If this is an important area of your life, write about what you would want it to be. As with all of the other areas, if this is not an important part of your values, skip to the next section.
8. **Citizenship.** For some people, participating in community affairs is an important part of life. For instance, some people think that it is important to volunteer with homeless or elderly people; lobby governmental policymakers at the federal, state, or local level; participate as a member of a group committed to conserving wildlife; or participate in the service structure of a self-help group, such as Alcoholics Anonymous. If community-oriented activities of this type are important to you, write about the direction you would like to take in these areas. Write about what appeals to you in this area.
9. **Health/physical well-being.** In this section, include your values related to maintaining your physical well-being. Write about health-related issues such as sleep, diet, exercise, smoking, and so forth.

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Values Narrative Form

Generate a brief narrative for each domain, based on discussion of the participant's values assessment homework. If the participant feels a given domain is not applicable to him/her, put "None" next to that domain. After generating all narratives, read each to the participant and refine. Continue this process, simultaneously watching out for pliance-type answers, until you and the participant arrive at a brief statement that the participant agrees is consistent with his/her values in a given domain.

DOMAIN	VALUED DIRECTION NARRATIVE
Couples/intimate relationships	
Family relations	
Social relations	
Employment	
Education and training	
Recreation	
Spirituality	
Citizenship	
Health/physical well-being	

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Values Assessment Rating Form

Read and then rate each of the valued direction narratives generated by your therapist and you. Rate how important each value is to you on a scale of 1 (high importance) to 10 (low importance). Rate how successfully you have lived this value during the past month on a scale of 1 (very successfully) to 10 (not at all successfully). Finally, rank these valued direction narratives in order of the importance you place on working on them right now, with 1 as the highest rank, 2 as the next highest, and so on.

DOMAIN	VALUED DIRECTION NARRATIVE	RATING or RANK		
		Importance	Success	Rank
Couples/Intimate relationships				
Family relations				
Social relations				
Employment				
Education and training				
Recreation				
Spirituality				
Citizenship				
Health/Physical well-being				

Session 5: Creative Hopelessness

Overview of Session 5

Session 5 will continue to isolate the perceived barriers participants have to achieving their valued goals, which typically involve attempts to control urges to tic, emotions surrounding ticcing, or other unpleasant private experiences. After identifying strategies the participant uses to control his or her tics, urges to tic, or emotions/thoughts/feelings surrounding the tics, the therapist and participant will discuss the effectiveness of the current strategies. The goal of the session is to demonstrate the ultimate ineffectiveness of trying to control urges, emotions, thoughts, feelings, etc., and by doing so, encourage the participant to be open to an acceptance-based strategy.

Experiential Centering Exercise

The therapist and participant should do the experiential centering exercise described in Session 4.

Reactions to Previous Material

The therapist should ask the participant to share his or her thoughts about, and reactions to, the topics discussed in Session 4.

Review of Homework Assignment and CTD Experiences Since Session 4

The therapist should praise the participant for engaging in the self-monitoring process and using his/her CR's, and point out the importance of continued monitoring and the continued use of his/her CR's. Patterns and trends in the data should be discussed, and the therapist should ask the participant why he or she thinks certain trends in the ticcing may have developed (e.g., "Why do you think you ticced so often that day?").

Continue Discussing the Barriers to Achieving Valued Goals

The therapist and participant will resume the discussion from Session 4 about the barriers that seem to stand in the way of the participant's valued life directions. If the participant does not specifically bring up the fact that his/her ticcing is a barrier, the therapist should ask what role, if any, ticcing plays in the participant's values and goals. Discussion of how the urges or actual tics interfere in the participant's life and what he/she has done to stop or control these feelings and actions will be addressed in the process of fostering creative hopelessness.

Many participants may state that the ticcing *is* the actual barrier to the accomplishment of their goals, but further questioning will show that it is the emotional reactions to ticcing (and an unwillingness to maintain contact with unpleasant private experiences that are typically alleviated by ticcing) that are the true barriers to moving in a valued life direction. This information will be elaborated in the section on creative hopelessness.

Creative Hopelessness

In this phase of HRT/ACT, the therapist attempts to undermine the participant's typical way of handling his/her urges and tics, as well as the emotions that typically precede or accompany ticcing. This phase of HRT/ACT is called Creative Hopelessness. The goal of Creative Hopelessness is for the participant to see, through his/her own experiences, that the reason he/she has not been able to control his/her urges to tic is *not* because he/she has not been trying hard enough, but because the methods he/she has been using are probably not going to work – no matter how hard he/she tries.

The therapist and the participant will discuss three areas of the participant's change agenda: (1) what the ticcing does for the person [e.g., stops urges, relieves pressure or tension], (2) what the person has tried to do to stop private events related to the ticcing [focusing on dealing with private events], and (3) how these strategies have worked in the long run.

This is done to help the participant see how poorly the current control agenda actually works. One of the major points a therapist should make when working with persons with CTDs is that ticcing reduces aversive private events in the short-term, but it is generally ineffective in the long-term. An example of what the therapist could say here is:

"It is quite natural to want to avoid the emotional distress associated with your urges and tics. Yet, often the pursuit of things that matter to us involves experiencing emotional distress. So what can we do about this paradox?" [*Provide patient with "The Paradox" handout (see below).*]

"Option 1. One way out of the paradox is to limit your life, so you avoid taking risks and you give up on things that are really important to you (such as relationships, work opportunities, etc.) to avoid feelings of anxiety, sadness, etc., related to your tics that might come up in these situations. Some people with tics begin to make choices in their life that are based on avoiding such pain and discomfort. For example, they might avoid taking a job they really want because they fear it will be stressful and make their tics worse.

Others might avoid getting close to their friends, or dating, because they don't want to feel awkward, vulnerable, or embarrassed by their tics. Sometimes, they are not even aware they are making these choices, which keeps them from being fully engaged in their lives."

"Option 2. Another way to deal with the paradox is to go ahead and do the things you want to do, while trying to internally control your responses and reactions to your urges and tics. This option seems like a good one, and many people with tics choose it. But what sometimes happens is that when you can't completely control the uncomfortable, tic-related feelings and thoughts that emerge when you take valued action, you can start to judge yourself negatively. You might think something is wrong with you, personally, if you cannot control your urges/tics and associated thoughts and feelings, when it seems like others can."

"Today, we are going to more fully consider the possibility that maybe no one can actually gain complete control over his or her thoughts and feelings. We are going to explore the possibility that judging our negative emotions as a sign of our own inadequacies and trying to change or get rid of them may actually be contributing to our distress."

To facilitate further understanding of Creative Hopelessness, the "Man in the Hole Metaphor" and the "Polygraph Metaphor" will be introduced. The goal of these metaphors is to help the participant gain willingness to drop his or her old control agenda. They can be presented as follows:

MAN IN THE HOLE METAPHOR

The ticcing problem you are in seems a bit like this. Imagine that you're placed in a field, wearing a blindfold, and you're given a little bag of tools. You're told that your job is to run around this field, blindfolded. That is how you are supposed to live life. And so you do what you are told. Now unbeknownst to you, in this field there are a number of widely-spaced, fairly deep holes. You don't know that at first - you're naive. So you start running around and sooner or later you fall into this large hole. You feel around and sure enough, you can't climb out and there are no escape routes you can find. Probably what you would do in such a predicament is take out the bag of tools you were given and see what is in there: maybe there is something you can use to get out of the hole. Now suppose there is a tool in that

bag, but what you've been given is a shovel. It's seemingly all you've got. So you dutifully start digging, but pretty soon you notice that you're not out of the hole. So you try digging faster, and faster. But you're still in the hole. So you try big shovelfuls, or little ones, or throwing the dirt far away or not. But still you are in the hole. All this effort and all this work and, oddly enough, the hole has just gotten bigger and bigger and bigger. Hasn't it? So you come in to see me thinking, "Maybe he has a really huge shovel - a gold-plated steam shovel." Well, I don't. And even if I did, I wouldn't use it, because digging is not a way out of the hole - digging is what makes holes. So maybe the whole agenda is hopeless - you can't dig your way out. That just digs you in deeper.

POLYGRAPH METAPHOR

Or you could think of your situation like this. Suppose I had you hooked up to the best polygraph machine that's ever been built. This is a perfect machine, the most sensitive ever made. When you are all wired up to it, there is no way you can be aroused or anxious without the machine knowing it. So I tell you that you have a very simple task here: all you have to do is stay relaxed and not tic. If you start feeling urges to tic and get the least bit anxious, however, I will know it. I know you want to try hard, but I want to give you an extra incentive, so I also have a .44 Magnum, which I'll hold to your head. If you just stay relaxed, I won't blow your brains out, but if you get nervous (and I'll know it because you're wired up to this perfect machine), I'm going to have to kill you. Your brains will be all over the walls. So, just relax! ... What do you think would happen? Guess what you'd get? BAM! How could it work otherwise? The tiniest bit of anxiety or the tiniest urge to tic would be terrifying. You'd be going, "Oh, my God! I'm getting anxious! Here it comes!" BAM! You're dead meat. How could it work otherwise?

These metaphors are two of the key ones in ACT. Also, because they are among the first metaphors presented in this treatment, the participant may not be sure what to think of them. Likely, the participant will try to make sense of the metaphors or make a new rule out of them (i.e., "So if I just stop trying to control my urges, then they will go away."). This is a problem in ACT therapy, because according to the ACT theory of psychopathology (Hayes et al., 1999), this sort of rule-following is, in part, contributing to the inflexibility of the problem behavior. Below is a sample response to a common participant reaction to the metaphors. Such reactions indicate a participant's attempts at creating new rules. The therapist should respond in a way to prevent the formation of such rules.

Participant: Oh, I see what you are saying. You're saying I just need to let myself have the urge and it will stop.

Therapist: Isn't that just like you? To say that? Haven't you thought similar things before? "I just need to deal with it."

Participant: Many times. I have tried to stay open and just feel what I feel.

Therapist: And so if that were the solution, wouldn't it have solved the problem before?

At this point, the clinician should continue as follows:

"The problem with us thinking that we should be able to control our uncomfortable thoughts and feelings or, even more importantly, that our sense of happiness is dependent on our ability to control these things, is that this can lead to us feeling worse and worse. Over the next week, I would like you to consider whether it is possible that one of the biggest struggles you have been facing is that you have put a lot of energy into trying to directly control something that maybe you can't always control. And if that is the case, engaging in these control efforts may actually be making certain thoughts and feelings occur more frequently and affect you more strongly than they would otherwise. Further, attempting to control your urges and tics, and repeatedly failing, may be adding to your distress by making you feel alone, different, and flawed in some way. Finally, focusing on control efforts may be pulling you away from focusing on the things in your life that matter to you."

Get the client's feedback. Be sure to conclude that you are not asking the client to "buy" or believe this explanation, but you would like them to consider it as they look at their experiences. If they use control strategies, and find control to be useful, ask if they are willing to open up and add this perspective to what they are currently doing. Are they willing to try something different on top of what they are doing now? Genuinely listen to the ways that they feel control works for them and try to develop a conceptualization that fits their experience, in which control may be part of the problem.

"Option 3. Perhaps, an alternative to avoiding risky situations or trying to control your thoughts and emotions in these situations, is to be willing to allow these private experiences to be present as you engage in activities that are important and meaningful to you. When

we talk about the limits of control, it can sometimes seem we are suggesting that we need to just give up and accept the fact that we must live with unbearable amounts of urges, discomfort, and anxiety. But that is not at all what we are suggesting in this treatment."

"The good news is that we believe you can and do have a great deal of control over a number of things in your life - many of the things that matter most, such as being the sort of son (or daughter), partner, and friend that you want to be; pursuing the sort of education or work that matters to you; engaging in a favorite hobby or activity, etc. We think that maybe your struggle to control your tics and urges has pulled you away from exerting control in these areas - maybe by taking up your attention, maybe by causing you to lose some faith in your ability to take action and move ahead, or maybe by fueling your fear of taking action and feeling even more discomfort, embarrassment, or anxiety."

"We are going to suggest to you that what may be the most helpful thing for you to do is to change your focus a bit. It's like you are in this massive tug of war with a monster. In between you and the monster is a pit, and as far as you can see, it is bottomless. If you lose and fall into this pit, you will be destroyed. So you pull and pull, but the harder you pull the harder the monster pulls, and it seems like you edge closer and closer to the pit. I would like to suggest that your job here is *not* to win the tug of war. Your job is to just drop the rope, let go of the struggle, and turn and move toward what matters in your life. Again, we are in no way suggesting that you will give up, or resign yourself to living with unbearable urges or anxiety. We are going to suggest a third possibility for dealing with this paradox. Instead of trying to control or suppress your tics or related thoughts and feelings, or trying to make choices in life based on the desire to avoid discomfort, we are going to suggest that you develop your life in a meaningful way which involves being *willing* to experience uncomfortable thoughts and feelings. Being willing doesn't mean that you will be in a constant state of anxiety or feel constantly overwhelmed, or that the answer to your difficulties is just to brace yourself to feel the full and overwhelming tide of urges and other negative thoughts and feelings. We are hoping that some of the exercises we practice together will help you to change the relationship you have with your tics, to bring some curiosity and compassion towards the responses you have, to learn to tune into your

emotions and understand how they pull you to respond in certain ways, and to bring some flexibility and choice to the actions you take.”

Assigning Homework

Before the fifth session is finished, the participant should be asked to self-monitor or keep a journal of the situations where he/she struggles with ticcing or with the private behaviors that precede tics or attempts not to tic. The participant should bring this to the next therapy session. This can be addressed in the following fashion:

“One thing you can do between now and when we get back together is to try to become aware of how the struggle with your urges to tic has been carried out. See if you can notice all the things you normally do: all the ways you 'dig' (see Person-in-the-Hole Metaphor). Getting a sense of what 'digging' is *for you* is important, because even if you put down the shovel, you will probably find that old habits are so strong that the shovel is back in your hands only instants later. So we will have to drop the shovel many, many times. You might even make a list that we can look at when we get back together - all the things you have been doing to moderate, regulate, and 'solve' your urges to tic. Distraction, self-blame, talking yourself out of it, avoiding situations, and so on.”

The participant should continue to monitor the frequency of ticcing episodes for those tics he/she deems the most bothersome. The participant will be asked to engage in the appropriate competing response when he/she experiences one of the warning signs of ticcing, starts to tic, or notices he/she just ticced. The participant will be asked to engage in the CR for 1 full minute.

The Paradox

- (1) We want to avoid negative thoughts and feelings.
- (2) We want a meaningful life.
- (3) A meaningful life brings us into situations that will stir up negative thoughts and feelings.

POSSIBLE RESPONSES.....

Limit life by making choices about relationships, work/school, and self-care that are driven by the desire to avoid painful thoughts and experiences.

- You can successfully avoid some difficult situations, but it is impossible to completely avoid fear, sadness, vulnerability, and critical thoughts about yourself.
- Making the choice to pass on some things you care about also brings up difficult and painful thoughts and feelings.

Attempt to live a meaningful life while attempting to control your responses and reactions.

- Total control over one's thoughts, feelings, and bodily reactions is not possible, and control attempts often make those reactions worse.
- It is hard to let go of control attempts because:
 - Sometimes they seem to work.
 - Other people seem to control their internal experiences.
 - Control works so well in other parts of life.

Live a meaningful life and be willing to experience the thoughts and feelings that come up along the way.

- Perhaps a change of focus is needed:
 - Give up the tug of war with negative thoughts and feelings.
 - Think about what you would like to do to make your life more fulfilling to you, and then take some action.
 - Mindfulness techniques can be helpful if you choose a willingness stance.

Session 6: Willingness

Overview of Session 6

Session 6 will attempt to offer the participant an alternative way of managing private events – acceptance. Through experiential exercises and the use of metaphorical examples, the participant will come to view willingness to experience private events as a potential response to unpleasant private events.

Mindfulness Exercise: Awareness of Physical Sensations

Make sure to go through this exercise slowly, allowing time for clients to find and attend to different physical sensations.

Begin by closing your eyes or looking down, and settle in your chair so that you are upright, but comfortable... notice the way you are sitting... the way your body feels in the chair... the places where your body is touching the chair. Notice your breath and where you feel it in your body... and just allow your awareness to expand so you notice any sensations that arise in your body... tension or soreness in your muscles... the feeling of the air on your skin... sensations of hunger... any physical sensations that arise (*pause*)... notice sensations as they arise, without labeling or judging them... just notice them as they are... "a sense of tension here," "a feeling of coldness there"... and if judgments arise, notice these too and shift awareness back to your body, to the sensations you are experiencing... allow each sensation to be, as it is, for however long it remains... just notice it and continue with expanded awareness... (*pause for a minute or two*)... and now bring your awareness back to the way you're sitting in the chair, to being in this room... and when you're ready, open your eyes.

Discuss with client.

Reactions to Previous Material

The therapist should ask the participant to share his or her thoughts about, and reactions to, the topics discussed in Session 5.

Review of Homework Assignment and CTD Experiences Since Session 5

The therapist should praise the participant for engaging in the self-monitoring process and using his/her CR's, and point out the importance of continued monitoring and the continued use of his/her CR's. Patterns and trends in the data should be discussed, and the therapist should ask the participant why he/she thinks certain trends in the ticcing may have developed (e.g., "Why do you think you ticced so often that day?").

The therapist should then ask the participant to review his/her creative hopelessness homework and discuss any experiences or insights he/she may have encountered. When discussing the homework, it is possible that the participant will have observed new things about his/her urges and want advice on how to fix the problem. These new insights could pertain to certain times and places where ticcing is common, certain thoughts that precede ticcing, and feelings that coexist with ticcing. The therapist should avoid giving the participant any new control strategies and help the participant see that the old control strategies have not worked. The notion to be communicated is that trying to suppress urges or emotions related to ticcing is actually counterproductive. After the homework from the last session is discussed, the therapist and the participant can begin a new topic.

Accepting Private Events: Willingness

"Last week we discussed how to deal with the paradox of wanting a meaningful life and wanting to avoid pain. We discussed several options: limiting your life, attempting to control internal responses, or taking a willingness stance. Today we will be talking about willingness and methods to help you if you choose to take this stance."

Some clients may be very clear about the fact that they avoid things that bring up urges to tic, anxiety, or other negatively evaluated experiences. Other clients may report that they do not avoid, and they can't see examples of a lack of willingness in their lives. The goal of the therapist with these types of clients is to ask the client to listen to the ideas presented and take a new look at their experiences with this information, to see if they can uncover any subtle unwillingness. Often it can be helpful for the therapist to give an example of his or her own subtle unwillingness. Finally, the therapist may gently point to examples of unwillingness that the client has discussed at other points in therapy. Unwillingness may take the form of engaging in actions but not being fully present to the experience while doing so, because such awareness would be painful.

"What we are going to try to build on in this treatment is the opposite of control, a state that could be called willingness. We see this as the first step one needs to take to expand the choices that are available in one's life."

The following aspects of willingness should be discussed with the client:

- (1) Willingness is directly related to current symptoms. When willingness is low, urges, tics, and associated thoughts and feelings get stuck on high.

The “Two Scales Metaphor” will be used to show willingness as an alternative to control. The “Two Scales Metaphor” demonstrates that a lack of willingness to have the urges will likely elevate them and increase the ticcing. This can be introduced as follows:

TWO SCALES METAPHOR

Imagine for a moment that there are two scales. (*Use hand gestures or drawings in this example*). The scale right in front of you is the one you have been focused on - the (*urge/tic/anxiety/stress... use appropriate term here*) scale. It is a reaction scale - it reflects the responses that you have had to different experiences and events in your life. This scale is set on high and you have spent a great deal of time and energy attempting to turn this scale down without the kind of success you had hoped for. Now there is also this other scale. It has been hidden and hard to see. This other scale can also move from low to high. This scale is marked as willingness, and it refers to how open you are to experiencing your own experience as it happens (your thoughts, feelings, physical sensations). When this scale (*urges, anxiety, etc. - use client's words*) is set on high, and you are trying to get rid of those feelings, this scale (willingness) is on low. But that is a tricky combination. Sometimes what happens is that when willingness is set on low, (*urges, anxiety, etc. - use client's words*) gets locked in at high and responding gets inflexible. What we would like to do in this therapy is to step back and broaden our perspective so that our focus can include the willingness scale.

Ticcing is a response, and as we have been discussing, you may not be able to directly control it all of the time. On the other hand, willingness is a stance, and we think it may be possible that you can make a choice as to whether or not you want to set this scale on high or low. Often when people come in to therapy, their responses are high, willingness is set on low, and the goal is to move responses to low without moving willingness to high. It makes perfect sense that willingness would be set on low when we judge emotions as negative, dangerous, and threatening, and when our responses have become so muddled and intense that the idea of being willing to have these

experiences seems impossible. What we are asking though, is that you consider moving willingness to high. In doing this, responses such as unpleasant urges, emotions, and thoughts won't necessarily drop to low. We think that being willing to experience your emotions, thoughts, sensations, etc., will mean that sometimes you might feel unpleasant things and sometimes you will not. Putting willingness on high can open you up to experiencing the full range of emotions associated with all the kinds of experiences you may have in your life. What increasing willingness may do is unlock or un-stuck the response scale so that you are not always stuck on high but have the flexibility to respond to events and situations as they occur.

- (2) Willingness refers to how open you are to having your own experience as it unfolds, without trying to manipulate it, avoid it, escape it, or change it.

"Willingness is not wanting - I am not trying to suggest here that there is something noble or worthwhile about experiencing negative thoughts and feelings. Or that feeling bad will somehow make you a better person. If I knew a way to get the things I want in my life (love, intimacy, a rewarding career, etc.) without experiencing pain, anxiety, etc., I would opt for that route in a second. We all would. There is nothing valuable about feeling pain for no purpose. Taking a stance of willingness suggests that you will accept and move forward with the thoughts and feelings (rational or irrational) that appear as you make your way through life, taking the actions that will help you obtain the things in life that you value. For instance, let's say that you want to ask someone out on a date (*use client relevant example*). To do so will likely elicit feelings of fear, thoughts about possible rejection, some of them related to your tics. However, you can be willing to experience those thoughts and feelings if they are what arises when you take the action you want to take. You may not like the feelings, you may wish it could be another way, but you can be willing to experience whatever comes up in order to take a valued action."

- (3) Willingness is an action, not a feeling.

"When engaging in an activity that brings up thoughts such as 'I can't do this, I'll start ticcing, I'm out of control' and feelings such as fear, embarrassment, or sadness, you may feel very unwilling to experience those private events. But you can feel unwilling to do something and still be willing to move forward. In other words, you don't need to feel willing or think willing thoughts, you just need to make a commitment

to do something and then do it. It is sort of like going to the dentist to get a root canal. We may feel very unwilling to go through the procedure, and yet we may be willing to go ahead with the visit despite those feelings."

- (4) You cannot be partially willing to do something; willingness is an all or nothing concept.

"A lot of times, we tell ourselves that we are willing to do 'X' (*use client example*) up to a point, but then if it gets too hard, or if we get too anxious, we will stop. This approach might make you feel better in the moment, but it ultimately creates more problems in the long run. It's the same thing with urges to tic, or thoughts and feelings about your tics. If you say that you can only stand a certain level of them in a situation, you will reach that level faster and faster each time. Until eventually, you might even give up on the situation (*give appropriate example*)."

"It's like this metaphor (Hayes et al., 1999):

ANNOYING JOE METAPHOR

Imagine that you have a new house and you invited all your neighbors over to a housewarming party. Everyone in the whole neighborhood is invited - you even put up a sign at the corner store. So everyone shows up and the party is going great and Joe, your annoying neighbor, shows up. Joe is always talking about himself incessantly, how great he is, his great job, his new car... everything is about him. He also complains about everything, the weather, the food, the other neighbors... his clothes are tacky, his voice is whiny, and you think, "Oh no, why did he show up," but you did say everyone in the neighborhood was invited. Can you see that it is possible to allow him to be at the party, even though you don't think well of him? You don't have to like him, his clothes, or his lifestyle. You may be embarrassed about his comments about the food and his loud voice. Your opinion of him, your evaluation of him, is absolutely distinct from your willingness to have him as a guest in your home. You could decide that even though you said everyone was welcome, he is really not welcome. But as soon as you make that decision, the whole party changes. Now you have to be at the front of the house, guarding the door to make sure he doesn't come back. Or if you say he is welcome, but you don't really mean it, if you only mean he is welcome if he stays in the

kitchen and doesn't mingle with the other guests, then you are going to have to be constantly watching him and your experience at the party will significantly change. As the party goes on, and you're off guarding against Joe, it's not much of a party. It's a lot of work."

"You can again make a distinction between willingness and wanting or wallowing using this metaphor. Allowing Joe to be at the party doesn't mean you have to hang out with him the whole time he's there. It doesn't mean you can't bring your attention to the people at the party whose company you enjoy more. It just means that you will also have Joe there, and Joe will make himself known at times, and if you want to be at the party, you're going to have to be willing to have him there too."

"Later in treatment, we will start to ask you to consider taking some actions that are consistent with your values. Each week, together, we will come up with actions that you want to take that are aimed at making your life more fulfilling. I will ask that, whenever you agree to take some action, you commit to doing it with willingness. If you commit to doing it, I will ask you to take the stance that you are willing to do it, no matter what negative internal experiences come up for you. You can certainly limit the action you want to take in some way - for instance, you might only want to commit to one action per week, or you might start by talking with one peer who is very friendly rather than choosing to ask your crush on a date (*if possible, use client relevant example*), but being willing means that you are 100% willing to go forward with this action, even if it means experiencing painful thoughts, emotions, or bodily sensations."

- (5) Becoming aware of yourself as separate from your thoughts, feelings, memories, bodily sensations, etc., can help to promote willingness.

"Our thoughts and worries can seem very powerful, and they can seem to have ultimate control over our behavior, particularly when we are not aware of the way they unfold. Many people feel defined by their thoughts - in other words, they feel that they *are* their thoughts. Believing that you are your thoughts - or becoming fused with your thoughts - can result in high levels of unwillingness. If (*mention some relevant behavioral activity*) will result in the thoughts, "I am out of control, I am defective, I can't stand this," and those thoughts are treated as truth, then the natural result of those thoughts is unwillingness to (*do the action*) and attempts to control and get rid of

the thoughts. However, if you feel you are separate from your thoughts in some way, if you can notice that thoughts come and go, if you change your relationship with thoughts such that they appear less threatening to you, then they will not need to always be believed or listened to, and they don't need to be changed."

Propose that this idea is best understood through experience rather than description. Suggest that the client think about this idea over the next week as he/she begins to pay more attention to his/her own experience.

At this point in therapy, clients may be saying things like, "OK, I get that control is a problem, and willingness is the answer, and I am ready to try willingness – what do I do?" On the one hand, we want to encourage this openness to looking at things a new way; on the other hand, we need to be careful that the adoption of willingness is not perceived as another 'quick fix' to make the client less anxious. The best thing to do at this point is to suggest that, given the habitual nature of unwillingness, developing the new habit of willingness is something that will take some time, awareness, and self-discovery. Be sure the client understands that the goal of willingness is to allow clients to live life in the manner in which they value, not to free themselves of any negative thoughts and feelings.

Assign Homework

The participant will be assigned the Daily Willingness Diary (see below) as homework. The willingness diary is a self-monitoring form that asks the participant to take notice of his or her reactions to a couple of urges to tic throughout the day. The participant will be asked to record an experience, what he or she was feeling when it happened, thoughts at the time, bodily sensations at the time, and how he or she handled the feelings, thoughts, and bodily sensations. The purpose is to gather information about the participant's struggle with private events, and to help the participant see how often he or she uses control strategies.

The participant should continue to monitor the frequency of his or her tics, focusing on the tics that are most bothersome to him or her. The participant will be asked to engage in an appropriate competing response (CR) whenever he or she experiences one of the warning signs of ticcing, starts to tic, or notices he or she has just ticced. The participant will be asked to engage in the CR for 1 full minute.

Daily Willingness Diary

Instructions: Please complete this form after you experience the urge to tic. This form need not be completed after every urge. The form only needs to be completed for a couple of urges per day. Please bring your responses to our next session.

DAY	What was the experience?	What were your feelings while it was happening?	What were your thoughts while it was happening?	What were your bodily sensations while it was happening?	What did you do to handle your feelings, thoughts, or bodily sensations?
<i>Day 1</i>					
<i>Day 2</i>					
<i>Day 3</i>					
<i>Day 4</i>					
<i>Day 5</i>					

Session 7: Cognitive Defusion

Overview of Session 7

Session 7 will attempt to change the context supporting the participant's language, from one that supports the fusion of a person's private events with his/her definition of who or what he/she is, to one in which private events are merely something to be experienced by the person. This process is called cognitive defusion.

Mindfulness Exercise

First, introduce this exercise to the participant by saying that you are going to ask him/her to imagine an aspect of nature and then imagine himself/herself as that aspect. Say that it may seem like an odd process, and he/she should just allow the images to come to him/her, noticing whatever he/she notices about how hard it is, or how odd it feels, and continuing to follow your words and vividly picture what you describe. Be sure to pause between sentences and speak slowly, so the client has time to connect to the image and the experience you describe.

THE MOUNTAIN MEDITATION (ADAPTED FROM KABAT-ZINN)

"Picture the most beautiful mountain you know or know of or can imagine, one whose form speaks personally to you. Focus on the image or the feeling of the mountain in your mind's eye, noticing its overall shape, the lofty peak, the base rooted in the rock of the earth's crust, the steep or gently sloping sides. Note, as well, how massive it is, how unmoving, how beautiful, whether seen from afar or up close."

"Perhaps your mountain has snow at the top and trees on the lower slopes. Perhaps it has one prominent peak, perhaps a series of peaks or a high plateau. However it appears, just sit and breathe with the image of this mountain, observing it, noting its qualities. When you feel ready, see if you can bring the mountain into your own body, so that your body sitting here and the mountain of the mind's eye become one. Your head becomes the lofty peak; your shoulders and arms the sides of the mountain; your buttocks and legs the solid base rooted to your cushion on the floor or to your chair. Experience in your body the sense of uplift, the elevated quality of the mountain deep in your own spine. Invite yourself to become a breathing

mountain, unwavering in your stillness, completely what you are — beyond words and thought, a centered, rooted, unmoving presence."

"Now, as well you know, throughout the day as the sun travels the sky, the mountain just sits. Light and shadow and colors are changing virtually moment to moment in the mountain's unyielding stillness. Even the untrained eye can see changes by the hour. As the light changes, as night follows day and day night, the mountain just sits, simply being itself. It remains still as the seasons flow into one another and as the weather changes moment-by-moment and day-by-day. Calmness patiently bearing all change."

"In summer, there is no snow on the mountain, except perhaps for the very top or in crags shielded from direct sunlight. In the fall, the mountain may display a coat of brilliant fire colors; in winter, a blanket of snow and ice. In any season, it may at times find itself enshrouded in clouds or fog, or pelted by freezing rain. The tourists who come to visit may be disappointed if they can't see the mountain clearly, but it's all the same to the mountain — seen or unseen, in sun or clouds, broiling or frigid, it just sits, being itself. At times visited by violent storms, buffeted by snow and rain and winds of unthinkable magnitude, through it all the mountain sits. Spring comes, the birds sing in the trees once again, leaves return to the trees which lost them, flowers bloom in the high meadows and on the slopes, streams overflow with waters of melting snow. Through it all, the mountain continues to sit, unmoved by the weather, by what happens on the surface, by the world of appearances."

"And now notice how, like the mountain, through all the changes occurring outside you, you continue to be the same underneath it all. We all experience storms of varying intensity and violence, in the outer world and in our own lives and minds. Buffeted by high winds, by cold and rain, we endure periods of darkness and pain, as well as savoring moments of joy and uplift. Even our appearance changes constantly, just like the mountain's; it experiences a weather and a weathering of its own. As light and weather and fog all change around us, we remain constant, like the mountain. Now, notice what it feels like to connect to the feeling of sameness, stability in the mountain..."

"What was that like for you?"

If the client connected to a sense of self as separate from thoughts, feelings, etc., use that throughout therapy as a metaphor. Have the client practice at home if the exercise was useful for him/her.

Reactions to Previous Material

The therapist should ask the participant to share his/her thoughts about, and reactions to, the topics discussed in Session 6.

Review of Homework Assignment and CTD Experiences Since Session 6

The therapist should praise the participant for engaging in the self-monitoring process and using his/her CR's, and point out the importance of continued monitoring and the continued use of his/her CR's. Patterns and trends in the data should be discussed, and the therapist should ask the participant why he/she thinks certain trends in the ticcing may have developed (e.g., "Why do you think you ticced so often that day?").

Next, the therapist and participant should discuss the findings from the Daily Willingness Diary. Reviewing the Daily Willingness Diary will show the participant and the therapist which coping strategies are involved. It will show if the participant attempts to control and eliminate the urges to tic or demonstrates willingness to have them.

Cognitive Defusion: The Role of Language

This phase of ACT therapy for CTDs largely involves defusing the role of language in the exacerbation of the tics. The purpose of language defusion is to break down the literality of verbal processes. Defusion also helps the participant to see private events for what they are, not for what they present themselves to be (e.g., see the "Passengers on the Bus Metaphor" presented later in this session). An example of this could be when a person tries to resist ticcing and, therefore, feels great tension and says privately, "If I don't tic, I will go crazy." The urge is only a feeling, and the thought, "If I don't tic, I will go crazy," is only a thought. Both are language-based and have functional properties in certain contexts that support the literality of language. The purpose of the defusion exercises is not to change the patient's thinking from something that is illogical to something that is logical. Rather, it is to change the context of language from something that supports private events as literal events to something that supports private events as phenomena to simply be experienced.

At this point, the therapist should say something like:

"As we discussed last week, one obstacle to willingness is that we judge and try to control our emotions and thoughts so strongly,

because we feel like they define us or reflect who we really are. It can be helpful to practice being aware that our thoughts and feelings are not the same as our actual experience, and also to notice that our thoughts and feelings are constantly changing. This can help us drop the rope of struggling with our internal experience — awareness that these reactions do not define us or our reality can help us stop struggling with changing them quite so much.”

“Today we are going to talk a bit more about our internal experiences and consider why it is so easy for us to become attached to them. We are also going to consider some ways in which observing our experience can provide us with much more information than automatically accepting what our thoughts are telling us. These concepts can all be helpful in addressing the internal obstacles that arise when we attempt to take valued actions.”

All of the following metaphors and exercises are used to help the person defuse from language. The first exercise is the “Milk, Milk, Milk Exercise.” This exercise shows the participant how a word can be stripped of its verbal meaning. The “Milk, Milk, Milk Exercise” is done as follows:

MILK, MILK, MILK EXERCISE

Therapist: We have a unique ability as humans to imagine, and react to, things that are not here in the present moment. For example, sometimes the memory of a difficult experience can feel as painful as the actual experience. Or, the imagined fear of something that might happen can cause the same reaction in us as the actual event (*use some client example*). For example, if you think about what it might be like to (*fit client appropriate example here*), you can notice the thoughts, feelings, and bodily sensations that arise. They are often no different from those that arise if the actual event occurs. So these bodily responses to our imagination signal to us that something is really happening, making it easy to get caught up in what we think or imagine, rather than noticing thoughts and images as events in our minds... Let's do a little exercise. It's an eyes-open one. I'm going to ask you to say a word. Then you tell me what comes to mind. I want you to say the word, "Milk." Say it once.

Participant: Milk.

Therapist: Good. Now what came to mind when you said that?

Participant: I have milk at home in the refrigerator.

Therapist: OK. What else. What shows up when we say "milk?"

Participant: I picture it — white, a glass.

Therapist: Good. What else?

Participant: I can taste it, sort of.

Therapist: OK, so let's see if this fits. What shot through your mind were things about actual milk and your experience with it. All that happened is that we made a strange sound — milk. Now, here is the little exercise, if you're willing to try it. What I am going to ask you to do is to say the word "milk", out loud, rapidly, over-and-over again and then notice what happens. Are you willing to try it?

[Therapist and participant say the word for one or two minutes, with the therapist periodically encouraging the participant to keep it going, to keep saying it out loud, or to go faster.]

Therapist: OK, now stop. Where is the milk?

Participant: Gone (*laughs*).

Therapist: Did you notice what happened to the psychological aspects of milk that were here a few minutes ago?

Participant: After about 40 times, it disappeared. All I could hear was the sound. It sounded very strange — in fact, I had a funny feeling that I didn't even know what word I was saying for a few moments. It sounded more like a bird sound than a word.

Therapist: Right. The creamy, cold, gluggy stuff just goes away. The first time you said it, it was as if milk was actually here, in the room. But all that really happened was that you said a word. The first time you said it, it was really meaning-full, it was almost solid. But when you said it again and again and again, you began to lose that meaning and the words began to also be just a sound.

Participant: That's what happened.

Therapist: Well, when you say things to yourself, in addition to any meaning behind those words, isn't it also true that these words are

just words? The words are just smoke. There isn't anything solid in them.

This exercise can be done with a different word that the participant reports initiating, or being involved in, his or her ticcing. For example, "tension" may be in a relational frame with many other unpleasant things, such as "anxiety", "I can't handle this", "uncomfortable", or "something that should be gotten rid of." Thus, if the word "tension" is giving the participant trouble, the "milk" exercise may be used at some point, substituting the word "tension" for the word "milk."

The second metaphor in the area of defusion of language is the "Passengers on the Bus Metaphor." The point of this metaphor is to objectify language. This metaphor also changes the function of one's thoughts from something that should be avoided to something that can be contacted safely. This metaphor can be introduced as follows:

PASSENGERS ON THE BUS METAPHOR

It's as if there is a bus and you're the driver. On this bus we've got a bunch of passengers. The passengers are thoughts, feelings, bodily states, memories, and other aspects of ticcing. Some of them are scary, and they're dressed up in black leather jackets and they've got switchblade knives. What happens is, you're driving along and the passengers start threatening you, telling you what you have to do, where you have to go. "You've got to turn left," "you've got to go right," etc. The threat that they have over you is that, if you don't do what they say, they're going to come up from the back of the bus.

It's as if you've made deals with these passengers, and the deal is, "You sit in the back of the bus and scrunch down so that I can't see you very often, and I'll do what you say, pretty much." Now what if one day you get tired of that and say, "I don't like this! I'm going to throw those people off the bus!" You stop the bus, and you go back to deal with the mean-looking passengers. Except you notice that the very first thing you had to do was stop. Notice now, you're not driving anywhere, you're just dealing with these passengers. And plus, they're real strong. They don't intend to leave, and you wrestle with them, but it just doesn't turn out very successfully.

Eventually you go back to placating the passengers, to try to get them to sit way in the back again where you can't see them. The problem with that deal is that, in exchange for getting them out of your life, you have to do what they ask. Pretty soon, they don't even have to

tell you, "Turn left" — you know as soon as you get near a left turn that the passengers are going to crawl all over you. Eventually, you may get good enough that you can almost pretend that they're not on the bus at all. You just tell yourself that left is the only direction you want to turn. However, when they eventually do show up, it's with the added power of the deals that you've made with them in the past.

Now the trick about the whole thing is this... The power that the passengers have over you is 100% based on this: "If you don't do what we say, we're coming up and we're making you look at us." That's it. It's true that when they come up they look like they could do a whole lot more. They've got knives, chains, etc. It looks like you could be destroyed. The deal you make is to do what they say so they won't come up and stand next to you and make you look at them. The driver (you) has control of the bus, but you trade off the control in these secret deals with the passengers. In other words, by trying to get control, you've actually given up control! Now notice that, even though your passengers claim they can destroy you if you don't turn left, it has never actually happened. These passengers can't make you do something against your will.

After discussing the participant's reaction(s) to the "Passengers on the Bus Metaphor," the therapist should say something like:

"One reason that it is so difficult to detach our sense of self from our thoughts is that it seems like our thoughts can guide our experience. In other words, we often think if we just think through a problem long enough, we can come up with an accurate and helpful response. Although many people engage in worry as a way of solving problems, there is research to suggest that this strategy is very ineffective. Thinking through or about certain things can only take us so far. Some things are best learned and known through our experiences. For instance, if I were to describe to you exactly how to play tennis like a pro, could you then do so? If you never swam before, could you learn to do so by reading a book? Could you explain to me how to walk? (*Have client do this: "Lift your leg."... "OK, how do I do that?"... "Tense your muscle."... "OK, how do I do that?"... etc. Talk about how humans learn to walk.*) We don't explain to our children how to walk, they can only learn by directly experiencing walking, paying attention to what works and what doesn't, making minor adjustments, and walking."

Another exercise that can be used is “Undermining Reasons as Causes.” This exercise may be helpful, as many participants will voice the reasons why they are not able to resist or accept their urges to tic:

Therapist: So let’s do an exercise. Let’s look at your previous monitoring homework, and review why you thought you had such bad ticcing days on some days, and other days were OK.

[Therapist and participant review the reasons.]

Therapist: Ok, why else? I mean, those sound like really true reasons. Could you give me some fake reasons?

Participant: What do you mean?

Therapist: You know, make some up. What reasons could you make up?

Participant: Someone forced me to do it, or I thought I might feel more relaxed if I did it.

Therapist: OK. Can you imagine anyone giving these reasons?

Participant: Sure.

Therapist: Probably several of them in combination. And if you asked several people with a tic disorder, you’d get a whole list of reasons. And some might even contradict one another. Hmm. Something is suspicious here, if the reasons are actually causing you to do things.

Participant: What do you mean?

Therapist: Well, what about the reasons you just used?

Participant: Because of the stressful day you mean?

Therapist: Sure. Right. But have you ever had a really stressful day and you did not tic?

Participant: Yeah, I guess.

Therapist: But if the reason caused it, why didn’t you tic then?

Participant: Well, there were other reasons not to tic.

Therapist: And they were somehow stronger than the other reasons, right? But here's the suspicious part... What if I asked whether there were any reasons not to tic last Tuesday? Could you think of any?

Participant: Sure... I mean, of course.

Therapist: For instance, if we did this exercise again, using good reasons, bad reasons, your significant other's reasons, parent's reasons, smart reasons, goofy reasons, maybe even reasons from your passengers on the bus; well, could you have given equally long lists for each perspective?

Participant: Mmm, well, it might take a while.

Therapist: Say we tried right now. Could you tell me a reason to tic? Sure you could, and if I asked you for a reason not to, you could come up with that too. And do you suppose that for any reason to tic, you could also come up with a reason not to?

Participant: I guess so.

Therapist: And I'll bet you've done that too. Sat and thought of lists of reasons why to and not to — and then you either ticced or you didn't. And where did all the reasons on the opposite side go once you picked a direction? What if it's the case that we just have this infinite storehouse of reasons that we can draw on for whatever we do? Could it be? And could it be that although these things go together a lot — doing and giving reasons for doing — that one doesn't really cause the other? My guess is that you have been trying to generate enough reasons, really good ones, in order to cause yourself to not tic. Isn't it really true that you've got some really powerful reasons to stop ticcing? Why else would you be doing this excruciating therapy? You have great reasons. Could you imagine any stronger reasons than feeling good about yourself?

Participant: Well, no.

Therapist: So isn't this suspicious? You've believed that you do this and that for x and y reasons. But here we have just uncovered two pieces of evidence that this isn't how it works. One is that we seem to have an unlimited supply of reasons and, two, you've got just about the most powerful reasons imaginable.

The point of this exercise is not to do away with reasons. The participant will always have them, and sometimes they will be useful. The point is to see them merely as more private content that should be attended to or followed only if it works, in the sense of moving the participant in his or her valued life direction.

Assign Homework

The participant will be assigned to practice “Awareness of Your Experience” (see below). The participant should be told that practicing using willingness instead of the old control strategies will make it more likely that, when willingness is really needed, it will be easier to bring up. The proper amount of time should be left in this session so this exercise can be completed. This exercise should be presented as follows.

Therapist: Often the buzz of mental activity draws us in, and we become thoroughly caught up in it. Sometimes this is so thorough that we can become intensely insensitive to our own moment-to-moment experience. The following meditation allows us to practice observing the buzz of mental activity without doing anything about it.

1. Assume a comfortable sitting position. Try to find a position where you are sitting straight and your shoulders are relaxed.
2. Either close your eyes or arrange yourself so that you are looking at something nondistracting, like a blank wall.
3. Center yourself. Bring yourself to this room you are in, to this space and time. Visualize your physical location: on your block, in your house, in your room, and in this chair. Become aware of your body, of the physical position of your arms and your legs, of your feet and your hands. Notice the feeling of your body pressing against the chair, of the muscles around your eyes and jaw; notice the feeling of your skin.
4. Become aware of your breathing. Follow a breath as it comes in through your nose, travels through your lungs, moves through your belly in and out, and leaves in the opposite direction. Ride the waves of your breathing without attempting to alter it: just notice it and pay attention as it happens.
5. Now, do nothing but observe what comes up. Practice awareness. As sensations emerge in your body, just watch them. As feelings emerge in your awareness, just notice them.

As thoughts come into your awareness, just watch them. Watch them come, and watch them go. Don't grab at anything, and don't push anything away.

6. If your mind wanders, if you find yourself getting angry or sad or imagining something you want to say to someone and slipping into fantasy, just notice that you have wandered off and bring yourself back in touch. Notice how you get sucked into the content of your thoughts and start to fuse with them; notice your analytical, judgmental mind. Just notice without getting sucked in, and bring yourself back again, gently and without judgment. If you have judgments about how well or how poorly you are doing, just notice these too. Your job is simply to practice awareness. This means that if your mind wanders 100 times, then your job is to gently bring it back to this moment 100 times, starting with the present moment.
7. Allow yourself to deeply experience the present moment. Be deeply present with yourself. Even if you are having thoughts or feelings that you don't like, try not to push them away. Adopt an attitude of acceptance towards all parts of your experience: treat every experience gently, even if the experience itself is undesirable. Gently be present with yourself.

The participant should be told to use this exercise for about 10 minutes every day until the next session.

The participant should also continue to monitor the frequency of his/her most bothersome tics, for 30-60 minutes each day. The participant will be asked to engage in an appropriate competing response whenever he/she experiences one of the warning signs of ticcing, begins to tic, or notices he/she has just ticced. The participant will be asked to engage in the CR for 1 full minute.

Awareness of Your Experience

Instructions: Often the buzz of mental activity draws us in, and we become thoroughly caught up in it. Sometimes this is so thorough that we can become intensely insensitive to our own moment-to-moment experience. The following meditation allows us to practice observing the buzz of mental activity without doing anything about it.

- Assume a comfortable sitting position. Try to find a position where you are sitting straight and your shoulders are relaxed.
- Either close your eyes or arrange yourself so that you are looking at something nondistracting, like a blank wall.
- Center yourself. Bring yourself to this room you are in, to this space and time. Visualize your physical location: on your block, in your house, in your room, and in this chair. Become aware of your body, of the physical position of your arms and your legs, of your feet and your hands. Notice the feeling of your body pressing against the chair, of the muscles around your eyes and jaw; notice the feeling of your skin.
- Become aware of your breathing. Follow a breath as it comes in through your nose, travels through your lungs, moves through your belly in and out, and leaves in the opposite direction. Ride the waves of your breathing without attempting to alter it: just notice it and pay attention as it happens.
- Now, do nothing but observe what comes up. Practice awareness. As sensations emerge in your body, just watch them. As feelings emerge in your awareness, just notice them. As thoughts come into your awareness, just watch them. Watch them come, and watch them go. Don't grab at anything, and don't push anything away.
- If your mind wanders, if you find yourself getting angry or sad or imagining something you want to say to someone and slipping into fantasy, just notice that you have wandered off and bring yourself back in touch. Notice how you get sucked into the content of your thoughts and start to fuse with them; notice your analytical, judgmental mind. Just notice without getting sucked in, and bring yourself back again, gently and without judgment. If you have judgments about how well or how poorly you are doing, just notice these too. Your job is simply to practice awareness. This means that if your mind wanders 100 times, then your job is to gently bring it back to this moment 100 times, starting with the present moment.
- Allow yourself to deeply experience the present moment. Be deeply present with yourself. Even if you are having thoughts or feelings that you don't like, try not to push them away. Adopt an attitude of acceptance towards all parts of your experience: treat every experience gently, even if the experience itself is undesirable. Gently be present with yourself.

Use this exercise for about 10 minutes every day until the next session.

Session 8: Combining Willingness & Cognitive Defusion

Overview of Session 8

Session 8 will continue to promote the context of cognitive defusion and will begin to combine this concept with the notion of willingness that was discussed in Session 6. The overall goal of this session is to continue the defusion process and to discuss commitment to a course in therapy.

Mindfulness Exercise: Clouds

"Close your eyes... first focus on your breathing. Just notice your breath as you take it in, it travels through your body, and then back out of your body... Notice how your body feels... Notice any tension in your body... and gently let it go..."

"Now picture yourself lying someplace outside where you can see the sky. You can picture any place that feels comfortable and vivid to you — lying on a raft in a pond, on a blanket in a field, on the deck of a house, anyplace where you have a clear full view of the sky. Imagine yourself, lying comfortably, your body sinking into whatever you're lying on, as you gaze at the sky... Notice the sky, and the clouds that hang in the sky, moving across it... See how the clouds are part of the sky, but they are not the whole sky... The sky exists behind the clouds... Imagine that your thoughts and feelings are the clouds in the sky, while your mind is the sky itself... See your thoughts and feelings gently drifting across the sky... As you notice thoughts and feelings, place them in the clouds and notice them, as they pass across the sky... Notice yourself as you become distracted, or immersed in the clouds, losing sight of the sky... notice how the clouds can be very light and wispy, or dark and menacing... notice how even when the clouds cover the sky, the sky exists behind them... Notice moments when your thoughts and feelings feel separate from you... and moments when they feel the same as you... picture the sky behind the clouds and the clouds drifting across the sky... practice putting your thoughts and feelings onto the clouds... notice the different shapes they take... the different consistency of the clouds they are on... when you find yourself feeling part of the clouds, slowly bring your attention back to the sky behind the clouds and practice putting your thoughts and emotions on the clouds... "

"Now slowly bring yourself back into this room... bring your attention to your breathing, the way you're sitting in the chair, your feet on the ground. When you're ready, open your eyes and look around."

Ask about the experience, particularly the struggle of separating from thoughts and feelings. Share your own experience with practicing this exercise. Spend some time on this – emphasize that this is a constant process, one that requires continual practice. It's very hard to experience self as separate from thoughts and emotions, but this can help with willingness.

Reactions to Previous Material

The therapist should ask the participant to share his or her thoughts about, and reactions to, the topics discussed in Session 7.

Review of Homework Assignment and CTD Experiences Since Session 7

The therapist should praise the participant for engaging in the self-monitoring process and using his/her CR's, and point out the importance of continued monitoring and the continued use of his/her CR's. Patterns and trends in the data should be discussed, and the therapist should ask the participant why he/she thinks certain trends in the ticcing may have developed (e.g., "Why do you think you ticced so often that day?").

The therapist should then ask the participant to review his/her "Awareness of Your Experience" practices. Special attention should be paid to participants noticing instances of cognitive fusion.

Continuing Discussion of Cognitive Defusion

The "Soldiers in the Parade Exercise" should help the participant distinguish between observing his/her thoughts and buying into or believing thought or concepts.

SOLDIERS IN THE PARADE EXERCISE

Therapist: I'd like us to do an exercise to show how quickly thoughts pull us away from experience when we buy them. All I'm going to ask you to do is to think whatever thoughts you think and to allow them to flow, one thought after the other. The purpose of this exercise is to notice when there's a shift from looking *at* your thoughts, to looking *from* your thoughts. You will know that has happened when the parade stops, or you are down in the parade, or the exercise has disappeared. I'm going to ask you to imagine that there are little people, soldiers,

marching out of your left ear, down in front of you in a parade. You are up on the reviewing stand, watching the parade go by. Each soldier is carrying a sign, and each thought you have is a sentence written on one of these signs. Some people have a hard time putting thoughts into words, and they see thoughts as images. If that applies to you, put each image on a sign being carried by a soldier.

Now here is the task. The task is simply to watch the parade go by without having it stop and without you jumping down into the parade. You are just supposed to let it flow. It is very unlikely, however, that you will be able to do this without interruption. And this is the key part of the exercise. At some point you will have the sense that the parade has stopped, or that you have lost the point of the exercise, or that you are down in the parade instead of on the reviewing stand. When that happens, I would like you to back up a few seconds and see whether you can catch what you were doing right before the parade stopped. Then go ahead and put your thoughts on the signs again, until the parade stops a second time, and so on. The main thing is to notice when it stops for any reason and see whether you can catch what happened right before it stopped. OK?

Participant: OK.

Therapist: One more thing. If the parade never gets going at all and you start thinking, "It's not working" or "I'm not doing it right," then let that thought be written on a sign and send it down into the parade. OK. Now let's get comfortable, close your eyes, and get centered. (*Help the participant relax for 1 or 2 minutes.*) Now allow the parade to begin. You stay up on the reviewing stand and let the parade flow. If it stops or you find yourself in it, note that; see whether you can notice what you were doing right before that happened, get back up on the reviewing stand, and let the parade begin to flow again. OK, let's begin... whatever you think, just put it on the signs.

Ok, now we will let the last few soldiers go by, and we will begin to think about coming back to this room. (*Help the participant re-orient for 1 or 2 minutes.*) Welcome back.

Therapist: What did you observe?

Participant: Well, at first it was easy. I was watching them go by. Then I suddenly noticed that I was lost and had been for about 15 seconds.

Therapist: Did you notice what had been happening right before everything stopped?

Participant: Well, I was thinking about how my body was feeling, and those thoughts were being written on the signs. And then I started thinking about my school situation and the test I have on Friday. I was thinking about how I might be anxious taking the test, since my final grade depends on it, and the next thing you know, it's a while later and I'm still thinking about it.

Therapist: So when the thought first showed up, "I'm going to be taking the test next Friday," was that thought written on a sign?

Participant: At first it was, for a split second. Then it wasn't.

Therapist: Where was it instead?

Participant: Nowhere in particular. I was just thinking it.

Therapist: Or it was just thinking you. Can we say it that way? At some point you had a thought that hooked you. You bought it and started looking *at* the world *from* that thought. You let it structure the world. So you started actually working out what might happen, what you will do, and so on, and at that point the parade has absolutely stopped. There is now no perspective on it — you can't even see the thought clearly. Instead you are dealing with the test.

Participant: It was like that. It was.

Therapist: Did you ever get that thought back on the sign?

Participant: Well, at some point I remembered I was supposed to let my thoughts flow, so I wrote the thought out and let a soldier carry it by. Then things went OK for a while, until I started thinking that this whole exercise is kind of silly.

Therapist: And did you notice that thought, or did it think you?

Participant: I bought it, I guess.

Therapist: What happened to the parade?

Participant: It stopped.

Therapist: Right. And check to see whether this isn't so... Every time the parade stopped, it was because you bought a thought.

Participant: It seemed that way.

Therapist: I haven't met anyone who can let the parade go by 100% of the time. That is not realistic. The point is just to get a feel for what it is like to be hooked by your thoughts and what it is like to step back once you're hooked.

Acceptance of Urges vs. Acceptance of Non-Valued Behavior: "Urge Surfing"

At this point, the therapist should say the following:

"Just as we can become hooked by our thoughts, we can also become hooked by our emotions and bodily sensations. Think about this in terms of your tics — in particular, your urges to tic. How often have you found yourself buying into your urges and starting to look *at* the world *from* the midst of your urges? How often have you let your urges structure your world? You get caught up in the urge and start thinking about what might happen, what you will do, and so on. This pulls you out of your life and prevents you from truly being in the present moment. The good news is this... Just like you did with your thoughts in the parade, you have the ability to step back whenever you get hooked by your urges. And like your thoughts, you can practice simply letting your urges flow, coming and going like the soldiers in the parade. Getting some perspective on your urges in this manner can help you respond to them more flexibly and skillfully. You might even choose to 'surf' your urges to tic, riding them out as they rise, peak, and eventually fall away. Let's try this now."

At this point, the therapist should guide the participant through an experiential exercise in which the intensity of one of the participant's urges to tic will be rated by the participant (on a scale of 1-to-10) and recorded by the therapist. The participant should be asked for an intensity rating at regular intervals (e.g., every 15 seconds) and should be instructed to mindfully observe the progression of the urge, without ticcing. Some participants will have more difficulty with this exercise than others. The participant should be told to simply do his/her best and to notice any judgmental thoughts that arise. A brief relaxation exercise may be helpful

here. For added illustration, once the participant's urge has passed, the therapist can plot the data on a graph of intensity versus time. The overall goal of the exercise is to help participants feel less fused with and controlled by their urges, and to begin to view urges as fleeting private content rather than mandatory commands.

"So what was that like for you — surfing your urge instead of immediately reacting to it? (*Discuss participant's experience.*) You can think of urge-surfing as a type of competing response, since it also functions to interrupt the 'URGE → TIC → RELIEF' cycle we talked about in our first session. More importantly, though, generating a more willing, accepting attitude toward your urges can help free you from the need to attend to them. So the energy you've been putting into controlling your urges can be directed toward pursuing more valued life directions."

Acceptance as an Acquired Skill

The therapist should emphasize that willingness to experience private events is a learned skill, and that the participant should look for experiences in which he or she can try to improve this skill. Part of the remaining therapy will involve seeking out opportunities to practice acceptance of private experiences.

Discussion of "Searching for Mr. Discomfort"

Partly as a way to prepare the participant for practicing the acceptance-based strategies, the therapist and participant will discuss the idea of looking for situations where the urge to tic is high. Discuss the idea that the participant should actually try to find the urge to tic and allow him or herself to experience the situation fully, thinking of "urge surfing" as a sophisticated competing response. This concept will be presented with the use of the following exercise (Hayes et al., 1999, p. 247).

SEARCHING FOR MR. DISCOMFORT EXERCISE

We're going to go out and find Mr. Discomfort, to try to call him forth, talk to him, and find out what's going on in your relationship with him. If Discomfort does not show up, that's OK. Our goal is just to experience being willing to have him there. If he does show up, and at any time you find you are not willing to stay and see what happens, that's OK too. Still, this is a commitment you've made, so I'd like you to see whether you can stay with it.

Assign Homework

The participant will be asked to complete the “Searching for Mr. Discomfort” Form as a way to identify those situations where the urges and other private events surrounding the ticcing are likely to occur. The participant should continue to monitor the frequency of his/her most bothersome tics. The participant should practice engaging in “urge surfing” as the competing response whenever he/she experiences one of the warning signs of ticcing, begins to tic, or notices he/she has just ticced. The participant will be asked to engage in “urge surfing” until the urge has dissipated.

“Searching for Mr. Discomfort” Form

Name:	Date:
List the times of the day when you felt the urge to tic:	
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List the activities you were involved with when you experienced the urge to tic:	
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List the settings you were in when you experienced the urge to tic:	
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Session 9: Commitment to Valued Action

Overview of Session 9

Session 9 will continue the discussion of commitment introduced in session 8, broadening the concept to include commitment to valued action, as well as commitment to a course in therapy. The difficulty of commitment is acknowledged by the therapist, along with the fact that commitment is a process. The therapist should emphasize how commitment allows us to engage in purposeful, intentional action. The participant will be helped to make a commitment to behavioral actions consistent with his or her previously identified values.

Mindfulness Exercise: 3 Minute Breathing Space

Therapist: Before we go over your homework, I'd like to do another mindfulness exercise with you. This is a briefer exercise that puts together a lot of what we've been practicing. This will allow you to use this kind of practice during your day, giving you another way to apply mindfulness to your life. The exercise is designed to be like an hour glass — first you'll bring awareness to your experience (the top wide part), then you'll narrow to your breath, to ground you, then you'll expand back out.

The first thing I want you to do is to take a very definite posture... relaxed, dignified, back erect, but not stiff, letting your body express a sense of being present and awake. Now close your eyes, if that feels comfortable for you... The first step is being aware of what is going through your mind... What thoughts are around? Here, again, as best you can, just note the thoughts as mental events... So we note them, and then note the feelings that are around at the moment... in particular, turn toward any sense of discomfort or unpleasant feelings. So rather than trying to push them away or shut them out, just acknowledge them, perhaps saying, "Ah, there you are, that's how it is right now." And similarly with sensations in the body... Are there sensations of tension, of holding, or whatever? And again, bringing awareness of them, simply note them. "OK, that's how it is right now."

So, you've got a sense of what is going on right now. You've stepped out of automatic pilot. The second step is to collect your awareness by focusing on a single object — the movements of the breath. So

focus attention down there in the movements of the abdomen, the rise and fall of the breath... spend a minute or so focusing on the movement of the abdominal wall... moment by moment, breath by breath, as best you can. So that you know when the breath is moving in, and you know when the breath is moving out. Just bind your awareness to the pattern of movement down there... gathering yourself, using the anchor of the breath to really be in the present.

And now as a third step, having gathered yourself to some extent, allow your awareness to expand. As well as being aware of the breath, also include a sense of the body as a whole. So that you get this more spacious awareness... a sense of the body as a whole, including any tightness or sensations related to holding in the shoulders, neck, back, or face... Follow the breath as if your whole body is breathing. Hold it all in this slightly softer, more spacious awareness. And then, when you are ready, just allow your eyes to open.

Ask about the participant's experience. Talk about how this might be used during the day, and suggest that the participant add this as an informal mindfulness practice to try out during the week.

Reactions to Previous Material

The therapist should ask the participant to share his or her thoughts about, and reactions to, the topics discussed in Session 8.

Review of Homework Assignment and CTD Experiences Since Session 8

The therapist should praise the participant for engaging in the self-monitoring process and practicing "urge surfing" as his/her CR. The importance of continued monitoring and use of the "urge surfing" CR should be emphasized, and patterns and trends in the data should be discussed. The participant should be given the opportunity to acknowledge any reactions he/she may have had to the use of the "urge surfing" procedure, including any ticcing related private experiences that may have arisen. Any difficulties the participant had should be addressed.

Careful attention should be given to processing the use of "urge surfing" as a chance to practice experiential willingness, and the therapist should ask what happened to the private events when they were accepted. The therapist and participant can review the "Searching for Mr. Discomfort" assignment as part of this process.

The Concept of Commitment

Discuss the idea of commitment in greater depth. The client's unwilling and distressing responses to his/her urges and tics are impairing his/her life. What needs to be done to change behavior from habitual ways of responding in the service of avoidance (e.g., avoidance of urges) to value-driven choices? The main points to cover here are:

1. Can the client commit to the *idea* of committing to valued behavior?
2. Are there one or two particular areas that currently need some commitment? What are areas in the client's life that are important and have been highly affected by avoidance?
3. Talk about commitment as a process. It's important to emphasize that we are talking about committing to an intention, not an action. We know that many things can get in the way of carrying out an action; however, we can all maintain a commitment to a certain course, regardless of how we actually act. It is important for the focus to be on *noticing* any failure to act consistent with a value and *reorienting* to the commitment, rather than beating oneself up for the failure. The goal is to repeatedly recommit, not to never waver or falter. Wavering and faltering are part of the process.
4. Commitment recognizes that thoughts, feelings, ambivalence and doubt will come and go. As we discussed in willingness, one's feelings about committing to a particular area may wax and wane. Once someone makes a commitment, they may doubt that commitment, or if they feel it is not going well, they may want to give up and change direction. It can be helpful to cultivate patience — maybe staying with a given value for an extra week or two past the moment when doubt arises, in order to see if doubts continue, or if they are part of the natural process of change. Help clients open up to the idea of hanging in there and sticking with an intention, even when there are reasons to make a change.

At this point in the session, the therapist should say something like:

"Last week we talked about commitment to a course in therapy and being more willing to experience your tic-related urges, thoughts, and feelings. Today we will talk about committing to valued actions in other domains of your life. People who have tics sometimes use their tics as reasons for not engaging in activities that are otherwise important to them. This can result in the person living an increasingly restricted and unfulfilling life — inadvertently maintaining and/or exacerbating their tics. (*Check to see if the participant has had any similar experiences.*) Today we will begin to identify actions for you

to try out in the coming week, consistent with the values you wrote about earlier in treatment.”

Using the client’s “Values Assessment Rating Form” as a guide, the therapist should work with the client to identify 2 or 3 specific actions he/she can perform during the upcoming week, to help him/her begin moving in more valued directions. The actions should be concrete and manageable and should be written on the “Values Monitoring” sheet to be completed by the client as a homework assignment (see attached).

This is the first time the therapist will be assigning behavioral action in valued domains as homework (even though many clients will already be taking some action, as a result of the issues previously discussed in therapy and the values monitoring). To help prepare the client for the assignment, spend some time underscoring the following points:

1. Despite an intention to engage in valued activities, he or she will inevitably experience failures to act.
2. An awareness of the factors involved in these failures can increase the probability of future successes.
3. The most common factors involved in failures to act are internal barriers.
4. Internal barriers are best responded to with an increased experiential contact with one’s valued directions, awareness of previous attempts at behavioral and experiential avoidance, practice in mindfulness (which facilitates cognitive and emotional defusion), and practice in participation in valued activities, which can be positively reinforcing.

Assign Homework

The participant should continue monitoring the frequency of his/her most bothersome tics. The participant should also continue practicing “urge surfing” as the competing response whenever he/she experiences one of the warnings signs of ticcing, begins to tic, or notices he/she has just ticced. The participant will be asked to engage in “urge surfing” until the urge has dissipated.

The participant should complete the “Values Monitoring” sheet for the 2-3 actions he/she committed to doing during the upcoming week.

Values Monitoring

Write down a few commitments that you would like to make for the week. A commitment should include a behavioral action and the willingness to remain present during the action.

Over the week, note some times when you acted consistently with your values and some times when you did not. Include in this monitoring activities related to the commitments that you made. Notice any potential obstacles that came up that got in the way of you engaging in valued activities. Jot down any observations that you notice about your valued action.

Date/Time	Valued Activities	Obstacles

Session 10: Review & Relapse Prevention

Overview of Session 10

Session 10 will review the various HRT and ACT interventions presented during the course of the treatment. Particular attention will be paid to the concepts of willingness, defusion, “urge surfing”, and commitment to valued action. Session 10 will also mark the beginning of relapse prevention procedures.

Mindfulness Exercise

The therapist should guide the participant in any of the mindfulness exercises presented thus far in treatment (e.g., Mindfulness of Breath, Awareness of Physical Sensations, The Mountain Meditation, Awareness of Your Experience, Clouds, Soldiers in the Parade, or 3 Minute Breathing Space). It is suggested that the therapist choose an exercise that the participant seemed to connect with or found to be especially helpful or useful.

After the exercise, ask about the participant’s experience, and discuss any practice using informal mindfulness during the week.

Reactions to Previous Material

The therapist should ask the participant to share his or her thoughts about, and reactions to, the topics discussed in Session 9.

Review of Homework Assignment and CTD Experiences Since Session 9

The therapist should praise the participant for engaging in the self-monitoring process and practicing “urge surfing” as his/her CR. The importance of continued monitoring and use of the “urge surfing” CR should be emphasized, and patterns and trends in the data should be discussed. The participant should be given the opportunity to acknowledge any reactions he or she may have had to the use of the “urge surfing” procedure, including any ticcing related private experiences that may have arisen. Any difficulties the participant had should be addressed.

The therapist should then review the participant’s “Values Monitoring” assignment. Actions taken in the previous week are reviewed, as are reasons for inaction. Both external and internal barriers should be addressed. For instance, if a client did not initiate a conversation with a peer because he/she couldn’t figure out what to say, time would be spent generating possible exchanges and role-playing the conversation. For internal obstacles (e.g., distressing feelings), willingness is practiced (for instance, through imaginal exposure or an in-depth

discussion of the original value upon which the specific action is based). Exercises promoting mindfulness of emotions or opening up to distress may be helpful here, as well. Practicing mindfulness of emotions often helps clients get a better sense of exactly which internal experiences are getting between them and a given action. Defusion and de-centering exercises can then be used to help increase the client's willingness to bring these experiences along with him/her while engaging in valued action.

Commitment and Valued Action

It is not uncommon for the client to begin to question his/her values as he/she begins to commit to taking action. The client may struggle with which value is most important to him/her, or which action best represents his/her value. There is no easy answer to this struggle. For instance, in the case of a client who has fears related to taking a management position at work, the client may learn that he/she values a management career and should move forward (which really could be a way of avoiding social and family values) or he/she may learn that he/she values family and social relations and should take a less demanding job (which could be avoidance of fears of work failure). The therapist should be aware of the potentially avoidant function of any activity in a valued area and should talk about this in session. The best way for the client to determine what is a valued activity and what is avoidance is to take action and reflect on his/her experience (does he/she feel fulfilled, satisfied, etc.?). As different values emerge, these are attended to in similar ways — identify actions that can be taken, potential barriers, and ways of responding to those barriers.

Again, the therapist will want to attend to the concept of balance. Clients do not have to value one domain above another in order to choose action. Clients should be encouraged to think generally about all of the domains and their specific values within each domain, and to work toward tending to each domain at some point in the course of living. It may be that, for a given time period, one domain is given precedence. For instance, someone who is really far from living according to his/her values in terms of relationships, but who has been living a valued life professionally, may want to achieve balance by focusing much more on relationships for awhile. Or a particularly challenging time at work or in school may necessitate some sacrifices in other domains. The main goal is for no domain to go completely unattended. Choice means being aware when one is attending to one domain at the cost of another. Again, engaging in action and remaining mindful of the consequences will help clients make the necessary adjustments in order to increase satisfaction.

Although attention should be paid to each of the domains and to the client's specific values, therapists should also help clients gradually shift to a more generalized stance of living a valued life. That is, clients are encouraged to go through their lives aware of the choices they are making in each situation, and

considering whether such choices are in line with what matters to them. Thus, the structure of specific domains may fall away over time, replaced by a more non-specific habit of living one's life in a way that is meaningful, day to day, throughout one's existence. Again, living a valued, consciously chosen life is considered a process, like mindfulness — something that we each return to over and over again.

As before, valued action may mean doing new things, or it may mean bringing mindfulness to activities the client is already engaged in. Actions can range from very concrete tasks, such as getting information about gyms in the area or looking in the paper for jobs, to more abstract practices like being attentive to one's partner in a conversation or bringing mindfulness of emotions to a particular situation. It can be helpful to balance more emotionally challenging tasks with more concrete tasks, and often it is useful to build toward more challenging actions. For instance, with a client who is still struggling with experiential avoidance, it may be helpful to begin with actions like 'taking an aerobics class' that are less likely to be avoided, so the client can begin to experience success and the positive reinforcement of engaging in chosen actions. This provides a foundation for building up to more challenging actions, like asserting one's needs with one's partner. However, it is important not to feed a client's avoidance by only assigning concrete, less emotionally intense tasks. Experiential acceptance and willingness is learned primarily through experience, so it is important that clients engage in emotionally evocative actions.

The therapist may choose to assign values writing assignments as new values emerge and further clarification is needed, or new obstacles arise, particularly if the early writing assignments were beneficial for the client.

Relapse Prevention Strategies

Session 10 marks the end of the acute treatment phase. As such, the therapist should prepare the participant for the upcoming break from formal treatment. The purpose of 'relapse prevention' is to identify situations that will put the participant at risk for falling back into an experientially avoidant pattern of behavior and, thus, beginning to re-engage in ticcing. To introduce the concept of relapse prevention, it may be useful to refer back to the 'Passengers on the Bus Metaphor' used in earlier sessions. This can be introduced as follows:

"Do you remember the *Passengers on the Bus Metaphor*? Well, one of the goals of this therapy has been to gradually move you into the driver's seat, and to get me out of the bus. In order to accomplish this, you've probably noticed that I have become less active, and you may have found yourself being more active in discussing and applying the concepts that we've talked about. We're getting to the point now where I'm leaving the bus, and you'll be driving solo. To prepare for

that, it might be useful to discuss how to handle things that might get in your way as you begin to drive.”

Here the therapist and participant can review strategies the participant has found to be helpful, in terms of managing and relating to his/her tics. In addition, situations that are more likely to trigger urges to tic can be discussed, along with strategies for handling these situations. The concepts of willingness and commitment to valued action should be woven throughout this discussion, with an emphasis on living a meaningful life, rather than controlling or suppressing urges/tics.

Lapse vs. Relapse

The idea that occasionally, the participant may find him/herself struggling with ticcing again should be brought up. This should be framed as a *lapse*, rather than a complete *relapse* in his/her condition. The participant should be encouraged to look at a lapse in ticcing as an opportunity to re-evaluate his/her willingness scale and efforts to utilize HRT procedures (e.g., “urge surfing”).

Vigilance in Using HRT

The participant should be made aware of typical patterns in HRT compliance. As persons using HRT begin to meet with success, they typically become less compliant with the procedures. To counter this, it may be useful for the participant to schedule daily practice sessions during which they practice “urge surfing” procedures on real or simulated episodes of ticcing.

Increase in Cognitive Fusion

Because the participant has been functioning in a context that supports cognitive fusion, he/she may find him/herself reacting to thoughts, urges, or emotions as if they were real events with physical characteristics. If he/she notices this, there should be a plan established to remind him/herself of the defusion exercises and to practice them on a daily basis.

Returning to the Old Agenda

The participant may begin to notice a return to an old agenda of attempting to control negative private experiences (e.g., urges to tic, or thoughts and feelings surrounding the ticcing). An increase in ticcing may be a signal that this is occurring. Should the participant notice that this is occurring, he/she should contact the therapist and discuss possible ways to return to the agenda of acceptance and willingness.

Assign Homework

The session concludes with commitment to valued actions for the upcoming month. Once again, the participant should be provided with “Values Monitoring” forms to keep track of his/her attempts at valued action, including any obstacles encountered.

The participant should continue monitoring the frequency of his/her most bothersome tics. The participant should also continue practicing “urge surfing” as the competing response whenever he/she experiences one of the warnings signs of ticcing, begins to tic, or notices he/she has just ticced. The participant will be asked to engage in “urge surfing” until the urge has dissipated.

Sessions 11 & 12: Follow-Up

Overview of Sessions 11 & 12

Sessions 11 and 12 are follow-up meetings, held one month and two months after the end of acute treatment. The primary focus is continued review of the various HRT and ACT interventions presented during the course of the treatment, along with a continued focus on relapse prevention.

Mindfulness Exercise

The therapist should guide the participant in any of the mindfulness exercises presented thus far in treatment (e.g., Mindfulness of Breath, Awareness of Physical Sensations, The Mountain Meditation, Awareness of Your Experience, Clouds, Soldiers in the Parade, or 3 Minute Breathing Space). It is suggested that the therapist choose an exercise that the participant seemed to connect with or found to be especially helpful or useful.

After the exercise, ask about the participant's experience, and discuss any practice using formal or informal mindfulness during the past month.

Check-In and Reactions to Previous Material

The therapist should check-in with the participant regarding how he/she has been doing, in terms of (1) managing and relating to his/her tics, and (2) engaging in values-consistent action. The participant should be encouraged to share his/her thoughts about, and reactions to, any of the topics previously discussed in treatment, as well as his/her experiences acting as the "driver of the bus" (see 'Passengers on the Bus Metaphor' used in earlier sessions).

Review of Homework Assignment

The therapist should praise the participant for engaging in the self-monitoring process and practicing "urge surfing" as his/her CR. The importance of continued monitoring and use of the "urge surfing" CR should be emphasized, and patterns and trends in the data should be discussed. The participant should be given the opportunity to acknowledge any reactions he or she may have had to the use of the "urge surfing" procedure, including any ticcing related private experiences that may have arisen. Any difficulties the participant had should be addressed.

The therapist should then review the participant's "Values Monitoring" assignment. Actions made in the previous month are reviewed, as are reasons

for inaction. Both external and internal barriers should be addressed. Exercises designed to promote willingness, mindfulness of emotions, and/or opening up to distress may be helpful here. Practicing mindfulness of emotions often helps clients get a better sense of exactly which internal experiences are getting between them and a given action. Defusion and de-centering exercises can then be used to help increase the client's willingness to bring these experiences along with him/her while engaging in valued action.

Relapse Prevention Continued

Once again, the therapist and participant can review strategies the participant has found to be helpful in terms of managing and relating to his/her tics. In addition, situations that are more likely to trigger urges to tic can be discussed, along with strategies for handling these situations. The concepts of willingness and commitment to valued action should be woven throughout this discussion, with an emphasis on living a meaningful life, rather than controlling or suppressing urges/tics.

Lapses and occasional increases in cognitive fusion are to be expected, and should be framed as learning opportunities and a chance to re-commit to willingness and valued action. The therapist should predict that emotional distress will re-emerge and that there will be times when the client feels that the gains of therapy have been lost. This should be described as a natural part of the process of life, and plans should be made for how to deal with this (e.g., reviewing handouts, increasing or re-engaging in mindfulness practice, recalling particularly helpful mindfulness exercises, bringing attention to valued domains, and/or doing some values writing). The therapist and client should collaboratively develop a personalized list of elements that have been particularly helpful for the client and that the client wants to return to. Areas of valued action that the client still wants to work on should also be reviewed.

Termination

During the final session, time should also be spent discussing the end of the therapeutic relationship and allowing the client to express feelings related to that termination, particularly as they relate to other themes in the client's life.

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Biography

Stephanie Helena Best, M.A., was born on August 21, 1974, in Wilmington, Delaware. In 1996, she graduated summa cum laude with a B.S. in Biology and a minor in Chemistry from the University of North Carolina at Chapel Hill (UNC). She later attended the University of California, Santa Barbara (UCSB), where she earned her M.A. in Biological Sciences in 1999. In 2002, after taking a year of psychology prerequisites at Santa Barbara City College (SBCC), Stephanie was admitted to the Department of Psychology & Neuroscience's program in Clinical Psychology at Duke University. She received her M.A. from Duke in 2006 and expects to receive her Ph.D. in September 2009. Stephanie is currently completing a pre-doctoral clinical internship at the Raleigh, North Carolina, campus of Central Regional Hospital. She will begin a post-doctoral Psychosocial Rehabilitation and Recovery Fellowship at the Veterans Affairs Medical Center in Durham, North Carolina, in September 2009. Since graduating from UNC, Stephanie has been awarded a National Science Foundation Graduate Fellowship and a UCSB Departmental Regents Fellowship, in addition to being recognized by SBCC for Outstanding Achievement in General Psychology and designated a Duke University Dean's Finalist for the Dolores Zohrab Liebmann Fund Fellowship. She is a member of the American Psychological Association, the Association for Behavioral and Cognitive Therapies, the Association for Contextual Behavioral Science, and the North Carolina Psychological Association.